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Background Paper

ON NATURAL RESOURCE ABUNDANCE AND UNDERDEVELOPMENT

S MANSOOB MURSHED

Commissioned by: Gunnar Eskeland
ON NATURAL RESOURCE ABUNDANCE AND UNDERDEVELOPMENT

S MANSOOB MURSHED*

Institute of Social Studies (ISS)
PO Box 29776
2502 LT The Hague, Netherlands
Murshed@iss.nl
www.iss.nl

ABSTRACT

This paper looks at the relationship between natural resource endowment, particularly the type associated with minerals and plantations, and economic development. It may not be natural resource endowment per se but its type that matters, when it comes to growth and development. Certain types of natural resources such as oil and minerals have a tendency to lead to production and revenue patterns that are concentrated, while revenue flows from other types of resources such as agriculture are more diffused throughout the economy. The former category is dubbed point-sourced economies, while the latter type is referred to as diffuse ones. Most countries in the first group have been prone to growth failure in recent times, with notable exceptions such as Botswana and Indonesia. The paper reviews two sets of models, the first group outlining the onset of the resource curse, and the second category sketching conditions where resource booms actually aid growth, or policies to avoid the resource curse. The vast majority of these models stress intersectoral linkages. An explicit model of growth collapse with micro-foundations in rent-seeking behaviour and contests is also presented. Political economy considerations associated with resource rents are also reviewed. The focus is on institutions that determine the policy superstructure. The importance of institutions is highlighted, followed by a sketch of institutional malfunctioning and an overview of the empirical models of institutional determination. The paper concludes that a rich natural resource endowment only becomes a curse if inappropriate policies are pursued. Inappropriate or bad policies are the products of poor institutions. The avoidance of the resource curse, therefore, requires fashioning good institutions of governance that produce appropriate policies.

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1 Introduction

This paper looks at the relationship between natural resource endowment, particularly the type associated with minerals and plantations, and economic development. It begins from the contention that a country with a greater endowment of natural resources relative to the rest of the world will be subjected to a “winners curse”. Its economic performance, in the long run, will be worse than that of countries that have a relatively lower resource endowment. See, for example, Auty (1997); Auty and Gelb (2001); Isham, Pritchett, Woolcock and Busby (2002); Murshed and Perälä (2001); Rodriguez and Sachs (1999); Sachs and Warner (1999a and b). Countries placing a heavier reliance on natural resources in their production structure will also experience greater cyclical fluctuations in their trend national income.

It may not be natural resource endowment *per se* but its *type* that matters, when it comes to growth and development (Auty, 1997; Woolcock, Pritchett and Isham, 2001). Certain types of natural resources such as oil and minerals have a tendency to lead to production and revenue patterns that are concentrated, while revenue flows from other types of resources such as agriculture are more diffused throughout the economy. Adopting the terminology defined in Auty (1997) and Woolcock-Pritchett-Isham (2001), the former category are dubbed point-sourced economies, while the latter type are referred to as diffuse ones. Economies with point-source or concentrated resources such as oil and diamonds can be expected to have a higher propensity to engage in rent-seeking and other unproductive activities when compared to economies with diffuse resources such as fertile soils, grazing land, and fisheries. There is a greater chance of a vicious cycle of mismanagement, rent-seeking and even conflict (Addison, Le Billon and Murshed, 2000) in countries with resources that can be more easily expropriated. Economies that are coffee/cocoa based may also be regarded as point-sourced, as these commodities tend to be produced in plantations with concentrated ownership. Easterly (2001) suggests another basis for classifying economies as point-sourced or diffuse. In the latter category, producers can directly consume output, which is very often food.

Table 1 presents a list of 42 developing countries\(^1\) that are growth failures having a real per-capita income level in 1998 achieved earlier, at some time before 1960 to the end of the 1980s. Catastrophic growth failure is considered to have

\(^1\) Former socialist countries in Europe, Asia and Africa are excluded due to incomplete data.
occurred in economies which attained their contemporary real per capita income level sometime during 1960s or before. Severe growth failure, in turn, is considered to have occurred in those economies that have had more than a decade of stagnation and that have reached their current real per capita income level either during 1970s or 1980s. All but 6 of these countries can be described as having point-sourced natural resource endowments.\(^2\) The diffuse economies are Honduras, Mali, Philippines, Senegal, Somalia and Zimbabwe.

Note that all the catastrophic growth failures, meaning those who had real per-capita incomes in 1998 achieved during the 1960s or earlier, are in sub-Saharan Africa with the exception of Bolivia and Jamaica. When we consider severe growth failures, defined as those having a real income per head in 1998 which was obtained in the 1970s or 1980s more nations from Latin America and the Caribbean enter the list, as well as countries from the Middle East and North Africa region. Only one East Asian nation, the Philippines, joins this list.

Table 1 is constructed on the basis of data availability on growth rates extending back to 1960 and earlier, a total of 98 countries. If we look into the picture after 1965, we can include more nations, as in Table 2.\(^3\) We would want to add, at least, Angola, Iraq and Ethiopia to the list of growth failures, based on a negative growth. There are data inadequacies with Tanzania, but if we use United Nations least-developed countries data, it too would be a growth failure. All of these are point-sourced or coffee/cocoa economies.\(^4\)

More importantly, only six (or 7 if we include Oman)\(^5\) point-sourced economies have real per-capita income growth rates that exceed 2.5 per cent per annum on an average between 1965-99. These are Botswana, Chile, the Dominican

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\(^2\) Based on the classification used in Isham, Pritchett, Woolcock and Busby (2002), who use UNCTAD export data for 1985. These authors also distinguish between point-sourced and coffee/cocoa economies, which for the purposes of this paper, are regarded to be point-sourced as well. A country is point-sourced or diffuse based upon its principal export commodity, not ownership patterns or the share of the natural resource sector in national income. Thus, it is anomalous that Zimbabwe is considered diffuse because its principal export is tobacco, a diffuse crop, whereas land ownership is more like a point-sourced economy. The same may be said for the Philippines.

\(^3\) Table 2 presents point-sourced and coffee/cocoa economies separately. We may consider both these categories to be point-sourced.

\(^4\) In Table 2 countries I add four more growth failures, indicated by a ‘yes’ (italics) in the growth failure column. They are Angola, Ethiopia, Iraq and Tanzania. We are unable to clearly pinpoint the exact decade when the growth collapse commenced going back to 1960 or earlier, except to say that it extends back to the 1970s or early 1980s.

