

# **When does natural resource abundance lead to a resource curse?**

S. Mansoob Murshed

ENVIRONMENTAL ECONOMICS PROGRAMME

Discussion Paper 04-01

March 2004

## **International Institute for Environment and Development (IIED)**

IIED is an independent, non-profit research institute working in the field of sustainable development. IIED aims to provide expertise and leadership in researching and achieving sustainable development at local, national, regional, and global levels. In alliance with others we seek to help shape a future that ends global poverty and delivers and sustains efficient and equitable management of the world's natural resources.

## **Environmental Economics Programme**

The Environmental Economics Programme (EEP) seeks to develop and promote the application of economics to environmental issues in developing countries. This is achieved through research and policy analysis on the role of the environment and natural resources in economic development and poverty alleviation.

## **The Author**

Dr S. Mansoob Murshed is Associate Professor of Development Economics at the Institute of Social Studies in the Netherlands. He may be contacted at:

Institute of Social Studies (ISS)  
PO Box 29776  
2502 LT The Hague, Netherlands.  
[Murshed@iss.nl](mailto:Murshed@iss.nl), [www.iss.nl](http://www.iss.nl)

## **Acknowledgements**

The author is grateful to George Mavrotas, Jörg Mayer and a referee of IIED for comments, as well as to Nicky Pouw and Admasu Shiferaw for their excellent research assistance. Grateful thanks are also due to the Royal Danish Ministry of Foreign Affairs (Danida) for providing funding for this research. Additional support for publication of this report was provided by the Swedish International Development Cooperation Agency (Sida).

The opinions expressed in this paper are the opinions of the author and not necessarily those of IIED.

**Citation:** Murshed, S. Mansoob. 2004. *When does natural resource abundance lead to a resource curse?*. EEP Discussion Paper 04-01. International Institute for Environment and Development, London.

**Permissions:** The material in this paper may be reproduced for non-commercial purposes provided full credit is given to the author and to IIED.

Copies of this report are available from:

Earthprint Limited, Orders Department, P.O. Box 119, Stevenage, Hertfordshire SG1 4TP, UK; Email: [orders@earthprint.co.uk](mailto:orders@earthprint.co.uk). Enquiries: tel +44 (0)1438 748111; fax +44 (0)1438 748844; Email [enquire@earthprint.co.uk](mailto:enquire@earthprint.co.uk) or from [www.earthprint.com](http://www.earthprint.com). The report is also available as a pdf document at [www.iied.org/EEP](http://www.iied.org/EEP) or from [frances.reynolds@iied.org.uk](mailto:frances.reynolds@iied.org.uk).

# Contents

1	Introduction	1
2	Dutch Disease and intersectoral effects of resource booms	4
2.1	Resource booms retard growth	4
2.2	When resource booms do not cause a problem	6
3	Political economy considerations	8
3.1	The importance of institutions	8
3.2	Institutional malfunctioning	9
3.3	Natural resources and conflict	10
3.4	Institutional determination	11
4	A dynamic model of growth collapse combined with rent-seeking	14
5	Empirical investigation	19
5.1	Data	19
5.2	Descriptive statistics	19
5.3	Regression results	21
5.3.1	The regression model	21
5.3.2	The random effects model	22
5.3.3	The feasible generalised least squares (FGLS) estimates	23
5.3.4	Cross-sectional estimate	24
6	Conclusions	26
7	References	28
	Appendix 1	32
	Appendix 2	32
	Figure 1 Growth collapse	34
	Figure 2 The probability of remaining at a given level of democracy	46
	Table 1 Countries with growth failure	35
	Table 2 Export classification, GDP per capita and export growth for selected developing countries	36
	Table 3 Governance indicators for selected developing countries 1997-98 and 2000-01	39
	Table 4 Distribution of major exports	46
	Table 5 Distribution of democracy by region	47
	Table 6 Joint distribution of democracy and major exports	48
	Table 7 Major exports by region	49
	Table 8 Summary of mean democracy by region and major exports	49
	Table 9 Summary GDP growth by region and major exports	49
	Table 10a Countries with a mean democracy index $\leq 5$ for 1950-2000	50
	Table 10b Countries with a mean democracy index $\geq 5$ for 1950-2000	51
	Table 11 Empirical results: dependent variable democracy	52
	Table 12 Comparisons of fixed and random effect coefficients	52
	Table 13 Empirical results: dependent variable natural logarithm of per capita GDP	53
	Table 14 Cross-sectional estimates of democracy and GDP growth	54

## 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 a point-source economies, while the latter type is referred to as diffuse. 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 set 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. 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. An explicit model of growth collapse with micro-foundations in rent-seeking behaviour and contests is also presented. The empirical analysis put forward is one of the few econometric investigations into the resource curse that includes analysis over time, as it is a panel data estimation. Due to this time series property our proxy for institutional quality is the degree of democracy. Our findings suggest that a point-source type natural resource endowment does retard democratic and institutional development, which in turn hampers economic growth. Institutions and institutional functioning are the crucial link between resource endowments, geography and policies, on the one hand and economic outcomes on the other hand.

# 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 “winner’s 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 et al. 2002; 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 et al. 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 Woolcock et al. (2001), the former category are dubbed point-source 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 et al. 2002) in countries with resources that can be more easily expropriated. Economies that are coffee/cocoa based may also be regarded as point-source, as these commodities tend to be marketed under concentrated ownership. Easterly (2001) suggests another basis for classifying economies as point-source or diffuse. In the latter category, producers can directly consume output, which is very often food. It should be borne in mind that a commodity may be diffuse in terms of production, coffee, say, but concentrated in ownership owing to the manner in which it is sold in the world market. Oil in Norway may be concentrated in production, but the revenues may be diffuse due to the manner in which rents are given back to citizens or saved for future generations. Although the point-source/diffuse distinction can be arbitrary in some cases, it is nevertheless a useful starting point to classify a country’s comparative advantage based upon its principal exports along these lines suggested in Woolcock et al. (2001) as well as Auty (1997). As our empirical analysis of developing countries will make clear, the real distinction in terms of economic success and institutional functioning lies between resource-based economies (whether point-source or diffuse) and manufactured goods exporters, the latter being more successful.

Table 1 presents a list of 42 developing countries<sup>1</sup> 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 occurred in economies that attained their contemporary real per capita income level some time during the 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 reached their current real per capita income level either during the 1970s or 1980s. All but six of these countries can be described as having point-

---

<sup>1</sup> Former socialist countries in Europe, Asia and Africa are excluded due to incomplete data. Table 1 is based on Perälä (2000).

source natural resource endowments.<sup>2</sup> The diffuse economies are Honduras, Mali, Philippines, Senegal, Somalia and Zimbabwe.

Note that all the catastrophic growth failures 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 for 98 countries. If we look at the picture after 1965, we can include more nations, as in Table 2.<sup>3</sup> 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-source or coffee/cocoa economies.<sup>4</sup>

More important, only six (or seven if we include Oman)<sup>5</sup> point-source economies have real per capita income growth rates that exceed 2.5 per cent per annum on an average between 1965 and 1999. These are Botswana, Chile, the Dominican 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-source, as well, even though her 1985 and contemporary export pattern suggests that she is both a diffuse and a manufacturing exporter. Therefore, in the developing world we have three point-source 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 per cent per annum on an average between 1965 and 1999. So any general problems associated with point-source growth tend to be as great, or greater, for plantation economies when compared to mineral economies.

If natural resource endowment, particularly of the point-source variety, retards economic growth and development, two questions immediately spring to mind. First, what are the channels between this type of wealth and underdevelopment? Second, is this resource curse inevitable, and what can be done to counteract it? Perhaps 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 may therefore require fashioning good institutions of governance that produce appropriate policies.

---

<sup>2</sup> Based on the classification used in Isham et al. (2002), who use UNCTAD export data for 1985. These authors also distinguish between point-source and coffee/cocoa economies, which for the purposes of this paper, are regarded to be point-source as well. A country is point-source 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-source economy. The same may be said for the Philippines.

<sup>3</sup> Table 2 presents point-source and coffee/cocoa economies separately. We may consider both these categories to be point-source.

<sup>4</sup> In Table 2 countries we 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.

<sup>5</sup> Oman does have a 5 per cent growth rate of per capita income between 1965 and 1999. It is not usual to include Oman among developing countries, due to its size. Libya and Kuwait have data problems, but the data we have clearly suggests they are growth failures.

The rest of the paper is organised as follows: sections 2 and 3 contain a review of the literature on the resource curse, whereas sections 4 and 5 contain our theoretical and empirical (econometric) contribution to the literature. 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 may aid instead of hamper growth, or policies to avoid the resource curse. The vast majority of these models stress intersectoral linkages. Political economy considerations are reviewed in section 3. The focus is on institutions that determine the policy superstructure and how they may be adversely affected in the presence of point-source natural resources. Section 4 presents a theoretical model of growth collapse with micro-foundations in rent-seeking behaviour and contests, which are linked to the institutional environment. Section 5 is concerned with our own empirical findings on the link between natural resource endowment and economic performance where the type of natural resource endowment and institutional quality play a leading part. Our analysis is based on panel analysis over time; all other econometric studies in the area are based on purely cross-sectional regressions. Section 6 concludes with some policy recommendations.

## 2 Dutch Disease and 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 rapid, 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. Sachs and Warner (2001) present empirical evidence suggesting that countries rich in natural resources tend to have higher price levels, and as a result their non-natural resource based goods are uncompetitive and cannot be exported. They, therefore, miss out on the benefits of export-led growth from which many other developing countries poorly endowed with natural resources have benefited. They also argue that a high natural resource endowment adversely effects growth even after previous growth and other factors that militate against economic growth are taken into account, such as a tropical location, distance from the sea and a high disease burden.

Why should the loss of competitiveness in non-natural resource based exports be a problem for the future? Surely competitiveness in exports, say labour-intensive manufactures, may be acquired at some future date when natural resource revenues dry up. 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. 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.

Another 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 characterise 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 industrialisation. 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 that uses the intermediate inputs, big-pushes are less likely. Also, unless expectations about the future are optimistic, even the most propitious circumstances may not trigger accelerated industrialisation 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.

In a similar vein Gylfason (2001) presents evidence that nations rich in natural resources systematically under-invest in education as a proportion of national income. They consequently pay less attention to the accumulation of human capital, something that is crowded out by their rich endowment of natural capital.

## 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<sup>6</sup> such as Australia, Canada and the USA. Both types 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 nineteenth century led 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 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-source), 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-source 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-source 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

---

<sup>6</sup> A term originally employed by the League of Nations.

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 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-source economies and the latter diffuse. Latin America's 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 point-source economies as was mainly the case in Latin America. 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 and 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 (2001, 1999a and b) and Clarida and Findlay (1992), can be avoided through judicious policy design. Growth failure represents the malfunctioning of the institutional superstructure. These and other political economy considerations are reviewed in the next section.

### 3 Political economy considerations

#### 3.1 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 (e.g., Indonesia, North-East Asian countries) or factional (e.g., Botswana, Malaysia) tends to maximise social welfare, invest in infrastructure and human capital. Above all a reliance on market forces, and competitive industrialisation of a variety that does not rely 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.

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 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 of '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 dataset 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)lteracy. 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.

More recent empirical studies also confirm the importance of institutions in determining economic performance as measured by the levels of per capita income. We currently have rich data on government capacity, (see Kaufmann et al. 2002).<sup>7</sup> The rankings are for voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption. They extend from -2.5 at the lower end of the spectrum, to 2.5 at the upper end. The implication also is that a positive score is good and a negative score is below average. The scores are correlated with per capita income. Most developing countries, particularly low-income nations score negatively in these areas (see Table 3). Easterly and Levine (2003) present evidence based on cross-sectional econometrics that natural resource endowments, a poor geographical location and an excessive mortality rate (disease burden) does retard economic development but via *institutions* as measured by Kaufmann et al. (2002). Similarly, bad economic policies and choices also hinder economic development via institutions. Consequently, institutions and institutional functioning are the crucial link

---

<sup>7</sup> Unfortunately there are only a few observations making time series or panel data econometrics using this data impossible.

between resource endowments, geography, and policies on the one hand and economic outcomes on the other hand. A similar line of reasoning is presented in Rodrik et al. (2002). Acemoglu et al. (2002) also argue that institutions determine the pattern of the current world income distribution, and the reversal of the ranking that existed five centuries ago because of the poor and extractive institutions implanted therein, see section 3.4 below.

### **3.2 Institutional malfunctioning**

Lane and Tornell (1996) 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 the model in section 4 below. 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.

Ross (2001) finds that countries rich in mineral resources, particularly oil, do not to make the transition to democracy or at least their score on an index of democracy tends to be low. The reasons he identifies are the following. There is a lack of “modernisation” as economic wealth does not translate into social and cultural change. Second, there is a repression effect; mineral and oil rich states can engage in higher levels of military and internal security expenditure to suppress internal dissent. Finally, and most importantly, there is a rentier effect. Revenues from oil and mineral resources create rents that can be utilised to bribe the population into silence regarding authoritarianism. This may also engender contests over the right to enjoy resource rents as in the model in section 4. Also, public goods may be provided alongside low taxes because resource rents are the main source of revenue for the state. Taxation normally results in pressures to introduce democracy.

A related area in institutional malfunctioning concerns the allocation of entrepreneurial talent (see Murphy et al. 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 more attractive options. This incentive is greater in states where law and contract enforcement is weak, 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-source natural resource abundant countries. Moreover, the rise in criminality encourages a parallel protection industry offering security services (see Mehlum et al. 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, and strong interventions that alter the rules of the game and the processes by which policies are actually formulated.

### **3.3 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 five years or so, economists have started paying greater attention to internal conflict. This new research has 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). These motives are not entirely separate in practice, 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 the result of greed (Collier and Hoeffler, 2001).

There are genuine grievances producing civil war, many of which are related to economic factors, for example, 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 can overcome problems. 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 more likely 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, the Democratic Republic of Congo (DRC), and Sierra Leone. Capturable point-source natural resource rents, such as alluvial diamonds (see Addison et al., 2002), can result in contests over the right to control these, some of which take the form of warfare, but also criminality and corruption in other instances. Olsson (2003) points out that an abundance of capturable alluvial diamonds may lead to a crowding out of other types of government spending in

favour of military expenditure, thereby depressing economic growth. 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 considerable '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.

