

NATIONAL DEVELOPMENT STRATEGIES

POLICY NOTES

STATE-OWNED ENTERPRISE REFORM

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This Policy Note aims to foster consideration and discussion of policy options in the preparation of National Development Strategies. The analyses, assessments and data have been prepared by the authors and revised in response to feedback from various reviewers. They do not necessarily represent the views of UN DESA, and appropriate credit should be given to the author for citation purposes.

Preface

The outcome document of the 2005 United Nations World Summit called on countries to prepare national development strategies, taking into account the international development goals agreed in the various United Nations Summits and Conferences of the past two decades. In order to assist countries in this task, the United Nations Department of Economic and Social Affairs (DESA) commissioned a series of notes for policy-makers and policy-shapers both in the government and civil society, in major and interconnected areas relevant to the formulation of national development strategies: macroeconomic and growth policies, trade policy, investment and technology policies, financial policies, social policy and state-owned enterprise reform. The preparation of the notes received generous funding in part from the United Nations Development Programme (UNDP). Colleagues from UNDP also provided helpful suggestions for and comments on the notes.

The policy notes, authored by experts in these fields, draw on the experience and dialogues of the United Nations in the economic and social areas, complemented by outside knowledge. However, the views expressed in the policy notes are those of the authors and do not necessarily reflect those of the United Nations. The notes provide concrete suggestions on the means to achieve at the national level, the internationally-agreed development goals synthesized in the United Nations Development Agenda. The policy notes are intended to provide those at the country level who shape and set policies, with a range of possible alternatives to the standard policy solutions that have prevailed over the past two decades, rather than to prescribe any single course of action. The notes serve to help countries take advantage of and expand their policy space - their effective room for maneuver in formulating and integrating national economic, social, and environmental policies.

I encourage readers to see these notes as complementary inputs into the debate at the country level on development challenges faced and the policies needed to meet them. The issues chosen are vital pieces of the policy mosaic that underlies national development strategies, which are ultimately geared to achieving sustained economic growth with social inclusion and environmental protection.



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List of Acronyms

ARAMCO	National Oil Company of Saudi Arabia
CalPERS	California Pension Fund
DACOM	Data Communications Corp, Republic of Korea
EMBRAER	Brazilian Aeronautic Enterprise
EU	European Union
FCW	Finnish Cable Works
FRW	Finish Rubber Works Ltd.
GLC	Government Linked Companies
GPL	General Public Licence
IMF	International Monetary Fund
MDGs	Millennium Development Goals
MTEF	Medium Term Expenditure Framework
OLJEFONDET	Norway Petroleum Fund
PETROBRAS	Brazilian Petroleum Company
POSCO	Pohang Iron and Steel Company Ltd, Republic of Korea
R&D	Research and Development
SINGTEL	Singapore Telecom Group
SMRT	Singapore Mass Rapid Transit Ltd.
SOE	State Owned Enterprise
TVES	Township and Village Enterprises

I. INTRODUCTION: PUBLIC INVESTMENT AND ECONOMIC DEVELOPMENT*

Public investment has to play a key role in any pro-poor national development strategy, including the achievement of the Millennium Development Goals (MDGs).

Markets are powerful mechanisms to promote economic development, but they often fail to produce the economic dynamism and the social justice that a sustainable economic development requires.

As a "one-dollar-one-vote" system, markets are not likely to adequately meet the basic needs of the poor. For example, 20 times more money is spent on research on slimming drugs than on research on malaria, a disease that kills more than a million people every year. If we want a broad-based and politically sustainable development, we need to find mechanisms that can meet the basic needs of everyone.

Moreover, there are "public goods" that are likely to be under-provided by individuals purely acting on market incentives. Law and order, basic infrastructure, primary health, basic education, and scientific research are examples of such public goods. The classic mechanism to provide such goods is through taxation and public provision.

Without appropriate regulation, markets encourage short-term profit-seeking at the cost of the long-term investments that are necessary for sustainable economic development. It is no coincidence that investment rates have fallen markedly in developing countries over the last two decades, following the liberalisation and the opening-up of their financial markets. Actions that are necessary in this regard include prudential regulation, appropriate counter-cyclical macroeconomic policy, financial market rules that discourage speculation, taxation and other policies that encourage long-term investment.

In correcting for the deficiencies of the market, public investment can, and should, play a key role, especially in relation to long-term development. Long-term development requires investments in a range of physical and human capabilities. Public investment programs can increase physical capabilities by investing in capital equipment and physical infrastructure (e.g., transport, telecommunications). They increase human capabilities by investing in health, education, training, and scientific research capacity. Appropriately targeted public investment programs – educational expenditure targeted at poor children or infrastructure built to help a poor region export its products – may also contribute to alleviating poverty and thus to economic and social development in the long run.

Public investment is also a critical instrument to enhance private sector activities through the "crowding in" effect.[1] Over the last two decades, there has been a tendency to presume that all public investment "crowds out" private investment. However, "crowding out" becomes a significant possibility only when the economy is near full employment. In most countries with underutilized resources or increased resources obtained through aid, we can expect public investment to "crowd in" private investment. Public investment can further enhance economic development,

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[1] See, Roy (2006) for an up-to-date and comprehensive discussion on the issue

especially if they are made in areas that complement private sector investment (e.g., road facilities for major export crop region, investment in the training of engineers for a newly-expanding industry, investment in the basic inputs industries that are too risky for the private sector).

Despite all its potential benefits, public investment has fallen in many developing countries (Roy, 2006). Public investment as a share of GDP in the developing countries fell from the peak of 10% in the early 1980s to just over 5% in 2000. The fall was particularly dramatic in Latin America, where it fell from 8-9% in the late 1970s to under 3% in 2000. This dramatic fall was not least because of the IMF conditionalities. The strong emphasis put on stabilization over other goals (growth, employment, development) has meant that countries had the incentive to cut investment of all kinds. At the same time, budget-balancing conditionality had no distinction between current and capital expenditures, thus making governments cut public investment rather than current expenditures, the reduction of which is politically more difficult.

All our concerns about falling public investment, of course, does not mean that everything has been fine with public investment. In many developing countries, poor management of public investment has been a serious problem, and ways need to be found to improve public investment management. This Policy Note addresses this issue.

This Policy Note covers two main areas of public investment management. The first is the management of the state-owned enterprises (SOEs). The second is the management of natural resources. It aims to provide practical policy suggestions but it is preceded by discussions of the theories underlying the key policy debates in this area, presented in a user-friendly way.

For a policy-maker who is anxious to get into action, the theoretical discussions may seem like an unnecessary detour. However, we provide the discussions in the belief that an understanding of the theories underlying policy debates is the best way to improve policy capabilities. If the policy-maker understands the underlying theories, he/she can apply the reasoning to a range of different situations.

II. MANAGING STATE-OWNED ENTERPRISES (SOES)

Before starting the main discussion, it is useful to state some major theoretical and empirical findings relating to SOEs. This is done in the belief that it is useful for the reader to see the “big picture” before getting into the details.

First of all, there is no clear theoretical case either for or against SOEs. Pervasive informational asymmetries and “bounded rationality” (Simon, 1983) necessitate “hierarchical” arrangements (i.e., firms) rather than “contractual” arrangements (i.e., markets). Furthermore, the Sappington-Stiglitz Fundamental Privatization Theorem shows that the performance of private-sector firms is superior to that of SOEs only under stringent and often unrealistic conditions.

Second, it is important to note that the problems faced by large SOEs and large private-sector firms are often very similar. As large and complex organisations that have multiple and overlapping layers of hierarchy, they both suffer from complex “agency problems”, or “principal-agent problems”. When discussing the problems of

SOEs, many people often implicitly assume that private-sector firms are perfectly controlled by their owners, thus assuming away their agency problems. If we compare idealized private-sector firms with real-life SOEs, it is not surprising that the former come out on top.

Third, even at the logical level, full-scale privatization, the solution often recommended by supporters of today's economic orthodoxy, is only one possible way to deal with the problems of SOEs. The government may sell a significant portion of the shares of an SOE but retain a majority share or at least a controlling stake (say, 30-40%) in it. Moreover, as will be explained later, SOE performance can be improved without any sale of shares but through organizational reform, an increase in competition, and political-administrative reforms.

Fourth, given the ambiguity of the theoretical findings, it is important to pay attention to real-world outcomes. There are undoubtedly many SOEs that are inefficient, un-dynamic, and corrupt. However, there is no clear systematic evidence that SOEs are burdens on the economy.[2] Furthermore, there is a certain degree of "selection bias" in the empirical materials relating to SOEs in the sense that poorly performing SOEs tend to get discussed more. It is natural that people talk more about problem cases, but this gives the wrong impression of the prevalence of poor SOE performance.

The case for SOEs

Despite popular perception, encouraged by the business media and contemporary conventional wisdom and rhetoric, SOEs can be efficient and well-run. This may sound like a trivial statement, but it is very important to start our discussion with this point, given the depth of prejudice against SOEs.

Singapore Airlines, often voted the best airline in the world, is an SOE, 57 per cent owned by the government holding company, Temasek Holdings, whose sole shareholder is the Singapore Ministry of Finance (see Box 1). The highly respected Bombay Transport Authority of India is also an SOE. World-class companies like the Brazilian regional jet manufacturer EMBRAER, the French carmaker Renault, and the Korean steel-maker POSCO all initially succeeded as SOEs, with the state still exercising critical influence in the case of EMBRAER and Renault (see Box 2).

[2] See, Chang & Singh (1993) for detailed reviews of the literature.

Box 1
Singapore's SOE sector

Singapore's domestic SOE sector comprises two main components: Government-Linked Companies (GLC's) and Government Statutory Boards. GLC's are entities in which the wholly-owned government holding company, Temasek Holdings, directly holds a controlling share as well as subsidiaries and associates of those entities. Statutory Boards include the Public Utilities Board, Economic Development Board, Housing and Development Board, etc. Over time, the Government of Singapore has converted many Statutory Boards into GLC's.

Temasek Holdings directly owns majority shares in the following enterprises: 100% of Singapore Power (electricity and gas) and of PSA International (ports), 67% of Neptune Orient Lines (shipping), 60% of Chartered Semiconductor Manufacturing (semi-conductor), 56% of SingTel (telecommunications), 55% of SMRT (rail, bus, and taxi services), 55% of Singapore Technologies Engineering (engineering), and 51% of SemCorp Industries (engineering). It also directly owns a controlling stake in the following enterprises: 32% of SembCorp Marine (shipbuilding) and 28% of DBS (the largest bank in Singapore).

Singapore's SOE sector, measured in terms of its share in national investment, is nearly three times that of the Republic of Korea, which has an average-sized SOE sector. According to a 1995 World Bank report, the weighted average of *the share of the SOE sector in GDP* in the 40 developing countries it studied was 10.7% during 1978-1991. The corresponding figure for the Republic of Korea was 9.9%. The World Bank study unfortunately did not provide the data on Singapore. However, in 1993, the Ministry of Finance estimated that "the public sector and GLC's…account for about 60% of our GDP". In 2001, the Department of Statistics estimated that GLC's accounted for 12.9% of GDP in 1998, with the non-GLC public sector accounting for another 8.9%, giving a total public sector/GLC share of 21.8%. The Department of Statistics used a tighter definition of GLC as those companies in which the government has an effective ownership of 20% or more.

Sources: Temasek website (http://www.temasekholdings.com.sg/), Shin (2005); World Bank (1995), Table A.1; Singapore Ministry of Finance (1993); Singapore Department of Statistics (2001).

Many countries achieved economic success with a large SOE sector. In addition to Singapore Airlines, the Singapore government owns enterprises not just in the "usual" sectors like telecommunications, power (electricity and gas), transport (rail, bus, and even taxi), and ports, but also in sectors like semiconductors, shipbuilding, engineering, shipping, and banking. It has one of the largest SOE sectors in the world (see Box 1 again). Taiwan (Province of China) achieved its economic "miracle" on the basis of a large SOE sector and with little privatization (see Box 3). Throughout most of the second half of the 20th century, countries like Austria, France, Norway, and West Germany had large SOE sectors and performed well. Especially in France, SOEs were often at the forefront of industrial modernization.

Box 2
EMBRAER, Renault, and POSCO:
World-class Firms with SOE Origins

EMBRAER

EMBRAER (Empresa Brasileira de Aeronáutica), the Brazilian manufacturer of "regional jets", was established as an SOE in 1960, with 51% government ownership. Until the mid-1980s, it did very well thanks to a shrewd management strategy that astutely targeted niche markets, emphasis on export that permitted longer production runs, and strong support from the Brazilian air force.

