Savings and Investment Decisions in Low-Income Resource-Rich Countries

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September, 2011

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1. Introduction

Many of the poorest countries on Earth are in the throes of a double-bonanza of high prices for their natural resource exports coupled with new discoveries. Over the next decade the potential financial flows from resource exports dwarf aid, remittances, and FDI, providing an unprecedented opportunity for development.

Directly, high prices disproportionately increase the rents available for governments. While prices may have peaked, Asian growth seems likely to sustain them well above past levels: an aspect of 'the new normal'. Indirectly, the high prices have triggered prospecting. Although Africa is considered resource-rich, as of the millennium the value of discovered sub-soil assets per square mile was only one-fifth that of the OECD. It is unlikely that this is because there is less below the ground: rather, there had been less prospecting. New discoveries are therefore concentrated in Africa and the other neglected, impoverished and misgoverned parts of the world such as Central Asia. A reasonable assumption is that new search will gradually bring discovered sub-soil assets up to around the OECD level, - i.e. a fivefold increase.

This unprecedented opportunity requires distinctive and sometimes non-obvious economic policy responses. This is the subject of Section 2. The actual policy record suggests that taking the right decisions is politically difficult. Section 3 proposes approaches that might bring policy choices closer to the theoretical ideal.

2. The Distinctive Economics of Resource Depletion in Low-Income Countries

Resource-rich, low-income countries face common challenges and need saving and investment policies that are broadly common. Further, these common policies are distinctive relative to other countries. All resource-rich countries need policies that differ from resource-scarce countries. However, those resource-rich countries that are low-income need policies that differ from those that are high-income. An important implication is that there are no OECD role-models. Not only are OECD countries high-income, but nearly all are resource-scarce. As a result, the prevailing OECD policy discourse inevitably neglects the saving and investment policies which are of fundamental importance to resource-rich, low-income countries. Even the few OECD countries that are resource-rich - Norway, Canada and Australia – are inappropriate role-models for these decisions. The common challenges faced by resource-rich, low-income countries only they face.

Since the saving and investment challenges are qualitatively common to the entire category of countries, the design of policies that are appropriate for them is an international public good, though not a global public good. As an international public good it is appropriately supplied by the International Financial Institutions rather that by each government individually: most resource-rich, low-income governments are ill-equipped for original economic policy design. However, in providing the public good of economic policy advice, it is vital that the IFIs

recognize that policy in this category of countries should be distinctive. Policies which are 'sound' for other categories of country would be fundamentally unsound for resource-rich, low-income countries. Neither staff trained in OECD macroeconomics, nor those trained in development economics, are adequately equipped for this task so that specific training is required.

I now discuss the distinctive aspects of savings and investment in low-income, resource-rich countries.

2.1 Rents and the Role for Government

The economic returns on the activity of resource extraction come partly in the form of factor incomes to capital and labour, and partly in the form of rents. Some of these returns accrue to nationals of the country, and some to foreigners. In low-income Africa relatively little of the factor income is likely to accrue to nationals: the massive capital investments required for resource extraction can only be financed by international companies, and the sophisticated skills required are only possessed by foreigners. Hence, the returns available to accrue to nationals are disproportionately rents. However, rents initially accrue to the resource extraction companies: they only accrue to nationals to the extent that the government is able to transfer them to itself through taxation in various forms. Thus, the predominant means by which the country can benefit from resource extraction will typically depend upon the efficacy of government rent capture. An implication is that for low-income countries government is central in making resource extraction nationally beneficial. The rents must accrue as public revenue; once accrued the government is then inevitably responsible for spending them. Low-income, resource-rich countries should therefore have a large and active state. This contrasts both with those low-income countries that are resource-scarce, and with those resource-rich countries that are high-income. The former will develop through the expansion of industry, services and agriculture in all of which rents are modest and much of the factor payments accrue privately to nationals. In the latter, exemplified by the USA, rent capture by the government is less important because factor incomes accrue largely to nationals, as do rents left with the extraction companies.

2.2 Savings: Depletion Matters

The extraction of mineral resources is unsustainable because endowments are not renewable. The appropriate savings rate from such natural resource revenues depends upon the horizon to depletion. For a given extraction rate, *the shorter the horizon until expected depletion the higher should be the savings rate*. This follows straightforwardly from the permanent income framework. For a given extraction rate, and hence a given annual revenue, the shorter is the extraction period the lower is the present value of the resource endowment and hence permanent income – the sustainable increase in consumption. With less consumption warranted from a given resource revenue, the higher is the savings rate.

A straightforward but important corollary is that for a given constant rate of extraction, *the savings rate should rise as resources are depleted*. Each year the horizon to full depletion is shorter and so the appropriate savings rate is higher. By the final year of depletion, the savings rate out of the revenues from extraction should be 100 percent.