\(^5\) Oman does have a 5 per cent growth rate of per-capita income between 1965-99. It is not usual to include Oman in a list of developing countries, due to its size. Libya and Kuwait have data problems, but the data we have clearly suggests they are growth failures.
Republic, Indonesia, Egypt and Tunisia. Of these only two, Botswana and Indonesia have high growth rates of over 4 per cent. We may wish to consider Malaysia to be point-sourced, as well, even though her 1985 and contemporary export pattern suggests that it is diffused and a manufacturing exporter respectively. Therefore, in the developing world we have three point-sourced success stories.

Furthermore, coffee/cocoa economies tend to be among the poorer growth performers (Table 2). Within that category, only Brazil, Colombia and Uganda have real per-capita income growth rates that exceed 2.0 per cent per annum on an average between 1965-99. So any general problems associated with point-sourced growth tend to be as great, or greater, for plantation economies when compared to mineral economies.

If natural resource endowment, particularly of the point-sourced variety, retards economic growth and development, two questions immediately spring to mind. First, what are the channels between this type of riches and underdevelopment? Secondly, is this resource curse inevitable, and what can be done to counteract it? The position taken in this paper is that a rich natural resource endowment only becomes a curse if inappropriate policies are pursued. Inappropriate or bad policies, in turn, are the products of poor institutions. The avoidance of the resource curse, therefore, requires fashioning good institutions of governance that produce appropriate policies.

The rest of the paper is organised as follows. Section 2 reviews two sets of models, the first group outlining the onset of the resource curse, and the second category sketching conditions where resource booms actually aid growth, or policies to avoid the resource curse. The vast majority of these models stress intersectoral linkages. Section 3 presents a model of growth collapse with micro-foundations in rent-seeking behaviour and contests. Political economy considerations are analysed and reviewed in section 4. The focus is on institutions that determine the policy superstructure. The importance of institutions is highlighted, followed by a sketch of institutional (mal)functioning. Section 4 ends with a review of the empirical models of institutional determination. Finally, section 5 concludes with policy recommendations.

2 Dutch Disease & Intersectoral Effects of Resource Booms

2.1 Resource Booms Retard Growth
The most common macroeconomic effect associated with natural resource booms is known in the literature as 'Dutch Disease', see Neary and Wijnbergen (1986) for example. The problem is not associated with a steady reliance on agriculture or resource based exports, but a sudden windfall gain. This may be due to a sudden, but temporary, increase in the price of oil and other primary commodities, as in the 1970s. Alternatively it can also be associated with natural resource discoveries, increases in worker remittances or other unrequited international transfers. Irrespective of the cause, a resource boom crowds out the leading sector of the economy. In an open economy a substantial current account surplus appears, leading to currency appreciation under a regime of flexible exchange rates. This renders existing (non-resource boom) exports even more uncompetitive in world markets. A shift in domestic output from tradeables to non-tradeables takes place.

Why should this be a problem over time? As the model in Krugman (1987) illustrates, if there are learning by doing effects, a country whose manufacturing base is eroded during a resource boom can irreversibly lose competitiveness, even when the exchange rate reverts to normal after the boom has subsided. Thus, temporary resource booms cause *hysteresis*, a permanent loss of competitiveness. For developing countries, this means that their future potential for exporting manufactured goods and diversifying the production base is stunted. If there are positive externalities from human-capital accumulation in manufacturing only, as in Matsuyama (1992), and resource booms retard the development of the more dynamic manufacturing sector, the growth path of the economy under free trade is lower than that of more resource poor countries.

In the paper by Sachs and Warner (1999a) a role for human capital is incorporated into a model with a non-traded sector, a traded good and a purely exportable natural resource sector. Human capital accumulation, in the form of an externality, takes place as a result of traded/manufacturing production only. In contrast, one of the earliest treatments of human capital accumulation is in Shell (1966). In that model, knowledge is a public good, the accumulation of which benefits all sectors in the economy through cost savings. Acquiring knowledge is not a costless process as in Sachs and Warner (1999a), but being a public good, is entirely financed by the state via taxation of the productive sector in Shell (1966). Resource booms, in the Sachs and Warner (1999a) model retard the growth of the economy via the crowding out of production in the traded (manufactures) sector. The stock of human
capital is diminished as employment in tradeables declines; this in turn hampers future production of all goods, and hence the growth of the economy. Growth is, however, studied within the limited framework of a two-period model.

The other Sachs and Warner (1999b) paper on resource booms permits increasing returns to scale in either of the two sectors of the economy (traded or non-traded), but not in both. Increasing returns characterize the production of a range of intermediate inputs that could be employed in final production. This feature is similar to the Grossman and Helpman (1991) model, where in a setting of monopolistic competition, varieties of new products are either innovated or imitated from abroad. The model then addresses whether resource booms can contribute towards 'big-push' type industrialization. A resource boom unambiguously expands the non-tradeable sector, while at the same time shrinking the traded sector. If it is the expanding (non-traded) sector that uses these intermediate inputs, it may contribute to a successful big push. If the opposite is the case, and it is the traded sector which uses the intermediate inputs, big-pushes are less likely. Unless expectations about the future are optimistic, even the most propitious circumstances may not trigger accelerated industrialization or the big-push. Implicitly, these expectations are related to the political system and social capital.

Clarida and Findlay (1992) present a model where absolute and comparative advantage is endogenous and policy induced. The mechanism via which this occurs is a public financed knowledge based input (non-rivalled and non-excludable) that lowers production costs, similar to the idea in Shell (1966). This input, will not be provided by the private sector, and is therefore a pure public good. One can also think of this input as human capital, or infrastructural investment. There are two sectors in the economy, one of which is akin to a resource sector where the benefit from the public financed input in terms of lower production costs is relatively lower. The other sector may be likened to manufacturing, and it derives greater benefit from the publicly provided input. Capital is a specific factor in manufacturing, whereas land is specific to the resource sector. All sectors require labour input. In these circumstances a resource boom will induce a lower optimal supply of the publicly financed input, as the resource sector obtains a proportionately smaller benefit from this input. Consequently, over the course of time, both sectors will be less productive, akin to a loss in absolute advantage in international trade. The expansion of international trade will also make countries with greater capital endowments gain absolute advantage in
all sectors, as exports of manufacturing increase, inducing greater provision of the
cost reducing public good. If an additional, non-traded and publicly supported
*consumption* sector is introduced, similar to the functioning of state owned
enterprises, resource booms will retard competitiveness in both the other sectors even
*further* in the presence of a strong societal or ruling class preference for this good.
The reason is that the reduction of the supply of the publicly financed productive
input is greater after a resource boom in the presence of a strong preference for a
publicly supported non-traded consumption good. A greater desire for this
consumption public good may characterise rentier societies.