However, by the end of the 1980s, government investments in the aerospace industry was greatly reduced, due to the new Constitution of 1988, which extinguished many forms of support to the industry, and due to the lack of interest in the defense area following the end of the Cold War. The failure of its CBA 123 Vector project, combined with the crisis in the aviation industry in general caused by the oil price increase of 1990, plunged EMBRAER into a deep financial crisis.

EMBRAER was privatized in 1994. However, the Brazilian government still owns the "golden share" (1% of capital) in the company, which allows it to veto certain deals regarding military aircraft sales and technology transfer to foreign countries.

EMBAER is now the largest regional jet manufacturer in the world and the third largest aircraft manufacturer of any kind, after Airbus and Boeing.

Sources: Embraer website (http://www.embraer.com/english/content/empresa/history.asp); Wikepedia on-line encyclopaedia (http://en.wikipedia.org/wiki/Embraer); Goldstein (2002).

Renault

The French carmaker Renault was established as a private company in 1898. It was nationalized in 1945 for having been "an instrument of the enemy" – its owner, Louis Renault, was a Nazi collaborator – and became an SOE.

Under state ownership, Renault did very well until the 1970s, producing a series of successful models, such as CV4, Dauphine, Renault 4, Renault 8, and Renault 5. In the 1980s, it ran into trouble. However, it has been doing very well since its restructuring in the mid-1990s. Privatization was an important, but not the sole, element in this restructuring.

Renault's privatization is an excellent example of a successful gradualist approach to privatization. In 1994, the French state started selling the shares, but kept a 53% share. In 1996, the French state relinquished its majority share, reducing its holdings to 46%. However, 11% of the shares was sold to what the company website calls "a stable core of major shareholders", essentially financial institutions partly controlled by the French state. Since then, the share of the French government has been gradually reduced to 15.3% in 2005, although it remains the largest single shareholder. Moreover, an important part of this reduction in state share is explained by the acquisition of 15% of its shares in 2002 by Nissan, in which Renault has owned the controlling stake (first 35%, now 44%) since 1999. Thus, the French state remains the dominant force in Renault.

Sources: Renault company official website (http://www.renault.com); Wikepedia on-line encyclopaedia (http://en.wikipedia.org/wiki/Renault)

POSCO

In 1967, the Korean government applied for a loan to build the country's first modern steel mill to an international consortium that included the World Bank. The application was rejected on the grounds that the project was not viable.

This was not an unreasonable decision. The country's biggest export items at the time were fish, cheap apparels, wigs, and plywood. The Republic of Korea didn't possess deposits of either key raw material – iron ore and coking coal. Furthermore, the Cold War meant it could not even import them from nearby China. They had to be brought all the way from Australia.

To cap it all, the Korean government proposed to run this as an SOE. There could not be a more perfect recipe for disaster, so it was thought.

The Korean government borrowed from some Japanese banks and set up the steel mill as an SOE, called Pohang Steel Company (POSCO), in 1968. POSCO started production in 1973. The company remained an SOE until 2000. Its first chairman, Tae-Joon Park, under whose leadership POSCO became a world-class firm, was a political appointee; he was an ex-army general personally close to the country's then President, (former) General Chung-Hee Park.

POSCO made profits right from the start, although this initially required tariff protection and subsidies. This success was partly due to government policy to let the company be profit-oriented. However, this result would not have been possible without the cutting-edge technology POSCO imported from New Nippon Steel, the leading Japanese steel-maker, and the strenuous efforts the company made to master it.

POSCO became the most efficient steel-maker in the world in the mid-1980s and remained so until the late 1990s, when it overtaken by Bao Steel, a Chinese SOE. It is now the fourth largest steel producer globally.

Sources: Amsden (1989); POSCO company official website (http://www.posco.co.kr/homepage/docs/en/company/posco/s91a1010010m.html); Wikepedia on-line encyclopaedia (http://en.wikipedia.org/wiki/POSCO)

Conversely, many unsuccessful economies have small SOE sectors. Even before the large-scale privatization of the 1990s, Argentina's SOE sector was less than half the average of 40 developing countries featured in a World Bank study (World Bank, 1995, Table A.1). Between 1978 and 1991, Argentina's SOE sector accounted for only 4.7% of GDP, against the 40-developing-country average of 10.7% and the Republic of Korea's 9.9%. The SOE sector in the Philippines, another widely recognized case of "development failure", was even smaller. During the same period, at 1.9% of GDP, it was just over 1/5 that of the Republic of Korea (9.9%) and less than 1/5 of the 40-country average of 10.7% (World Bank, 1995, Table A.1). Despite this, Argentina and the Philippines are commonly touted as economies that failed because of large public sectors.

Box 3
Privatization, Taiwan Province of China Style

Taiwan Province of China (PoC) achieved its economic miracles with a large SOE sector. During the miracle years of the 1960s and the 1970s, the SOE sector's share in the economy increased, from 14.7% in 1951 to 15.9% in 1961 to 16.7% in 1971 before coming down slightly to 16.0% in 1981. Although the Taiwanese government allowed the private sector to grow, the SOE sector occupied the "commanding heights" of the economy, controlling the banking sector and the key upstream inputs industries, such as steel and petrochemicals.

Taiwan (PoC) started privatizing in a serious way only in 1996, relinquishing majority shares in SOEs in banking, insurance, petrochemicals, transportation, and a few other industries. However, Taiwan's privatization has been a very controlled one, as the government still has a controlling stake (average of 35.5%) and accounts for 60% of board members in the 18 privatized SOEs. The Taiwanese government is allowed to own the "golden share" (i.e., the veto over important decisions) when privatizing SOEs in defence or public utilities.

Source: CEPD (2002)

In addition to the above real life examples going against the conventional wisdom of "private, good; public, bad", there are respectable theoretical justifications for the existence of SOEs. These are explained below and summarized in Box 4.

The most frequently cited reason is the case of *natural monopoly*. This refers to a situation in which the technical requirements of an industry are such that only one supplier may exist. When a natural monopoly exists, the supplier is able to extract high monopoly profits by charging high prices. A natural monopolist can also exploit suppliers by bargaining their prices down, if it happens to be a monopsonist (sole buyer) for some inputs. Such positions result not only in unequal distribution of economic surpluses, but also in economic inefficiency, as the monopolistic firm produces (or buys, in the case of the monopsonist) less than the socially desirable amounts of output. Under such circumstances, there is a strong case for an SOE to be set up and regulated to prevent abuse of such a natural monopoly.

Another justification for SOEs is *capital market failure*, where private sector investors refuse to finance projects that have high returns in the long run but carry high risks in the short term. For example, the Korean government set up the steel-maker POSCO as an SOE, as the risk was considered too high by the private sector (see Box 2). If the venture subsequently proved so successful, why did the private sector fail to finance it? This is because capital markets have an inherent bias towards short-term gains and do not like risky, large-scale projects with long gestation periods. One obvious solution to capital market failure is for the government to set up a development bank that finances risky, long-term ventures, rather than to set up and run productive SOEs itself. However, in most developing countries, there is a shortage of entrepreneurial talent in the private sector so, even with the development bank, the necessary venture may not be set up. In this case, setting up SOEs may be a more effective way to address capital market failure than setting up a development bank.

Box 4
Justifications for SOEs

- **Natural Monopoly**: In industries where technological conditions dictate that there can be only one supplier, the monopoly supplier may produce at less than socially optimal level and appropriate monopoly rents.

  Examples: railways, water, electricity

- **Capital Market Failure**: Private sector investors may refuse to invest in industries that have high risk and/or long gestation period.

  Examples: capital-intensive, high-technology industries in developing countries, such as aircraft in Brazil or steel in the Republic of Korea

- **Externalities**: Private sector investors do not have the incentive to invest in industries which benefit other industries without being paid for the service.

  Examples: basic inputs industries such as steel and chemicals

- **Equity**: Profit-seeking firms in industries that provide basic goods and services may refuse to serve less profitable customers, such as poor people or people living in remote areas.

  Examples: water, postal services, public transport, basic education

Source: The Text

The example of POSCO illustrates another classical justification for SOEs, namely, the problem of *externalities*. POSCO, under government direction, did not abuse its monopoly position to make extra profits; instead, it passed on its productivity gains to buyers of its products, thus benefiting the rest of the economy. The "social" return to the Korean government's investment in POSCO – or the return to the whole economy – was therefore higher than the "private" return – or the return to the company alone. Such discrepancies

between private and social returns, known as externalities in economic jargon, is another reason for setting up an SOE.[3]

Fourth, SOEs may be set up to address *equity* concerns, broadly defined. For example, if left at the mercy of profit-seeking firms, people living in remote areas may be denied essential services like post, water, and transport. In such cases, an SOE is an easy way to ensure universal access to essential services for all citizens. Another example: privately-run pensions or health insurance systems may refuse to admit "high-risk" cases, usually poorer people. Running such systems as SOEs would ensure that the most vulnerable groups get vital social security.

In theory, all of the above justifications for SOEs, with the exception of moral concerns, can be addressed by private enterprises operating under an appropriate regulatory regime and/or tax-and-subsidy scheme, which equates private and social costs/benefits. For example, the government may subsidize private-sector firms that are engaged in activities with high externalities (e.g., R&D). For another example, the government may license private-sector firms to operate "essential services" (e.g., post, rail, water) on the condition that they provide universal access (the "equity" concern). Therefore, it may appear that SOEs are not necessary.

However, this ignores one crucial point. Regulation or tax/subsidy regimes involve contractual agreements – explicit, in the case of direct regulation, or implicit, in the case of tax/subsidy regimes – that are costly to manage.

Outside the ideal world of economics textbooks, it is impossible to specify all contingencies for which the contents of a contract – for example, the level of the regulated price ceiling or the amount of subsidy, may need to be revised. Such contractual revisions usually involve a lot of negotiation and even legal disputes, all of which can incur substantial costs, known as "transaction costs" in economic jargon. This is the 1991 Nobel Economics Laureate Ronald Coase's classic explanation of why not everything is done by the market and firms exist.

Of course, the savings on transactions costs made by choosing SOEs over private-sector provision under government regulation and/or tax-and-subsidy schemes have to be set against the "organizational costs" of SOEs. Most importantly, the lower degree of transparency of the firm-type arrangement compared to more contractual arrangements may make the former more susceptible to political influence ("capture") and, worse, outright corruption. [4]

However, even considering the "organizational costs", the existence of transaction costs means that it is often much less costly to set up an SOE and deal with unexpected contingencies through internal government directives than to set up some contract-based regime – regulation and/or taxes/subsidies – to address such concerns. This argument is particularly relevant for activities that SOEs normally engage in,

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[3] The most important class of externalities for the purpose of economic development is the "learning externalities", that is, the knowledge spill-over from new industries to the traditional sectors. For a general theoretical exposition of this point, see Greenwald & Stigtliz (2006).

[4] The fact that SOEs have often been the worst offenders in terms of safety and environmental standards in many countries is due at least partly to this reason. Given this consideration, it is important to subject SOEs to the same set of clearly specified regulatory standards as private-sector firms, whether they are supervised by issue-specific regulatory agencies (e.g., environmental regulatory agency, work safety regulatory agency) or by SOE-specific agencies (e.g., specialized SOE supervisory body, relevant ministries, government audit agency).

where market price signals are non-existent (e.g., natural monopoly) or unreliable (e.g., externalities). It is particularly relevant for developing countries whose governments lack legal capabilities even more than they lack administrative capabilities.

The case against SOEs – and its limitations

Despite the theoretical justifications for SOEs and the many examples of well-performing SOEs, many SOEs are not well run. Why? The most popular explanation contains two elements: the *principal-agent* problem and the *free-rider* problem, both based on the assumption of self-seeking individuals.

An SOE is, by definition, run by managers who do not own the firm. Given the self-seeking nature of humans, the argument goes, no SOE manager will run the firm as efficiently as an owner-manager would run his own firm. This problem would not exist if the citizens, who are the owners (principals) of SOEs, can perfectly monitor the SOE managers (their agents). However, because it is inherently difficult to verify (although managers know) whether poor enterprise performance is due to shirking by the managers or circumstances beyond their control, monitoring by principals will always remain imperfect, resulting in inefficient management. This is called the principal-agent problem.