### **3.4 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 to three empirical sources of institutional determination, all 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-source 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.

Isham et al. (2002), interestingly, point out that the categorisation of point-source and diffuse economies 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 the period following the first oil shock. This makes intuitive sense, as the commodity price booms may have engendered greed and venal institutions in some countries; the predatory states to which Auty and Gelb (2001) refer. The problems of the predatory state may worsened 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 et al. (2001), representing the second empirical strand in the literature, date poor (or good) institutional determination to at least a century ago, and the pattern of colonisation. They distinguish between two types of colony. 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.<sup>8</sup> In the second category of colonies, an extractive pattern of production was established. This extractive and exploitative pattern of production is also the legacy of colonialism, malign colonialism in these cases. Clearly, this pattern was more prevalent in some parts of the world, particularly in Africa and Latin America; the Belgian

---

<sup>8</sup> The authors argue that the mortality rate amongst Europeans is what determined whether Europeans settled a colony or not.

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 et al. (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 decolonisation, and the opportunities it provides for policy changes, not alter the destiny of an extractive economy? It does in some, but not others. Second, despite the significance of the colonial phase in history, many developing nations have had a collective experience prior to, and after, colonisation that must have also shaped institutions. In East Asia, South Asia, the Middle East and North Africa, well functioning institutions of good governance existed well before colonisation, and European colonial powers merely adapted existing administrative institutions. The work of Acemoglu et al. (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-source variety (see the work of Sokoloff and Engerman (2000), 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, like the forces of the state, use their power to coerce and extract rents. When different groups compete with each other for these rents, the rent-seeking contest analysed in the next 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 determine the right policies, 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). The Bourguignon and Verdier (2000) model introduces the possibility of endogenous redistribution of income by an oligarchic elite leading to democracy. The reason is that mass education promotes growth, although it eventually leads to power shifting away from elite groups. Education is costly, but it results in a private benefit for the educated (higher lifetime income), as well as an important growth-enhancing public benefit. The benefits from the latter effect also accrue to oligarchs. This may induce the selfish elite to redistribute income as it allows the capital-constrained poor to obtain an education and contribute to rapid national economic development, even though this means the eventual loss of power for the oligarchy through democracy. The important point is that a small oligarchy may be the most disinclined to redistribute income. A smaller and extremely wealthy elite group is most likely in point-source mineral and plantation rich economies.

But not all point-source economies are subject to persistent coercive behaviour by elites. The obvious exceptions are in the diffuse economies of North-East Asia. But, in the point-source 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, namely

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. Unlike the fatalistic implications of some of the econometric models outlined above, they can be altered.

## 4 A dynamic model of growth collapse combined with rent-seeking

We now turn to the theoretical analysis of growth failure. The innovative feature of the model that follows is that the macroeconomic collapse has micro-foundations in rent-seeking contests. The macro-model in this section 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:

$$\text{Max } U(t) = \int_t^{\infty} u(C(t)) \exp(-it) dt \quad (1)$$

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:

$$\dot{D}(t) = C(t) + I(t) + iD(t) - f(k(t)) \quad (2)$$

$$\dot{k}(t) = I(t) \quad (3)$$

I ignore the rate of depreciation. Output subject to constant returns, Y is given by:

$$Y(t) = f(k(t)) \quad (4)$$

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, where I is the interest rate and D is debt stock), 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:

$$H(t) = u(C(t)) - \mu(t) [C(t) + I(t) \left\{ 1 + g\left(\frac{I(t)}{k(t)}\right) \right\} + iD(t) - f(k(t))] + \mu(t) p_k I(t) \quad (5)$$

Here  $p_k$  is the shadow price of capital. The function inside  $g(\cdot)$  gives us the cost of installing capital per unit of existing capital,  $g' > 0$ .<sup>9</sup> In other words, it is the cost of investment per-unit of extant capital. The two co-state variables are:  $\mu(t)$  and  $\mu(t)p_k$ .

---

<sup>9</sup> 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.

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

$$\begin{aligned} \frac{\delta H(t)}{\delta C(t)} &= u'(C(t)) - \mu(t) = 0 \\ \frac{\delta H(t)}{\delta I(t)} &= 1 + g(\cdot) + \frac{I(t)}{k(t)} g'(\cdot) = p_k \end{aligned} \quad (6,7)$$

Equation (6) tells us that the optimising agent will equate the marginal utility of consumption,  $u'(C(t))$  to the 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 ( $p_k$ ).<sup>10</sup> This will allow us to write a steady-state differential equation in  $k$ , with  $g(\cdot) = 0$ :

$$\dot{k} = I(t) = k(t) \varphi(p_k(t)); \varphi' > 0, \varphi(1) = 0 \quad (8)$$

indicating 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 the Hamiltonian (5) in connection with the second co-state variable with respect to time,  $(dH/d\mu(t)p_k)$ . Also utilising the fact that  $d\mu(t)/dt = 0$ , and  $I(t)/k(t) = p_k$  from (8):

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

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

---

<sup>10</sup> In a model with *no capital installation costs*, no debt, and a population growing at a constant rate  $= n$ , the rate of capital accumulation would be  $f(k(t)) - c - nk$ . 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.

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 with implications for future indebtedness and debt servicing. Note that the resource rents ( $z_1$ ) are exogenous in the sense that they are like a pure transfer or ‘manna from heaven’. The costs to the economy (the multiplicative term  $z_0$ ) are, however, a result of rent-seeking activities described below.

We now turn to the effects of extracted resource rents on productivity, investment and the capital stock. This occurs via the multiplicative term.<sup>11</sup> We postulate that rent-seeking will reduce the effective marginal product of capital, due to the diversion of 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 Appendix 1, and the events related to investment and capital accumulation are depicted in figure 1 in  $k$  and  $p_k$  space. In figure 1 the  $\dot{k} = 0$  schedule is a horizontal line. This tells us that the optimal capital stock is related to marginal productivity and not  $p_k$ . The  $\dot{p}_k = 0$  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 via  $z_0$ , the economy jumps from the initial equilibrium at  $E_1$  to the new saddle-path ( $SS_2$ ) at point F. The  $\dot{p}_k = 0$  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 capital flight.<sup>12</sup>

We 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

<sup>11</sup> This effect is somewhat similar to a decline in per-worker productivity in the Solow model.

<sup>12</sup> Rodriguez and Sachs (1999) present a Ramsey growth model where an economy undergoing a resource boom, which eventually peters out, enjoys higher consumption temporarily.

seize. This prize corresponds to the revenue or income component of resource rents ( $z_1$ ) in (10). It is, therefore, similar to the voracity effect emanating from resource rents, discussed in Lane and Tornell (1996) and the rentier effect discussed in Ross (2001). 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:

$$E_i = \pi_i P - c_i \quad (11)$$

$\pi$  is the probability of winning and  $c$  represents lobbying costs or expenditures.

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

In this example above there are two agents,  $i = 1, 2$ . The parameter  $s$  represents the "efficiency" of lobbying expenditure or bribery, if  $s > 1$ , there are 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. In many ways,  $s$  can be parameterised to be negatively related to good institutional quality, with  $s > 1$  being a sign of poor institutional quality.

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

$$c_i = \frac{sP}{4}; i = 1, 2. \quad (13)$$

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:

$$E_i = \frac{P}{2} - \frac{sP}{4} \quad (14)$$

The above expression becomes negative if  $s > 2$ . If this is so, it will lead to an even more socially wasteful game of attrition, 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):

$$\sum c_i = z_0 \quad (15)$$

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 large in (10) above. In some cases, competition for rents could descend into civil war, as in Addison et al. (2002).

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.<sup>13</sup> In either case,  $z_0$  will be smaller, as  $s < 1$ , 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 ( $z_0 = 0$ ). It would also mean  $z_1$  (the resource rents) in (10) would become a part of the regular production process in (4).

---

<sup>13</sup> 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).

## 5 Empirical investigation

### 5.1 Data

Our sample includes 91 developing countries that correspond to the list of countries included in Isham et al. (2002). For each country the first two major export items were identified based on the UNCTAD (2002). The export commodities were then characterised as originating from one of the following four sources: (i) point-source natural resources; (ii) diffuse-source natural resources; (iii) coffee/cocoa or, (iv) manufacturing. The data spans the period 1970-2000 over which the structure of export is allowed to vary; this is unlike previous studies where export structure is assumed to be fixed. Several East and South Asian countries have altered their export structure going from point-source or diffuse exports to manufactured goods exports.

The democracy index is drawn from the Polity 98 dataset (the 2000 version)<sup>14</sup> compiled by Gurr and Jagers (1996). The democracy index is a proxy for the general openness of political institutions and it is measured on a 0 to 10 scale where higher values correspond to greater democracy. In many ways it is a proxy for institutional capacity. For macroeconomic variables like per capita GDP, investment, inflation and real effective exchange rate, the main source was the World Bank (2002). Other qualitative variables are similar to that found in Isham et al. (2002).

### 5.2 Descriptive statistics

In this section we carry out some preliminary data analysis. More robust findings are reported in the econometrics sub-section (5.3) below. We investigate the link between natural resources, institutional developments and economic growth in 91 developing countries over the period 1970-2000. Our sample excludes industrialised nations and former socialist economies (the latter because of data problems). Table 4 shows the distribution of the two principal exports for these countries. In this table “point” includes both proper point-source commodities such as minerals, as well as coffee and cocoa. This is because various authors, including Isham et al. (2002), have argued in favour of aggregating coffee/cocoa economies along with point-source goods due to their similar conditions of production and distribution. As can be seen from the table, point-source exports account for 55.3 per cent of the total observations over time. The middle column indicates that 54 countries had diffuse sources as major export items at some time during the sample period. Likewise, 68 countries had point-source exports as major export items, and 34 had manufactured goods exports. The last column indicates stability in the three categories of major exports. It shows that conditional on a country having a point-source major export item, 71.5 per cent of its remaining observations are likely to be point-source exports. This shows the tenacity of point-source exports particularly as compared to manufactures. In the latter case, for a country that once had manufactures as a major export only 31 per cent of the rest of its export observations is likely to be in the same category. The fact that manufacturing is a recent phenomenon for most developing countries may explain this situation. Turning to probabilities of transition: if the major export of a country in any one year happened to be a diffuse source resource, there was a 90.6 per cent probability that it will continue as a diffuse type exporter (of one form or

---

<sup>14</sup> See [www.bsos.umd.edu/cidcm/polity](http://www.bsos.umd.edu/cidcm/polity). The democracy score measures the general openness of political institutions based on competitiveness of political participation and executive recruitment, and the extent of executive constraints pertaining to the independence of the executive.

another) next year. It has, however, a nearly 7 per cent probability of turning into a point-source exporter. On the other hand, countries with point-source major exports have a 3.5 per cent chance of becoming a diffuse exporter in the ensuing year. There is a 95 per cent chance for such countries to remain point-source exporters, showing once again the tenacity of point-sources in the sample.

We now turn to democracy, our indicator of institutional quality. Although other measures of institutional quality do exist, and it may be argued that they are more relevant in determining growth and economic progress, there are insufficient observations on these variables over time. We cannot therefore employ them in our panel (time series and cross-sectional) estimation. This problem does not apply to the Polity dataset on democracy where annual observations are available for most countries. Our justification for using democracy as an institutional variable is not just its readily available quality for parametric estimation. There is strong evidence that institutional quality and democracy are strongly correlated with per capita income. The link between institutional quality and growth may be more direct, but democracy too follows hard on its heels. The democracy scores given to each nation in the Polity dataset run from zero (lowest) to ten (highest).

Only eight nations in the entire sample period have had the maximum democracy score, suggesting that democracy is new to the developing world; hardly a surprising finding. More important, during the sample period nearly 50 per cent of the observations have had zero democracy scores (see Table 5). This finding has an important regional dimension; a zero democracy index was noted in 68 per cent of the African observations while for Asia and Latin America the corresponding figures were 37 per cent and 26 per cent respectively. Latin America fares best for high democracy (a score of ten) where it was 10.2 per cent, followed by Asia and Africa at 4.8 per cent and 3.8 per cent of the observations respectively. Moreover, zero democracy dominates the sample period, occurring 49.3 per cent of the time. Sixty-four per cent of the total sample observations on democracy are below the median score of five. Figure 2 illustrates the probability of remaining at a particular level of democracy. It indicates that both at high and very low democracy scores the probability of remaining the same in the future is high. In fact, the greatest probabilities of not staying at a democracy score is at low levels of democracy, implying that new democracies with scores below the median value of five are fragile and may revert back to zero democracy. Countries with democracy indices of seven and eight, on the other hand, appear to consolidate their democracy by showing a tendency to move to the next level of democracy, instead of falling backwards.

Table 6 indicates that among the observations where point-source resources are the major exports, slightly over 50 per cent are associated with a zero democracy score. This provides preliminary evidence to our prior hypothesis that a point-source endowment is associated with poor institutions via the proxy of democracy, and is in line with the findings of Ross (2001), about the relationship between democracy and mineral resource endowment. Diffuse exporters are not far behind, however, with 47.5 per cent of diffuse exporters having zero democracy scores. Manufactured goods exporters fare better with democracy. Only 24 per cent of cases with manufactures as the principal exports are associated with zero democracy, on the other hand 40 per cent of cases of exporters of manufactured goods are associated with high democracy scores of eight to ten. Diffuse type exports seem to be slightly better in their democracy scores compared to point-source exporters at the bottom end of the spectrum. The differences between the two, however, peter out at higher levels of democracy (seven or more).

Table 7 indicates that for the Africa and Latin America sub-samples, point-source commodities are major exports more than 60 per cent of the time. Asia seems to have a more diversified export base in terms of major exports. While Africa accounts for 46 per cent of the total observations, it accounts for only 7 per cent of the observations on manufactured goods as major exports. On the other hand, while Asia accounts for 28 per cent of the total observations, 72 per cent of the observations on manufactured exports are from this region. This suggests that their institutions, endowments and comparative advantage take them towards manufacturing exports. Latin American nations make up 25.6 per cent of the sample, but only 20.8 per cent of the principal export data pertains to manufactured goods for that region.