Applying this to Africa, because the really large deposits of natural resources are easier to find than smaller deposits, those deposits that were still awaiting discovery when the present commodity boom started were disproportionately smaller than those already discovered. Evidently, smaller deposits are depleted more rapidly than larger deposits, so the time-frame for depletion is liable to be shorter for recent and forthcoming discoveries than the historical norm. For example, the oil fields typically being discovered in Africa usually have an economic life of only around two or three decades. Hence, the initial savings rate out of the revenues from extraction should be higher than in the Middle East where deposits typically have a longer life.

The physical rate of extraction is seldom constant. More typically, it follows a humped pattern, rising to a peak and then tapering off. Evidently, when extraction is at its peak and set to decline, some of the volume can be sustained only briefly and so the savings rate should be higher. Conceptually, each unit of volume regularly extracted has a specific time-to-exhaustion and hence a distinct path of the savings rate from the revenues generated by it. In the phase of rising extraction rates, as time passes not only is the horizon for the existing volume of extraction getting shorter, but each addition to volume has a shorter horizon than the existing volume. *Both influences imply that in the phase of rising extraction the rate of savings should rise particularly rapidly.*

A final proposition on the appropriate savings rate from depleting resources is that *the savings rate varies inversely with the expected long run rate of change in the world price of natural resources*. According to the Hotelling Rule the price of natural resources can be expected to increase at the world rate of interest. In practice, prices of natural resources do not follow this predicted path and it would be highly risky for the governments of resource-rich countries to assume that they would. However, to see the difference that the assumed path of prices makes consider a scenario in which the world interest rate is two percent and the initial resource discovery will be depleted at a constant physical extraction rate over fifty years. In this benchmark case, in the first year of extraction the appropriate savings rate out of the revenues from extraction would be zero: permanent income would be maintained purely by the rise in the value of resources remaining in the ground. With a constant extraction rate the appropriate savings rate would rise linearly from 0 percent in the first year to 100 percent in the fiftieth year. The other extreme from assuming that prices follow the Hotelling Rule is to assume that they will collapse to zero next year and remain there. On this assumed price path the appropriate savings rate is always 100 percent (the ‘Bird-in-the-Hand Rule’). More generally, the more valuable that natural resources left in the ground are assumed to become, the higher is the permanent income that can be supported by their gradual depletion. Hence, for any given

physical extraction rate the higher is the consumption that is warranted, so that less of the revenue needs to be saved.

Whereas the Hotelling Rule provides a reason to expect that natural resources will become continuously more valuable, the historical experience has been of eventual technological obsolescence. When the price of a commodity rises there is investment in research to develop substitutes. Ultimately the Hotelling Rule gets overridden: a time is reached at which people expect the resource to become less valuable but the remaining endowment cannot quickly be extracted and sold off because the costs of extraction would become prohibitive. Those who have gambled on continued rising prices get caught and suffer losses. The lags in technological obsolescence are long and variable, but since global technological research has intensified, they may well be shortening.

Perhaps a reasonable compromise between the cheery implication of the Hotelling Rule and concerns about technological obsolescence is to assume that over the horizon of a generation there will be no trend change in the real level of prices but that thereafter either physical exhaustion or obsolescence is a serious prospect.

2.3 *Savings: the Prospect of Convergence*

A low-income society with significant natural resource endowments can reasonable expect that, if it manages its opportunities effectively, it will gradually converge with richer societies. In effect, by appropriately saving and investing the revenues from its depletion of natural assets, the economy can rectify its initial shortage of capital, in the process enjoying a phase of growth in excess of global rates.

An important implication is that per capita consumption today is markedly lower than it will be in the future. On the usual Utilitarian framework this justifies some redistribution of consumption from the low-marginal-utility future to the high-marginal-utility present. In other words, *it justifies having a lower savings rate in the early period of resource extraction than would be warranted by an application of the permanent income framework* (Van der Ploeg and Venables, 2011; Collier et al. (2009).[1] [2]

[1] Van der Ploeg, R. and A. Venables, 2011, Harnessing Windfall Revenues: Optimal Policies for Resource-Rich Developing Countries, *Economic Journal*, 121, pp.1-30. P. Collier, R. van der Ploeg, M. Spence and A. Venables, Managing Resource Revenues in Developing Countries, *Staff Papers*.