Moreover, individual citizens do not have the incentive, and means, to monitor the SOE managers. Instead, the costs that an individual owner (citizen) incurs in monitoring SOE managers are solely his or hers, while the benefits of improved management accrue to all owners. Thus, individually, the citizens have no incentive to monitor the SOE managers, which means that in the end, no one monitors them. This is the so-called free-rider problem.

While the principal-agent and free-rider problems are real, and can be very important in explaining poor SOE performance, they also apply to large private enterprises with dispersed ownership. If the private enterprise is run by hired managers and if numerous shareholders own small fractions of the company, the hired managers will also have an incentive to put in sub-optimal (from the shareholders' point of view) levels of effort, while individual shareholders do not have enough incentive to monitor the hired managers. In other words, the monitoring of hired managers is a "public good", whose provision is a problem for both SOEs and private-sector firms.

In fact, under certain circumstances, it may be easier to monitor SOEs than to monitor private sector firms with dispersed ownership. On the one hand, the public, comprising taxpayers whose contributions will be squandered if SOEs are inefficiently managed, has at least as great an incentive to discipline errant SOE managers as do shareholders in the private sector. On the other hand, the centralized governance structure within which SOEs operate makes it easier to monitor them. In the SOE sector, there is often one, or, at most a few, clearly identifiable agencies responsible for monitoring SOE performance, e.g., relevant ministries, public holding companies, government audit board, dedicated SOE supervisory agency, whereas dispersed shareholders of private enterprises cannot take concerted actions unless there are some shareholders that are large enough to unilaterally provide the "public good" of monitoring.[5] Indeed, we may say that governments are set up to solve

[5] The takeover mechanism may provide another disciplinary device.

"public good problems", of which monitoring of hired managers (of SOEs) is an example.

More importantly, the fact that many companies, both private and state-owned, are well managed despite dispersed ownership suggests there is more to the good management of an enterprise than giving individuals the right material incentives.

Individual self-interest is not the only thing that drives humans. People working in an enterprise are motivated not simply by "selfish" things like their own salaries and power but also by loyalty to the enterprise, a sense of obligation to their colleagues, commitment to workmanship, honesty, dignity, a work ethic, and many other moral values. When it comes to SOEs, there may be additional motives that need to be taken into account, such as nationalism, dedication to public service, concern for social justice, pride in working for a "leading" company, and so on. These motives matter and we ignore them at our peril (for a further discussion, see Box 5).

Box 5
Non-selfish Motives in Enterprise Management

A good way to see the limits to the contractual approach based on self-interested individuals in understanding enterprise management is the fact that "working to rule" is a widely-used method of industrial action. If everything could be specified in a contract, working-to-rule could never be a method of industrial action, as the workers would be doing exactly what they should be doing. Enterprises run as they do, only because people put in efforts that go beyond their contractual obligations.

As the 1978 Nobel Economics Laureate Herbert Simon once remarked, if human beings were as selfish as depicted in orthodox economics textbooks, it would be impossible to run any company. In such a world, companies would collapse under the burden of monitoring and bargaining costs (transaction costs).

Moreover, if non-selfish motives did not matter, there would be no difference between good and bad managers. All a manager has to do is to contractually specify the employees' duties and to design an effective, but obvious, incentive system, using individual rewards and punishments. However, non-selfish motives matter and good managers are those who can induce his/her workers to do extra through mechanisms that cannot be contractually specified – it is impossible to contractually specify that an employee should be, say, "loyal to the company" or "take pride in his work".

If there is relatively little difference between the internal workings of SOEs and those of private enterprises with widespread ownership, can there be other factors that differentiate them?

One obvious candidate is the so-called *soft budget constraint* that SOEs are typically subject to, due to their status as *public* enterprises. The argument is that, being part of the government, SOEs are able to secure additional finances if they make losses and get rescued with public money if they are threatened with bankruptcy. In this way, it is argued, SOEs can act as if the limits to their budgets are malleable, or "soft".

The term, soft budget constraint, was coined by the famous Hungarian economist, Janos Kornai, to explain the behaviour of socialist enterprises under central planning, but it can be applied to SOEs in capitalist economies too. For example, the existence of "sick enterprises" in India that never go bankrupt is the most frequently cited example of the soft budget constraint of SOEs.

It is true that politically-generated or politically-sustained soft budget constraints encourage lax management, and therefore need to be "hardened". However, it should

also be noted that the soft budget constraint is not simply a consequence of the ownership status of SOEs. If they are politically important enough, e.g., large employers or politically sensitive industries such as armaments or hospitals, private firms can also have soft budget constraints, although it may be reasonable to argue that an SOE will find it easier to get political support than a private enterprise.

Box 6
Soft Budget Constraints For Large Private Sector Firms

In the late 1970s, the bankrupt Swedish shipbuilding industry was rescued through nationalization by the country's first right-wing government in 44 years, despite the fact that the government came to power with a pledge to reduce the size of the state.

In the early 1980s, the troubled US carmaker Chrysler was rescued by the Reagan administration, which was at the vanguard of neo-liberal market reforms at the time.

Chile was plunged into a financial crisis in 1982, following its premature and ill-designed financial liberalization in the late 1970s. Faced with the crisis, the Pinochet government, which had come to power in bloodshed in the name of defending the free market, rescued the entire banking sector with public money.

In Greece, the SOE sector is filled with former inefficient private firms, which were nationalized, thus bailed out, because of their political importance. It is no surprise that the Greek SOE sector has performed poorly.

These examples show that "soft budget constraints" exist not only for SOEs but for private sector firms that are "too big to fail". The above examples, except for Greece, show that avowedly pro-market governments are no exceptions when it comes to bailing out politically and economically important private sector firms in trouble.

Source: Chang & Singh (1993); Chang (2000)

Interestingly, many government bail-outs of large private sector firms have been made by avowedly free-market governments (see Box 6).

Having acknowledged the existence of soft budget constraint, it has to be emphasized that it *does not have to* make the managers of SOEs lazy. Why?

If professional managers, whether they are running an SOE or a private enterprise, know they will be severely punished for poor management, say, have their salaries cut or even lose their jobs, they will not have the incentive to mismanage their firms (Chang, 2000). Indeed, if we believe in unadulterated self-seeking, what matters to the managers is their personal welfare, and not whether their company survives thanks to government bail-out. If they know they will be sanctioned for poor management, the possibility of government bail-out for their firms is unlikely to induce mismanagement.

Box 7
Arguments against SOEs

The Principal-Agent Problem: SOEs are not run by their owners. Unable to monitor them perfectly, the owners cannot tell how much of performance is due to managerial failure or external factors. This allows the managers to put in sub-optimal efforts.

The Free-Rider Problem: SOEs have numerous owners (all citizens). No individual owner (citizen) has the incentive to monitor the SOE managers as the benefits from monitoring will accrue to all owners while the costs are borne by the individuals who do the monitoring.

The Soft Budget Constraint: Being part of the government, SOEs are able to secure additional financial assistance if their performance lags. This leeway makes the SOE managers lax in their management.

Therefore, even if we acknowledge the greater likelihood of soft budget constraints for SOEs, its adverse impact on SOE efficiency will be reduced in so far as SOE managers are held accountable for SOE management.

Our discussion in this section shows that public ownership, in itself, whether due to ownership dispersion or political influence, is not an inevitable reason for poor performance by SOEs. All the key arguments against SOEs – the principal-agent problem, the free-rider problem, and the soft budget constraints (summarized in Box 7) – apply to large private sector firms with dispersed ownership.

Is Privatization a Solution to SOE Problems?

Despite the absence of any peculiar barriers to good SOE performance, it is the case that, as a group, SOEs have under-performed private enterprises in many countries. For this reason, privatization has been touted as a means for squeezing better performance out of SOEs. Unfortunately, such a solution presents a conundrum. At root, it appears that if a government has the capacity and capability to conduct a good privatization, it probably also has the capacity to operate good SOEs; whereas, if a government does not have the capacity to operate good SOEs, it likely also lacks the capacity to conduct a good privatization. This section examines this issue in some detail and two boxed items provide some guidance on the matter.

From the 1980s until recently, privatization was widely considered to be the main, or even the only, way to improve SOE performance.[6] The financial muscle of donor governments, the World Bank, and the IMF made sure that this view was put into practice in the developing and transition economies.

While the conviction with which privatization has been pushed has diminished in recent years, not least because of the accumulating evidence that it has often failed to deliver on the promises, privatization is still considered the obvious solution to the problems associated with SOEs.

Privatization is definitely an option to consider for policy-makers interested in improving the performances of their SOEs. However, as discussed in the next section, there are many ways to improve SOE performance without privatization. Moreover, it is wrong to assume, as is often done, that the choice is between fully-privatized and fully-state-owned enterprises. There are many intermediate "third way" solutions. The government can sell some of the shares of an SOE while retaining majority control or a controlling stake (see the cases of Renault in France in Box 2 or of many Taiwanese SOEs in Box 3).[7] Such "partial" privatization may be done in order to raise revenues, but it is also done in order to gain access to key technologies or key markets through partnership with a major foreign company. Some governments have utilized the so-called "golden share" to retain control over key matters (e.g., control over key technology, M&A) while selling almost all its stake (e.g., see the case of EMBRAER in Brazil in Box 2). There are also possibilities of "cooperative corporatization", where the government could sell an SOE to a "cooperative" of private-sector firms, such as selling airports to a "cooperative" of arilines (Stiglitz, 2006).

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[6] See, World Bank (1995) for the most representative statement of this view

[7] There is no clear definition of the "controlling share", but a shareholding that is above 30-40% is normally considered "controlling". Depending on shareholding patterns, the controlling share could be significantly lower than that (see the case of Renault in Box 2 above).

Even if we ignore all the "third way" options using the intermediate organizational forms mentioned above, privatization involves a number of serious practical problems that limit its effectiveness. Thus seen, privatization should be undertaken only when the conditions are right, as explained below and summarized in Box 8.

Box 8
Privatization Checklist

Factors in favour of privatization

- The SOE is in a potentially competitive industry, but competition cannot be increased without privatization for political reasons.
- The domestic capital market is relatively well developed, making it easy to sell the SOE shares.
- The government at the relevant level (national, state, local, etc.) has adequate regulatory capabilities.
- There are domestic firms that can value and arrange the sale of the SOE at adequate price.
- The government is considered relatively clean.
- Only one or a few SOEs are going to be sold at any one time and, if more than one, at sufficient intervals.
- Organizational reforms in the SOEs are impossible for political reasons.
- The SOE in question is performing certain non-essential functions at considerable cost to its current efficiency and future growth, and it is not politically feasible to establish institutions that may perform those functions better.

Factors against privatization

- The SOE is in a natural-monopoly industry.
- The SOE is in a potentially competitive industry, and competition can be increased without privatization.
- The SOE is providing an essential service for which universal access is crucial (e.g., water, electricity, urban transport, postal service, railways).
- The government at the relevant level (national, state, local, etc.) lacks adequate regulatory capabilities.
- The prospective buyers are already politically influential, which means that the "soft budget constraint" is likely to persist, even after privatization.
- Valuation and sales of the SOE have to be arranged through foreign firms that charge high fees.
- The government is considered relatively corrupt.
- The political decision-makers want to sell a lot of SOEs at the same time or sell them at short intervals.
- The economy has a severe foreign exchange shortage, which makes large-scale privatization a convenient way out.
- The prospective buyer is a foreign SOE.
- It is politically feasible to make organizational reforms in the SOEs.
- Political compromises can be struck that are necessary for setting up new institutions to take over certain non-essential functions that the SOE has been performing at considerable cost to its efficiency and future growth.

First, experience shows that privatization of profitable SOEs makes little difference to their performances, so the government should focus on privatizing unprofitable SOEs. Unfortunately, the private sector is not very interested in buying unprofitable SOE. Therefore, in order to generate private sector interest in a poorly-performing SOE, the

government often has to invest heavily in it and/or restructure it.[8] This raises a dilemma – if SOE performance can be thus improved while in state ownership, why privatize in the first place? Indeed, there is evidence that gains in productivity in privatized enterprises usually occur *before* privatization through anticipatory restructuring. This suggests that restructuring is more important than privatization. Therefore, unless it is *politically* impossible to restructure an enterprise without a strong government commitment to privatization, a lot of problems in the SOEs may be solved through restructuring without privatization.

Secondly, the very process of privatization involves financial expenditure, which can be a significant problem for cash-strapped developing country governments. The valuation of an SOE and the flotation of its shares on the stock market are costly exercises, especially if they have to be managed by expensive international accounting firms and investment banks – often inevitable for developing countries that do not have such firms domestically.