Table 8 displays a summary of mean democracy scores by region along with its major export category. Africa, with a mean democracy index of 1.78, is doing badly, while Latin America performs best with an average democracy index of 5.26 and Asia in the middle with 4.24 over the sample period. This regional pattern is distinctly clear among point-source exporters. Differences in mean democracy scores among Asian and Latin American countries almost disappear if we consider only those cases where diffuse type and manufactured goods are major exports. The last row shows the unconditional mean of democracy by type of major export. It tells us that export of manufactures is associated with relatively high democracy. However, this average tendency is not equally shared by all regions. In Africa for instance, the few observations where manufactures were the major exports did not seem to be associated with high democracy.

Table 9 contains a brief summary of GDP growth between 1970 and 2000 (annual average) in the three major regions alongside the type of principal exports. Growth rates are highest for Asia, regardless of the export type. Furthermore, manufactured goods exporters exhibited the highest growth rates, irrespective of region. Table 10 provides the complete list of countries whose mean democracy scores are below or above the median value of five.

### 5.3 Regression results

#### 5.3.1 The regression model

Consider the following model that consists of equations for democracy and economic growth.

$$Democracy_{it} = \theta_1 + \theta_2 Point_{it} + \theta_3 Diffuse_{it} + u_i + e_{it} \quad (16)$$

$$Growth_{it} = \beta_1 + \beta_2 Democracy_{it} + \alpha_i Region_i + \delta_i Z_{it} + \eta_i + v_{it} \quad (17)$$

The econometric model is motivated by the theory outlined in section 2. The first equation (16) is a reduced form of the rent-seeking effect where  $Democracy_{it}$  represents the democracy index for country  $i$  at time  $t$  as a proxy for rent-seeking activities. Other indicators of governance such as those in the Kaufmann et al. (2002) data might be more appropriate, but we can only utilise them in cross-sectional estimates. Democracy is supposed to depend on indicators of endowments. Our proxy for a country's endowments are its two principal exports. A case can be made for the GDP share of natural resources; however, a nation's principal exports are indicative of both its competitive and comparative advantage, which has to be related to its endowments over time. In our model  $Point_{it}$  and  $Diffuse_{it}$  are dummy variables coded 1 if a country's major export in a particular year is a point-source or diffuse resource, and 0 otherwise. They also act as instruments that correct for any endogeneity between growth and democracy. The model has two error components;  $u_i$  which is

unobserved country-specific and time invariant, and  $e_{it}$  which is normally distributed with zero mean and constant variance.

Equation (17) is the reduced form of the growth collapse equation with proxies for the reduction in the marginal product of capital via already estimated institutions in the first equation and other standard features of growth regressions. In addition to the democracy index, it includes the variable *Region* representing regional dummies for Africa, Latin America and Asia.  $Z_i$  is a vector of standard growth regressors including investment as a ratio to GDP, indicators of macroeconomic instability and a control for initial levels of per capita GDP. Macroeconomic instability is proxied by standard deviations of inflation, the terms of trade and real exchange rate on a three-year moving average basis. Like the model for democracy, equation (17) has two error terms; a country specific term ( $\eta_i$ ) and a normally distributed disturbance ( $v_{it}$ ).

Our empirical model is closely related to the work of Isham et al. (2002) and Ross (2001). The former run a pure cross-sectional estimate, as do all other authors testing for the link between economic growth and natural resource endowments. Our estimation is, however, based on a pooled cross-sectional time-series dataset. In that sense it is similar to the work in Ross (2001), which is a single equation estimate of the effect of natural resource endowment on democracy. He finds that a mineral or oil endowment has a significantly negative impact on democracy, where oil has the worse effect. We are interested, however, in economic development, particularly growth. For this reason we pursue a three stage least squares method with two estimated equations. This is because we want to measure the impact of the type of natural resource endowment upon institutions that determine the policy superstructure, and then look at the impact of these very institutions on growth, as in Isham et al (2002). In other words, we make institutions endogenous and determined by endowments. We then let economic growth be determined by the estimated institutions plus some of the other standard explanatory variables for growth that are permissible over time, such as investment. The first half of our aim closely overlaps with the work of Ross (2001) on democracy. Indeed we have the same dependent variable in our first regression.

Our estimates are over the 1970-2000 period, and therefore changes in the pattern of exports and comparative advantage, are taken into account, unlike in other works (Isham et al., 2002, for example). The choice of exogenous instruments/control variables are dictated by the choice of estimation method (panel data estimation) where these variables have to exhibit some variation over time, unlike variables associated with geography and colonial legacies, as is the case in Isham et al. (2002), Rodrik et al. (2002) or Easterly and Levine (2003). Appendix 2 presents the framework in connection with different types of panel data estimates, including differences between fixed effects and random effects estimators.

### 5.3.2 *The random effects model*

Table 11 presents the regression results based on a random effects estimator. The regression includes 74 countries with a total of 1,737 observations. The  $R^2$  is not very impressive; overall the model explains 14 per cent of the total variation in democracy. Most of the variation is between countries rather than within countries over time. The Wald chi-square value is like the F-statistic, its p-value is zero suggesting that we can reject the null hypothesis that the slope coefficients are jointly zero. Asian countries that export manufactured goods are the reference group. We parameterise the model by including three

control variables for macroeconomic instability; these are the three years moving average standard deviations of inflation, real exchange rate and terms of trade. The model suggests that after controlling for regional differences, dependence on diffuse and point-source commodities as major exports significantly undermines democracy relative to export of manufactures. Both point-source and diffuse commodities are based on natural resource endowments. However, point-source commodities are less of a deterrent to democracy than diffuse sources. The Latin American effect is positive and significant but only at a 10 per cent level of significance, while the African dummy is negative and highly significant. The Hausman test rejects the null hypothesis that the coefficients of the fixed and random effects models do not show systematic differences. But visual inspection of the results in Table 12 suggests that the differences are insignificant from a practical point of view. In the growth regression however, the p-values of the Hausman test show that the unobserved country effect is not correlated with explanatory variables and that the random effects estimator is superior to the fixed effects estimator.

In general the growth regression (the second stage estimation) reported in Table 13 appears to do better than the first stage estimation. The model explains 73 per cent of the variation in per capita GDP. The estimation is based on 76 countries. The model suggests that democracy is positively and significantly associated with growth. The African dummy is significant and negative, while the Latin American dummy is negative but not significant. Among the macro-instability indicators, uncertainty due to volatility of prices and the terms of trade have a significant negative impact on growth. As expected, investment is positively associated with growth. The result also suggests that there is no convergence among the sample developing countries; the coefficient of divergence is, however, very small.

The most surprising finding here is that the diffuse type endowment has a worse impact on democracy than the point-source endowment. This is contrary to findings of Isham et al. (2002), who have different institutional dependent variables, but especially Ross (2001), who has the same dependent variable as in our model (democracy index from the Polity database). The anomalous results we obtain are perhaps due to the use of democracy as a proxy for institutional capacity. The impact on democracy of institutional efficiency may appear with a lag. Other unexplained features may be present, and these may be related to past values. The estimates reported in this section assume away autocorrelation and heteroscedasticity. Alternative methods, therefore, need to be explored and used.

### 5.3.3 *The feasible generalised least squares (FGLS) estimates*

The random effects model assumes that the error term is homoscedastic and serially uncorrelated (see appendix 2). It is known that cross-sectional analyses are usually prone to the problem of heteroscedasticity while time series analyses often suffer from autocorrelated disturbances. Since panel data has both cross-sectional and time dimensions, the problems could be very serious. Statistical tests indicate that the error component that varies both over time and across countries (i.e.  $e_{it}$  and  $v_{it}$ ) is autocorrelated, and heteroscedastic across countries. The correlation coefficient is common to all panels. This additional information has to be taken into account to arrive at efficient estimates. We deployed the feasible generalised least squares method. This estimation process proceeds first by correcting for autocorrelation and then for heteroscedasticity. The results are reported in Tables 11 and 13 for the first and second stage regressions respectively.

The first stage results in Table 11 indicate that while dependence on both point-source and diffuse resources undermines democratic outcomes, the former appear to have an almost 40 per cent higher negative effect than dependence on diffuse sources. This result corroborates the finding of Isham et al. (2002) and Ross (2001). As already indicated countries that rank low on the democracy scale tend to remain so while those countries with a democracy index close to but below the median are more likely to fall back to lower democracy indices. In as much as this dynamic is important and that most low democracy countries are dependent on point-sources, the FGLS estimates seem to be more reliable. We believe that the additional information that we get by considering the autocorrelated disturbances in the model captures this phenomenon.

Other than the significant change in the magnitude of the coefficients of the point and diffuse source variables, the random effects and FGLS model provide comparable coefficients for the rest of the variables in equations 16 and 17. The growth regression using the predicted value of democracy from the FGLS model is qualitatively similar to the results for the random effects estimation discussed in section 5.3.2 above. However, the coefficient on democracy is considerably smaller but still statistically significant.

#### *5.3.4 Cross-sectional estimate*

As already highlighted, the democracy model in the previous two estimations has been somewhat inadequate due to lack of time series data on key explanatory variables. To make up for this shortfall and take advantage of cross-country datasets made available by other researchers, we estimate in this section a cross-sectional regression model. In the cross-sectional analysis, our dependent variable is the average democracy index for the period 1995-2000. We believe that this provides a more stable measure of institutional quality than a single year democracy index chosen arbitrarily or an average democracy index for the entire sampling period, which may not adequately reflect contemporary developments. The dummy variables for resource dependence were constructed based on the principal source of export over the entire sampling period. A country that has predominantly exported manufactured goods in recent years, such as Malaysia, could thus be labelled as a point-source exporter if the latter has been the principal export for most of the sampling period. The other explanatory variables featured in our previous estimations enter the model with their mean value over the sample period. The additional variables we are about to consider like educational achievement (secondary school), ethnolinguistic fractionalisation, whether a former British colony, and distance from the equator are based on observations taken at a point in time, and most are time invariant.

Table 14 shows the results of OLS estimations. The first three columns report the results of the democracy regression and the last three on the growth regression. While both diffuse source and point-source (including coffee and cocoa) countries perform poorly in terms of democracy relative to resource poor economies (which are our reference category), it is only the coefficient of point-source that turns out to be statistically significant. The results also show that other things being equal, African countries score low in the democracy index relative to Asian countries. As in the FGLS model, Latin American countries tend on average to be more democratic than Asian countries, at least in our sample. As indicated in Table 14, the explanatory power of the model has improved although the estimation is based on 50 countries.

Once again the predicted value of democracy shows a strong positive association with growth. Although still negative, the African dummy is very small and statistically insignificant while the Latin American dummy is negative, large and statistically significant. This might indicate that the African growth performance is adequately explained by variables already included in the model while there are unaccounted-for factors that affect economic performance in Latin America. This finding is the converse of results obtained in the panel data estimates above.

Among the standard growth variables, investment and trade openness are positively and significantly associated with growth. There appears to be no convergence among the developing countries in our sample.

We have experimented with the six indicators of institutional quality by Kaufman et al. (2002)<sup>15</sup> as dependent variables in the first stage regression. These indicators do not seem to respond to the natural resource dependence of developing economies. The only indicator that seems to have a statistically significant association with resource endowments is political stability. The strong correlation between democracy and political stability presumably explains this pattern. Note, however, that the coefficients for natural resource dependence are significant only at the 10 per cent level and countries that depend on diffuse source resources seem to suffer political instability more often than point-source economies (albeit marginally).

---

<sup>15</sup> The rankings for voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and control of corruption extend from -2.5 at the lower end of the spectrum, to 2.5 at the upper end.

## 6 Conclusions

In conclusion, the stylised facts do point to the fact that developing countries with a rich endowment of mineral or point-source natural resources have performed worse in economic terms than countries less rich in point-source resources, at least in the last three decades.

The theoretical literature explaining this phenomenon may be classified into two different strands. The first category stresses resource misallocation. A rich natural resource endowment or a substantial if temporary increase in their prices distorts relative prices and exchange rates such that there is a greater emphasis on non-traded goods (Sachs and Warner, 1999a, 1999b, 2000). This causes these countries to miss out on export-led growth. The emphasis is on inter-sectoral linkages. The resource misallocation effects also have their dynamic counterpart (Krugman, 1987; Clarida and Findlay, 1992). Temporary resource misallocation can have long-lasting or permanent effects (hysteresis or path dependence) resulting in damaging alterations to the pattern of comparative and competitive advantage in resource rich countries. Policies may be pursued, however, to counteract these adverse effects (Murshed, 2001) such that the economy's long-term dynamic sectors are not neglected. The second type of literature emphasises the political economy linkage via the strategic behaviour of key economic agents (Auty and Gelb, 2001). Resource rents can lead to rent-seeking behaviour, increasing the appetite for resource rents (Ross, 2001; Lane and Tornell, 1996). It can cause extractive and non-developmental institutions to appear and become entrenched (Acemoglu et al, 2002, 2001; Sokoloff and Engerman, 2000). It may also prevent the growth enhancing redistribution of income towards the middle classes (Bourguignon and Verdier, 2000; Easterly, 2001). Capturable resource rents can also lead to the outbreak of civil war reducing growth (Murshed, 2002). The empirical evidence does point to the importance of institutions that are the crucial link between endowments of natural resources and economic outcomes (see Easterly and Levine, 2003). This is because economic policies, and the strategic interaction between agents, occur in the context of specific economic institutions. Institutional reform is therefore key to altering economic outcomes.

Our own theoretical model encapsulates macroeconomic growth collapse as a consequence of resource dissipation, resulting from a wasteful rent-seeking game where the object of the contest is the capture of resource rents. The econometric analysis put forward in the paper contains major innovations. First, it has theoretical foundations. Second, it is one of the few econometric investigations into the resource curse that includes analysis over time, as it is a panel data estimation. Due to this time series property our proxy for institutional quality is the degree of democracy. In a sense we have advanced the empirical literature on democracy and growth.