[2] The Utilitarian framework sees no ethical problem in a poor current generation raising its consumption at the expense of future generations by using up the national endowment of natural assets. However, while this ethics is common among economists, it is probably not shared by many ordinary citizens. In particular, many young people may feel that the generation in power has a responsibility of *stewardship* towards natural assets: if natural assets are exploited, equivalent value should be passed on to future generations. As I argue in *The Plundered Planet* (OUP 2010), this need not imply a reversion to the Permanent Income implication of 100 percent savings rate. In a capital-scarce economy, properly invested savings should be able to generate a return above any return earned by leaving the natural assets in the ground (the world rate of interest if the Hotelling Rule were to be relied upon). For example, if the rate of return is double the world interest rate, the present generation can satisfy the obligation of passing on

Of course, this is conditional upon convergent growth, and so depends upon the society adopting and maintaining appropriate savings and investment policies from resource depletion. However, a virtue of the assumption of convergence is that it provides a coherent policy vision: *if the policies are implemented the outcome will validate the choice of policies*. The apparently more cautious policy would be to assume that either savings or investment policies will not be implemented, so that the economy will not converge, in which case the society should rationally have a higher savings rate initially. Yet planning an optimal savings policy for current revenues conditional upon other policy mistakes rapidly leads into policy confusion: for example, if it is assumed that current savings will subsequently be squandered it is better not to save at all. The approach taken here is first to establish what an optimal policy set would look like and then propose a political-economy solution to the practical challenge of getting these decisions taken.

The assumption of convergence justifies an initial savings rate out of resource depletion somewhat lower than that which would be implied by a simple application of permanent income. However, the appropriate initial savings rate is still likely to be substantial. *Since the justification for a lower savings rate is the prospect of convergence the investment rate must be consistent with convergence*. To date, Africa's investment rate of around 20 percent has been considerably below that of emerging Asia which has mostly been above 30 percent. For Africa to assume convergence with emerging Asia yet persist with an investment rate far below that of Asia would be to place too much reliance upon achieving a rate of return on investment well above global rates. The prudent course is therefore to raise the investment rate to above 30 percent as soon as practically possible. In turn, this implies that the initial savings rate out of resource depletion should probably be no lower than 30 percent. If the onset of resource revenues yields a quantum increase in overall government revenues the implied increase in consumption might pose transitional problems which temporarily warrant a higher savings rate: this is discussed in the next sub-section.

2.4 Investment: Capital-Scarcity and Investment Capacity

Convergence depends upon investment which gradually rectifies capital-scarcity. This has an important implication for the choice of assets acquired with the savings from resource depletion. Whereas a capital-abundant economy such as Norway should rationally acquire claims on capital in other economies that are less capital-rich, a low-income economy should acquire capital domestically.

There is an important caveat to such a policy. Whereas savings is generic, physical investment is always specific and so requires a decision process that designs, selects and implements projects. One reason why low-income societies are capital-scarce is that they do not have the capacity to

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equivalent value to future generations with a savings rate of only 50 percent. Hence, both Utilitarian ethics and the ethics of stewardship imply qualitatively the same strategy: savings rates out of income from natural resource extraction should be above that on other income but less than 100 percent.

manage domestic investment well. Further, if the investment rate is to be increased from around 20 percent to around 30 percent, the demand for the capacity to manage the investment process will increase by 50 percent. The likely consequence of such an increase in the demands placed upon already weak capacity would be deterioration in the efficiency of the investment process. In turn, this would manifest itself as a decline in the rate of return on investment. This is not just hypothetical. Globally, episodes of large surges in the investment rate are not usually followed by accelerations in growth: high investment is dissipated in reduced returns.

Hence, a critical stage prior to an increase in domestic investment is to build the capacity to manage it. I term this process 'investing-in-investing'. It has three components. One is the capacity to manage the process of public investment: project design, appraisal and selection, implementation, and *ex post* evaluation. These are the capabilities assessed by the new *Public Investment Management Index* of the IMF. The Index provides a useful benchmark to judge improvements, and potentially also can be used in a decision rule as to when the return of public money held abroad is warranted.

The second component is to improve the environment for private investment. Public and private investments are complements – for example, roads and trucks – so that the return on either depends upon investment in the other. The environment for private investment is already reasonably well-measured by the *Doing Business* annual rating of the World Bank. The government of Rwanda has demonstrated how it is possible to improve performance on this rating very rapidly: Rwanda has now overtaken several European countries.

The third component is for policy to reduce the unit cost of capital goods for both public and private investment. Typically in Africa capital goods are expensive.[3] Structures are costly because construction costs are avoidably high: the market for urban land is restricted, there are impediments to imports of key inputs such as cement, and there has been little training in construction skills. Conceptually, government policies need to shift down and flatten the supply curve of construction so that the large increase in demand, (which is inevitable if depleting natural assets are to be converted into domestic capital), should not be dissipated in higher unit costs. It would be useful to build an international index to benchmark and monitor construction costs analogous to PIMI and *Doing Business*. Equipment, though imported, is costly because national markets are too small to be competitive and trade barriers have inhibited the emergence of regional markets. Trade policies and behind-the-border measures could regionalize the market in capital goods, leading to lower mark-ups. Again, a benchmarking index would be useful.