Third, privatization processes in many countries have been riddled with corruption, with a large part of the *potential* proceeds ending up in the pockets of a few insiders rather than in the state coffers. The corrupt transfer is sometimes effected illegally, through bribery, but often legally, e.g., government 'insiders' acting as consultants in the process. This is ironic, given that one frequent argument against SOEs is that they are rife with corruption. However, the sad fact is that a government that is unable to control or eliminate corruption in SOEs is not suddenly going to have the capacity to prevent corruption when it is privatizing them. Indeed, the corrupt have an incentive to insinuate themselves into the privatization process and to push through privatization at all costs, because it means they do not have to share the bribery with their successors and can "cash in" all future bribery streams. It should also be added that privatization will not necessarily reduce corruption, for private sector firms can be corrupt too. False accounting and insider trading became huge problems even in the relatively well-regulated United States during the "Roaring Nineties".[9]

Fourth, privatization can put an excessive burden on the regulatory capabilities of the government, especially if done on a large scale**.** When the SOEs concerned are natural monopolies, privatization without appropriate regulatory capability can make things worse, as it may replace inefficient, but restrained public monopoly with inefficient and unrestrained private monopoly. The problem of regulatory capability is particularly serious with local governments. In the name of political de-centralization and of "bringing service providers closer to the people", the World Bank and donor governments have recently pushed for breaking up SOEs into smaller units on a geographical basis, and leaving the regulatory function to the local governments. This looks very good on paper, but given the reality of inadequate regulatory capabilities of local governments, it has, in effect, often resulted in regulatory vacuums (see Kessler & Alexander, 2003).

Fifth, the timing and the scale of privatization matters. For example, trying to sell many enterprises within a relatively short period – the so-called "fire sale" approach – weakens the government's bargaining power, thus lowering the proceeds it gets. As another example, trying to privatize when the stock market is down, other things

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[8] Moreover, it is not always possible for the government to recoup the value of the additional investments that were made for restructuring.

[9] The term is from the title of Stiglitz, 2003a

being equal, will lower the proceeds of privatization. In this sense, setting a rigid deadline for privatization – which the IMF often insists on and which some governments have also voluntarily adopted – is a bad idea, as it will force the government to privatize regardless of the market condition. If the government gets the scale and the timing of privatization wrong, the prices paid for the enterprises will not be as high as they could have been had the government taken a more pragmatic approach and waited more patiently for the best deals.[10]

Sixth, privatization should be done for the "right" reason. It should be done for the purpose of improving enterprise performance, rather than as a means to raise money ("selling the family silver"). For example, in many Latin American countries in the 1990s, large-scale privatization was conducted as a means to raise large amounts of foreign exchange in a short period of time. The proceeds were then used to reduce external debt, finance consumption binges (of mainly imported goods) and/or to prop up an unsustainable exchange rate. Such "abuses" of privatization proceeds are to be avoided.

Seventh, SOEs in developing countries, especially in Latin America, were often sold to foreign SOEs. For example, the state-owned Spanish airline, Iberia, bought a number of state-owned Latin American airlines, while the state-owned Spanish telephone company, Telefonica, bought a number of state-owned Latin American telephone companies. If public ownership and management is the problem, it is rather strange to sell one SOE to another, albeit foreign, one. The only argument for such a practice is that the government will be less compelled to grant politically-motivated soft budget constraints to SOEs of foreign countries. However, very often, the foreign SOEs have even greater political leverage than domestic ones, due to their sheer size and the international political clout wielded by the national governments that own them.

Eighth, care needs to be taken to get the privatization contracts right. There are a number of issues involved here. One such issue is that of breach of contract by the purchaser of the privatized SOE. The firm can extract profits and then simply walk away, when they turn negative, leaving the government to deal with the problem.[11] This may not be a problem in some cases, such as radio spectrum, where the underlying asset is not destroyed by the termination in services. However, if it involves assets that require maintenance (e.g., water system, roads), it can lead to the deterioration, or even destruction, of the assets involved. Therefore, privatization contracts should include expedited procedures for reclaiming the assets when there is a breach of contract. A related issue is that of performance requirements. One

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[10] Countries have sometimes used "creative accounting" to exaggerate the extent of privatization in an attempt to circumvent IMF conditionality on privatization. For example, a government can lower its ownership share of an enterprise below 50%, while having a state-run pension fund, or government-controlled financial entities own 2%, thus effectively retaining control. The picture is even more complicated in the case of public-private partnerships. According to the IMF, "[n]o internationally acceptable accounting standard has been developed so far to reflect varying degrees of risk transfer from the government to the private sector, and country practices differ substantially in this area" (IMF, 2004). Further, many countries include privatization receipts as budget revenues. This is against international practice and dangerous. Privatization receipts are capital receipts and are "one-offs". You can only privatize an airport once. Including these as revenue receipts can overstate resources available to government.

[11] For some examples, see Kessler & Alexander, 2003, p. 15

challenge here is to use the right performance indicator – for example, profitability may not be the best performance measure in a contract for essential services like water. Another challenge is to find a way to prevent companies (should they be multi-national) from undermining performance requirements (e.g., investment requirement) by using, for example, transfer pricing.

As can be seen, the list of conditions necessary for privatization to succeed is rather lengthy (see Box 9). Many of these conditions are not met in reality, especially in developing countries. Not surprisingly, many privatization attempts have failed.

Box 9
Conditions Necessary for Successful Privatization

A poorly thought-out privatization may cause more problems than it solves, resulting in more corruption, a greater rich-poor divide, exacerbate social tensions, enrich a select few and create a system that defies future reform.

Privatization should not occur in the absence of an appropriate legal, regulatory and institutional framework, especially if the entities being considered for privatization are engaged in activities requiring regulation and oversight, such as activities with significant environmental or health impacts.

Assuming such a framework is in place, below is a brief checklist of the essential requirements for successful privatization:

- A clear, transparent, and comprehensive strategy, including a timetable setting forth to-be-achieved milestones:
  - a commercial strategy
  - an industry strategy (one size does not fit all)
  - a regulatory and institutional strategy
  - a legal strategy
  - an educational/training strategy
  - A social impact assessment
  - Anti-corruption strategy
- Expertise and skills
  - Negotiation experts, financial experts, legal experts
  - Policy oversight of the experts (Experts do not necessarily view the big picture as they focus on the functional expertise)
- A well-worked-out sales plan
  - Set up a separate agency to oversee, supervise and implement, possibly reporting directly to the highest levels of the government
  - Consider pros and cons of different approaches (e.g., auctions, direct sales)
  - Consider societal impacts (e.g., deprivation of some, enrichment of others)
  - Establish contractual sales terms as well as buyer commitments
    - Should require a proposed business plan from the purchaser
    - Should provide for default on provisions of sales agreement commitments (failure to meet conditions should even result in return of privatized property)
    - Need to know true identity of buyer and the source of funds
    - Where appropriate, domestic purchasers should be encouraged (e.g., special loans, management and skill support)

Source: Jenik Radon

Alternatives to privatization

If public ownership *per se* is not the only, or even the most, important reason for inefficient performance, privatization cannot be an effective cure for the problems of SOEs. Moreover, as seen above, there are many practical problems involved in privatization. Hence, it may be fair to say that privatization should be considered as one of the last, rather than the first, means to address poor SOE performance.

Below, we discuss three groups of policy alternatives to privatization – organizational reforms, increasing competition, and political-administrative reforms. These are explained below and summarized in Box 12 at the end of this section.

Organizational Reforms

First, the goals of the SOEs should be critically reviewed. Very often, SOEs are charged with serving too many goals – for example, meeting social goals (e.g., affirmative action for women and minorities), employment generation, industrialization, and provision of basic services. There is nothing inherently wrong with an SOE serving multiple goals, but this can adversely affect enterprise performance, if the goals and the relative priority among them are left unclear. Therefore, each SOE should have clear goals, with explicit weights given to each goal. It would also be helpful to minimize the number of goals and provide guidelines for reconciling potentially contradictory goals.

The second important element of organizational reform involves improving the quality of information regarding SOE performance and enhancing the ability of the monitoring agency to process and act on that information. In some countries, the agencies that supervise SOEs lack even the most basic information (e.g., balance sheets). Therefore, it is vital that such information be generated, and clear lines and schedules of reporting be specified, adhered to, and meaningfully used in order to monitor and improve performance without the government engaging in external micro-management. At the same time, the supervisory authorities' ability to obtain, process, and effectively use information should be improved. Making more information available, without increasing the ability to process and utilize it, is of little use.

Third, the incentive systems for those who work for SOEs need to be improved. A system of clear and effective incentives should be designed to reward the managers and employees for improvements in efficiency, productivity, and consumer satisfaction (see Box 10). However, "incentives" here should not necessarily be narrowly interpreted as meaning individual materialistic incentives. They should include various types of non-materialistic and non-individualistic motives (see section II.2 above).

Fourth, the establishment of a single, competently-staffed agency dedicated to SOE supervision could also improve monitoring. In some countries, SOEs are monitored by multiple agencies. In practice, this can often mean that they are not meaningfully supervised by any agency. Alternatively, it can put an unreasonable demand on the SOE managers by subjecting them to almost constant inspection (see the case of the Republic of Korea in Box 10). Consolidation of monitoring responsibilities into a single agency could increase monitoring efficiency either by making it impossible for the agency to "pass the buck" or by liberating the SOE mangers from excessive inspection. However, in consolidating the monitoring responsibilities, it is necessary to ensure that there are adequate checks and balances on such an all-powerful agency.

Fifth, reducing the number of SOEs may also help improve the monitoring of SOEs, given that the government only has a limited ability to monitor and reform SOEs. Liquidations, mergers and even privatization of some less essential SOEs (say, tourist hotels) may be helpful in improving the performance of other, more essential, SOEs (say, water and gas companies) by releasing the government's monitoring and reforming resources.

Box 10
Organizational Reform of the SOE Sector:
The Case of the Republic of Korea

In 1984, the Korean government reformed its system of evaluating the SOEs. It was meant to address the criticisms against the country's SOE sector, which had been performing well on the whole but still could be improved. The thrusts of this reform were more managerial autonomy, an improved performance evaluation system, and a better incentive structure.

To provide more managerial autonomy, government control over budget, procurement, and personnel management was reduced. For example, previously all procurements for SOEs had to be made through the Office of Supply, but under the new provision, the central executive officer of an SOE had an option to directly purchase from outside sources or to commission the purchase to the Office of Supply. To eliminate political influences in the managerial appointment, the new system banned appointing outsiders for senior executive positions.

Another change was concerning inspection. Previously, the government had monitored the SOEs very tightly through various audits and inspections conducted by the Board of Audit and Inspection and the relevant ministries. As a result, an enormous amount of time and energy of SOE managerial staff were spent in preparing for such inspections. For example, the Korean Electricity Company underwent eight government inspections, lasting for 108 days, in 1981 alone. Under the new system, the Board of Audit and Inspection was authorized as the sole inspection agency for the SOEs, thus lessening the burden of inspection both on the side of the ministries and on the side of the SOE managers.

The reform also introduced a new evaluation system, to which bonus payments for the employees of the enterprise were linked. The performance was evaluated with multiple criteria, including both quantitative measures (70% weight) like private profitability, public profitability, and productivity, on the one hand, and qualitative measures (30% weight) like R&D expenditure, long-term corporate planning, organizational improvements, product quality, improvement in the managerial system. And the profitability measure chosen was pre-tax, pre-interest payment profit, reflecting the idea that essentially non-value-adding activities like tax-saving and loan recruitments, although not actively discouraged, should not enter performance evaluation.

After the reform, there was a noticeable changes in managerial attitude, which lead to a universal adoption of long-term corporate planning, which not all SOEs had been practicing before the reform. Operating profit was up 50% in 1984 and up 20% in 1985. The R&D/sales ratio increased from 1.0% to 1.2% between 1984 and 1985. There were also reports of noticeable improvements in product (goods and services) quality.

Source: Chang & Singh (1993).

Increasing Competition

Beyond organizational reforms, increasing competition can be important in improving SOE performance. SOEs are often in activities where there is a natural monopoly, and increasing competition is either impossible or socially unproductive. However, there are cases when competitive pressure can be increased with positive results.