Our findings suggest that a point-source type natural resource endowment does retard democratic and institutional development, which in turn hampers economic growth. The type of resource endowment can only *partially* explain the evolution of democracy and institutions. Although, it means that institutions can be refashioned or improved even when a country has the “wrong” kind of endowment, nevertheless the nature of resource endowment does affect institutional quality and democracy, which in turn promotes economic growth. Point-source or mineral/coffee-cocoa economies are the worst in terms of the impact of endowments on institutions and democracy. Diffuse economies (agricultural goods exporters), although better, are not greatly superior. Manufacturing and manufactured goods exports do promote better institutions and democracy. This in turn helps to explain the superior growth performance of nations that export manufactured goods. Not only is the

presence of manufactured exports an indication of a more dynamic and growing economy, but it is also an indication of better institutions and higher levels of democracy.<sup>16</sup> As far as special regional effects are concerned over time the Africa dummy is significant as a negative explanatory factor in connection with growth. It implies that there are additional and unaccounted-for factors besides democracy and investment, outside our model, that may help to explain Africa's growth performance. At any point in time, however, it is not true (cross-sectional estimates). Variables absent in our model may help to explain the growth experience of other regions, particularly Latin America.

Each nation is a policy experiment. Institutional malfunctioning, and the absence of institutional restraint on greed, can have severe growth retardation effects in resource rich countries. Easterly and Levine (2003) demonstrate that the adverse effects of natural resource endowments, policies and geography can only occur via poorly functioning institutions. This finding is supported by our own empirical investigation. Changes to affect institutions can take the form of deep or shallow interventions (Dixit, 2001). The former refers to fundamental change - constitutional redesign and altering the rules of the game, or 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. Easterly and Levine (2003) come to a similar conclusion, and our own empirical analysis also suggests that simply altering policies without root and branch reform of the institutional superstructure is unlikely to have lasting and long-term benefits for the economy. Lasting institutional change, however, cannot be brought about without societal ownership; in other words it cannot be effected from without and must come from within the nation. In some successful point-source economies, such as Norway, revenues from resources are 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. Above all it discourages rent-seeking, and there is also a powerful case for sustainable resource management. This type of fund is currently being developed for Chad.

---

<sup>16</sup> This outcome may be undermined or diminished if we weight our regressions by population. For example, China is a very populous country, and a major manufacturing exporter, and it is not a democracy. Our argument against such a procedure is that each nation, large or small, is a separate policy experiment.

## 7 References

- Acemoglu, Daron, Simon Johnson, & James A. Robinson (2002) 'Reversal of Fortunes: Geography and Institutions in the Making of the Modern World Income Distribution', *Quarterly Journal of Economics* 117 (4): 1231-44.
- Acemoglu, Daron, Simon Johnson & James A. Robinson (2001) 'The Colonial Origins of Comparative Development: An Empirical Investigation', *American Economic Review* 91 (5): 1369-1401.
- Addison Tony, Philippe Le Billon & S. Mansoob Murshed (2002) 'Conflict in Africa: The Cost of Peaceful Behaviour', *Journal of African Economies* 11: 365-86.
- Auty, Richard M and Alan G Gelb (2001) 'Political Economy of Resource Abundant States' in Richard M Auty (ed.) *Resource Abundance and Economic Development*, Oxford, UK: University Press, 126-44.
- Auty, Richard M (1997) 'Natural Resources, the State and Development Strategy', *Journal of International Development*, 9: 651-63.
- Baldwin, Robert E (1956) 'Patterns of Development in Newly Settled Regions', *Manchester School of Social and Economic Studies*, 24: 161-79.
- Bourguignon, François and Thierry Verdier (2000) 'Oligarchy, Democracy, Inequality and Growth', *Journal of Development Economics*, 62 (2): 285-313.
- Campos, Neantro F: and Jeffrey B Nugent (1999) 'Development Performance and the Institutions of Governance: Evidence from East Asia and Latin America', *World Development*, 27: 439-52.
- Clarida, Richard H and Ronald Findlay (1992) 'Government, Trade and Comparative Advantage', *American Economic Review* 82 (2): 122-7.
- Collier, Paul and Anke Hoeffler (2001) 'Greed and Grievance in Civil Wars', [www.worldbank.org](http://www.worldbank.org).
- Dixit, Avinash, K (2001) 'Some Lessons from Transaction-Cost Politics for Less-Developed Countries', unpublished manuscript, Princeton University, [www.princeton.edu](http://www.princeton.edu).
- Easterly, William (2001) 'Inequality *Does* Cause Underdevelopment', mimeo, Washington DC: World Bank.
- Easterly, William and Ross Levine (2003) 'Tropics, Germs and Crops: How Endowments Influence Economic Development', *Journal of Monetary Economics* 50: 3-39.
- Findlay, Ronald and Mats Lundahl (1994) 'Natural Resources, 'Vent-for-Surplus' and the Staples Theory' in Gerald M Meir (ed) *From Classical Economics to Development Economics*, New York: St. Martin's Press, 68-93.

- Freedom House (2002) *Freedom in the World Country Ratings 1972-73 to 2001- 2002*, Washington, D.C.: Freedom House.
- Greene, William H (2003) *Econometric Analysis*, 5<sup>th</sup> edition, London: Prentice Hall.
- Grossman, Gene and Elhannan Helpman (1991) *Innovation and Growth in the Global Economy*, Cambridge, Mass.: MIT Press.
- Gurr, Ted and Keith Jagers (1996) 'POLITY III: Regime Change and Political Authority, 1800-1994' computer file, Study #6695, Ann Arbor, MI: Inter-University Consortium for Political and Social Research [distributor].
- Gylfason, Thorvaldur (2001) 'Natural Resources, Education and Economic Development', *European Economic Review* 45: 847-59.
- Hall, Robert E. and Charles I. Jones (1999) 'Why do Some Countries Produce So Much More Output Per Worker Than Others?' *Quarterly Journal of Economics*, 114 (1): 83-116.
- Isham, Jonathan, Lant Pritchett, Michael Woolcock and Gwen Busby (2002) 'The Varieties of Rentier Experience: How Natural Resource Endowments Affect the Political Economy of Growth', mimeo, Washington DC: World Bank.
- Kaufmann, Daniel, Aart Kraay and Pablo Zoido-Lóbaton (2002) 'Governance Matters II, Update Indicators for 2000/1', Policy Research Working Paper No. 2772, Washington DC: World Bank, [www.worldbank.org](http://www.worldbank.org).
- Krugman, Paul (1987) 'The Narrow Moving Band, The Dutch Disease and the Competitive Consequences of Mrs Thatcher: Notes on Trade in the Presence of Dynamic Scale Economies', *Journal of Development Economics* 27: 41-55.
- Lane, Philip and Aaron Tornell (1996) 'Power, Growth and the Voracity Effect', *Journal of Economic Growth* 1: 213-41.
- Matsuyama, Kiminori (1992) 'Agricultural Productivity, Comparative Advantage and Economic Growth', *Journal of Economic Theory* 58: 317-34.
- Mehlum, Halvor, Kalle Moene and Ragnar Torvik (2002) 'Plunder & Protection Inc', *Journal of Peace Research* 39: 447-59.
- Milanovic, Branko (2002) 'Is Inequality in Africa really different?' Washington DC: World Bank, <http://www.worldbank.org/research/inequality/index.htm>.
- Murphy, Kevin, Andrei Shleifer and Robert Vishny (1991) 'The Allocation of Talent: Implications for Growth', *Quarterly Journal of Economics* 106: 503-30.
- Murshed, S Mansoob (2002) 'Civil War, Conflict and Underdevelopment', *Journal of Peace Research* 39: 387-93.

Murshed, S Mansoob (2001) 'Short-Run Models of Natural Resource Endowment', in Richard M Auty (ed) *Resource Abundance and Economic Development*, Oxford, UK: Oxford University Press, 113-25.

Myint, Hla M (1958) 'The "Classical Theory" of International Trade and the Underdeveloped Countries', *Economic Journal* 68 (270): 317-37.

Neary, J Peter and Sweder van Wijnbergen eds. (1986) *Natural Resources and the Macroeconomy*, Oxford, UK: Blackwell.

Olsson, Ola (2003) *Conflict Diamonds*, Working Paper in Economics No 86, Sweden: Göteborg University.

Perälä, Maiju (2000) *Explaining Growth Failures: Natural Resource Type and Growth* mimeo, UNU/WIDER and University of Notre Dame.

Ramsey, Frank (1928) 'A Mathematical Theory of Saving', *Economic Journal*, 38: 543-59.

Rodriguez, Francisco and Jeffrey Sachs (1999) 'Why do Resource Abundant Economies Grow More Slowly? A New Explanation and an Application to Venezuela', *Journal of Economic Growth* 4: 277-303.

Rodrik, Dani (1999) 'Where Did All the Growth Go? External Shocks, Social Conflict, and Growth Collapses', *Journal of Economic Growth* 4: 385-412.

Rodrik, Dani, Arvind Subramanian and Francesco Trebbi (2002) *Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development*, NBER Working Paper 9305. Cambridge MA: National Bureau of Economic Research.

Ross, Michael (2001) 'Does Oil Hinder Democracy', *World Politics* 53(3): 325-61.

Sachs, Jeffrey (1999) 'Resource Endowments and the Real Exchange Rate: A Comparison of Latin America and East Asia', in Takatoshi Ito and Anne Krueger (eds), *Changes in Exchange Rates in Rapidly Developing Countries: Theory, Practice and Policy Issues*, Chicago: University Press, pp 133-53.

Sachs, Jeffrey and Andrew Warner (2001) 'The Curse of Natural Resources', *European Economic Review* 45: 827-38.

Sachs, Jeffrey and Andrew Warner (1999a) 'Natural Resource Intensity and Economic Growth', in Jörg Mayer, Brian Chambers and Ayisha Farooq (eds) *Development Policies in Natural Resource Economies*, Cheltenham, UK: Edward Elgar, pp 13-38.

Sachs, Jeffrey and Andrew Warner (1999b) 'The Big Push, Natural Resource Booms and Growth', *Journal of Development Economics* 59: 43-76.

Shell, Karl (1966) 'Towards a Theory of Inventive Activity and Capital Accumulation', *American Economic Review* 56: 62-68.

Sokoloff, Kenneth L. and Stanley L. Engerman (2000) 'Institutions, Factor Endowments, and Paths of Development in the New World', *Journal of Economic Perspectives* 14 (3): 217-32.

Stewart, Frances (2000) 'Crisis Prevention: Tackling Horizontal Inequalities', *Oxford Development Studies* 28 (3): 245-62.

Tobin, James (1969) 'A General Equilibrium Approach to Monetary Theory', *Journal of Money, Credit and Banking*, 1: 15-29.

Tullock, Gordon (1967) 'The Welfare Costs of Tariffs, Monopolies and Theft', *Western Economic Journal* 5: 224-32.

UNCTAD (2002) 'Handbook of Statistics' online database, Geneva: UNCTAD.

Woolcock, Michael, Lant Pritchett and Jonathan Isham (2001) 'The Social Foundations of Poor Economic Growth in Resource-Rich Countries' in Richard M Auty (ed.) *Resource Abundance and Economic Development*, Oxford, UK: Oxford University Press, pp 76-92.

World Bank (2002) *World Development Indicators 200'*, CD-Rom database, Washington DC: The World Bank.

## Appendix 1

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

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

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

$$\Delta = f''(k^*) k^* \varphi' < 0 \quad \text{implying a saddle-path solution.} \quad (\text{A.2})$$

$$\frac{d[k - k^*]}{df'(k^*)} = \frac{1 - z_0}{f''(k^*)} < 0 \quad (\text{A.3})$$

$$\frac{d[p_k - 1]}{df'(k^*)} = 0 \quad (\text{A.4})$$

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

## Appendix 2

### Error Components Model

The basic framework for a panel data regression is:

$$Y_{it} = X_{it}' \beta + \varepsilon_{it} \quad i = 1, \dots, N; \quad t = 1, \dots, T \quad (\text{A.5})$$

Where  $Y_{it}$  is the observation on the dependent variable for cross-sectional unit  $i$  at time  $t$ , and

$X_{it}$  is a vector of explanatory variables for unit  $i$  at time  $t$ . In most panel data applications the error term  $\varepsilon_{it}$  is assumed to be comprised of two components:

$$\varepsilon_{it} = \mu_i + v_{it} \quad (\text{A.6})$$

Where  $\mu_i$  denotes the unobserved individual specific effect and  $v_{it}$  denotes the remainder disturbance.

The two components are assumed to be independent of each other and the first component is time invariant. There are two basic approaches to estimate equation (A.5).

### The Fixed Effects Estimator

The fixed effects estimator, also known as the dummy variable model, considers  $\mu_i$  as an estimable constant term. This suggests that equation (A.5) can be rewritten as follows:

$$Y_{it} = X_{it}' \beta + D_N \mu_i + v_{it} \quad i = 1, \dots, N; \quad t = 1, \dots, T$$

Where  $Y_{it}$  is an  $(NT \times 1)$  vector of observation on the dependent variable and  $X_{it}$  is  $(NT \times K)$  matrix of explanatory variables. The matrix  $D$  contains a set of  $N$  individual dummies and has a Kronecker product representation,  $D_N = I_N \otimes I_T$ . The model assumes  $v_{it}$  to be uncorrelated with  $X_{it}$ , independently distributed with zero mean and constant variance. With these assumptions OLS provides unbiased and efficient estimates.

### The Random Effects Estimator

The random effects approach specifies  $\mu_i$  as a random disturbance characterising the  $i$ th unit but entering the model every time with the same value. The assumption that  $\mu_i$  is not correlated with the explanatory variables is very critical for the efficiency and consistency of the random effects estimator. The model with individual effects only (ignoring time effects) is:

$$Y_{it} = X_{it}'\beta + \mu_i + v_{it} \quad i = 1, \dots, N; \quad t = 1, \dots, T$$

In the random effects model the following assumption hold:

$$E [v_{it}] = E [\mu_i] = 0$$

$$E [\mu \mu'] = \sigma_\mu^2 I_N, \quad E [v v'] = \sigma_v^2 I_{NT}$$

$$E [v_{it} \mu_j] = 0 \text{ for all } i, t, \text{ and } j,$$

$$E [v_{it} v_{is}] = 0 \text{ for } t \neq s \text{ or } i \neq j,$$

$$E [\mu_i \mu_j] = 0 \text{ for } i \neq j.$$

The random effects estimator, the coefficients are estimated based on a weighted combination of the within-group and between group estimators. This is done using a generalised least squares (GLS) method. The Hausman test is employed to choose between the fixed and random effects estimators. On these methods see Greene (2003).