2.2 When Resource Booms Do not Cause a Problem

Historical experience informs us that natural resource endowment and/or booms were
not always immiserising. Findlay and Lundahl (1994) construct an intersectoral model
with links between a natural resource sector and manufacturing, where a resource
boom can lead to growth expansion. They distinguish between tropical subsistence
economies (today’s developing world) and the regions of recent settlement such as
Australia, Canada and the USA. Both these parts of the world interact with an
industrialised region, Europe. The tropical regions have no manufacturing, unlike the
two other regions, but have a subsistence agricultural sector with a fixed wage, as well
the possibility of producing traded primary goods. Manufacturing employs labour and
sector specific capital. Production in the resource sector utilises labour and a sector
specific land input. Land utilised in the natural resource based production sector is not
just exogenous, but the land frontier (and the output of the resource sector) can be
extended by the application of capital input.

Globalisation in the 19th century lead to a rise in the demand and price of
primary goods produced both in the tropics and the regions of recent settlement. This
not only raises the rental rate on land used in primary goods production, but also
extends the land frontier. It also raises the demand for labour in the new world and in
tropical regions, and leads to immigration into the regions of recent settlement (settled
by Europeans), and a movement away from subsistence farming to cash crops or
mining in the tropical regions. Manufacturing, too, expands in Europe and in the

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6 A term originally employed by the League of Nations.
regions of recent settlement. The mechanism of expansion for manufacturing is a decline in the real rate of interest. This raises the capital intensity in manufacturing, as well as the real wage rate. In tropical areas there is also an increase in the real wage in the primary goods sector, above subsistence sector levels. This wage premium is necessary to finance additional land clearance, allowing the resource sector to expand in the absence of foreign investment. Even with foreign investment, a wage premium may be necessary, reflecting higher productivity. In plantation type economies (point-sourced), for example in Latin America, landlords capture the wage premium, whereas in peasant, owner-occupied diffuse type societies, the extra rent accrues to peasant entrepreneurs.

What happens later? The regions of recent settlement will be on their way to a bliss point of high per-capita incomes that we nowadays associate them with, because of the backward and forward links to manufacturing, competitive industrialisation in contemporary parlance. The tropical regions may never industrialise, stagnating instead into a staple trap (a fixed reliance on a few commodity exports). This outcome is more likely in point-sourced economies. By contrast, it is the diffuse economies, such as in North-East Asia, where prospects of industrialising are more promising. This is because, as Baldwin (1956) points out, peasant entrepreneurs will generate demand for simple, labour intensive manufactures, which later become exportable. Further on, these economies move up the manufacturing product cycle. Moreover, peasant societies are also more likely to support publicly financed infrastructure and human capital formation, compared to countries dominated by a small elite interested in siphoning off resource rents. Also, when point-sourced economies experiment with industrialisation, it is usually capital intensive and dependent on public subsidy. They are often non-traded as in Murshed (2001); for domestic consumption only; uncompetitive and unsustainable in the long run. Clearly, the crucial link is between the resource sector and manufacturing. If the nascent manufacturing sector is competitive, resource booms can act as the spur towards future growth and sustainable development.

The model in Murshed (2001) incorporates more contemporary experience, and is based on Sachs’ dichotomy about East Asian economies that rely more heavily on manufactured exports, and a stylised Latin American countries with a relatively greater share of natural resource intensive exports. According to Sachs (1999), Latin America, when compared to East Asia, exhibits a pattern of growth associated with
natural-resource abundance. The former comprise point-sourced economies and the latter diffuse. Latin American long-run growth rates will be less impressive than in East Asia. The model in Murshed (2001) involves three sectors: a resource based commodity, a non-traded good and a traded goods sector. The traded good is labour intensive, whereas the non-traded good utilises an imported intermediate input making it the capital-intensive sector. If a resource boom, which can occur for a variety of reasons, takes place it will not automatically cause the traded sector to contract and the non-traded sector to expand. Under East Asian conditions of a high propensity to consume the domestically produced traded good, that sector could expand.

With regard to policies to tackle the effects of resource booms, devaluation may be a policy initiated to avoid the adverse effects of resource booms. There is the possibility of contractionary devaluation, particularly for the non-traded sector. This likelihood is strongly associated with Latin American or point-sourced economies. When devaluation is expansionary, it is so because the non-traded sector is less important to domestic consumers and there is a sharp reduction in imported consumer goods. These are more likely in the East Asian or diffuse resource-rich case. Policies to tax non-traded goods consumption will be akin to an industrial policy favouring the production of traded goods. Such a policy would be initiated because of the view that labour-intensive manufactured traded goods are superior to non-traded goods production, the latter incorporating manufacturing 'dinosaurs' from the past. This policy is most likely to succeed when non-traded goods are quite price-elastic in demand, and the propensity to consume them out of income is small. Arguably, these are features of the more successful East Asian economies with their diffuse production structure. Country size would also be an important consideration. Without a critical mass of consumers geared to the domestic consumption of labour-intensive traded manufactures, industrial policies of this type cannot succeed.

The point in the Findlay-Lundahl (1994) and the Murshed (2001) models is that the effects of resource booms do not always lead to macroeconomic problems and growth collapses. Even the adverse consequences of resource booms via intersectoral linkages, as in Sachs and Warner (1999a and b) and Clarida and Findlay (1992), can be avoided through judicious policy design. Growth failure represents the malfunctioning of the institutional superstructure. Before I move on to consider these, and other political economy considerations, it is worth explicitly outlining a model of growth failure associated with rent seeking of a type that might be engendered by a
resource boom. The innovative feature of the model that follows is that the macroeconomic collapse has micro-foundations in rent seeking contests.

3 A Dynamic Model of Growth Collapse Combined with Rent Seeking

The analysis in this section is based on Murshed and Perälä (2001). In turn it is akin to the celebrated Ramsey (1928) model, with modifications as to the cost of capital installation along the lines suggested by Tobin (1969). The analysis requires us to model the economy via choices made by a representative agent. All variables are given in per-capita values. Also to simplify the algebra, the growth in population is assumed to be constant. The equilibrium level of the capital stock in the steady state implicitly defines growth rates, and a fall in the equilibrium capital stock implies a decline in the growth rate. Growth collapses are associated with periods of declining capital accumulation.