Indeed, in many countries, SOEs compete vigorously with private sector firms in activities that are not natural monopolies (see Box 2). For example, in France, Renault,

which was state-owned until 1996, faced direct competition from the private firm Peugeot as well as from foreign producers. Even when they were virtual monopolies in their domestic markets because of trade protection and subsidies, SOEs like EMBRAER and POSCO were required to export and therefore had to compete internationally.

Even SOEs in natural monopolies can be given some competitive stimulus because all products and services are at least partially substitutable. For example, during the 1980s, the state-owned railway of Britain faced rather intense partial competition from privately-owned bus companies in some market segments.

Competition does not always have to come from the private sector. Where feasible, competition can be increased by setting up another SOE. In 1991, the Republic of Korea set up a new SOE, Dacom, specializing in international calls, whose competition with the existing dominant telephone SOE, Korea Telecom, greatly contributed to increasing efficiency and service quality throughout the 1990s.

In theory, it is also possible to "simulate" competition by artificially dividing up a natural monopoly industry into regional units and reward/punish them according to their relative performances. This may be accompanied by privatization, as in the case of the British railway system, but it can be done under state ownership.[12] This method, known as "yardstick competition", unfortunately does not work very well, especially in developing countries where the regulators are not fully capable of administering complicated performance-measurement formulas. Moreover, in the case of network industries (e.g., railways), the potential benefit from simulated competition among regional units should be set against the increased costs of coordination failure due to the fragmentation of a network – as in the case of the disastrous failure of the British railway privatization program which created dozens of regional operators who, in fact, competed very little, if at all.

Political and Administrative Reforms

In some countries, SOEs are used as a mechanism to address problems that could have been better addressed by other means, because the "first best" solutions are *politically* difficult to implement. In such cases, it may be desirable, although certainly not easy, to make it possible to go for the "first best" policies through political and concomitant institutional reform.

For example, SOEs may be instructed to retain unnecessary workers despite making losses, because the government does not have an unemployment insurance program nor can it create more "productive" jobs through public works programs. In this case, a better solution would be to create a political environment where the government does not have to worry about generating "fictitious" employment because it has good unemployment insurance and public works programs. Setting up these programs,

[12] A natural question that arises at this point is whether the government privatize a monopoly before breaking it up. This is sometimes done in the belief that the government will receive more money (part of the monopoly rents). However, it is a costly (to the economy) way of getting revenue. Privatizing before the monopoly is broken up results in a special interest to preserve the monopoly. Moreover, the government often receives little in return, since the bidder attaches considerable risk to the monopoly being broken up in the future, and so will highly discount the future monopoly profits. I thank Joseph Stiglitz for raising this important point.

however, may need political reforms, because they require a political consensus for higher taxes and government deficit spending (when necessary).

Box 11
Improving the Quality of the Economic Bureaucracy

A high-quality economic bureaucracy is necessary for the success of economic policy, including the management of SOEs and the management of natural resource rents. Indeed, a good economic bureaucracy is required for good post-privatization regulation; without such regulation, privatisation cannot succeed either.

A good economic bureaucracy cannot be built overnight, but it is possible to build one within a relatively short span of time, if there is a political will and economic investment. For example, the quality of the Korean bureaucracy was so poor that, until the late 1960s, Korean bureaucrats were sent to Pakistan and the Philippines for extra training! However, thanks to continuous administrative reform and investment in bureaucratic training, it came to be considered among the best in the developing world by the early 1980s.

What makes for a high-quality economic bureaucracy? In popular perception, a high-quality economic bureaucracy is one staffed with people with advanced training in economics or management. However, the East Asian countries provide some interesting, if not necessarily generalizable, examples that suggest that this may not be the case.

Most of the elite economic bureaucrats in Japan have been lawyers by training. The Republic of Korea also has had a high proportion of lawyers running the economic bureaucracy. In Taiwan (PoC) and China today, the elite economic bureaucrats have been mostly engineers by training. These lawyers and engineers did acquire some training in economics, but the economics training was often of the "wrong" kind until the 1980s. For example, until the 1980s, Marxists dominated Japanese economics faculties, and Schumpeter and List were widely taught. Above all, until recently, the economics training in these countries was not of such high quality, going by international standards. The fact that the bureaucracy in India, a country with arguably one of the best economics training in the world, has not been equally successful in guiding its economy also suggests that specialised training in economics may not be so crucial to the creation of a high-quality economic bureaucracy.

In the end, and somewhat counter-intuitively, the competence needed for good economic bureaucrats seems to be that of a generalist, rather than that of an economist in the conventional sense, as Johnson (1982) pointed out in his classic work on Japan. This suggests that the least developed countries intent on developing a good economic bureaucracy should put more emphasis in recruiting people of generally high calibre, rather than looking for specialists in economics and other related subjects.

Source: Chang (2004a); Johnson (1982).

To be effective, political reforms must be accompanied by administrative reforms. Unless the bureaucrats monitoring the SOEs are competent in doing their job, creating the political space for them is not going to produce results.

Administrative reform requires a number of different elements. Improving the relative pay of civil servants will allow the government to recruit better people and also reduce corruption. Civil servant training also needs to be improved, although the training required is more of a generalist kind, rather than technical training in economics (see Box 11). A campaign to inculcate a public service ethos into civil servants will be useful, if it is accompanied by a decent pay scale: many civil servants are willing to work for the good of the nation without parity with private sector pay, but there is a limit to what their good intentions can bear or afford.

Box 12
What makes a good SOE?

The theories of enterprise performance and real-life examples discussed above allow us to state principles that are likely to lead to successful SOEs. Many of these principles also apply to running successful private firms.

At the enterprise level,

- Clearly define non-profit objectives
  - There is nothing wrong with SOEs having non-profit objectives, such as guaranteeing universal access to basic social services. Indeed, in many cases they are their *raison d'être*. However, these objectives need to be clearly defined and their trade-offs with profit objectives clarified.
- Given the non-profit objectives, establish a management strategy that is profit-oriented but from a long-term point of view.
  - Once the trade-off with non-profit objectives is made clear, management strategy should focus on running a profitable enterprise, given the constraints. However, in developing countries, where long-term investment in capability building is crucial, it is important that profitability is defined from a long-term point of view.
- Adopt the latest possible technologies
  - As seen in the case of POSCO (Box 2), adopt the latest possible technologies, provided that there are technological capabilities to cope with them (with appropriate invesment in enhancing technological capabilities).
- If in the tradable sector, promote exports
  - Exports reduce costs by allowing longer production runs, thus spreading the costs of product development and of dedicated machinery, and higher capacity utilisation. Exports also exposes firms to higher product standards. Exports should be promoted whenever feasible, even though it should be combined with protection and subsidies in the beginning.
- Invest in human resources
  - Ultimately, good enterprises require good people to run them. Invest in training at all levels, from the mangers and research scientists, down to the level of ordinary workers.
- Improve the incentive system
  - Good work should be rewarded and poor performance punished. However, the rewards need not be individually-oriented material rewards. Group incentives are sometimes better, while non-material benefits matter.

At the level of the government,

- Create a dedicated supervisory agency if possible
  - Create a dedicated agency to supervise the SOEs, if possible. Often the supervisory responsibility for SOEs is diffused across many ministries and other government agencies, resulting either in neglect or, conversely, supervision overload.
- Reduce the number of SOEs when appropriate
  - Reducing the number of SOEs through liquidation, mergers, or even privatization of some non-essential SOEs may reduce the demand on monitoring resources.
- Improve information
  - Establish a good accounting system. Improve the flow of information to the supervisory agencies by requiring regular and detailed reporting by the SOEs.
- Increase competition where feasible
  - Many SOEs operate in natural monopolies, where increasing competition is not feasible. However, competition can be increased outside those industries by allowing new entries of private firms and SOEs.
- Avoid political appointments to managerial positions
  - Political appointments tend to harm performance. Although the case of POSCO (Box 2) shows that political appointees can be good mangers too, this is an exception to the rule.
- Reform politics so that SOEs do not need to take on non-essential functions
  - SOEs are sometimes used as a mechanism to address problems better addressed by other means, which are unavailable for political reasons. Political reforms can lead to the creation of such means (e.g., public works program or unemployment insurance) releasing the SOEs from the unnecessary burden.
- Improve the quality of the economic bureaucracy
  - Without a competent economic bureaucracy, creating the necessary political space is no use. The government should improve pay, invest in training, and encourage the public service ethic of the economic bureaucrats (see Box 11).

All this takes time, but we do not need to believe in the currently popular view that developing country governments with poor administrative capabilities should not try to do anything "difficult". A poor country does not need to, indeed cannot, start its economic development with a fully-formed economic bureaucracy. More importantly, bureaucratic capabilities can be increased within a relatively short period of time (see Box 11).

III. MANAGING NATURAL RESOURCE RENTS

Most people agree that non-renewable, mainly mineral, natural resources should be treated differently from other sources of wealth (see, Box 13). This is because such resources are not created by the efforts of those who own the land that produces them. Moreover, their extraction will render them unavailable to others, including later generations.[13] This is why many mineral resources are publicly owned in most

[13] In order to take this problem into account, attempts have been made to construct "Green GDP". The intuition is that, "[j]ust as a firm's accounting frameworks take into account depreciation of its assets, a country's accounting framework should take into account depletion of its natural resources and deterioration of its environment. Just as a firm's accounting frameworks consider assets and liabilities,

countries, which means that countries with larger mineral resources tend to have larger SOE sectors. Additional material on, especially non-renewable, natural resource management and development can be found in the Annex I.

Box 13
What makes natural resources different?

Natural resources, especially minerals and energy,

- are depleteable, non-renewable, assets
  - therefore need to be compensated for the asset as such, taking account of
    - changes in value over time due to market conditions
    - "replacement" cost of its value, as the resource itself cannot be replaced
- are location specific
- are permanent assets, i.e., they take a relatively long time to develop

In many nations natural resources belong to the state by law

- Private property owners do not have rights to them simply by the fortuitous fact that such resources are located beneath their property.
- Mere location of a natural resource within a nation can make a nation wealthy.

The development of natural resources has a wide-ranging impact

- Natural resource development does not happen in isolation
  - It impacts on local communities, neighbouring communities and the nation
    - Impacts can be both positive and negative
    - Impacts are social, including health and labour, environmental and political
      - Determining the impacts is critical
    - Extensive externalities
      - If the externalities and their costs are not defined, hence not covered by the development, the true cost of development is being subsidized
  - Recommendation:
    - Have a developer commit to defining the externalities (by what they are and what they are not) and fully guarantee the costs thereof
    - They are the experts and they should know

Source: Jenik Radon

Fewer people take the same view on renewable natural resources, but in most countries, exploitation of certain renewable resources, e.g., forestry or fisheries, is publicly regulated for reasons of sustainability, while in others, at least parts of such resources are publicly owned. Therefore, the management of natural resources shares certain important characteristics with the management of SOEs.

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so should a country's, noting whether there are increases in liabilities. A country that sells off its natural resources, privatises its oil company, and borrows against future revenues, may experience a consumption binge that raises GDP, but the accounting framework shows that the country has actually become poorer." (Stiglitz, 2005, pp. 14-5).

Appropriating Natural Resource Rents

The challenge of managing renewable resources is even greater than in the case of non-renewable resources. In the case of renewable resources, good management can make the difference between depletion and sustainability, whereas not even the best management can make non-renewable resources last forever.

However, even in the case of non-renewable resources, outcomes can be very different, depending on policies adopted in relation to the mode of resource rent appropriation, management of price volatility, and the management of the so-called "Dutch Disease".[14]

The option most frequently recommended to developing country governments in relation to natural resource rent appropriation is to sell off exploitation rights and to live off the proceeds that accrue. Those who advocate this view emphasize that developing countries lack the ability to extract the resources efficiently and to prudently manage the resulting rents.

This option may be sensible in theory, especially in the short run, but in practice, it requires two critical conditions if the potential benefit is to be realized. First, the developing country government should design and sell the contracts for natural resource exploitation in the right way. Second, there should be no corruption involved in the rights sales process or in the process of revenue appropriation. These conditions are often absent in developing countries (see Box 14 on how these conditions may be improved).

Box 14
Designing and Selling Contracts for Natural Resource Exploration

Designing and selling the rights to exploit natural resources is not a simple matter. Depending on how the rights are designed and sold, the benefits a country derives from the sale could be markedly different.

In terms of contract design, it is crucial that the contract is transparent so that it reduces the chance of corruption. Most important is to make companies "publish what they pay", although making transparent the amount produced and the use of the received funds is also important. The home governments of natural resource companies can also help by allowing only published payments to be tax deductible.