Figure 1: Growth Collapse

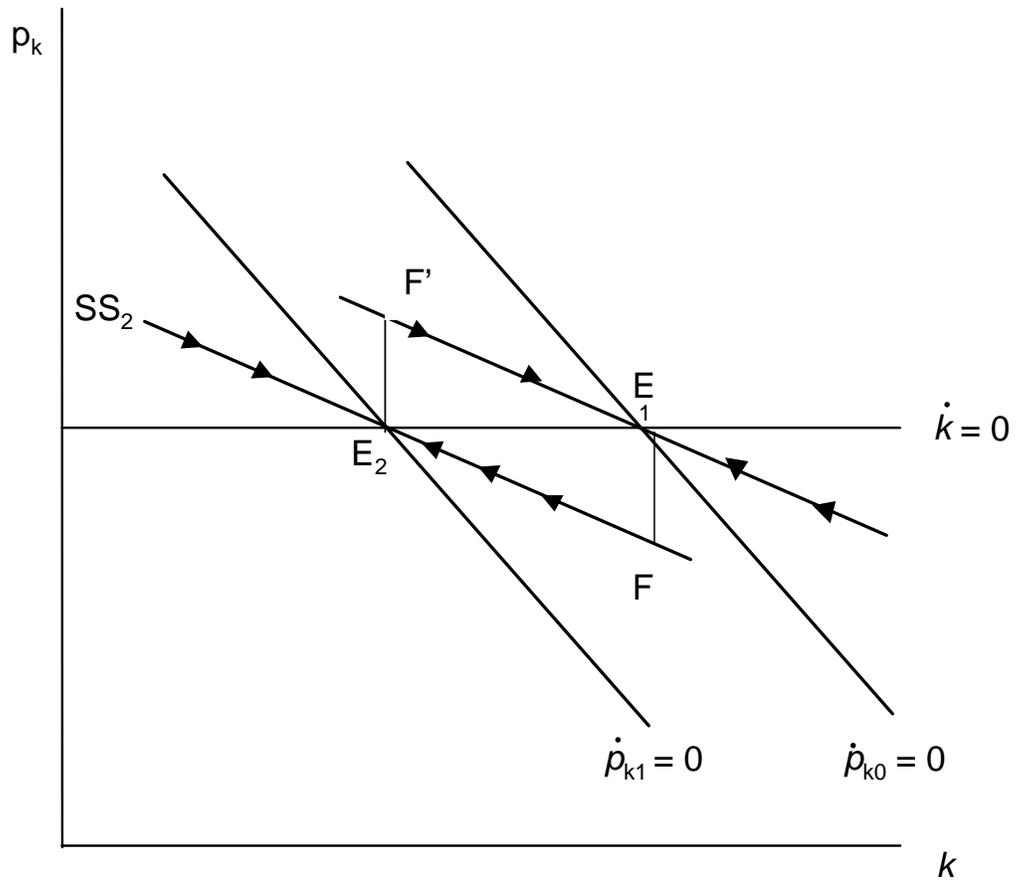


Table 1. Countries with Growth Failure

Catastrophic		Severe	
1960 or before	During 1960s	During 1970s	During 1980s
Central African Republic	Côte D'Ivoire	Burundi	Kenya
Chad	Mauritania	Cameroon	Republic of Congo
Democratic Republic of Congo <sup>3</sup>	Togo	Gabon	
Ghana		Malawi	Ecuador
Liberia	Bolivia	Mali	Paraguay
Madagascar	Jamaica	Zimbabwe	Trinidad and Tobago
Niger			
Nigeria <sup>1</sup>		El Salvador	Jordan
Rwanda		Guatemala	
Senegal		Guyana	
Sierra Leone		Honduras	
Somalia		Peru	
Zambia			
		Algeria <sup>1</sup>	
Haiti		Iran <sup>2</sup>	
Nicaragua		Saudi Arabia	
Venezuela			
		Philippines <sup>1</sup>	

Based on a sample of 98 countries for whom data is available, see Perälä (2000) .

Source: World Development Indicators, World Bank, various issues; UNDP, Human Development Report, 1996. 1996

<sup>1</sup> Economy considered large, 1960 population clearly above 25 million.

<sup>2</sup> Economy considered large, 1960 population clearly above 20 million.

<sup>3</sup> Economy considered large, 1960 population clearly above 15 million.

**Table 2. Export Classification, GDP Per Capita and Export Growth for Selected Developing Countries in 1985**

TYPE	Country	Year	First and second exports	SIC export Code for 1 <sup>st</sup>	SIC export Code for 2 <sup>nd</sup>	Percent of category exports	GDP growth 1965-99	Export* growth 1965-99	Growth Failure
<b>Manufacturing</b>	Bangladesh	1985	Woven textile, textile	653	656	65.8	1.3	7.8	
	China	1985	Vehicles parts, knitwear	784	845	35.9	6.4	11.2	
	Hong Kong		Manufacturing				5.4	11.7	
	India	1985	Pearl, clothing	667	841	58	2.4	7.3	
	Korea, Republic of	1985	Ships, clothing	735	841	91.3	6.6	15.6	
	Nepal	1985	Floor cover, clothing	657	841	59.1	1.2	8.8	
	Singapore		Manufacturing				6.3	..	
	Taiwan, China								
	Turkey	1985	Clothing, textile	841	651	61.0	2.2	..	
<b>Diffuse</b>	Argentina	1985	Wheat, oil sees and nuts	041	221	66.1	0.4	5.3	
	Burma (Myanmar)	1985	Rice, wood	042	242	56.5	1.5	3.8	
	Gambia	1985	Oil seeds, veg oils	221	421	84.0	0.5	3.2	
	Guinea-Bissau		Fruits				0.0	3.4	
	Honduras	1985	Fruits, coffee	051	071	84.7	0.6	2.5	Yes
	Lesotho						2.8	7.6	
	Malaysia	1985	Crude petrol, veg oil	331	442	31.5	4.3	9.9	
	Mali	1985	Cotton, live animals	263	001	58.6	-0.1	6.9	Yes
	Mozambique	1984	Fish, fruit	031	051	69.0	1.3	5.8	
	Pakistan	1985	Cotton, rice	652	042	61.9	2.7	6.2	
	Panama	1985	Fruit, fish	051	031	78.0	1.1	0.0	
	Philippines	1985	Special trans, veg oil	931	422	26.9	0.9	6.4	Yes
	Senegal	1985	Fish, veg oils	031	421	38.0	-0.4	1.6	Yes
	Somalia	1985	Live animals, fruit	001	057	85.6			Yes
	Sri Lanka	1985	Tea, clothing	074	841	47.4	3.0	4.2	
	Thailand	1985	Rice, veg	042	054	46.2	5.1	11.2	
	Uruguay	1985	Wood, meat	262	011	46.1	1.4	5.7	
	Zimbabwe	1985	Tobacco, Pig Iron	121	671	36.3	0.9	7.0	Yes

TYPE	Country	Year	First and second exports	SIC export code for 1 <sup>st</sup>	SIC export code for 2 <sup>nd</sup>	Percent of category exports	GDP growth 1965-99	Export growth 1965-99	Growth failure
Point	Algeria	1985	Petroleum products, crude petrol	332	331	97.6	1.0	2.7	Yes
	Angola	1985	Crude petrol, petroleum products	331	332	84.9	-2.1	..	Yes
	Benin	1982	Cotton, cocoa	263	072	46.0	0.2	3.1	
	Bolivia	1985	Tin, gas	687	341	55.7	-0.3	3.1	Yes
	Botswana		Diamonds				7.1	4.8	
	Burkina Faso	1985	Cotton, live animals	263	001	56.8	1.1	3.2	
	Chad	1980	Cotton, live animals	263	001	79.8	-0.6	1.7	Yes
	Chile	1985	Copper, nonferrous ore	682	283	58.3	2.5	8.3	
	Congo	1985	Crude petrol, petroleum products	331	332	93.3	1.7	6.3	Yes
	Dominican Rep.	1985	Sugar, pig iron	061	671	42.7	2.5	5.8	
	Ecuador	1985	Crude petrol, coffee	331	071	66.7	1.9	7.0	Yes
	Egypt	1985	Crude petrol, cotton	331	263	68.1	3.3	5.4	
	Fiji		Sugar						
	Gabon	1985	Crude petrol, wood	331	242	81.2	0.8	5.4	Yes
	Guinea						..	..	
	Guyana								Yes
	Indonesia	1985	Crude petrol, gas	331	341	68.6	4.8	5.6	
	Iran	1987	Crude petrol, tapestry	331	657	95.8	-1.0	-1.1	Yes
	Iraq	1985	Crude petrol, fruit	331	051	98.8	-3.5	..	Yes
	Jamaica	1986	Inorganic elements, nonferrous metal	513	283	51.9	-0.2	1.9	Yes
	Jordan	1985	Fertilisers (crude), fertiliser (manual)	271	561	43.3	0.4	7.1	Yes
	Liberia	1985	Iron, rubber	281	231	62.9			Yes
	Malawi	1983	Tobacco, tea	121	074	96.0	0.6	3.7	Yes
	Mauritania	1985	Iron, fish	281	031	58.3	-0.2	2.1	Yes
	Mauritius	1985	Sugar, clothing	061	841	49.8	3.9	5.9	
	Mexico	1985	Crude petrol, petroleum products	331	332	60.0	1.5	10.0	
	Morocco	1985	Fertilisers, Inorganic elements	271	513	40.5	1.9	5.3	
	Namibia						0.0	2.9	
	Niger	1981	Uranium, live animals	286	001	80.0	-2.3	-0.3	Yes
	Nigeria	1985	Crude petrol, cocoa	331	072	96.7	0.0	2.6	Yes
	Papua New Guinea	1985	Nonferrous metal, coffee	283	071	45.1	0.7	7.0	
	Paraguay	1985	Cotton, oil	263	221	49.5	2.1	8.3	Yes
	Peru	1985	Petrol, nonferrous metal	332	283	40.8	-0.3	2.6	Yes
	Saudi Arabia						-0.1	..	Yes
	Sierra Leone	1985	Pearl, nonferrous metal	667	283	34.8	-1.2	-5.4	Yes

TYPE	Country	Year	First and second exports	SIC export code for 1 <sup>st</sup>	SIC export code for 2 <sup>nd</sup>	Percent of category exports	GDP growth 1965-99	Export growth 1965-99	Growth failure
	South Africa	1985	Special, coal	931	321	34.2	0.0	1.8	
	Sudan	1985	Cotton, oil seeds	263	221	71.3	0.5	-2.1	
	Syria	1985	Crude petrol, petroleum products	331	332	74.1	2.3	6.2	
	Togo	1985	Fertilisers, cocoa	271	072	53.6	-0.5	3.1	Yes
	Trinidad & Tobago						1.8	3.7	Yes
	Tunisia	1985	Crude petrol, clothing	331	841	44.5	2.7	6.7	
	Venezuela	1985	Crude petrol, petroleum products	331	332	80.0	-0.8	2.1	Yes
	Zaire (Dem. Rep of Congo)	1985	Copper, crude petrol	682	331	44.2	-3.4	2.4	Yes
	Zambia	1985	Copper, zinc	682	686	93.4	-2.0	-0.9	Yes
Coffee/cocoa	Brazil	1985	Coffee, petroleum products	071	332	37.0	2.4	8.2	
	Burundi	1985	Coffee, tea	071	074	92.2	0.6	3.5	Yes
	Cameroon	1986	Coffee, cocoa	071	072	52.5	1.1	6.2	Yes
	Central African Rep.	1985	Coffee, wood	071	242	41.6	-1.1	2.1	Yes
	Colombia	1985	Coffee, petroleum products	071	332	59.3	2.1	5.7	
	Costa Rica	1985	Coffee, fruit	071	051	60.5	1.4	7.2	
	Cote d'Ivoire	1985	Cocoa, coffee	072	071	68.0	-0.7	5.1	Yes
	El Salvador	1985	Coffee, sugar	071	061	51.3	-0.3	1.6	Yes
	Ethiopia	1985	Coffee, hides	071	211	71.2	-0.3	1.3	Yes
	Ghana	1985	Coffee, aluminum	072	684	69.3	-0.7	-0.1	Yes
	Guatemala	1985	Coffee, crude veg materials	071	292	58.1	0.7	2.5	Yes
	Haiti	1985	Coffee, clothing	071	841	74.2	-0.9	0.5	Yes
	Kenya	1985	Coffee, tea	071	074	63.6	1.2	2.9	Yes
	Madagascar	1985	Coffee, spices	071	075	79.2	-1.7	-0.3	Yes
	Nicaragua	1985	Coffee, cotton	071	263	58.2	-2.9	0.6	Yes
	Rwanda	1985	Coffee, tin	071	687	76.4	-0.1	2.7	Yes
	Tanzania	1985	Coffee, cotton	071	263	68.1	..	..	Yes
	Uganda	1985	Coffee, hides	071	211	90.0	2.5	8.1	

Source: Based on appendix Table 1 in Isham *et al.* (2002), and the World Bank's World Development Indicators (WDI), 2001 and UNCTAD (2002).

Note: Growth rates for Tanzania in the 1980-99 period are negative at -0.8 per cent per annum. \*Export of goods and services.