Investing-in-investing takes time, but it is concerned with a manageable set of tasks, processes and skills. Emerging Asia was able to build its investment capacity, ramping up its investment rate without the return on investment collapsing. Once policy makers recognize that in the sequence of policies for development investing-in-investing must precede an increase in

[3] The Penn World Tables provides some evidence of high unit costs but is not suited to benchmarking for tracking improvement.

domestic investment then it should be feasible over the course of a decade. Until investment capacity is built, the increase in savings generated from resource depletion should be parked abroad in financial assets. The time-scale for such saving abroad is, however, much shorter than that adopted by Sovereign Wealth Funds: the objective is to preserve asset value until investment capacity has expanded sufficiently for the money to be brought back and invested domestically. Hence, the asset composition should be more conservative than in a SWF.

2.5 Absorption and Temporary Saving Abroad

The above concerns about the capacity to invest have been microeconomic. Potentially, as investment spending is ramped up it may also generate macroeconomic effects. However, in low-income countries capital spending has a high import content and so the repercussions for the domestic economy are largely limited to the construction sector. Here, sectoral policies targeted at breaking supply constraints are more appropriate than generalized macroeconomic restraint of demand such as would be achieved by increasing the proportion of savings allocated to foreign financial assets. From the perspective of asset accumulation, the rationale for an initial phase of accumulating foreign assets is fundamentally microeconomic rather than microeconomic. It is not demand that has to be managed but supply.

Macroeconomic considerations may, however, matter for the warranted increase in consumption. This will depend upon the scale of the increase and the composition of demand. Except with major discoveries, the initial increase in warranted consumption may be quite modest: even the initial savings rate out of revenues from natural resource depletion should be markedly higher than that from sustainable revenues, so that the implied percentage increase in consumption will be lower than that for investment. Nevertheless, even modest increases in warranted consumption may have substantial effects on the real exchange rate: in many low-income economies the share of consumption met by imports is low whereas the increase in the supply of consumer goods warranted by resource revenues consists only of imports. This is especially the case for public consumption, which is the component of consumption most likely initially to be increased by a step-increase in government revenue.

Since a substantial temporary increase in the real exchange rate is liable to be disruptive to the real economy, there is therefore a good case for delaying much of the increase in consumption to provide the time for domestic production of non-tradable consumer goods to increase. Evidently, such an increase in supply is predominantly a consequence of investment (public and private). This returns us to the investing-in-investing agenda. Once the capacity to invest is in place domestic investment can scale up without reducing the efficiency of investment. In turn this will increase the supply of consumer goods and services, enabling the demand for consumption to be increased without a substantial appreciation in the real exchange rate.

Hence, analogous to the temporary accumulation of foreign assets out of the revenues eventually to be used for domestic investment, there may also need to be temporary accumulation of foreign

assets out of the revenues to be used for consumption. As domestic investment ramps up the continuing flow of such temporary savings can be tapered out and reversed, with the accumulated savings-for-consumption repatriated.

This macroeconomic approach of countering Dutch disease by the sequencing of investment can be complemented by a sectoral policy concerned with the composition of investment. Commonly, a key policy concern is that real appreciation will damage non-resource exporters. By skewing the composition of public investment towards projects that lower the costs of non-resource exporters, the sector can even be advantaged by resource revenues rather than squeezed. An example is the active promotion of Penang as an export zone for electronics by the government of Malaysia. During the 1970s much of government revenue still came from natural resources; this helped to finance the physical and social public infrastructure that transformed Penang.[4]

A further compositional policy is that between government, firms and households. Depending on the scale of resource revenues, there is a case for transferring decisions over some spending to firms and households. In the rare cases in which a poor economy receives very large resource revenues the case for some transfer to private households is overwhelming, otherwise households will have an imbalance of abundant public goods yet inadequate private goods. Similarly, since public capital and private capital are complements, there is a case for some transfer to firms. However, there is a good case for delaying such a transfer until both public infrastructure and the policy environment for private investment have been improved (as tracked by *Doing Business*). Ideology-driven assumptions that the private sector is inherently better at handling the investment process are probably misplaced. For example, in Kazakhstan a prudent government saved resource-revenues abroad but permitted the banking sector to borrow heavily on the implicit security of these public foreign assets. The banking sector thereupon channelled the resource revenues into a disastrously excessive property boom.

Instead of using the banking system, the transfer of decisions over investment from the government to firms can potentially be done through reducing taxation. However, there are two powerful political-economy arguments against this: the taxation of business gives the government a stake in private sector growth, and it also provokes scrutiny. In practice, if the domestic banking system is unreliable it may be better to induce private investment indirectly through improving infrastructure and the policy environment.