In terms of selling the rights, selling large rights in quick succession or allowing one firm to come in ahead of others should be avoided. The first course of action is likely to progressively reduce prices in subsequent sales, as even the largest firms have limited appetite for risk. The second course of action gives the first firm informational advantages in subsequent auctions, thus making the others bid less in the knowledge that, if they beat the first firm in the auction, it is because they bid too much.

Different forms of auction produce different results. Bonus bidding, where the company willing to pay the largest up-front bonus wins the contract, will discourage bidders because they have to bid without having full knowledge of the cost of production. Bonus bidding is especially of concern in developing countries, where there is more risk of expropriation, or of future governments changing the terms of the contract. It is also important to estimate the implied interest rate of bonus payments, as it is rather like a loan. In contract, royalty bidding, where competitors bid on the fraction of revenue (royalties) they give to the government, carries less risk and generates more competition and therefore more revenue for the government.

Source: Stiglitz (2005)

[14] "Dutch Disease" refers to a situation where the sudden discovery and/or increase in the price or rate of extraction of a natural resource leads to increased export earnings, which then leads to the appreciation of the local currency, weakening the export competitiveness of other products.

More importantly, this is not a very good option in the longer run. Contrary to the popular claim of a "resource curse"[15], renewable and non-renewable natural resources can create numerous forward and backward linkages, and thus become engines of growth. For example, forestry resources can create forward linkages into paper and furniture, and backward linkages into logging machinery and earth-moving equipment. In turn, the furniture industry can create backward linkages into metal-working (e.g. nails, hinges) and chemicals (e.g. paint).

That natural resources do not have to be a "curse" is demonstrated by the examples of several developed countries that have turned their resource endowments to their advantage. Examples include the United States (numerous minerals, forestry, fisheries), Canada (numerous minerals, forestry, fisheries), Australia (numerous minerals), Sweden (iron ore, forestry), Finland (forestry) and Norway (oil and gas). Even in the developing world, there are countries like Malaysia (forestry, tin, oil and gas), Indonesia (oil and gas), and Botswana (diamonds) that have managed their natural resources rather well and not allow them to become "curses".

Given the potential forward and backward linkages that natural resources can create and contribute to economic development, a developing country government should find ways to create *national* capabilities to exploit natural resources productively in the long run. For example, because foreign oil companies did not want to transfer key technologies related to drilling for or refining of oil to the host nation, the Brazilian government has invested heavily and successfully to develop such capabilities through an SOE, Petrobras.

Even if it decides to sell off the exploitation rights, care should be taken to find the right forms of contracts – licenses, joint venture, production-sharing arrangements (for the respective merits and problems of these forms, see Radon, 2005). In addition, the rights should be made renewable after a relatively short period of time (10 or 20 years), so that the situation can be reviewed in light of the development of national capabilities, whose development trajectories are difficult to predict with precision. Moreover, in the event of award or sale of rights to a foreign company, the sales process and the resulting contracts should be designed to effect a transfer of technological, managerial or even production capabilities by the foreign company. This may be achieved through a joint-venture agreement with a national, usually public, company and/or through explicit requirements for various types of capability transfers, e.g. transfer of technologies, managerial training and worker training, so that the country is better able to exploit the resources with its own capabilities in the future, if it so chooses.

Investing the Rents

More important, especially in the long run, than the method of rent appropriation is the way the rent is invested. In this regard, the following quote from Joseph Stiglitz (2003b) is highly instructive.

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[15] "Resource curse" refers to the fact that many resource-rich countries have experienced low growth and unequal income distribution, despite the fact that abundant resources should help growth and also enable countries to redistribute income without having to impose distortionary taxes (thus possibly lowering growth). For a quick, user-friendly introduction to the issues surrounding the "resource curse",, see Stiglitz (2005).

> "One can think of natural resources, oil, as a capital good. It is a capital good. It is a capital good that is below the ground. And what you're doing when you sell oil is taking the wealth of the country and moving it from below the ground to above the ground. Now as you move it from below the ground to above the ground, the question is whether the country is wealthier or poorer as a result. The answer depends on what you do with that money. If you just spend it on consumption, then you are poorer. You had wealth and you no longer have that wealth – that wealth has disappeared. If you take it from below the ground and bring it above the ground and you convert that oil into roads, or capital goods, then you could become wealthier, if those capital goods that you replaced the oil with are highly productive. It is like a portfolio allocation problem: you covert from one form of capital to another form of capital and if in that process you make it into a more productive form of capital, you're wealthier".

Investing in Financial Assets

The easiest option in relation to investment of natural resource rents is to invest them in financial assets, probably through a dedicated fund, and to live off the returns from them (see Box 15). Norway's Petroleum Fund (now called the Government Pension Fund) is the best-known example of this kind (see Box 16). Given the volatile nature of natural resource prices, these funds may also be used by countries as "stabilization funds" that allow them to smooth their income and expenditure.

Box 15
National Resource Funds

A good natural resource fund should have the following features:

- Clear purpose
  - Should be a combination of the short and long term
  - Should be set forth in statutes, possibly even anchored in the Constitution with barriers to easy modification, such as requiring a citizen referendum
  - Should be established as a trust
- Clear policy and strategy on the use of funds specifying the time perspective and the types of uses
- Supervision by an independent board, made up of persons appointed by the executive, legislature and civil society, with staggered terms, not overlapping with national or local elections, and with its structured anchored in law
- Expertise to advise on economic impact
- Skilled fund managers
- Transparency, with publication of accounts and independent audit

A good natural resource fund should *not* be:

- an extension of the budget, although it can be a supplement to the budged if prescribed by clear rules
- a petty cash machine for government, including executive
- a substitute for a normal tax regime

Best practice examples of fund management are Norway (Box 14), Chile, Alaska (United States) and Alberta (Canada).
Source: Jenik Radon

Especially when the resource rents have suddenly increased, investment in *foreign* financial assets is an attractive option in the short run for two reasons. First, an economy's absorptive capacity cannot be increased quickly, so the rents are likely to be invested in low-yielding projects. Moreover, keeping the money outside the country will help reduce the pressure for currency appreciation, thus alleviating the Dutch Disease.

However, the safe financial assets (e.g., US Treasury bonds) are not likely to give high returns, while investing in high-risk financial assets, especially in foreign financial markets, is the last thing a developing country should do, especially considering their lack of financial expertise. More importantly, financial investments are unlikely to enhance the productive capabilities of the national economy. This may not be a huge problem for an advanced economy like Norway, but it is a serious one for developing countries, where investments in capability building are still necessary.

To sum up, investment in financial assets is often the "safest" option with regards to the management of natural resource rents. However, in the long run, developing countries need to invest in building productive capabilities. If so, the option of investing in financial assets should mainly be used as a short-term measure when faced with a large and sudden increase in resource rents.

Box 16
The Petroleum Fund of Norway

In 1990, Norway established the Petroleum Fund (*oljefondet*) – called the Government Pension Fund (*Statens pensjonsfond*) since January 2006 – in order to invest parts of the large surplus generated by the oil sector, mainly taxes of companies but also payment for license to explore. It was set up to counter the effects of the forthcoming decline in income and to smooth out the disrupting effects of highly fluctuating oil prices. It is administered by the Norwegian Central Bank.

The Fund has rightly maintained a relatively conservative investment strategy. Its official website states its objective as "high return subject to moderate risk in order to contribute to safeguarding the basis of future welfare, including national pensions". Consequently, it was only in 1998 that the fund was allowed to invest in equity (but only up to 50% of its portfolio). It was not until 2002 that it was allowed to invest in non-governmental guaranteed bonds.

Since 2004, the Fund has acted under a strict ethical guideline. As a result, on January 5, 2006, arms-related companies such as Boeing, Northrop Grumman, Honeywell International BAE Systems, were removed from its portfolio. In June 2006, Wal-Mart was similarly removed from its portfolio for ethical reasons.

It is predicted that revenues from the petroleum sector, at over NOK1.48 trillion (US$245 billion), is now at its peak and will decline over the next decades. It is currently similar in size to the California public-employees pension fund (CalPERS), the largest public pension fund in the United States.

Source: Norwegian Central Bank website (http://www.norgesbank.no/nbim/pension_fund/); wikipedia on-line encyclopaedia (http://en.wikipedia.org/wiki/The_Petroleum_Fund_of_Norway)

Investing in General Capability Building

Natural resource rents can be invested in building the "general" capabilities of the economy. For example, they could be invested in improving health, basic education, or general physical infrastructure, thereby enhancing overall capabilities in the economy, rather than those of specific industries.

Investing in general capabilities is likely to be a politically safe option, as few would object to such investment at least in theory. For the poorer developing countries, which need more investment in basic capabilities, it is probably also an economically necessary option as well. However, it is a limiting strategy for most developing countries that already have established much of those general capabilities. At their stages of development, they need more targeted investments in specific capabilities. As soon as we move beyond basic education or the most basic of the infrastructure, there is no such thing as investments in "general" capabilities. We don't educate engineers in abstract nor do we build roads in abstract; we have to decide whether we are going to train chemical engineers or electronic engineers, while we need to make up our minds as to whether the next highway will be built between the textile city and the port or between the forestry region and the port.[16]

Therefore, except in the poorest countries, only a small part of the natural resource rents should be devoted to investments in general capabilities, and the rest should be channeled to developing specific capabilities that are deemed necessary for economic upgrading for the future.

Investing in Related Diversification

Another option is to invest the natural resource rents by diversifying into areas related to the natural resource bases. So, for example, Sweden successfully diversified from its forestry resources into paper-making, furniture, and then, into paper-making and furniture-making machinery, and eventually into high-quality furniture design and life-style services (as exemplified by the case of the famous flat-pack furniture company, IKEA). It has also successfully diversified from its iron ore deposits, into an iron and steel industry, and then, to various steel-based products including ships, cars and armaments. As another example, Malaysia had spectacular success in diversifying from raw palm oil into refined palm oil, with moderate success in diversifying from rubber into tyres (see Box 17 for details).

Related diversification is of course a "natural" choice that is also forward-looking. Some activities "naturally" lead to certain others, which either provide inputs to them or buy from them. Albert Hirschman's classic Linkage Approach and Wassily Leontief's Input-Output Approach is built on the very insight.

However, for most natural resources, the scope for related diversification is simply limited – there is only so much one can diversify from coffee or fish. There are some resources that have much greater potential for related diversification – iron ore, forestry or oil. However, even for them, at least some degree of unrelated diversification is needed, if related diversification is to proceed to the top of the value chain. For example, iron ore is "related" to the automobile industry, which uses a lot of steel plates, but the development of the automobile industry requires many other industries that are "unrelated" to iron ore (e.g., electronics, glass, rubber, and paint, just to name a few). Therefore, even those natural resources with a high potential for

[16] The contrast between "general" and "specific" capabilities is somewhat less severe in the case of human capabilities. Once, for example, a road is built, it is there and cannot be moved. However, if people initially invest in acquiring better learning capabilities ("learning to learn"), it may give them higher returns to their investment in subsequent investments in the acquisition of specific capabilities that they need in order to get a job. However, even with enchanced learning capabilities, there is only so much specific knowledge one person can learn in his/her lifetime, so the worker is likely to be locked into certain areas of knowledge, once he/she chooses his/her initial career.

related diversification are likely to be stuck at low value-added activities, unless those unrelated industries are also developed.

Box 17
Resource-based Diversification: The Malaysian Case

Under British colonial rule, Malaysia was a major producer of tin and rubber. After independence in 1957, Malaysia attempted to diversify away from tin and rubber but even as late as 1970 the two commodities still accounted for nearly 60% of the country's exports.

From the 1970s, the government encouraged diversification from tin and rubber. "Horizontal" diversification into other primary commodities was tried. For example, palm oil and cocoa production was encouraged with crop-specific subsidies. Exports of hardwoods and newly-discovered oil and gas also grew. "Vertical" diversification was also encouraged, especially from rubber and palm oil.

Malaysia's attempt to diversify from rubber into tyre manufacturing was not very effective because it failed to demand export success in return for the protection granted to (foreign-owned) tyre manufacturers. This contrasts with the export success of the tyre industry of the Republic of Korea, a country that produces neither rubber nor oil (the raw material for synthetic rubber). The Republic of Korea's export success in tyres was possible because tough export requirements on the protected (domestically-owned) tyre manufacturers made them attain scale economies quickly.