**Table 3. Governance Indicators of Selected Developing Countries for 1997-98 and 2000-01**

Country	Dataset	Voice and Accountability		Political Stability/No Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption	
		Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile Rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)
AFGHANISTAN	2000/01	-1.64	2.3	-2.06	0.6	-1.23	8.8	-2.95	0.0	-2.17	0.0	-1.47	0.0
	1997/98	-1.62	2.9	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
ALGERIA	2000/01	-1.19	12.2	-1.27	9.3	-0.81	22.7	-0.79	16.1	-0.97	13.6	-0.62	32.0
	1997/98	-1.31	8.1	-2.42	0.6	-1.09	11.6	-1.17	10.3	-1.10	10.9	-0.88	13.6
ANGOLA	2000/01	-1.26	11.0	-1.98	1.8	-1.31	6.3	-1.39	6.5	-1.49	2.3	-1.14	5.0
	1997/98	-1.00	15.6	-1.78	3.2	-1.39	3.8	-0.71	20.6	-1.23	5.4	-0.86	14.9
ARGENTINA	2000/01	0.57	68.0	0.55	68.7	0.18	58.8	0.25	58.6	0.22	61.3	-0.36	45.2
	1997/98	0.49	67.4	0.51	69.9	0.26	69.9	0.67	77.5	0.32	64.8	-0.27	48.0
BANGLADESH	2000/01	-0.20	45.3	-0.57	26.8	-0.54	34.1	0.01	44.3	-0.76	22.6	-0.64	29.5
	1997/98	-0.01	53.4	-0.40	32.6	-0.56	28.3	-0.16	34.5	-0.93	14.5	-0.29	46.1
BENIN	2000/01	0.47	65.1	-0.72	20.6	0.12	56.3	0.07	48.5	-0.57	33.3	N.A.	N.A.
	1997/98	0.69	71.5	-0.94	17.6	-0.07	50.9	-0.08	38.7	-0.42	37.5	-0.78	22.0
BOLIVIA	2000/01	0.27	61.6	0.61	24.3	-0.47	36.7	0.66	77.2	-0.41	41.0	-0.72	25.7
	1997/98	0.39	65.1	-0.14	43.7	-0.22	46.4	0.88	87.2	-0.35	41.2	-0.44	38.3
BOTSWANA	2000/01	0.80	73.2	0.71	73.7	0.83	79.1	1.02	88.0	0.68	73.8	0.89	81.1
	1997/98	0.78	74.4	0.74	77.1	0.22	67.7	0.57	72.7	0.50	68.4	0.54	75.3
BRAZIL	2000/01	0.53	67.4	0.47	65.0	-0.27	44.3	0.13	50.2	-0.26	48.8	-0.02	56.6
	1997/98	0.58	68.6	-0.32	38.5	-0.22	47.0	0.13	47.2	-0.22	47.2	0.06	64.2
BURKINA FASO	2000/01	-0.26	42.4	-0.54	28.7	-0.02	50.6	0.04	46.7	-0.79	20.2	-0.93	15.0
	1997/98	-0.21	43.6	-0.52	29.4	-0.06	52.2	-0.04	41.2	-0.35	42.4	-0.37	40.9
BURUNDI	2000/01	-1.35	8.7	-1.54	5.6	-1.14	10.7	-0.59	20.9	-1.07	8.9	-1.40	0.6
	1997/98	-1.29	9.3	N.A.	N.A.	N.A.	N.A.	-0.85	16.9	-0.88	17.5	N.A.	N.A.
CAMEROON	2000/01	-0.82	22.0	-0.13	43.7	-0.40	39.2	0.05	47.9	-1.02	12.5	-1.11	6.2
	1997/98	-0.70	26.7	-0.72	23.5	-0.64	22.5	-0.16	33.3	-1.02	12.7	-1.10	3.2
CENTRAL AFR REP	2000/01	-0.59	30.2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	1997/98	-0.05	52.3	N.A.	N.A.	-0.75	18.0	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
CHAD	2000/01	-0.88	20.3	N.A.	N.A.	N.A.	N.A.	-0.57	21.5	-0.86	17.2	N.A.	N.A.
	1997/98	-0.85	21.5	-0.74	22.8	-0.71	19.3	-0.74	19.3	-0.83	20.0	-0.59	29.2

Country	Dataset	Voice and Accountability		Political Stability/No Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption	
		Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile Rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)
CHILE	2000/01	0.63	70.3	0.87	81.8	1.13	86.0	1.10	92.8	1.19	86.3	1.40	89.9
	1997/98	0.62	69.1	0.45	67.9	1.17	85.8	0.90	89.6	1.09	86.0	1.03	84.4
CHINA	2000/01	-1.11	13.3	0.39	63.1	0.14	57.5	-0.13	40.1	-0.19	50.0	-0.30	48.4
	1997/98	-1.29	8.7	0.48	69.2	0.02	58.7	-0.07	39.3	-0.04	52.7	-0.29	46.7
COLOMBIA	2000/01	-0.41	35.4	-1.36	7.5	-0.38	40.5	0.02	44.9	-0.77	22.0	-0.39	44.6
	1997/98	-0.15	46.5	-1.29	9.1	-0.06	52.9	0.29	58.7	-0.78	22.4	-0.49	33.7
CONGO	2000/01	-1.38	6.9	-1.36	8.1	-1.58	1.2	-0.76	16.7	-1.11	8.3	-0.49	37.1
	1997/98	-0.77	24.4	-1.83	2.6	-0.58	25.8	-0.99	13.9	-1.44	3.0	-0.60	28.5
CONG, DEM REP (FORMER ZAIRE)	2000/01	-1.70	1.7	-2.59	0.0	-1.38	3.7	-2.87	0.5	-2.09	0.5	-1.24	1.2
	1997/98	-1.57	3.4	-2.59	0.0	-1.77	0.6	-2.34	1.2	-2.15	0.0	-1.56	0.6
COSTA RICA	2000/01	1.37	91.2	1.08	85.6	0.74	77.2	0.88	85.0	0.61	70.8	0.87	80.5
	1997/98	1.35	87.7	0.91	81.6	0.55	73.5	0.93	90.9	0.55	71.5	0.58	76.6
COTE D'IVOIRE	2000/01	-1.19	11.6	-0.95	15.6	-0.81	21.5	-0.30	31.1	-0.54	35.1	-0.71	26.4
	1997/98	-0.57	32.5	-0.14	44.4	-0.18	47.7	0.15	47.8	-0.33	43.0	-0.08	57.1
DOMINICAN REP	2000/01	0.42	64.5	0.46	64.3	-0.24	46.2	0.60	76.0	0.01	56.5	-0.20	50.3
	1997/98	-0.08	50.5	0.12	54.2	-0.83	16.1	0.54	70.3	0.38	65.4	-0.77	22.7
ECUADOR	2000/01	-0.14	47.0	-0.80	18.7	-0.94	18.9	-0.00	43.7	-0.76	23.2	-0.98	12.5
	1997/98	0.27	62.2	-0.47	30.0	-0.56	29.0	0.38	63.6	-0.72	26.6	-0.82	19.4
EGYPT	2000/01	-0.65	28.4	0.21	56.2	0.27	62.0	0.13	49.7	0.21	60.7	-0.16	52.8
	1997/98	-0.67	29.0	-0.07	46.4	-0.14	49.6	0.12	46.0	0.13	58.1	-0.27	48.7
EL SALVADOR	2000/01	0.21	61.0	0.62	70.0	-0.25	45.5	0.94	86.8	-0.65	29.7	-0.33	46.5
	1997/98	-0.10	49.4	-0.02	48.3	-0.26	44.5	1.23	99.3	-0.66	29.6	-0.35	41.5
ETHIOPIA	2000/01	-0.85	21.5	-0.55	28.1	-1.01	15.1	-0.71	18.5	-0.24	49.4	-0.40	42.7
	1997/98	-0.5	35.4	0.14	55.5	-0.15	48.3	-0.03	42.4	0.27	63.0	-0.44	38.9
Country	Dataset	Voice and Accountability		Political Stability/No Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption	
		Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile Rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)
FIJI	2000/01	0.05	55.2	0.39	62.5	0.38	65.1	-0.41	26.3	-0.52	36.3	1.01	81.7
	1997/98	0.01	54.6	0.01	50.3	0.63	79.3	-0.37	26.0	-0.50	33.9	0.81	82.4

GABON	2000/01	-0.40	36.0	-0.44	31.8	-0.45	37.3	-0.12	40.7	-0.44	38.0	-0.58	34.5
	1997/98	-0.31	40.1	-0.56	26.1	-1.13	9.6	0.35	62.4	-0.53	32.7	-1.02	5.8
GAMBIA	2000/01	-0.73	25.5	0.49	66.2	0.41	66.4	-0.01	43.1	-0.00	55.9	0.13	62.8
	1997/98	-0.97	16.8	0.56	71.2	0.16	64.5	-0.25	30.9	0.27	64.2	-0.02	58.4
GHANA	2000/01	0.02	54.0	-0.11	44.3	-0.06	50.0	0.24	57.4	-0.08	53.5	-0.28	49.6
	1997/98	-0.43	37.2	-0.10	45.0	-0.29	42.5	0.28	57.5	-0.01	53.9	-0.30	45.4
GUATEMALA	2000/01	-0.33	39.5	-0.77	19.3	-0.63	29.7	0.16	50.8	-1.00	13.0	-0.69	27.6
	1997/98	-0.56	33.1	-0.75	22.2	-0.23	45.8	0.44	66.6	-1.11	10.3	-0.82	18.8
GUINEA	2000/01	-0.98	17.4	-0.99	15.0	0.41	66.4	0.16	52.0	-0.59	32.1	0.13	62.8
	1997/98	-0.87	20.9	-1.03	13.7	-0.03	54.8	0.20	51.5	-0.76	23.0	-0.85	17.5
GUINEA-BISSAU	2000/01	-0.87	20.9	-1.21	11.2	-1.48	1.8	-1.04	13.7	-1.50	1.7	0.10	60.3
	1997/98	-0.45	36.0	-1.20	10.4	-0.33	39.3	-1.35	7.2	-1.61	1.2	-0.18	53.8
GUYANA	2000/01	0.94	76.1	-0.70	21.2	0.02	52.5	0.04	46.7	0.13	57.7	-0.45	40.2
	1997/98	1.01	79.0	-0.20	41.8	0.01	56.1	0.23	54.5	-0.14	49.6	-0.02	58.4
HAITI	2000/01	-0.80	23.2	-0.38	35.6	-1.32	5.0	-1.29	7.7	-1.45	2.9	-0.84	20.7
	1997/98	-0.71	26.1	-1.71	3.9	-1.23	7.7	-1.13	11.5	-1.50	1.8	-0.53	31.8
HONDURAS	2000/01	-0.04	51.7	0.25	56.8	-0.58	32.2	-0.16	38.3	-1.06	9.5	-0.63	30.8
	1997/98	-0.06	51.1	-0.33	36.6	-0.41	36.1	0.08	43.6	-0.90	16.9	-0.94	11.0
HONG KONG	2000/01	-0.33	40.1	1.13	88.1	1.10	85.4	1.44	98.2	1.37	89.2	1.16	85.5
	1997/98	0.01	55.2	0.92	83.6	1.25	87.0	1.21	98.7	1.33	89.6	1.31	88.3
INDIA	2000/01	0.66	70.9	-0.05	45.6	-0.17	48.1	-0.16	37.7	0.23	61.9	-0.39	44.0
	1997/98	0.36	64.5	-0.04	47.7	-0.26	43.8	-0.04	40.6	0.16	60.6	-0.31	44.8
INDONESIA	2000/01	-0.40	36.6	-1.56	4.3	-0.50	34.8	-0.43	24.5	-0.87	16.6	-1.01	11.9
	1997/98	-1.13	12.2	-1.29	9.8	-0.53	30.3	0.12	46.6	-0.92	15.1	-0.80	20.7

Country	Dataset	Voice and Accountability		Political Stability/No Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption	
		Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile Rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)
IRAN	2000/01	-0.36	37.2	0.02	48.1	-0.21	47.4	-1.07	12.5	-0.39	42.2	-0.64	30.1
	1997/98	-0.56	33.7	0.13	54.9	-0.34	38.7	-1.25	9.0	-0.36	40.0	-0.85	16.8
IRAQ	2000/01	-1.93	0.0	-1.57	3.7	-1.41	3.1	-2.78	1.1	-1.64	1.1	-1.15	4.4
	1997/98	-1.75	0.5	-2.24	1.3	-1.88	0.0	-3.14	0.0	-1.84	0.6	-1.26	2.5
JAMAICA	2000/01	0.78	72.6	0.35	61.2	-0.30	43.6	0.42	68.2	-0.38	44.0	-0.06	54.7
	1997/98	0.75	72.6	-0.34	35.9	-0.48	32.9	0.76	81.2	-0.73	24.8	-0.12	56.4
JORDAN	2000/01	0.10	56.3	0.13	53.1	0.42	67.7	0.73	78.4	0.66	73.2	0.09	59.1
	1997/98	0.15	60.4	-0.06	47.0	0.63	78.0	0.42	65.4	0.71	75.1	0.14	65.5
KENYA	2000/01	-0.68	27.9	-0.83	18.1	-0.76	25.3	-0.26	34.1	-1.21	4.7	-1.11	6.9
	1997/98	-0.70	27.3	-1.10	12.4	-0.90	13.5	-0.13	35.7	-1.22	6.0	-0.65	26.6
KOREA, REP OF	2000/01	-1.82	77.3	0.79	67.5	-1.06	68.3	-1.39	61.6	-0.74	70.2	-0.90	69.1
	1997/98	-1.79	76.7	0.37	56.8	-0.30	70.9	-1.40	53.9	-0.67	81.8	-0.53	66.2
LESOTHO	2000/01	-0.15	46.5	N.A.	N.A.	N.A.	N.A.	-0.17	36.5	-0.19	50.5	N.A.	N.A.
	1997/98	-0.15	47.0	-0.82	19.6	-0.46	34.1	-0.06	40.0	-0.24	45.4	0.19	66.8
LIBERIA	2000/01	-1.04	16.8	-0.65	23.1	-0.94	18.3	-1.29	8.3	-1.03	10.7	-0.59	33.9
	1997/98	-0.89	19.7	-0.95	16.3	-0.92	12.9	-1.25	9.6	-1.29	4.8	-1.05	4.5
MADAGASCAR	2000/01	0.28	62.2	-0.34	36.8	-0.35	41.1	-0.05	41.9	-0.68	27.9	-0.93	15.7
	1997/98	0.31	63.9	-0.79	20.2	-0.29	41.9	-0.21	32.1	-0.82	20.6	-0.47	35.0
MALAWI	2000/01	-0.14	47.6	0.03	48.7	-0.77	24.0	0.28	60.4	-0.36	44.6	0.10	59.7
	1997/98	0.06	56.9	0.04	51.6	-0.62	23.2	0.08	43.0	-0.41	38.1	-0.19	53.2
MALAYSIA	2000/01	-0.13	48.2	0.31	59.3	0.53	68.9	0.22	55.6	0.34	64.2	0.13	61.6
	1997/98	-0.09	50.0	0.55	70.5	0.71	81.2	0.48	67.2	0.83	78.1	0.63	79.8
MALI	2000/01	0.32	62.7	-0.13	42.5	-1.44	2.5	0.27	59.8	-0.66	28.5	-0.41	42.1
	1997/98	0.42	65.6	-0.29	39.2	-0.05	53.5	0.29	59.3	-0.47	36.3	-0.48	34.4
MAURITANIA	2000/01	-0.59	30.8	-0.87	16.8	-0.66	29.1	-0.57	21.5	-0.57	33.3	-0.97	13.8
	1997/98	-0.97	17.4	N.A.	N.A.	N.A.	N.A.	-0.85	16.9	-0.56	31.5	N.A.	N.A.