2.6 Managing Volatility

Commodity prices are volatile and their path is deeply unknowable. For example, in January 2008 the bounds of the 95 percent confidence interval for the twelve month market-based forecast for the world oil price were around $210 and $65. Two features of this forecast are equally striking: its range is so wide as to be useless for practical budgeting purposes, and the

[4] See P. Collier and A. Venables (eds.) *Plundered Nations?* Palgrave, 2011.

actual price, at $37, was far outside it. What is important, therefore, is not to forecast prices as accurately as possible, but to smooth spending in the face of price volatility.

Revenues are even more volatile than prices: not only does supply naturally respond to price, but markets are not fully cleared by price. The failure of prices to clear commodity markets became evident during the collapse in demand of 2008/9 when the market for commodities started to resemble that for manufactures, with mines temporarily closed.

There is a very strong case to avoid revenue volatility generating corresponding volatility in expenditure. Often the costs of volatile expenditure are thought of with reference to Dutch disease. However, the fundamental reasons for expenditure smoothing in the face of volatility are microeconomic rather than macroeconomic. Large fluctuations in consumption are inefficient even in the most rudimentary, single-good, framework (that is, with no real exchange rate). Due to both habit formation and political costs, substantial reductions in consumption alternating with substantial increases yield less utility than a constant level around the same mean. While volatility in investment does not face these difficulties, beyond a point large swings in investment are liable to impair its efficiency. If investment spending faces steep unanticipated reductions projects will be abandoned uncompleted, and if it is increased very fast then project selection and implementation are likely to deteriorate. Hence, the true diagnostic for managing volatility is not the real exchange rate but the level of aggregate spending and its decomposition into consumption and investment, public and private.

Smoothing spending in the face of unknowable volatility in revenues is necessary but costly. Were the path of fluctuations in revenues fully known the least-cost way of smoothing expenditure would be to accumulate liquid savings during periods of above-average revenue, running them down when revenue was below-average. However, because the path of revenues is not known smoothing spending is a matter of managing risk. The appropriate way of coping with risk is not savings but insurance. In the face of price risk governments can in principle either fully insure by locking into long-term contracts at an agreed price, or bound the degree of risk through hedging. Many governments of low-income countries lack the credibility to be able to commit to long-term price contracts (except at deeply discounted prices), and so the practical alternatives are saving and hedging. Markets are not yet sufficiently deep to permit hedging many years out, and so the most efficient structure is likely to be to hedge prices over a short horizon (at a minimum the price assumed for the annual budget process), relying upon savings for the longer term. The cost of hedging is evident. The cost of liquid savings is the opportunity cost of domestic investment forgone.

Because both methods of smoothing expenditure are costly, the objective should not be literally to stabilize public spending. Rather, governments should aim to keep rates of change of spending (both increases and decreases) within manageable bounds. Politically, the key issue is to set maximum rates at which public consumption and public investment will be permitted to rise, so that revenues in excess of these ceilings on expenditure will be used to smooth future spending,

whether by purchasing hedges or by saving. What is manageable is itself endogenous to policy: the more public investment can be varied without damaging its efficiency, the less liquidity is needed. Public investment can potentially be designed so as to be able to cope with a degree of volatility. A high average level of investment should make fluctuations easier: for example, if investment is on average 30 percent of GDP, a ten point swing (25-35) is proportionately less drastic than if it averages 20 percent (15-25). Further, in periods of low investment, project preparation can continue so that there is a shelf of projects ready for implementation as finance becomes available.

The task of smoothing public spending is essentially driven off the upper and lower bounds placed on *changes* in public spending. Initially, all the work is done by the upper bounds on public consumption and public investment. These bounds determine how much money is channelled into expenditure smoothing, whether by the purchase of hedges or the accumulation of savings. Until there has been a substantial phase during which the upper bounds on expenditure growth are binding, there can be no counterpart phase in which expenditures can be permitted to decline less rapidly than resource revenues are declining. Hence, with the benefit of hindsight, the decade 2000-10 was the ideal time to put such a policy in place.

While this opportunity has gone, an equivalent opportunity still pertinent for many countries is at the onset of a resource discovery. As discussed in Section 2.5, in such circumstances there is a case for restraining the increase in consumption until investment has increased supply to meet new demand. Rather than this being merely a transitional pot of liquidity, a first call on it can be to fund the long-term task of smoothing public spending. In other words, the transitional need to accumulate liquidity until productive capacity has been enhanced so as to avoid Dutch disease can be matched to the other transitional need to accumulate liquidity to cope with volatility.

In the steady state the liquidity pot, combined with hedges, is judged sufficient to meet all likely calls on it. Since the path of commodity prices is not known, once the pot is being drawn down there is an inherent risk that low prices will persist for long enough to bankrupt it. To guard against this the bound on the maximum rate of decrease in public consumption should be endogenous to the available financing, with hedges used to limit the risk of further price declines. As the available finance was depleted, the cushioning limit on the rate of reduction in public consumption would be reduced.