There is an "infinitely" lived individual who maximises utility at each time period (t) according to:

\[ \text{Max } U(t) = \int_{t}^{\infty} u(C(t)) \exp(-it) \, dt \]  

(1)

where utility (U or u) depends on consumption, C; exp is the exponential operator; and the real interest rate is, i. Maximisation is subject to two budget constraints at time t:

\[ \dot{D}(t) = C(t) + I(t) + iD(t) - f(k(t)) \]  

(2)

\[ \dot{k}(t) = I(t) \]  

(3)

I ignore the rate of depreciation. Output, Y is given by:

\[ Y(t) = f(k(t)) \]  

(4)

The stock constraint (3) tells us that the rate of capital accumulation at time t, is equal to investment (I) at time t. Equation (4) is the production function for Y (output) written in per capita fashion, k is the capital-labour ratio. Equation (2) is the flow constraint in an open economy. It informs us that the rate of accumulation of international debt is given by the excess of consumption (C) plus investment (I) and debt servicing (iD), over production or output (f(k)). This is the exact counterpart of the current account deficit, the excess of absorption over output. In the closed economy context, or with no debt, investment is equal to output minus consumption.
The current value Hamiltonian \((H)\) is:

\[
H(t) = u(C(t)) \cdot \mu(t) / C(t) + I(t) \left( 1 + g\left( \frac{I(t)}{k(t)} \right) \right) + iD(t) - f(k(t)) + \mu(t) p_k I(t)
\]

Here \(p_k\) is the shadow price of capital. The function inside \(g(.)\) gives us the cost of installing capital per unit of existing capital. In other words, it is the cost of investment per-unit of extant capital. The two co-state variables are: \(\mu(t)\) and \(\mu(t)p_k\).

Maximisation yields the following, among other, first order conditions:

\[
\frac{\delta H(t)}{\delta C(t)} = u'(C(t)) \cdot \mu(t) = 0
\]

\[
\frac{\delta H(t)}{\delta I(t)} = 1 + g(.) + \frac{I(t)}{k(t)} g'(.) = p_k
\]

Equation (6) tells us that the optimising agent will equate the marginal utility of consumption, \(u'(C(t))\) to shadow price of consumption, \(\mu\). This means that optimal consumption is fixed in every period as it depends on \(\mu\) which is a constant (the Ramsey rule). The consumption and investment decisions are separable.

We now turn to investment. Equation (7) informs us that the ratio of investment to the existing stock of capital is equated to the shadow price of capital \((p_k)\). We may write the ratio of investment to capital as a function of the shadow price of capital \((p_k)\). This will allow us to write a differential equation in \(k\):

\[
\dot{k} = I(t) = k(t) \varphi(p_k(t)); \varphi' > 0, \varphi(1) = 0
\]

This indicates that investment is an increasing function of the shadow price of capital \((p_k)\).

The picture regarding investment is incomplete unless we postulate an equation determining \(p_k\). This is obtained after manipulating the first order condition of

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7 Note that \(p_k\) is akin to Tobin’s (1969) \(q\), which he defined as the market price of capital relative to its replacement cost.

8 In a model with no capital installation costs, no debt, and a population growing at a constant rate \(\gamma\), the rate of capital accumulation would be \(f(k(t)) - c - n\gamma\). This would give us a modified “golden rule” regarding consumption maximising investment rates. It would relate the marginal product of capital to the real interest rate and population growth.
the Hamiltonian (5) in connection with the second co-state variable with respect to time, \( \frac{dH}{d\mu(t)p_k} \). Also utilising the fact that \( \frac{d\mu(t)}{dt} = 0 \), and \( I(t)/k(t) = p_k \) from (8):

\[
\dot{p}_k = p_k i - f(k(t)) - \varphi(p_k(t))^2 g'().
\]

In the steady-state equilibrium \( p_k = 1 \), capital’s shadow price is equal to its replacement cost. Given that, in the steady state, we are interested in the deviation of \( p_k \) from its steady rate value of unity, and utilising (8) above, the equation above reduces to:

\[
\dot{p}_k = p_k i - f(k(t)) \quad (9)
\]

Equations (8) and (9) can be utilised to describe the dynamics and steady state equilibrium of the system.

In order to subject the system to the effects of a resource boom or terms of trade effect, we incorporate an additive and multiplicative effect to the production function in (4):

\[
Y(t) = (1 - z_0)f(k(t)) + z_1 \quad (10)
\]

Here \( z_0 \) represents the diversion of a part of the capital stock from ordinary production to rent seeking activities, and \( z_1 \) is the revenue component. The revenue component can be either positive or negative. If, as in the case of some countries and activities, revenues are mainly transferred abroad via corruption and other forms of leakage, then \( z_1 \) is negative. If it generates income in the domestic economy it is positive. The additive component, \( z_1 \) has no effect on the marginal product of capital, and therefore no effect on investment and the capital stock. It immediately raises consumption, but not savings, by a proportionate amount. Conversely, consumption declines if revenues are negative. Adjustment in income is immediate and dramatic. In an open economy, however, the country might be able to borrow from abroad to smooth consumption. Clearly, this has implications for future indebtedness and debt servicing.

We now turn to the effects of resource rents on production, investment and the capital stock. This occurs via the multiplicative term.\(^9\) We postulate that rent seeking will reduce the effective marginal product of capital, due to the diversion of

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\(^9\) This effect is somewhat similar to a decline in per-worker productivity in the Solow model.
productive investment away from normal activities towards rent seeking, analysed in the rent seeking contest below.

The mathematical workings in terms of the phase diagram are described in the appendix, and the events related to investment and capital accumulation are depicted in figure 1 in k and p_k space. In figure 1 the k. = 0 schedule is a horizontal line. This tells us that the optimal capital stock is related to marginal productivity and not p_k. The p_k. = 0 line is negatively sloped as a rise in p_k increases the rate of investment, which in turn raises the capital stock (k). However, with a fixed interest rate and marginal productivity of capital, the capital stock is given at its optimal level, k^*, such that p_k = 1 in the steady state; hence k will decline.