Country	Dataset	Voice and Accountability		Political Stability/No Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption	
		Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile Rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)
MAURITIUS	2000/01	1.27	88.9	1.12	87.5	0.76	77.8	0.41	67.0	1.00	82.7	0.49	72.9
	1997/98	1.01	79.6	1.14	86.9	0.17	65.1	0.22	53.3	1.28	89.0	0.34	68.8
MEXICO	2000/01	0.12	58.1	0.06	50.0	0.28	63.2	0.58	73.0	-0.41	40.4	-0.28	49.0
	1997/98	-0.10	48.8	-0.35	35.2	0.18	67.0	0.61	75.1	-0.47	35.1	-0.28	47.4
MOROCCO	2000/01	-0.23	43.0	0.16	53.7	0.10	54.4	0.54	71.8	0.46	68.4	0.44	70.4
	1997/98	-0.24	42.4	0.09	52.9	0.27	70.3	0.22	52.7	0.68	73.9	0.13	64.9
MOZAMBIQUE	2000/01	-0.22	44.1	0.20	55.0	-0.49	35.4	0.16	52.0	-0.32	46.4	0.10	60.3
	1997/98	-0.17	45.3	-0.53	27.4	-0.33	40.0	-0.23	31.5	-1.05	12.1	-0.53	31.1
MYANMAR	2000/01	-1.93	0.0	-1.20	11.8	-1.25	7.5	-1.15	11.3	-1.02	11.9	-1.18	3.1
	1997/98	-1.74	1.1	-0.97	15.6	-1.46	2.5	-1.01	12.1	-0.84	19.3	-1.10	3.8
NAMIBIA	2000/01	0.32	63.3	-0.52	30.0	0.60	70.8	0.53	70.6	1.24	87.5	1.25	88.6
	1997/98	0.47	66.8	0.71	76.4	0.04	60.0	0.27	56.9	0.95	82.4	0.38	70.1
NEPAL	2000/01	-0.06	51.1	-0.26	40.6	-1.04	13.2	-0.41	26.3	-0.65	30.3	-0.31	47.1
	1997/98	0.05	55.8	N.A.	N.A.	N.A.	N.A.	-0.36	26.6	-0.56	31.5	N.A.	N.A.
NICARAGUA	2000/01	-0.06	50.5	0.31	60.0	-0.73	27.2	-0.16	37.1	-0.79	20.8	-0.80	23.8
	1997/98	0.07	57.5	-0.32	37.9	-0.55	29.6	-0.10	36.9	-0.73	25.4	-0.84	18.1
NIGER	2000/01	0.11	56.9	-0.61	25.0	-1.16	10.1	-0.30	32.3	-1.17	6.5	-1.09	7.5
	1997/98	-0.74	25.0	-0.76	20.9	-1.39	4.5	-0.52	23.0	-1.14	8.4	-1.57	0.0
NIGERIA	2000/01	-0.44	34.8	-1.36	6.8	-1.00	15.8	-0.39	28.7	-1.13	7.1	-1.05	9.4
	1997/98	-1.23	11.0	-1.05	13.0	-1.32	5.8	-0.35	27.2	-1.10	11.5	-0.95	10.3
OMAN	2000/01	-0.50	33.7	1.00	82.5	0.85	79.9	0.60	75.4	1.06	83.3	0.44	71.0
	1997/98	-0.57	31.9	0.91	82.3	0.90	83.8	0.30	61.2	1.08	84.2	0.48	72.0
PAKISTAN	2000/01	-1.43	4.6	-0.39	33.7	-0.48	36.0	-0.38	30.5	-0.74	25.0	-0.79	24.5
	1997/98	-0.44	36.6	-0.65	24.8	-0.74	18.7	-0.20	32.7	-0.76	23.6	-0.77	23.3
PANAMA	2000/01	0.77	72.0	0.57	69.3	-0.14	49.3	0.91	85.6	-0.12	52.9	-0.45	41.5
	1997/98	0.66	70.9	0.15	56.2	-0.28	43.2	1.00	93.9	-0.39	39.3	-0.46	37.0

Country	Dataset	Voice and Accountability		Political Stability/No Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption	
		Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile Rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)
PAPUA NEW GUINEA	2000/01	-0.03	52.3	-0.48	30.6	-0.67	28.4	-0.38	29.3	-0.28	48.2	-1.21	2.5
	1997/98	0.12	59.3	-0.4	33.3	-0.69	20.0	-0.13	36.3	-0.31	43.6	-0.85	15.5
PARAGUAY	2000/01	-0.70	26.1	-0.87	16.2	-1.20	9.4	-0.43	25.1	-0.83	17.8	-0.97	13.2
	1997/98	-0.42	37.7	-0.57	25.4	-1.10	10.9	0.37	63.0	-0.70	27.8	-0.96	9.7
PERU	2000/01	0.15	59.8	-0.23	41.2	-0.35	41.7	0.36	64.0	-0.53	35.7	-0.04	55.3
	1997/98	-0.69	28.4	-0.53	28.1	0.17	65.8	0.67	78.1	-0.52	33.3	-0.20	52.5
PHILIPPINES	2000/01	0.53	66.8	-0.21	41.8	0.03	53.1	0.21	55.0	-0.49	37.5	-0.49	36.4
	1997/98	0.63	70.3	0.27	60.7	0.13	61.9	0.57	71.5	-0.08	51.5	-0.23	51.2
RWANDA	2000/01	-1.42	5.8	-1.16	13.1	N.A.	N.A.	-0.73	17.9	-1.17	5.9	0.35	68.6
	1997/98	-1.17	11.6	N.A.	N.A.	N.A.	N.A.	-1.17	10.9	-1.20	6.6	N.A.	N.A.
SAUDI ARABIA	2000/01	-1.07	13.9	0.51	68.1	-0.00	51.8	-0.11	41.3	0.19	60.1	-0.35	45.9
	1997/98	-1.10	13.3	0.24	59.4	-0.35	38.0	-0.15	35.1	0.49	67.2	-0.58	29.8
SENEGAL	2000/01	0.12	59.3	-0.68	22.5	0.16	58.2	-0.38	29.9	-0.13	52.3	-0.39	43.4
	1997/98	-0.29	40.6	-0.87	18.9	0.05	60.6	-0.34	28.4	-0.10	50.3	-0.24	50.6
SIERRA LEONE	2000/01	-1.35	8.1	-1.26	10.0	-1.60	0.6	-1.21	9.5	-0.38	43.4	-0.45	40.2
	1997/98	-1.62	2.3	-1.52	7.1	0.01	56.1	-1.50	4.8	-0.91	16.3	-0.02	58.4
SINGAPORE	2000/01	0.11	57.5	1.44	96.8	2.16	100.0	1.82	100.0	1.85	98.2	2.13	98.1
	1997/98	0.13	59.8	1.39	95.4	2.08	100.0	1.24	100.0	1.94	99.3	1.95	95.4
SOMALIA	2000/01	-1.45	4.0	-1.55	5.0	-2.34	0.0	-1.50	4.7	-1.28	3.5	-1.16	3.7
	1997/98	-1.69	1.7	-1.71	5.2	-1.70	1.9	-1.77	3.0	-1.50	1.8	-1.05	4.5
SOUTH AFRICA	2000/01	1.17	85.4	0.07	51.2	0.25	60.7	0.07	49.1	-0.05	54.1	0.35	67.9
	1997/98	0.99	78.4	-0.53	28.7	-0.00	55.4	0.24	55.7	-0.35	41.8	0.30	68.1
SRI LANKA	2000/01	-0.23	43.6	-1.63	3.1	-0.44	37.9	0.38	64.6	-0.31	47.6	0.00	57.2
	1997/98	-0.16	45.9	-1.63	6.5	-0.61	24.5	0.62	76.9	-0.36	40.6	-0.12	55.8
SUDAN	2000/01	-1.53	2.9	-2.01	1.2	-1.34	4.4	-0.41	25.7	-1.04	10.1	-1.24	1.8
	1997/98	-1.50	4.0	-1.73	3.9	-1.70	1.2	-0.83	18.1	-1.35	3.6	-1.02	5.8

Country	Dataset	Voice and Accountability		Political Stability/No Violence		Government Effectiveness		Regulatory Quality		Rule of Law		Control of Corruption	
		Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile Rank (0-100%)	Point Estimate	Percentile rank (0-100%)	Point Estimate	Percentile rank (0-100%)
SYRIA	2000/01	-1.40	6.3	-0.28	40.0	-0.81	23.4	-0.66	19.7	-0.52	36.9	-0.83	22.0
	1997/98	-1.36	6.9	0.08	52.2	-1.18	8.3	-0.92	14.5	-0.29	44.2	0.79	21.4
TAIWAN	2000/01	0.83	74.4	0.70	73.1	0.91	82.2	0.73	80.8	0.75	76.1	0.53	73.5
	1997/98	0.71	72.0	0.93	84.3	1.29	89.0	0.83	82.4	0.93	81.2	0.63	79.2
TANZANIA	2000/01	-0.07	50.0	-0.34	37.5	-0.43	38.6	-0.02	42.5	0.16	59.9	-0.92	16.9
	1997/98	-0.28	41.2	0.57	71.8	-0.49	32.2	0.18	49.6	0.16	61.2	-0.92	11.6
THAILAND	2000/01	0.37	63.9	0.21	55.6	1.00	53.7	0.56	72.4	0.44	67.8	-0.46	39.6
	1997/98	0.22	61.6	0.25	60.1	0.01	58.0	0.19	50.9	0.41	66.6	-0.16	54.5
TOGO	2000/01	-1.06	14.5	-0.62	23.7	-1.32	5.6	-0.99	14.3	-0.82	18.4	-0.48	38.3
	1997/98	-1.05	13.9	-0.91	18.3	-0.37	37.4	-0.85	15.7	-0.80	21.8	-0.24	50.0
TRINIDAD & TOBAGO	2000/01	0.61	69.1	0.27	57.5	0.62	73.4	0.86	83.8	0.41	66.0	0.49	72.3
	1997/98	0.95	77.3	0.32	61.4	0.52	72.9	0.72	79.3	0.51	69.6	0.51	74.6
TUNISIA	2000/01	-0.61	29.6	0.82	78.1	1.30	88.6	0.81	82.6	0.81	77.9	0.86	79.8
	1997/98	-0.59	31.3	0.66	75.1	0.63	78.8	0.43	66.0	0.65	72.7	0.02	62.3
TURKEY	2000/01	-0.55	31.9	-0.75	20.0	-0.15	48.7	0.04	46.1	-0.16	51.7	-0.48	38.9
	1997/98	-0.88	20.3	-0.94	16.9	-0.41	35.4	0.59	73.9	-0.01	55.1	-0.35	42.8
UGANDA	2000/01	-0.79	24.4	-1.31	8.7	-0.32	42.4	-0.20	35.9	-0.65	29.1	-0.92	16.3
	1997/98	-0.52	34.8	-0.98	15.0	-0.25	45.1	0.18	50.3	-0.01	54.5	-0.47	35.7
URUGUAY	2000/01	1.08	81.9	1.05	85.0	0.61	72.7	0.95	87.4	0.63	72.0	0.71	77.3
	1997/98	0.77	73.8	0.35	63.3	0.62	76.7	0.95	92.7	0.27	63.6	0.43	71.4
VENEZUELA	2000/01	-0.34	38.9	-0.33	38.1	-0.81	22.1	-0.30	31.7	-0.81	19.6	-0.59	33.3
	1997/98	0.15	61.0	-0.25	40.5	-0.85	14.8	0.09	44.8	-0.66	29.0	-0.72	25.3
ZAMBIA	2000/01	-0.17	45.9	-0.42	32.5	-0.75	26.5	0.49	68.8	-0.39	41.6	-0.87	19.4
	1997/98	-0.05	52.9	-0.00	49.0	-0.40	36.7	0.25	56.3	-0.40	38.7	-0.61	27.9
ZIMBABWE	2000/01	-0.9	19.7	-1.25	10.6	-1.03	14.5	-1.66	2.9	-0.94	14.2	-1.08	8.1
	1997/98	-0.67	29.6	-0.54	26.7	-1.13	9.0	-0.34	27.8	-0.15	49.0	-0.32	44.1

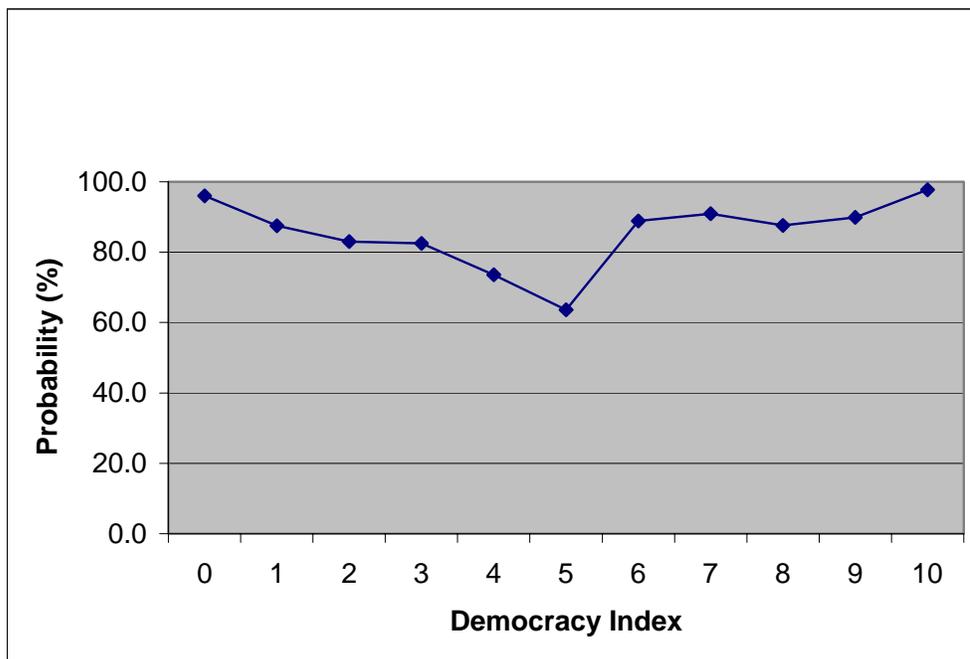
Note: Point Estimates: Higher values imply better governance ratings (2.5 to -2.5). Percentile rank: percentage of countries (worldwide) that rate below the selected country. Source: Kaufmann, *et al.* (2002).