In contrast to the tyre industry, Malaysia has had spectacular success in diversifying from crude palm oil into refined palm oil by imposing a higher export duty on crude palm oil in the mid-1970s, thus attracting massive investments in palm-oil refining capacity. Since the mid-1980s, Malaysia has been the world leader in palm oil refining technology.

Source: Jomo & Rock (1998)

Therefore, while the potential for related diversification should be exploited to the full, in the longer run there has to be a shift to unrelated diversification into technologically dynamic areas. Moreover, unrelated diversification is often necessary to maximize the scope for related diversification.

Investing in Unrelated Diversification

Natural resource rents also need to be invested in "unrelated diversification". There is only so much related diversification and upgrading that one can do even for a very widely-used resource like wood or iron ore, as we pointed out above. Therefore, in order to achieve sustainable long-term development, countries need to use their natural resource rents in order to diversify into unrelated industries that are the most technologically dynamic.

Nokia, the Finnish company famous for mobile phones, offers the best example of a successful unrelated diversification out of natural resources (see Box 18 for further details). Nokia started as a logging company, but later diversified into rubber, electric cables, and telephone exchanges, and more recently, into electronics and mobile telecommunications. Interestingly it took the electronics company of the Nokia group 17 years before it made any profit, suggesting that unrelated diversification often involves a long gestation period.[17]

Box 18
From Logging to Mobile Phones: The Story of Nokia

The Finnish company, Nokia, is today known as the maker of ultra-modern mobile phones. However, it was founded as a logging company in 1865.

The shape of modern Nokia group started emerging when Finnish Rubber Works Ltd. (founded in 1898) bought the majority shares in Nokia in 1918 and in Finnish Cable Works (founded in 1912) in 1922. Finally in 1967 the three companies were merged to form Nokia Corporation. Some Finnish observers summarize the nature of the merger by saying that the name of the merged company (Oy Nokia Ab) came from wood processing, the management from the cable factory, and the money from the rubber industry.

Nokia's electronic business, whose mobile phone business forms the core of the company's business today, was set up in 1960. Even until 1967, when the merger between Nokia, FRW, and FCW happened, electronics generated only 3% of Nokia group's net sales. The electronics arm lost money for the first 17 years, making its first profit only in 1977.

The world's first international cellular mobile telephone network, NMT, was introduced in Scandinavia in 1981 and Nokia made the first car phones for it. Nokia produced the original hand-portable phone in 1987. Riding on this wave, Nokia rapidly expanded during the 1980s by acquiring a series of electronics and telecommunications companies in Finland, Germany, Sweden, and France. Since the 1990s, Nokia's leading business has been mobile phone.

By the 1990s, Nokia became the leader in mobile telecommunications revolution and an icon of globalization. The facts that Finland used to classify all firms with more than 20% foreign ownership as "dangerous" until 1987 or that its electronics arm had played havoc with the sacred "shareholder value" by making losses for the first 17 years were conveniently forgotten by the globalization enthusiasts.

Sources: Steinbock (2001); Chang (2004b);
Nokia official website: http://www.nokia.com/link?cid=EDITORIAL_3913

[17] Our emphasis on the long-term perspective should not be interpreted as saying that, given sufficient time, everything will succeed, and therefore that we can back any venture. It is important to know when to accept failure and cut losses. There is no clear rule on this, but at least after the first few years of "teething", one would expect a venture to show a trend improvement in performance if it is to justify acontinued support.

Unrelated diversification is of course the most difficult option, with a long gestation period. It also needs a good long-range industrial planning, which may be difficult to manage for the poorest developing countries that lack administrative capabilities, although such capabilities can be built relatively quickly, contrary to the conventional wisdom (see Box 11 above).

However, as we can see from the Nokia example, unrelated diversification into technologically dynamic industries can bring the highest return, albeit after a long gestation period. Therefore, efforts should be made to move away from the natural resource-based industries in the long run through unrelated diversification. However, given its long gestation period, it is necessary in the short- to medium-run to supplement this option with other options that yield more immediate returns.

Choosing the Right Policy Mix

Investments of natural resource rents in (related or unrelated) diversification should be based on a coherent development strategy. Its execution may be done through SOEs (in which case, the points made in Section II need to be heeded) or by using the rents to provide subsidies (directly or indirectly through tariffs and other forms of trade protection) to private sector firms setting up in new industries (for this, see the Policy Notes on Investment and Technology Policy in this series).

The appropriate mix of the different strategies for using resource rents – financial investment, investment in general capability building, investment in related diversification, investment in unrelated diversification – will differ across countries, but it is likely to involve all four options, with their relative importance varying across countries and changing over time, even in the same country. The pros and cons for each option and the recommended policy actions in relation to each option are summarized in Box 19.

For example, in the very early stage of development, financial investment and investment in general capability building may be more important, while the other two routes will become more important as the economy develops. Similarly, the relative importance of related and unrelated diversifications may alternate, as countries may first need unrelated diversification to jump to a new stage, while a period of consolidation of new industries through related diversification may be necessary after it enters a new industry.

Box 19
Options for Natural Resource Management

Option 1. Sell off the exploitation rights

Pros:

- May be the only option if the country lacks productive capacities in the extreme

Cons:

- Weak administrative capacities make it difficult to conclude a good deal with foreign investors
- Likely to create more room for corruption
- Low return in the long run

Recommended Policy Actions:

- The sales process should be transparent in order to prevent corruption
- Contracts should be made renewable after a relatively short period (say, 10 years) so that they can be re-negotiated according to the changes in the country's capabilities
- Contracts should be designed in order to ensure capability transfers

Option 2. Invest in Financial Assets

Pros:

- Especially good option when rents have suddenly increased, as it can get around the problem of the lack of absorptive capacity and may also mitigate "Dutch Disease"

Cons:

- The safe assets are not likely to give high returns, while investing in high-risk financial assets is the last thing a developing country should do.
- Does not enhance the productive capabilities of the national economy.

Recommended Policy Actions:

- Should be used as a short-term measure when faced with a large and sudden increase in resource rents

Option 3. Invest in General Capability Building

Pros:

- Likely to be a politically safe option.
- For the poorer developing countries, it is probably an economically necessary option as well.

Cons:

- A limiting strategy for most developing countries that have already established much of those general capabilities.

Recommended Policy Actions:

- Except in the poorest countries, only a small part of the resource rents may be devoted to this option. The rest should be channeled to developing more industry-specific capabilities.

Option 4. Invest in Related Diversification

Pros:

- A "natural" choice that is also forward-looking.

Cons:

- For many natural resources, the potential for related diversification is limited (e.g., coffee).
- Even those few resources with much greater potential for related diversification – iron ore, forestry, or oil – may become stuck at low value-added activities, unless complemented by unrelated diversification.

Recommended Policy Actions:

- The potential for related diversification should be exploited to the full
- Needs careful coordination with unrelated diversification to maximize the scope
- In the longer run, a shift to unrelated diversification into technologically dynamic areas is necessary

Option 5. Invest in Unrelated Diversification

Pros:

- The most productive strategy in the long run, if diversified into the technologically most dynamic industries

Cons:

- Most difficult to manage
- Long gestation period

Recommended Policy Actions:

- This should be the ultimate goal, but given the long gestation period, it is necessary to combine it with other options that yield more immediate returns.

The Political Economy of Natural Resource Rents Management

One major concern regarding the management of natural resources is the apparently greater susceptibility of natural resources to corruption.

Some have argued that mineral resources are usually concentrated in their natural locations (so-called "point resources") and therefore easy to "steal" or "loot" (i.e. have high "lootability") They argue that high lootability makes the prevention of corruption and of private attempts at rent-capture (through politics and violence) much more difficult. In contrast, they point out, agricultural resources – say, coffee or cocoa – tend to be more dispersed (so-called "diffuse resources"), requiring sustained work to generate income, making looting more difficult.

While there is some truth to this argument, we should not take the natural characteristics of resources as given. Depending on the political and administrative capabilities of the state, agricultural resources can also be concentrated to a very high degree, while a government made up of honest people and well monitored by civil society may make looting of even very geographically concentrated resources difficult. Nature is not destiny.

African marketing boards are probably the best-known mechanism used to concentrate agricultural resources. Less well known but equally important is the fact that countries like Taiwan (Province of China) and the Republic of Korea were able to

almost completely concentrate their rice output. This was achieved through mandatory sale of rice to the state-controlled Agricultural Cooperative, whose control over the supply of chemical fertilizers and the irrigation system made it virtually impossible for farmers to “opt out”. In contrast, through the Petroleum Fund and the welfare state within a “clean” political system, Norway has been able to equitably distribute its oil rents (see Box 14).

Thus, lootability is more a consequence of politics and institutions than an immutable natural characteristic of the natural resource concerned. There is nothing inevitable about the so-called “resource curse”. If there is nothing pre-destined about the lootability of particular resources and the likelihood of corruption surrounding them, it becomes possible to think of ways to design a natural resource rent management system that is less corrupt, with more equitable and sustainable consequences.

The first thing to do is to design a system of allocating the rights to exploit natural resources that is less prone to corruption. This requires that the system be transparent and simple, so that outsiders can easily monitor it. It would be better if the system is subject to relatively frequent review, so that wrong decisions can be promptly corrected.

At the same time, it is a good idea to create a transparent single fund for resource rents, rather than leaving them diffused in lots of different little pots. This will make it easier to monitor the use of such rents, thereby ensuring its developmental and equitable deployment, as well as preventing abuse.

With a reasonable degree of transparency in the system and proper auditing as well as accountability mechanisms, a single fund will be much easier to monitor. This can be enhanced by consolidating monitoring responsibilities in a single supervisory agency, as discussed above in relation to SOE management.

Preventing abuse, corruption and fraud is not easy. Joseph Stiglitz (2003b) has pointed out that cheating on resource rents is widespread and not easy to detect, even in countries like the United States. However, strenuous effort must be made to ensure that wealth belonging to everyone, including future generations, in the country is not appropriated by a small minority.

IV. ANNEX

Annex I. Natural Resource Management and Development

In view of the apparent difficulties with natural resource management and development, this annex provides some guidance on these matters, focusing particularly on non-renewable resources.

Annex Box 1
Natural Resource SOEs

Natural resource SOEs are, or should be managers and trustees of a valuable national non-renewable asset.

However, natural resource SOEs are risky ventures, subject to outright failure for reasons of:

- heavy exploration and development costs
- heavy capital investment
- market swings in commodity prices
- competitive pressures from other producers
- availability of experts and skilled services

While natural resource SOEs do not themselves have to be the operators, they do have to be:

- national wealth creators/ transformers
- the supervisors or operational watch-dogs
- the policy and strategic directors
- responsible to the nation and the impacted communities

At the same time, it should be clearly recognized that the SOEs are not themselves the regulators, and therefore need to be regulated.

A natural resource SOE requires a sophisticated organization with

- clear policy and plans addressing
  - strategic, operational and commercial concerns
  - investment
  - technology concerns and management
  - social and environmental impact concerns
    - skilled personnel
- ability to separate regulatory concerns, e.g., environment, health and safety, from the non-regulatory, e.g. commercial, ones

Examples of well-run natural resource SOEs are Statoil of Norway and Saudi Aramco of Saudi Arabia.

Source: Jenik Radon

Annex Box 2

Managing the exploration and development of natural resources

The following is a list of some critical issues with regards to the exploration and development of natural resources.