2.7 The Desired Policy Package

A useful way of bringing these disparate aspects of savings and investment policy together is to think of three policy clocks. The government of a resource-rich, low-income country needs to be conscious of all of these clocks, each ticking at a different speed.

The slowest ticking clock is that of resource depletion: over the course of a generation, natural assets should be converted into productive assets, implying the need for substantial savings out of resource revenues. As noted, the proportion saved will depend upon several assumptions but a

common feature is that the savings rate should rise over the course of depletion and rise especially rapidly in the phase during which the rate of extraction is increasing. This policy clock earmarks, year-by-year, the proportion of revenues appropriate for long-term asset accumulation, remaining revenue being earmarked for warranted consumption.

The second clock is that of investing-in-investing: building the capacity to invest a high proportion of income domestically while maintaining a good rate of return. If this is given its proper priority then this clock should run much faster than that of depletion: perhaps it might take a decade to put in place the systems and human skills to manage the investment process well. During this phase both the revenues earmarked for long-term asset accumulation, and much of the revenues earmarked for warranted consumption, should temporarily be invested in foreign financial assets. As capacity is built and the productive capital stock increased, both of these temporary pots of foreign assets can be repatriated, financing domestic investment and consumption respectively.

The third clock is that which rides the tiger of commodity prices. This clock has an initial phase during which revenues are being set aside to accumulate liquid assets and hedges, followed by a steady-state in which spending is cushioned relative to revenues. The transition phase requires that the upper bound on the rate of increase of public consumption be set sufficiently conservatively that the revenue warranted for consumption exceeds the ceiling on expenditure for a sustained period. For the steady state to be sustainable, the maximum permitted rate of reduction in public consumption should adjust as funds are depleted.

Since these three clocks are all running in real time the required policy dance is complicated. Sometimes one clock will be indicating a time for high savings while another will be indicating a time to run savings down. Faced with such complexity ad hoc decisions taken day-by-day are liable to go wrong. There is a need for some policy rules, but policy rules are political: they only work if they are politically realistic. This is the task of Section 3.

3. The Political Economy of Saving and Investment Decisions

There is now a large and contentious literature on the ‘resource curse’. This is ably and recently covered by Michael Ross and I do not propose to review it here.[5] I will confine myself to some new and disturbing evidence directly on public investment.

Whatever else the government of a resource-rich low-income country does with the revenues from natural resources, one prescription is unambiguous: over the medium term it should accumulate public capital. Of course, all governments should accumulate public capital, but the case for resource-rich low-income countries is overwhelming: they start chronically short of public capital and their revenues are coming disproportionately from depleting the society’s

[5] M. Ross, *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*, Princeton University Press, 2011.

natural capital. Yet, in general such governments do the opposite. Bhattacharyya and Collier (2011) bring together a new international time-series dataset on the stock of public capital with data on resource rents. They find that controlling for per capita income and fixed effects, resource rents significantly and substantially *reduce* the public capital stock.[6]

Faced with this gulf between the savings and investment policy appropriate for resource-rich low-income societies, and that which their governments have actually implemented, it is evident that managing resource depletion has proved to be politically difficult. Instead of accelerating the accumulation of public capital, resource rents have enabled the few to plunder what should have benefited the many, and the current generation to plunder what should have benefited the future.

However, such outcomes are by no means inevitable: some resource-rich societies have indeed harnessed natural resources for an accelerated transition out of poverty, Botswana and Malaysia being examples. Further, societies can and do learn from economic policy mistakes: they are not condemned to repeat them. In many low-income societies citizens are well aware of past plunder. This is a potential political constituency for policy change.

However, the saving and investment policies required by resource depletion in a low-income country are long-term: good decisions need to persist for a generation. An episode of good savings decisions is not enough. Nigerian experience is salutary. Following a prolonged period of plunder, in 2003 Ngozi Nkonjo-Iweala was appointed Finance Minister. Inheriting a fiscal deficit, she rapidly turned the budget around and accumulated large foreign savings. But after three years she was removed from her post and within five years of her departure these savings had been dissipated. The lesson from this frustrating experience is that the priority for an episode of reform is to build commitment technologies that can survive their creator.

Building commitment technologies is difficult. First, they have to be designed. As I have suggested, the rules appropriate for resource-rich, low-income societies are distinctive and so cannot simply be copied from some OECD template. I have suggested that the IFIs have an important role here. Even well-designed new rules can easily be ignored or not survive their initiator. Three features are likely to make them more robust: legislation, an institutional champion, and broad popular support.