**Table 4. Distribution of Major Exports**

<i>Resource type</i>	<i>Overall</i>		<i>Between</i>		<i>Within</i>
	Frequency	Percentage	Frequency	Percentage	Percentage
<b>Diffuse</b>	857	32.84	54	61.36	53.20
<b>Manufacturing</b>	308	11.80	34	38.64	30.99
<b>Point</b>	1445	55.36	68	77.27	71.50
<b>Total</b>	2610	100.00	156 (n=88)	177.27	56.33

*Source:* Own calculations based on UNCTAD (2002).

**Figure 2. The Probability of Remaining at a Given Level of Democracy**



**Table 5. Distribution of Democracy by Region**

<i>Democracy level</i>	<i>Africa</i>	<i>Asia</i>	<i>LAC</i>	<i>Total</i>
<b>0</b>	780 (68.12%)	210 (37.04%)	163 (26.08%)	1153 (49.34%)
<b>1</b>	81 (7.07%)	13 (2.29%)	36 (5.76%)	130 (5.56%)
<b>2</b>	15 (1.31%)	57 (10.05%)	25 (4.0%)	97 (4.15%)
<b>3</b>	52 (4.54%)	20 (3.53%)	14 (2.24%)	86 (3.68%)
<b>4</b>	8 (0.70%)	18 (3.17%)	13 (2.08%)	39 (1.67%)
<b>5</b>	14 (1.22%)	0 (0.0%)	1 (0.16%)	15 (0.64%)
<b>6</b>	28 (2.45%)	41 (7.23%)	50 (8.0%)	119 (5.09%)
<b>7</b>	46 (4.02%)	16 (2.82%)	48 (7.68%)	110 (4.71%)
<b>8</b>	49 (4.28%)	97 (17.11%)	110 (17.6%)	256 (10.95%)
<b>9</b>	28 (2.45%)	68 (11.99%)	101 (16.16%)	197 (8.43%)
<b>10</b>	44 (3.84%)	27 (4.76%)	64 (10.24%)	135 (5.78%)
<b>Total</b>	1145 (100%)	567 (100%)	625 (100%)	2337 (100%)

Source: Own calculations based on POLITY 98.

**Table 6. Joint Distribution of Democracy and Major Exports**

<i>Democracy Index</i>	<i>Diffuse</i>	<i>Manufacturing</i>	<i>Point</i>	<i>Total</i>
<b>0</b>	345 (47.46%)	59 (24.08%)	617 (51.16%)	1021 (46.88%)
<b>1</b>	57 (7.84%)	10 (4.08%)	59 (4.89%)	126 (5.79%)
<b>2</b>	13 (1.79%)	24 (9.80%)	58 (4.81%)	95 (4.36%)
<b>3</b>	30 (4.13%)	11 (4.49%)	44 (3.65%)	85 (3.90%)
<b>4</b>	14 (1.93%)	7 (2.86%)	17 (1.41%)	38 (1.74%)
<b>5</b>	4 (0.55%)	1 (0.41%)	10 (0.83%)	15 (0.69%)
<b>6</b>	60 (8.25%)	27 (11.02%)	27 (2.24%)	114 (5.23%)
<b>7</b>	37 (5.09%)	8 (3.27%)	59 (4.89%)	104 (4.78%)
<b>8</b>	75 (10.32%)	50 (20.41%)	123 (10.20%)	248 (11.39%)
<b>9</b>	53 (7.29%)	37 (15.10%)	107 (8.87%)	197 (9.04%)
<b>10</b>	39 (5.36%)	11 (4.49%)	85 (7.05%)	135 (6.20%)
<b>Total</b>	727 (100%)	245 (100%)	1206 (100%)	2178 (100%)

Source: Own calculations, based on POLITY 98 and UNCTAD (2002).

**Table 7. Major Exports by Region**

<i>Region</i>	<i>Diffuse</i>	<i>Manufacturing</i>	<i>Point</i>	<i>Total</i>
<b>Africa</b>	443 (36.61%)	22 (1.82%)	745 (61.57%)	1210 (100%)
<b>Asia &amp; Pacific</b>	242 (33.11%)	222 (30.37%)	267 (36.53%)	731 (100%)
<b>Latin America &amp; Caribbean</b>	172 (25.71%)	64 (9.57%)	433 (64.72%)	669 (100%)
<b>Total</b>	857 (32.84%)	308 (11.80%)	1445 (55.36%)	2610 (100%)

Source: Own calculations, based on UNCTAD (2002).

**Table 8. Summary of Mean Democracy by Region and Major Exports**

<i>Region</i>	<i>Diffuse</i>	<i>Manufacturing</i>	<i>Point</i>	<i>Total</i>
<b>Africa</b>	2.28	1.73	1.49	1.78
<b>Asia &amp; Pacific</b>	4.31	5.03	3.32	4.24
<b>Latin America &amp; Caribbean</b>	4.06	5.07	5.80	5.26
<b>Total</b>	3.21	4.84	3.15	3.36

Source: Own calculations, based on POLITY 98 and UNCTAD (2002).

**Table 9. Summary GDP Growth by Region and Major Exports**

<i>Region</i>	<i>Diffuse</i>	<i>Manufacturing</i>	<i>Point</i>	<i>Total</i>
<b>Africa</b>	3.59	4.06	3.11	3.30
<b>Asia &amp; Pacific</b>	4.83	5.97	4.63	5.09
<b>Latin America &amp; Caribbean</b>	3.83	2.83	2.89	3.12
<b>Total</b>	3.98	5.13	3.31	3.74

Source: Own calculations, based UNCTAD (2002) and World Bank (2002).

**Table 10a. Countries with a Mean Democracy Index =<5 for 1950-2000\***

<b>Africa</b>	<b>Mean democracy index 1950-2000</b>
Algeria	0.29
Angola	0.09
Benin	1.88
Burkina Faso	0.50
Cameroon	0.07
Central African Republic	1.35
Chad	0.10
Congo	0.00
Congo, Democratic Republic (former Zaire)	0.00
Côte d'Ivoire	0.17
Egypt	0.29
Ethiopia	0.78
Gabon	0.27
Ghana	1.89
Guinea	0.26
Guinea-Bissau	1.04
Kenya	0.52
Lesotho	1.43
Madagascar	2.43
Malawi	1.74
Mali	1.97
Mauritania	0.13
Morocco	0.73
Mozambique	0.86
Niger	1.10
Nigeria	1.37
Rwanda	0.10
Senegal	2.19
Sierra Leone	0.45
Sudan	0.86
Tanzania	0.55
Togo	0.08
Tunisia	0.23
Uganda	0.79
Zambia	1.55
Zimbabwe	3.23
<b>Latin America</b>	
Argentina	4.81
Brazil	4.71
Chile	3.71
Guyana	2.87
Haiti	1.04
Honduras	4.53
Mexico	1.94
Nicaragua	2.90
Panama	3.06
Paraguay	2.29
Peru	3.82
<b>Asia &amp; Pacific</b>	
Afghanistan	0.00
Bangladesh	2.55
China	0.00
Indonesia	0.52
Iran	0.29
Jordan	0.42
Nepal	3.16
Pakistan	4.00
Philippines	4.37
Saudi Arabia	0.00
Singapore	2.00
Taiwan	2.48
Thailand	4.45

**Table 10b. Countries with a Mean Democracy Index  $\geq 5$  for 1950-2000\***

<b>Africa</b>	<b>Mean democracy index 1950-2000</b>
Botswana	5.2
Gambia	6.3
Mauritius	9.6
South Africa	7.5
<b>Latin America</b>	
Bolivia	5.2
Colombia	7.81
Costa Rica	10
Dominican Republic	5.0
Ecuador	6.39
El Salvador	5.81
Jamaica	9.74
Trinidad & Tobago	8.61
Uruguay	5.08
Venezuela	8.68
<b>Asia &amp; Pacific</b>	
Fiji	7.5
India	8.16
Korea, Republic of (South)	5.79
Malaysia	7.61
Papua New Guinea	10
Sri Lanka	6.45
Turkey	7.13

\*Starting in 1950, if data are available.

Source: Polity 98D database, version June 1998, see Gurr and Jagers (1996).

**Table 11. Empirical Results: Dependent Variable – Democracy**

	<i>Random Effects</i>		<i>FGLS</i>	
	<i>Coefficient</i>	<i>z</i>	<i>Coefficient</i>	<i>z</i>
<b>Diffuse</b>	-1.4137***	-5.78	-0.6697**	-2.17
<b>Point</b>	-0.8832***	-3.20	-0.9296***	-3.11
<b>Africa</b>	-1.8124**	-2.17	-1.9017***	-7.90
<b>LAC</b>	1.5578*	1.70	1.3182***	5.27
<b>Inflation</b>	0.0004***	2.93	0.0002	1.32
<b>Real exchange rate (RER)</b>	-0.0000**	-2.55	-0.0000***	-3.70
<b>Terms of trade (TOT)</b>	0.161786***	2.67		
<b>Investment</b>	0.0091872	0.92	0.0119	1.07
<b>Initial GDP</b>	0.0000239	0.10	0.0001	1.43
<b>Constant</b>	4.677315***	5.80	4.6498***	12.02
<b>No. of Observations</b>	1737		1737	
<b>R<sup>2</sup></b>	14.13%		NA	
<b>Wald <math>\chi^2</math> (p-Value)</b>	0.000		0.000	
<b>Hausman test (p-value)</b>	0.0014			

Note: \*\*\*, \*\*, \* stand for significance at 1% ,5% and 10% level of significance, respectively. NA- not applicable.

**Table 12. Comparisons of Fixed and Random Effect Coefficients**

<i>Democracy</i>	<i>Coefficients</i>		
	Fixed effects	Random effects	Difference
<b>Diffuse</b>	-1.484541	-1.413673	-0.0708679
<b>Point</b>	-0.8480186	-0.8831924	0.0351738
<b>Inflation</b>	0.0003758	0.0003703	5.52e-06
<b>Standard deviation RER</b>	-4.18e-08	-4.46e-08	2.74e-09
<b>Standard deviation TOT</b>	0.0176898	0.0161786	0.0015111
<b>GDI</b>	0.0088251	0.0091872	-0.000362
<b>Initial GDP<sup>2</sup></b>	0.0002724	0.0000239	0.0002486

**Table 13 – Empirical Results: Dependent variable natural logarithm of per capita GDP**

	<i>Random Effects</i>		<i>FGLS</i>	
	Coefficients	z	Coefficients	z
<b>Democracy<sup>1</sup></b>	0.2412***	5.73	0.0429***	3.32
<b>Investment</b>	0.0914***	5.71	0.1102***	6.93
<b>Initial income</b>	0.0005***	11.17	0.0005***	10.47
<b>Africa</b>	-0.5155***	-2.90	-0.6585***	-3.57
<b>LAC</b>	-0.0807	-0.44	-0.1283	-0.67
<b>Inflation</b>	-0.0346***	-9.16	-0.0326***	-8.36
<b>RER</b>	-0.0036	-0.79	-0.0051	-1.08
<b>TOT</b>	0.0914***	-5.04	-0.0076*	-1.73
<b>Constant</b>	5.9697***	-82	6.149***	34.13
<b>No. of Observations</b>	1304		1306	
<b>Overall R<sup>2</sup></b>	72.8%		71.8%	
<b>Wald <math>\chi^2</math> (p-value)</b>	0.000		0.000	
<b>Hausman test(p-value)</b>	1.00		1.00	

Note, 1 = predicted value of democracy  
 \*\*\* significant at 1% level of significance  
 \*\* significant at 5%  
 \* significant at 10%

**Table 14: Cross-Sectional Estimates of Democracy and GDP Growth**

<b>Dependent variable Democracy</b>	<b>Coefficient</b>	<b>t</b>	<b>Dependent variable growth</b>	<b>Coefficient</b>	<b>t</b>
<b>Diffuse</b>	-1.917	-1.27	<b>Democracy<sup>1</sup></b>	1.720**	2.31
<b>Point</b>	-2.587*	-1.75	<b>Africa</b>	-0.149	-0.16
<b>Africa</b>	-2.322*	-1.82	<b>LAC</b>	-2.398***	-3.17
<b>LAC</b>	3.025*	2.15	<b>Ethnolinguistic fractionalisation</b>	-0.013	-1.51
<b>Ethnolinguistic fractionalisation</b>	0.006	0.36	<b>Secondary enrolment in 1960</b>	0.022	0.72
<b>Secondary enrolment in 1960</b>	0.068	1.24	<b>British colony</b>	-0.121	-0.26
<b>British colony</b>	0.691	0.71	<b>Inflation</b>	-0.638**	-2.53
<b>Inflation</b>	-0.002	-0.00	<b>Exchange rate</b>	-0.175	-1.57
<b>Exchange rate</b>	0.186	1.14	<b>TOT</b>	0.427	0.86
<b>TOT</b>	-0.571	-0.71	<b>Investment</b>	2.109**	2.38
<b>Investment</b>	0.460	0.29	<b>Initial income</b>	0.099	0.33
<b>Initial-income</b>	-0.176	-0.31	<b>Trade-openness</b>	1.428*	1.83
<b>Constant</b>	6.219	1.09	<b>constant</b>	-6.90**	-2.06
No.of observations	50		50		
R <sup>2</sup>	54.4		74.8		
F-statistic(p-value)	0.001		0.000		

Note: 1 = predicted value of democracy

\*, \*\*, \*\*\*, indicate significance at the 10, 5 and 1 per cent levels, respectively.