When there is a negative effect on capital’s productivity, the economy jumps from the initial equilibrium at E_1 to the new saddle-path (SS_2) at point F. The p_k. = 0 schedule will then shift to the left, and the final equilibrium is at E_2. There is an initial, but not steady state, fall in the shadow price of capital. This makes the rate of investment negative between F and E_2, which, in turn, causes the capital stock to decline, prompting negative growth. The economy comes to a rest with a lower steady state capital stock and growth rate at E_2. The growth collapse occurs between F and E_2. Net output declines in the new steady state due to the combined effect of the diversion of output to rent seeking and a lower capital stock. There is also a decline in consumption associated with lower net output.

The complete picture, as regards resource rents, will entail both a revenue and a productivity effect. The former impacts on consumption, whereas the latter principally affects investment. The additive effect is unclear, as in some instances it increases income, but in other cases it lowers income via the mechanism of capital flight. But, the additive effect can have consequences for future indebtedness particularly when revenues are negative and transitory.¹⁰

I now turn to the rent-seeking contest. The competitive game of rent seeking in this model stems from the work of Tullock (1967). In this framework, several (or a few) agents compete for rents in every period that resource revenues exist. In our example, the rents are the natural resource revenues. The competition for this entails a cost, be that bribery, lobbying expenditure and so on. This is precisely what leads to the diminution of the productivity of capital in (10) above. Let P represent the prize.
that each rent-seeking agent is attempting to seize. This prize corresponds to the revenue or income component of resource rents ($z_i$) in (10). It is, therefore, similar to the voracity effect emanating from resource rents, discussed in Lane and Tornell (1996). Each agent’s probability of success will depend on their rent seeking expenditure relative to all others. The expected utility ($E$) of an agent (i) in a symmetrical setting (all agents are similar) can take the form:

$$E_i = p_iP - c_i$$  \hspace{1cm} (11)

$p_i$ is the probability of winning and $c_i$ represents lobbying costs or expenditures.

$$\pi_i(c_i, c_j, s) = \frac{c_{i}^{s}}{c_{i}^{s} + c_{j}^{s} }; i = 1,2; j \neq i$$  \hspace{1cm} (12)

In this example above there are 2 agents, $i = 1, 2$. The parameter $s$ represents the “efficiency” of lobbying expenditure or bribery, if $s > 1$, there is increasing returns to scale in such expenditure. If that is so, under weak institutions of governance, lobbying expenditure is even more productive as far as rent-seekers are concerned.

Substituting (12) into (11) and maximising with respect to $c_i$ we find that:

$$c_i = \frac{sp_i}{4}; i = 1,2. $$  \hspace{1cm} (13)

Equation (13) gives us the Cournot-Nash equilibrium level of lobbying spending by each agent. The substitution of (13) into (11) will yield the following level of expected utility:

$$E_i = \frac{P}{2} - \frac{sp_i}{4}$$  \hspace{1cm} (14)

The above expression becomes negative if $s > 2$. If this is so, it will lead to an even more socially wasteful war of attrition game, where the object is to make one’s opponents exit the rent-seeking game. The opponent’s presence in this type of game yields a negative expected utility.

Lobbying or rent seeking expenditure is wasteful and detracts from the productivity of capital. Total lobbying expenditures is what causes the decline in capital’s productivity in (10):

$$\sum c_i = z_0$$  \hspace{1cm} (15)

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10 Rodriguez and Sachs (1999) present a Ramsey growth model where an economy undergoing a resource boom, which eventually peters out, enjoys higher consumption temporarily.
The important point to note is that total rent seeking expenditure in the presence of natural resource rents may be greater in some circumstances, such as in point source economies where the polity may be more predatory and oligarchic. This means that \( z_0 \) is negative and large in (10) above. In some cases, competition for rents could descend into civil war, as in Addison, Le Billon and Murshed (2000).

In other situations, where natural resource revenues are more diffuse, the prize \((P)\) in (11)-(14) could be considerably smaller (say \( P/n \), the population being given by \( n \)). Also, in societies where many agents enter the rent-seeking contest, the benefit to each of lobbying expenditure is smaller.\(^{11}\) In either case, \( z_0 \) will be smaller, and the resultant negative growth effect is also diminished.

A developmental state that is democratic or benevolent would reduce lobbying and rent seeking expenditure, (Auty, 1997; Auty and Gelb, 2001; Lane and Tornell, 1996). Rent seeking contests would not yield much to corrupt agents, who would be better off in productive entrepreneurial activities. In that case, natural resource revenues would not retard growth \((z_0 = 0)\), if Dutch disease effects were countered by effective policies.

4 Other Political Economy Considerations

4.1 The Importance of Institutions

Auty and Gelb (2001, Table 8.1) construct a typology of states based on whether they are homogenous or factional (several ethnic groups), as well as benevolent or predatory. A benevolent state, whether homogenous (Indonesia, North-East Asian countries) or factional (Botswana, Malaysia) tends to maximise social welfare, invest in infractstructure and human capital. Above all a reliance on market forces, and competitive industrialisation of a variety not relying on state subsidies, tends to emerge in the benevolent state. A predatory state promotes rent-seeking, lobbying and uncompetitive industrialisation. The line of reasoning adopted in the Auty-Gelb (2001) typology does, indeed, go a long way in explaining the development successes of the past forty years, but we are left wondering what determines the emergence of either of the two models and their associated institutions.

\(^{11}\) In the \( n \) person case, the right hand side of (13) is \((n-1)sP/n^2\), which is smaller than the expression in (13).
Campos and Nugent (1999) attempt to operationalise more amorphous notions of the institutions of good governance. Although their paper lacks a properly specified theory, one can deduce that they are indicating at a 'production function' for good governance. This is a function of: (i) an accountable executive; (ii) an efficient civil service; (iii) the rule of law; (iv) participation by 'civil society' in policy making; and (v) an open and transparent policy making process. One can imagine other 'inputs' such as property rights and contract enforcement. Be that as it may, the authors construct a data set based on scaling coefficients for the first four characteristics, pertaining to various countries in East Asia and Latin America. This data is then related econometrically to three measures of human development: per capita income, infant mortality and adult (il)literacy. To summarise, the rule of law tends to be the most important institutional characteristic in explaining human development, particularly in Latin America. If East Asia is taken alone, the quality of the civil service is the most important factor. Furthermore, in Latin America the quality of the bureaucracy and the rule of law are often substitutes into the good-governance production function; whereas in East Asia it is strong civil society and the rule of law that are often the substitutable inputs. One of the more important policy conclusions that follows from this study is that institutional capital is important, but it can be accumulated, and the stock altered, following appropriate political choices.