Legislation has the major advantage that laws are costly to reverse. Constitutional laws are particularly costly to reverse and so ideally the policy rules concerning resource depletion should be embedded in the constitution. In turn, getting an appropriate law adopted is a political process. However, because once done it is difficult to reverse it lends itself to a temporary big push such as is common in NGO campaigns. The cost of coordinating political pressure has fallen dramatically and so legislation has potentially become more feasible.

[6] S. Bhattacharyya and P. Collier, 2011, Public Capital in Resource-Rich Countries: Is there a Curse, CSAE Working Paper, Department of Economics, Oxford.

A new law is inherently fragile: it can easily be overridden, ignored, or reinterpreted by the pressures of personal interest. To counter these pressures it needs a credible existing organization within government that is tasked with implementing it. I will suggest that for the custodial role of natural assets the most appropriate public institution is likely to be the central bank.

An institutional rule is only likely to survive if it has broad popular support. For this it needs to be understood by ordinary citizens. To take a currently pertinent example from another context, German constitutional opposition to funding the fiscal deficits of other Euro-Zone countries is clearly underpinned by the continuing German folk memory of the hyperinflation of 1923. Resource-rich Africa has already been through equivalently searing experiences of resource plunder. But social learning from mistakes is not automatic: economic events need to be appropriately interpreted. Such interpretation is a public good and has to be supplied. Small, low-income societies lack the market size to support high-quality information media and so citizens are not naturally well-informed about economic issues. Again, I will suggest that this is an appropriate role for central banks.

The law-cum-institution that is most closely analogous to what is needed is the Sovereign Wealth Fund. Many governments have sought to commit both themselves and their successors to prudent decisions through the creation of such funds and they are now becoming fashionable in the low-income resource-rich societies. Typically, a SWF has three sets of rules. One determines the size of the flows going into the fund. A second protects the accumulated stock of its assets from being dissipated. The third rule concerns the composition of the stock, namely foreign financial assets.

Such a rule structure is not appropriate for a poor country. Whereas in a capital-rich country it is better to accumulate foreign than domestic assets, in countries which are chronically capital-scarce the investments should ultimately be domestic.

Instead of a SWF I will propose two rule structures which between them incorporate the three policy clocks. One is a Sovereign Resilience Fund, the other is a Sovereign Development Fund.

Sovereign Resilience Funds

The purpose of a SRF is to ride the tiger of commodity price volatility. It therefore needs one set of rules for the flow of money going into the fund, one for the composition of assets, and one for the flow out of the fund. In steady state these to flows will balance out over time.

As discussed in Section 2.6, in steady state the rules governing the inflows should be by means of ceilings on the rate of expansion of public consumption and public investment (these ceilings should not be the same since investment needs to grow on average more rapidly than consumption). The SRF should also be used to manage the transition: guarding against Dutch disease by avoiding demand for consumption rising ahead of investment in supply.

The composition of the assets should clearly be conservative and liquid: the whole purpose of the fund is to liquidate its assets when times are bad. However, subject to this, the SRF should be free to manage how it meets the calls upon it by combining liquid assets with commodity hedges. Delegating this to a public organization tasked specifically with delivering resilience has a major political advantage. Although hedging is generally the best way of protecting against the risk of price changes, it is very rarely used. The reason for this is well-understood: the political costs of hedging are too high. If a finance minister uses precious budget revenue to purchase a hedge, in any particular year the chances that this will pay off are below 50 percent. As a result the minister is exposed to the charge that money has been wasted. Since all politicians have enemies, it is a certainty that this charge will be made. Further, there is a considerable risk that if the policy is maintained it will again fail to pay out, exposing the minister to the added charge of 'I told you so'. The best prospect of hedging being adopted is therefore for it to be removed from the day-to-day political arena and delegated to an organization whose sole purpose is to use money for resilience, partly through the acquisition of foreign assets, and partly through hedges. There is less political mileage in attacking professional technocrats than politicians, and in any case the organization can reasonably defend itself on the grounds that it must be judged on its mandate which is to protect public spending during difficult times.

The rules governing the outflows are correspondingly the maximum permitted rates of reduction in public spending on investment and consumption. As discussed in Section 2.6, there is a case for endogenizing these rules on the evolving capacity to finance periods of persistent withdrawal.

In good years a SRF top-slices the revenues from natural resources, whereas in bad years it supplements them, providing money to sustain both investment and consumption.

Sovereign Development Funds

An SDF is a variant of a SWF. The first two rules of SDFs are the same as in a SWF: they govern flows into the fund and restrict the scope for flows out of it.

As to the flow into the SDF, as discussed above the available flow is pre-adjusted to the commodity cycle through the SRF. In good times the SDF has the second call on resource revenues, whereas in bad times it receives some of its inflow from natural resource revenues and some from the SRF.