1. Data/information
    - need exploration data: this is costly
    - need market data
        - E.g. what is the prospective market, profile, etc.
2. Exploration
    - expensive, with risk of no commercial discovery
3. Development
    - expensive and long term by definition
4. Negotiation: the key to pursuing exploration and development
    - need "partners"
        - whether as real partners, as service providers, etc.
    - need to negotiate everything
        - all types of agreements: exploration, development, service, marketing
    - negotiation is a skill
        - not everyone can negotiate effectively
    - the devil is in the details
        - outsourcing of certain responsibilities/tasks is unavoidable (engagement of experts)
            - negotiation
            - legal
            - technical, including environmental, etc.
            - financial
            - Remember: experts are expensive and often you get what you pay for
                - Make sure experts are free of conflicts of interest, i.e., truly independent): find out who are their clients
    - terms: compensation, operation, termination etc.
        - need compensation for the asset (i.e. the natural resource)
        - different types of compensation
            - e.g. upfront fees, royalties, profit taxes, windfall profit taxes
                - industry finds it unacceptable but a windfall profit tax should be considered, e.g., tied into market prices
                    - all companies base investment decisions on an expected internal rate of return; excess returns are an unexpected bonanza
        - regulatory issues
            - should be set forth in statutes and regulations, not in agreements
                - if the legal system is inadequate, refer to other legal systems

- type of agreements (not all will be done internally by SOE)
  - exploration, development, production
    - production sharing
    - license
    - joint venture
  - marketing, distribution
  - service
  - *note*: each form is different, has a different purpose, and have different results
    - *remember*: potential partners to such agreements are often multinational companies with extensive experience and knowledge, are financially strong and professionally staffed
      - makes negotiation challenging
    - each provision of an agreement must be negotiated
    - service contracts are not popular with international companies as returns are too small
      - challenge is to find companies willing to part with knowledge in return for service type compensation
  - always make sure the ultimate parent company is contractually legally responsible, including through a guarantee
    - accountability and responsibility stops only at the top and should not be limited to a subsidiary
    - just because a provision is industry practice, does not make it right, fair or acceptable
      - example: stabilization clauses which include provisions other than a fixed tax regime for a limited period of time
        - they make the present permanent
        - limit the right of a nation to enact new legislation and regulation

5. Supervision/management of operations
   - exploration plans
   - development plans
   - termination and abandonment plans
   - community/social impact studies/plans
   - environmental impact studies/plans
6. Access to capital
   - SOEs need to be able to borrow significant funds
   - need to be able to give security

Source: Jenik Radon

Annex 2. The Role of Property Rights in Economic Development*

There is great emphasis on the importance of property rights in recent orthodox discourse. The logic behind it is simple, but powerful.

It is argued that we have to give people the right to claim the fruits of their investments, to encourage them to invest and raise productivity. And in making such an argument, it is pointed out that such a right should be "private", because if something is collectively owned, no one would take care of it properly.

This idea is best expressed in the so-called "tragedy of the commons", where common grazing land with open access is over-grazed to everyone's detriment, because it is always in an individual's interest to let his/her cattle graze as much as possible, without regard to the sustainability of the grazing land.

The same logic is applied to SOEs, when it is argued that no citizen (as a principal) has the incentive to invest in monitoring the SOE managers (as his/her agents), because the gains from better management are shared by everyone, while the costs are borne by individuals.

However, there are numerous problems with this argument.

The Measurement problem

To begin with, unlike some other institutions (e.g., the bureaucracy or the fiscal system), the property rights system is a complex of a vast set of institutions – land law, urban planning law, tax law, inheritance law, contract law, company law, bankruptcy law, intellectual property rights law, and customs regarding common property, to name only the most important ones.

And being made up of such diverse elements, it is almost impossible to "aggregate" these component institutions into a single institution called the property rights system.

Given the impossibility of aggregating all elements of a property rights system into a single measurable indicator, empirical studies tend to rely on subjective measures of the overall "quality" of the property rights system.

Many rely on surveys among (especially foreign) businessmen, "experts" (e.g., academics, chief economists of major banks and firms, etc.), or even the general public, asking them how they assess the business environment in general, and the quality of property rights institutions in particular.

Such measures are very problematic, as the survey results can be strongly influenced by the general state of business, rather than the inherent quality of the property rights system itself. For example, a lot of people who were quite happy to praise the good business environment in East and Southeast Asia suddenly started criticizing cronyism and other institutional deficiencies in these countries once the 1997 financial crisis broke out.

As with so much else, we need to be cautious in accepting the evidence allegedly showing that a "stronger" property rights system is better for economic development.

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* This is drawn from Chang (2007, forthcoming)

The coverage problem

The discourse on property rights does not recognize all possible forms of property rights. It essentially recognizes only three types of property rights – open access, state ownership, and pure private ownership, of which the last is deemed the best. However, there are other important forms of property rights.

Usually overlooked in the orthodox literature, there are genuinely *communal property rights* that allow no individual ownership but are based on clear rules about access and utilization. For example, in most rural communities, there exist communal rules for gathering firewood in communally-owned forest; on the internet there exist rules regulating profit from open source software distributed under the General Public License (GPL).

Moreover, post-socialist developments in China have involved *hybrid forms of property rights*. For example, the TVEs (township and village enterprises) are *de jure* owned by local governments, but in most cases, operate with *de facto*, although legally unclear, control by powerful local political figures.

Limits to the notion of "private" ownership

Much economic analysis starts from the assumption that all property rights are exogenously and clearly defined.

However, in reality, existing ownership rights are the product of previous social bargaining, and are constantly being altered because people are constantly attempting to create new property rights, expand the boundaries of existing property rights, eliminate existing property rights, and defend their existing property rights against such encroachments.

As a result, most, if not all, ownership rights are "truncated" in a most complex manner, and there are very few examples of pure private ownership as envisaged in economics textbooks.

Ceilings or floors are imposed on the prices at which individuals may buy or sell. For example, rent control imposes price ceilings on real estate rentals, while the Common Agricultural Policy of the European Union establishes price floors, the minimum prices at which the EU guarantees purchase.

The ability to use assets or to transform them can also be limited. Zoning laws, which restrict the ways in which land can be used, are the best example of this. For another example, many regulated firms have only limited freedom to scrap their physical capital, to set prices, or to decide on the geographical areas they want to serve.

Even when there are no such explicit restrictions, the uses to which a resource can be put are bound to be limited. For example, I may own a knife, but may not kill someone with it. Or you may own a certain machine, but you may not be allowed to operate it with the labour of a child under a certain age.

In other words, the delineation of property rights is not independent of what members of society believe to be legitimate rights and corresponding obligations. What is accepted as legitimate depends on the politics of the society concerned. For example, banning child labour may be seen as encroaching on employers' rights in one society, but not in another.

Security of property rights and economic development

In the orthodox literature, it is presumed that stronger protection of property rights is always better. However, this cannot be true as a general proposition.

The fact that something, in this case, protection of property rights, is good does not mean that more of it is always better. While it is probably true that very weak protection of property rights is bad, excessively strong protection may not be good either, as it can end up protecting obsolete technologies and outmoded organizational forms. If that is the case, there may be an inverse U-shaped relationship, where a system of protection that is too strong or too weak is not good. Alternatively, it may be that, as long as it is above a minimum threshold level, the strength of property-rights protection may not matter too much.

Whatever the exact relationship between the strength of property-rights protection and economic development, it is not likely to be linear.

Moreover, and more importantly from the point of view of economic development, the growth-impact of a particular property right may not be constant over time.

A particular property right may become good or bad for society, depending on changes in the underlying technology, population, political balance of power, or even ideologies.

Indeed, there are many examples in history where the preservation of certain property rights proved harmful for economic development, while the violation of certain existing property rights and the creation of new property rights were actually beneficial for economic development.

The best known example is probably the enclosure movement in England, which violated existing communal property rights by confiscating the commons, but contributed to the development of wool manufacturing by promoting sheep farming on the land thus confiscated. De Soto (2000) documents how the recognition of squatter rights, in violation of the existing property rights of owners, was crucial in developing the American West. Land reform in Japan, the Republic of Korea and Taiwan (PoC) after the Second World War violated the existing property rights of landlords, but contributed to the subsequent development of these countries. Many people argue that the nationalization of industrial enterprises in France after the Second World War contributed to its industrial development, by transferring certain industrial properties from a conservative and non-dynamic industrial capitalist class to professional public sector managers with a penchant for modern technology and aggressive investments.

The examples could go on, but the point is that, if there are groups who are able to utilize certain existing properties better than their current owners can, it may be better for the society not to protect the existing property rights and to create new ones that transfer the properties in question to the former – bearing in mind that what is the "better" use is always debatable, not only from economic but also from political point of view. In this circumstance, too strong a protection of certain (existing) property rights may become a hindrance to economic development.[18]

[18] This is, of course, the main insight from Marx's theory of social evolution, where a property rights system ("social relations of production") that was once good for the development of technologies

V. REFERENCES

Amsden, Alice (1989). *Asia's Next Giant – South Korea and Late Industrialization*, New York and Oxford: Oxford University Press.

Chang, H-J. (2000). The hazard of moral hazard – Untangling the Asian crisis. *World Development*, 28 (4).

——— (2004a). Institutional foundations for effective design and implementation of selective trade and industrial policies in the least developed countries: Theory and Evidence. In *The Politics of Trade and Industrial Policy in Africa: Forced Consensus*, C. Soludo, O. Ogbu and H-J. Chang, eds. Trenton, New Jersey and Asmara, Eritrea: Africa World Press.

——— (2004b). Regulation of Foreign Investment in Historical Perspective. *European Journal of Development Research*, 16(3).

——— (forthcoming). Understanding the relationship between institutions and economic development: Some key theoretical issues. In *Institutional Change and Economic Development*, H-J. Chang, ed. Tokyo and London: United Nations University Press and Anthem Press.

——— and A. Singh (1993). Public enterprise in developing countries and economic efficiency. *UNCTAD Review*, 1993, no. 4.

De Soto, Hernando (2000). *The Mystery of Capital*. London: Bantam Books.

Goldstein, Andrea (2002). Embraer: From national champion to global player. CEPAL Review, no. 77, August 2002. http://www.eclac.cl/publicaciones/SecretariaEjecutiva/0/LCG2180PI/lcg2180i-Goldstein.pdf

Greenwald, Bruce, and Joseph Stiglitz (2006). Helping infant economies grow: Foundations of trade policies for developing countries. *American Economic Review*, 96 (2).

IMF (2004). *Public Investment and Fiscal* Policy. Washington D.C.: International Monetary Fund.

Johnson, Chalmers (1982). *MITI and the Japanese Miracle.* Stanford: Stanford University Press.

Jomo, K.S., and Rock, Michael (1998). Economic diversification and primary commodity processing in the second-tier South-East Asian newly industrializing countries. UNCTAD Discussion Paper, no. 136. Geneva: United Nations Conference on Trade and Development.

Kessler, Tim, and Nancy Alexander (2003). Assessing the risks in the private provision of essential services. Discussion Paper for G-24 Technical Group, Geneva, Switzerland, 15-6 September 2003. http://www.unctad.org/en/docs/gdsmdpbg2420047_en.pdf

Radon, Jenik (2005). The ABCs of oil agreements. In *Covering Oil: A Reporter's Guide to Energy and Development*, Anya Schiffrin and Svetlana Tsalik, eds. New York: Open Society Institute.

http://www.revenuewatch.org/reports/072305.pdf

("forces of production") can become an obstacle to further developments of the very same technologies that it once helped to promote.

Radon, Jenik (2007). How to negotiate your Oil Agreement, in *Escaping the Resource Curse,* Macartan Humphreys, Jeffrey Sachs and Joseph Stiglitz eds. New York: Columbia University Press.

Roy, Rathin (2006). Fiscal space for public investment: Towards a human development approach. Paper prepared for the G-24 Technical Meeting, Singapore, 13-14 September 2006.

Sappington, David, and Joseph Stiglitz (1987). Privatization, information, and incentives. *Journal of Policy Analysis and Management,* 6 (4).

Singapore Department of Statistics (2001). Contribution of government-linked companies to gross domestic product. Occasional Paper on Economic Statistics, no. 22.

Singapore Ministry of Finance (1993). *Interim Report of the Committee to Promote Enterprise Overseas*.

Shin, J-S. (2005). Globalization and challenges to the developmental state: A comparison between South Korea and Singapore. *Global Economic Review*, 34 (4).

Simon, Herbert (1983). *Reason in Human Affairs*. Oxford: Basil Blackwell.

Steinbock, Dan (2001). *The Nokia Revolution*. New York: AMACOM.

Stiglitz, Joseph (2003a). *The Roaring Nineties – A New History of the World's Most Prosperous Decade*. New York and London: W.W. Norton.

——— (2003b). Covering Resource Wealth. Presentation at the Initiative for Policy Dialogue/Public Finance Monitor Center Workshop, 20 November, Baku, Azerbaijan. http://www2.gsb.columbia.edu/ipd/bakutranscript.pdf.

——— (2005). Making natural resources into a blessing rather than a curse. In *Covering Oil: A Reporter's Guide to Energy and Development*, Anya Schiffrin and Svetlana Tsalik, eds. New York: Open Society Institute.

http://www.revenuewatch.org/reports/072305.pdf

——— (2006). An airport debacle worsened by greed and neglect, *Financial Times*, 22 August 2006.

World Bank (1995). *Bureaucrats in Business – The Economics and Politics of Government Ownership*. New York: Oxford University Press.