4.2 Institutional Malfunctioning

In section 3 above, I have already presented a model of institutional failure resulting in wasteful rent-seeking contests that retard growth. This has similarities to the work of Lane and Tornell (1996) regarding the increased voracity effects of natural resource booms. In their model they postulate the existence of powerful groups that are coalitions formed in order to extract rents or transfers from the rest of society. The transfers are effected at the expense of other groups, and the general productivity of the economy. Resource booms and windfalls increase the appetite for transfers, within these powerful coalitions, by a factor that is more than proportionate to the size of the boom. These groups become greedier, and demand an even larger share of national income. This constitutes the voracity effect, and it results in a fall in the marginal productivity or the rate of return on capital, and a decline in growth rates similar to my model in section 3. The activities of these greedy coalitions can, however, be
restrained by effective institutions. Countries that have operational institutions of restraint on these groups will enjoy higher growth rates compared to countries that do not.

A related area in institutional malfunctioning concerns the allocation of entrepreneurial talent, see Murphy, Shleifer and Vishny (1991). The idea being that talent can focus either on production or predation. This decision is a function of the relative returns to these two activities. Natural resource rents can make corruption, predation and rent-seeking a more attractive option. This incentive is greater the weaker the environment of law and contract enforcement following societal upheavals, such as in Russia. Furthermore, societies in transition, or in the phase of post-conflict reconstruction, often experience a rise in criminal predation, particularly if there is a lot to loot, as in point-sourced natural resource abundant countries. Moreover, the rise in criminality encourages a parallel protection industry offering security services, see Mehlum, Moene and Torvik (2002). This constitutes a further avenue of resource dissipation.

Finally, there is the notion of transaction-cost politics (see Dixit, 2001). This view begins from the premise that policies in any society are an endogenous product of a political process. The political process entails transaction-costs due to the opportunistic nature of repeated interaction and the failure to commit. In other words, it is difficult to design mechanisms that allow parties to commit to policies, including optimal policies, as they have an incentive to renege on pre-announced commitments. This reduces the credibility of policy pronouncements and commitments. It should be noted that transaction-cost politics constitutes an additional problem, over and above the standard difficulties associated with agency such as adverse selection and moral hazard. Transaction-cost politics is a general problem, not peculiar to developing countries or resource rich economies. The amelioration of the problems associated with it in a badly functioning institutional environment requires mechanism design and constitutional change. In other words, a sea change is necessary, deep interventions that alter the rules of the game and the processes by which policies are actually formulated.

4.3 Natural Resources and Conflict
As Rodrik (1999) emphasises, countries with weak institutions of conflict management, as well as high income inequality are less able to withstand economic shocks and experience growth failure. They are also more prone to the risk of civil strife and war, since their weak institutions, which are further weakened by shocks and lower growth, are unable to contain the resulting social pressure and distributional conflict. Over the last 5 years or so, economists have started paying greater attention to internal conflict. This new research has very much arisen out of a pressing need to understand continued development failure, especially in Sub-Saharan Africa. In this new literature, a distinction is often made between grievance, a motivation based on a sense of injustice in the way a social group is treated, often with a strong historical dimension; and greed, an acquisitive desire similar to crime, albeit on a much larger scale, see Murshed (2002). Nobody would claim of course that these motives are entirely separate in practice (and motives often change during the course of war), but the distinction can be a useful analytical starting point. An important question is whether contemporary civil wars are more the product of grievances or more the result of greed (Collier and Hoeffler, 2002).

There are genuine grievances producing civil war, many of which are related to economic factors: systematic economic discrimination against groups based on ethno-linguistic or religious differences. Extreme poverty and poor social conditions (including refugee camps) also facilitate conflict by providing more readily available combatants. Competing groups are formed when collective action problems can be overcome. Many of today’s civil wars have an ethnic or nationalist dimension and ethnicity, whether based on language, religion or other distinctions, is often a superior basis for collective action in contemporary conflicts in poorer countries than other social divisions such as class. In coalescing groups, therefore, present-day and historical grievances play a crucial part. This is all the more possible when there are inequalities across a small number of clearly identifiable groups—horizontal inequalities (see, Stewart, 2000). More often than not, these take the form of high asset inequality, discriminatory public spending across groups and unequal access to the benefits of state patronage. Furthermore, state failure in providing security and a minimal level of public goods often force individuals to rely on kinship ties for support and security, this ethnic capital thereby becoming highly important to individuals.
Discussion of greed as a motive for conflict has mainly arisen in the context of natural resource endowments, an abundance of which—at least so far as valuable minerals are concerned—appears to increase the risk of a country falling into serious conflict. Certainly there are all too many tragic examples of conflict in mineral-rich countries, notably Angola, DRC, and Sierra Leone. Capturable point-source natural resource rents, such as alluvial diamonds (see, Addison, Le Billon & Murshed, 2000), can result in contests over the right to control these, some of which takes the form of warfare, but also criminality and corruption in other instances. But poverty also plays a part in the model by lowering the cost of participation in the civil war. But for all of these forces to take the form of large-scale violence there must be other factors at work, specifically a weakening of the social contract. Therefore, while rents from capturable point resources do constitute a sizeable ‘prize’, violent conflict is unlikely to take hold if a country has a framework of widely-agreed rules, both formal and informal, that govern the allocation of resources, including point-resource rents, and the peaceful settlement of grievances. Such a viable social contract can be sufficient to restrain, if not eliminate, opportunistic behaviour such as large-scale theft of resource rents, and the violent expression of grievance. The viability of this social contract, in turn, depends on the existence and functioning of good institutions.

4.4 Institutional Determination

What determines the all important institutions of governance? Clearly there is now a consensus of opinion that the framework of governance, including respect for property rights, contract and law enforcement, the rule of law and administrative capacity, matter a great deal if a country is to be successful in its quest for growth and development. The current literature points out to three empirical sources of institutional determination, all three of which relate to natural resource endowment.

The first, and most intimately connected to natural resource endowment is the work of Isham et al (2002). It postulates that institutions are determined by the pattern of exports. Thus point-sourced economies and coffee/cocoa exporters have the worst institutions. These poor institutions in turn adversely affect growth, which is borne out by the stylised facts on growth reported in Table 2. One of the weaknesses of their methodology is that export pattern relates to the mid-1980s, forming the basis of their classification of an economy being point-sourced, coffee/cocoa, diffuse or
managing. The pattern of competitive and comparative advantage has rapidly altered in the last two decades and many more developing countries are now exporters of manufactures compared to the mid-1980s. Secondly, countries should not be classified to be in the point-sourced or another category on the basis of their exports alone, but also on the GDP share of these important sectors. The argument being that these exportables should also account for a substantial fraction of national income; if so the classification based on export patterns is made more robust.