Despite being pre-adjusted for the commodity cycle, the proportion of available resource revenues appropriately devoted to savings is not constant. As discussed in Section 2.2, through the course of depletion the savings rate should rise. This may prove to be one complexity too many for the rules of an implementable SDF in which case a constant-savings approximation will need to be adopted. However, a rule of a rising savings rate is potentially very attractive for a government. Being of the generic form 'God make me good but not yet' it imposes less pain on the government that introduces the legislation than on future governments that are stuck with abiding by it. This enables the average rate out of savings over the course of depletion to be set

higher than if the full burden of prudence had to be borne by the initiating government. For once, such a rule is fully justified by the underlying economics.

All moneys flowing into the SDF are irreversibly for the accumulation of assets. This is one reason why it is important to have two distinct funds rather than a single fund: the SRF has to permit withdraws to finance public consumption whereas the SDF should expressly forbid such withdrawals. The other reason is that the asset composition is very different.

A key decision for the SDF is the balance between the accumulation of foreign financial assets and domestic investment. Whereas the liquidation of foreign assets to fund public consumption is forbidden, liquidation to fund domestic investment is permitted, subject to conditions. The guiding principles in the allocation between foreign and domestic investment should relfect the considerations discussed in Sections 2.4 and 2.5: the pace of implementing the investing-in-investing agenda, and any remaining concerns about Dutch disease in the construction sector.

For those funds assigned to domestic investment, a fundamental part of the SDF is to police professional standards of project assessment: design, selection, implementation and evaluation. In other words, the SDF is the agency enforcing a rising performance in the Public Investment Management Index.

Potentially an effective way to strengthen adherence to the rules of the SDF and in particular to the microeconomic procedures for investment projects is to open the Fund to contributions from aid donors.[7] Most low-income, resource-rich countries will continue to receive significant aid inflows to fund development and channelling aid-for-investment through an SDF would avoid duplication and in effect import good economic governance into domestically financed investment.

The Roles of Central Banks

Who then should bell the cat? That is, where should the SRF and the SDF be lodged within government? The dismal experience of Anti-Corruption Commissions illustrates that small, new, isolated, purpose-designed agencies of restraint are liable to be unsuccessful. Hence, the SRF and the SDF should not be free-standing.

In the typical small, low-income society there are few institutions that are within government but have some independence to restrain economic policy. By far the most important is the central bank. Both the SDF and the SRF could be agencies under the umbrella of the central bank, reporting through the Governor to government.

The SRF is a natural extension of the current functions of a central bank: reserve management and risk management. The SDF is an extension of role but is philosophically still within the overall purpose of custodianship. Just as the central bank is the custodian of the currency, and of

[7] I am indebted to Kerfalla Yansane, Minister of Finance, Government of Guinea for this suggestion.

debt sustainability, in a society where the major assets are natural resources it is reasonable for it to have a role in the prudent management of these assets.

Further, since the typical small, low-income country is short of technically qualified senior public sector officials, it is important to economize on their use. By lodging both the SRF and the SDF within the central bank they can both draw readily upon central bank expertise and indeed their memberships can overlap. There is no inherent conflict of interest that requires walls between personnel. The importance of keeping the agencies distinct is that the money under their control needs to be subject to different rules and different objectives.

There is a final reason for lodging the SRF and the SDF with central banks. Recall that their authority rests ultimately upon building support among a critical mass of citizens who understand its purpose. Central banks are appropriate for building this constituency of support. As trusted public authorities they are in a position gradually to build a critical mass of economically literate citizens. By a critical mass I mean a group large enough for these key economic decisions to be well-taken. In the OECD central banks have increasingly communicated directly with ordinary citizens. In Africa, where there are far fewer other sources of trusted economic information, this role is more important but less developed. The aspirations of Africa's central banks need to extend beyond the technocratic.

International Support

Finally, the wider international community has a useful supplementary role in setting global standards. The *Extractive Industries Transparency Initiative* (EITI), launched in 2002, was swiftly adopted by Dr. Nkonjo-Iweala, becoming the NIETI. However, while the focus of the EITI on transparency in the reporting of resource revenues was the right place to start, it does not address the savings and investment decisions. The more recent *Natural Resource Charter* (naturalresourcecharter.org) covers the entire decision chain, from discovery through to investing-in-investing. Already adopted by NEPAD as a flagship program, endorsed by the African Development Bank, and supported by the IFIs, it is designed both for public officials and for citizens. While the EITI and the NRC are voluntary codes, there is also potential for enforcement of more ethical practices in resource extraction: a global extension of the Cardin-Lugar Amendment is surely a priority for the G20.

Africans are well aware of their history of resource plunder. Courageous politicians, responsible central banks, and new international standards must try to make a reality of 'this time it's different'.