Isham et al. (2002) interestingly point out that the point-sourced and diffuse categorisation is important in explaining growth success or failure post-1973, but not necessarily before that time period. Indeed all developing countries can be found to have grown at a similar pace in the two decades before 1973. Thus, the type of resource endowment seems to matter in post first oil shock period. This makes intuitive sense, as the commodity price booms may have engendered greed and venal institutions in some countries, the predatory states that Auyt and Gelb (2001) refer to. The problems of the predatory state may have become worse following the slump in commodity prices that has steadily occurred since the early 1980s, as there are fewer resources to go around exacerbating the nature of predation. But some authors such as Acemoglu, Johnson and Robinson (2001), representing the second empirical strand in the literature, date back poor (or good) institutional determination to at least a century ago, and the pattern of colonialisation. They distinguish between two types of colonies. The first group corresponds to what Findlay and Lundahl (1994) call the regions of recent settlement. These are parts of the new world settled by European migrants, as in North America and Australasia. The second group refers to tropical developing countries, today’s third world. The idea is that better institutions, especially property rights and the rule of law, were embedded in the first group. In the second category of colonial countries, an extractive pattern of production was set up. This extractive and exploitative pattern of production is also the legacy of colonialisation, malign colonialisation in these cases. Clearly, this pattern was more prevalent in some parts of the world, particularly in Africa and Latin America, the Belgian Congo is cited as the worst example. Its contemporary counterpart Zaire or the Democratic Republic of Congo (DRC) is the worst growth failure in Table 1. Acemoglu, Johnson and Robinson (2001) also refer to a literature in the political
economy field that states that British colonies inherited better institutions with regard to respect for the rule of law and democracy. As the extractive state is expropriatory and predatory, bad institutions emerge and become entrenched even after independence, and a predatory equilibrium in the sense of Hall and Jones (1999) emerges. The important question that remains unanswered is why does de-colonialisation, and the opportunities it provides for policy changes, not alter the destiny of an extractive economy? It does in some, but not others. Secondly, despite the saliency of the colonial phase in history, many developing nations have had a collective experience prior to, and after, colonialisation that must have also shaped institutions. In East Asia, South Asia, the Middle East and North African regions of the developing world, well functioning institutions of good governance existed well before the advent of colonialisation, and European colonial powers merely adapted pre-existing administrative institutions. The work of Acemoglu, Johnson and Robinson (2001) is therefore mostly applicable to sub-Saharan Africa, Latin America and the Caribbean.

The third strand of the literature builds on the link between inequality and resource endowment of the point-sourced variety, see the work of Sokoloff and Engerman, who discuss the historical experience of Latin America, and Easterly (2001) for a cross-sectional analysis across nations. Commodity endowments of the point-source variety tend to depress the middle-class share of income in favour of elites, as in Latin America. The idea being that these elites, in turn use their power, identical with the forces of the state, to coerce and extract rents (Bourguignon and Verdier, 2000). When different groups compete with another for these rents, the rent-seeking contest analysed in the previous section becomes applicable, and can lead to even more perverse and wasteful outcomes than when elites collude. The important point made by Easterly (2001) is that small elite-based societies do not have a stake in the long-term development of the land. Unlike in middle-class dominated societies, publicly financed human capital formation and infrastructural development falls by the wayside, hence depressing growth prospects. The other important point of the paper is that inequality does matter for economic growth, but the chain of causation between inequality and growth is unconventional. Here it is the middle class share of income, and the concomitant middle class agenda that determines the right policies,

The authors argue that the mortality rate amongst Europeans is what determined whether a colony
particularly in terms of education and infrastructure. All three of the models described in this sub-section are econometric, and lack theoretical underpinning, except that Easterly’s work is motivated by the theory in Bourguignon and Verdier (2000).

But not all point-sourced economies go through, or stay with, persistent coercive behaviour by elites. The obvious exceptions are in the diffuse economies of North-East Asia. But, in the point-sourced economies of South-East Asia such as Malaysia, or to an extent in Indonesia, the elites opted for redistribution. The difference here was that the danger of an ideological upheaval in terms of communism was much more real than in Latin America (Communist China was a close neighbour), and the ruling class wanted to avoid ethnic strife. Botswana, too, avoided ethnic fractionalisation, unlike in the rest of Africa. In Latin America ethnic minorities have usually been suppressed, and processes of conciliation avoided. It has to be said that the poor institutions associated with extractive industries or colonial coercive policies are not immutable, they can be altered unlike the fatalistic implications of some of the econometric models outlined above.

5 Policy Implications

5.1 Historical experience informs us that natural resource booms do not necessarily retard economic growth and development. This is particularly true of the 19th century regions of recent settlement. Additionally we have earlier historical experiences, including the negative inflationary impact of Spanish gold, versus the positive impact on industrialisation of British colonial trade and largesse. We might wish to ponder over which countries have graduated from mineral and point-sourced export dependence to exporters of other types of products in recent times. Of the manufacturing exporters listed in Table 2, based on mid-1980s export patterns, none were ever truly point-sourced economies. More contemporary data on manufacturing exports would suggest that Costa Rica and Mexico, as well as Indonesia, Malaysia and Thailand have made major inroads as manufacturing exporters. The first three were point-sourced in the mid-1980s. Malaysia and Thailand too were point-sourced at an earlier stage. This suggests that countries, which pursue the right policies, can

was settled by Europeans or not.
To make the transition to competitive manufacturing, and sustainable development. A few other point-sourced economies, Botswana prominent among them, have also made rapid progress, yet it is true that most have not.

5.2 The analysis reviewed in section 2 above stresses the importance of intersectoral linkages in the context of resource booms, particularly to the dynamic manufacturing sector, see Findlay-Lundahl (1994), Sachs-Warner (1999b) and Murshed (2001). Resource booms may be engineered to contribute towards competitive and sustainable industrialisation, avoiding the staple trap (the reliance on a few fixed commodity exports). The idea is to be adaptable to economic change. Most importantly, an uncompetitive domestic non-traded manufacturing sector, similar to the many state owned enterprises in developing countries, needs to be avoided (Auty-Gelb, 2001 and Murshed, 2001).

5.3 It is important to utilise resource rents to develop human capital via education, and infrastructure as in transport and telecommunication networks. This ought to be continued even when the resource boom peters out, via careful prioritisation of public expenditure. A well developed human capital and infrastructural stock is what allows a country to respond positively to change in the economic environment.

5.4 The pursuit of sound macroeconomic policies to manage resource rents as outlined in Murshed (2001) is essential. These pertain to exchange rate and monetary policies in particular.

5.5 Well functioning fiscal institutions are crucial because resource booms are about revenues. These institutions are important if revenue is to be collected, leave alone spent wisely. Many point-resource rich countries, who are also in a state of civil war, such as Angola and Afghanistan, have allowed their fiscal institutions, especially related to revenue collection to degenerate greatly. They are forced to rely on inflation taxes (seignorage) to finance government expenditure, and their domestic resource mobilisation capacity is severely debilitated.

5.6 In some successful point-sourced countries such as Norway, Botswana and some of the Gulf States revenues from resources are not diverted by individuals, but invested in a societal trust fund. This trust fund may defray
current expenditure on infrastructure and human capital, but is also earmarked for future consumption and investment, when resource rents dry up.

5.7 It is instructive to contrast cases of success such as Botswana, Malaysia, Indonesia on the one hand, against failures such as Nigeria, Democratic Republic of Congo (Zaire), Venezuela on the other hand amongst point-sourced economies. Those in the first group all: (a) redistributed income, because of political exigencies, via policies of asset redistribution; and, (b) invested in infrastructure and human capital. In Indonesia and Malaysia policies of competitive industrialisation were also followed, as opposed to the unsustainable state owned enterprises, common to many countries.

5.8 Conflict avoidance via a sustainable social contract should be a major policy goal in point-sourced economies. The literature on contemporary civil wars lists two major reasons underlying contemporary conflict (Murshed, 2002). The first is to do with intra-group or horizontal inequality. The second is concerned with acquisitiveness, the desire to capture resource rents. Both these features are more likely in point-source economies. But ultimately, open conflict reflects state failure and the breakdown of the mechanisms of conflict prevention, the social contract. Malaysia and Botswana provide recent examples of multi-ethnic states that avoided not only economic mismanagement, but also natural resource contests degenerating into civil war.

5.9 Conflict avoidance, as well as other developmental considerations create a hugely important link to inequality, as this determines the venality of society, its attitude to poverty and its approach to broad based human capital formation (Easterly, 2001). Consequently, strategies of poverty reduction by themselves are insufficient, attention has to be focussed on lessening inequality, in the sense of the middle-class share, if growth is to take place and be truly pro-poor. Also, the reduction of group or horizontal inequalities is important in outright conflict prevention in low-income countries endowed with point-sourced resources and weak institutions.

5.10 Each nation is a policy experiment. Whether it adopts good policies or not depends on its institutions, and hence the importance of the institutional framework that determines policies. The work of Campos and Nugent (1999) suggests that its well functioning administrative apparatus aided East Asia’s growth miracle, just as Latin America’s indifferent performance may have
been linked to the weak enforcement of the rule of law. Institutional malfunctioning, and the absence of institutional restraint on greed can have severe growth retardation effects in resource rich countries. Lasting institutional change cannot be brought about without societal ownership; in other words it cannot be effected from without and must come from within the nation.

5.11 Changes to affect institutions can take the form of deep or shallow interventions (Dixit, 2001). The former refers to fundamental change, constitutional re-design and altering the rules of the game, mechanism design in game theory. This is relevant for low-income countries and economies in transition that are in deep trouble. By contrast shallow interventions refer to tinkering with the existing system, and often this is insufficient to bring about lasting change. Once again, it is necessary to emphasise ownership in deep policy changes; they must be home grown as externally imposed alterations to institutions tend to be transient.
REFERENCES


APPENDIX

In the steady state equilibrium $k = \bar{k}$ and $p_k = 1$. Totally differentiating (8) and (9) around some steady state values, $k - \bar{k}$ and $p_k - 1$, and utilising (10) we obtain the following in matrix notation:

$$
\begin{bmatrix}
0 & k'\varphi \\
-f'(k^*)i & p_k - 1
\end{bmatrix}
\begin{bmatrix}
k - \bar{k} \\
-\frac{z_0}{1}
\end{bmatrix} =
\begin{bmatrix}
0 \\
-\frac{z_0}{1}
\end{bmatrix}df(k^*)
$$

(A.1)

Note that $f'(k) < 0$. The trace is positive and the determinant is:

$$
\Delta = f'(k^*)k'\varphi < 0 \quad \text{implying a saddle-path solution.}
$$

(A.2)

$$
\frac{d[k - \bar{k}]}{df(k^*)} = \frac{1 - z_0}{f'(k^*)} < 0
$$

(A.3)

$$
\frac{d[p_k - 1]}{df(k^*)} = 0
$$

(A.4)

It can be readily discerned that the slope of $k = 0$, and the slope of the $p_k = 0$ is negative from (A.1).
Figure 1

\[ S S_2 \]

\[ E_2 \]

\[ E_1 \]

\[ F \]

\[ F' \]

\[ \dot{p}_{k1} = 0 \]

\[ \dot{p}_{k0} = 0 \]

\[ \dot{k} = 0 \]
<table>
<thead>
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<th>During 1960s</th>
<th>During 1970s</th>
<th>During 1980s</th>
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</thead>
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<td>Kenya</td>
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<td>Mauritania</td>
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<tr>
<td>Venezuela</td>
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**Source:** Murshed and Perälä ( ). Based on a sample of countries for whom data is available.

*Economy considered large, 1960 population clearly above 25 million.*

*Economy considered large, 1960 population clearly above 20 million.*

*Economy considered large, 1960 population clearly above 15 million.*
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<th>Second exports</th>
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<th>SIC export code for 2nd</th>
<th>Percent of GDP * goods and services</th>
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<td>68.1</td>
<td>..</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uganda</td>
<td>1985</td>
<td>Coffee, hides</td>
<td>071</td>
<td>211</td>
<td>90.0</td>
<td>2.5</td>
<td>8.1</td>
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</tr>
</tbody>
</table>

*Table 2 is based on appendix table 1 in Isham et al., 2002, and the World Bank's World Development Indicators, 2001. Growth rates for Tanzania in the 1980-99 period are negative at -0.8 per cent per annum, (source UNCTAD).