Polity qualities: how governance affects poverty

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POLITY QUALITIES: HOW GOVERNANCE AFFECTS POVERTY

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SUMMARY

For a large sample of 61 developing countries, over the period 1980-95, we calculate a measure of the efficiency with which national political-economic systems convert a given volume of material resources (GNP per capita) into human development (longevity, education and literacy) for their citizens. This we label this RICE (relative income conversion efficiency). Four main variables explain variations in RICE. The first, population density, that works largely in technical fashion. It is easier and cheaper to provide health and education services to densely-clustered populations. The second variable is geographical: all else being equal, location in West Africa lowers the rate at which material resources are converted into human development. This probably reflects West Africa's highly disease-prone natural environment. The third and fourth variables relate to governance. They however correlate with RICE in strikingly contrasting ways. A composite measure of the quality of government institutions, produced for international investors and lenders, turns out to be significantly but negatively correlated with RICE. In other words, countries with governance institutions that are attractive to international investors tend to perform badly at converting material resources into human development. By contrast, a variable relating to state-society relations - the extent to which governing elites are financially independent on their own citizens - is significantly and negatively correlated with RICE. Governments that are dependent on their own citizens for critical resources appear more effective at converting material resources into human development. Democracy appears neither to strengthen this particular accountability mechanism nor to play an independent role in raising RICE scores: we could find no statistical connection between RICE and the degree of democracy.

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A INTRODUCTION: WHAT IS A 'PRO-POOR' POLITY?

Our research task was to assess how far one could draw conclusions about the extent to which different types of (national) political systems were 'pro-poor' by using cross-national quantitative data. We began with a literature survey. That proved disappointing, for it quickly became clear that published research is very difficult to interpret. A methodological quagmire awaits those who measure poverty in terms of income levels and then try to use cross-national quantitative research to assess the influence of political variables on the incidence of poverty. For one cannot in practice separate out two sets of causal relations that both have a political dimension: (a) those that affect poverty by influencing aggregate economic performance and (b) those that affect poverty by (also) shaping the pattern and consequences of economic growth. That general point can be sharpened, and the current research put into context, by listing four different types of causal chains through which national political variables might affect the incidence or rate of reduction of poverty:

- **Political variables → aggregate economic growth**: Political variables - such as the stability of government - may directly influence the rate of economic growth. The main practical problem lies in interpreting the statistical analysis that underlies claims about these kinds of processes. By one estimate, recent statistical and econometric analysis has unearthed 97 different variables that appear to 'explain' variations in national economic performance. Many of these explanatory variables are inter-correlated. Few of the statistical findings are robust in the face of variations in data sets and in the specification of equations. It is not difficult to generate statistically-significant correlations between political variables and aggregate economic growth performance. It is extremely difficult to assess whether these results really imply a causal relationship (from politics to economic growth). We were unwilling and ill-equipped to enter this very crowded and contested territory.
- **Political variables → the pattern of economic growth**: Political variables might also affect the extent to which the benefits of economic growth accrue to the poor, by affecting market relations, and thus income distribution. For example, a strong trades union movement with close ties to government might help ensure that a high proportion of additional national income accrues to (organised) labour, and therefore (perhaps) to the poor. However, the problems of testing for this kind of outcome through cross-national quantitative analysis are similar to those set out above. In particular, there is the problem of taking account of all the other (economic) variables, such as changes in production technologies and in patterns of demand for different products and for labour, that might also affect the share of additional national income accruing to labour.

- **Political variables → pro-poor distribution policies**: Political variables might directly affect poverty through their effect on non-market redistribution. For example, well-institutionalised small farmer organisations might contribute to 'pro-poor growth' by reducing 'urban bias' in public policy. All governments redistribute national income through their fiscal operations. To assess their performance on a comparative basis, one needs detailed data on how they raise and spend money. These data are rarely available for the poorest countries. A great deal of work would be needed to (a) find reliable data on government income and expenditure patterns for a large cross-section of poor countries and (b) try to explain the political determinants of variations.
- **Political variables → the conversion of national income into human development**: This is the approach we have chosen to follow here. How efficient are national political-economic systems, relative to one another, in converting a given volume of national material resources (GNP per capita) into human development (longevity, education and literacy) for their citizens?

B THE DEPENDENT VARIABLE: RELATIVE EFFICIENCY IN CONVERTING NATIONAL MATERIAL RESOURCES INTO HUMAN DEVELOPMENT

Conceptually, our dependent variable is defined as 'the relative efficiency of national political-economic systems in converting national material resources into human development'. For simplicity, we will label as RICE (relative income conversion efficiency) both this underlying concept and our operational measure of it. The procedure followed to arrive at our operational measure is quite straightforward. For some years UNDP have been calculating what is known as the Human Development Index (HDI). HDI is a composite measure, with three equally-weighted components:[1]

- Life expectancy.
- Educational attainment, that is in turn composed of two sub-components: (a) adult literacy rates (given a two-thirds weighting) and combined primary, secondary and tertiary school enrolments (with a one third weighting).
- GDP per capita.

Taking the latest available HDI figures (1995), we re-calculated a modified HDI by omitting the GDP component. Following UNDP practice, we call this HDI*. HDI* therefore comprises two

[1] For precise details on the calculation procedures, see the annual UNDP Human Development Reports.

equally weighted components: life expectancy and educational attainment. We then regressed HDI* on the natural logarithm of GNP per capita (purchasing power parity, 1995) to generate an operational measure of RICE.[2] RICE is the residual of the regression of HDI* on logarithm of income per capita. It is defined and measured for each country in the sample as the (ordinary least squares) difference between (a) actual HDI* for 1995 and (b) the HDI* level that was predicted for that country in the regression equation on the basis of 1995 per capita GNP (purchasing power parity). Put more simply, RICE is the difference between (a) the actual level of the human development indicator and (b) the level that one would predict for a country on the basis of its income per head. RICE is either positive (i.e. the country performs better than predicted in terms of human development indicators), or negative. The RICE figures for our sample of countries are given in the second column of Table 1 in Annex Three.

This procedure for defining the dependent variable is unlikely to be very contentious. We know that levels of national income are powerful determinants of levels of human development (education, literacy, health and longevity). The deviations of actual from projected human development are *prima facie* good measures of the concept we are reaching for. The ranking of countries by RICE contains no surprises. We used these HDI data to estimate RICE in part because they happen to be available, and because they have received sufficient attention and scrutiny that their reliability is to some degree assured. Accepting the general approach followed here, one can raise three main questions about whether RICE is the best way of measuring our underlying concept, i.e. 'the relative efficiency of national political-economic systems in converting national material resources into human development'. We do not find any of these questions very worrying. They are treated in Annex One. There is a further, technical question about the statistical procedure we have followed in defining our dependent variable. That is treated in Annex Two: the potential technical problem does not in practice materialise.

Note that RICE, like the HDI* data set from which it derives, measures two distinctly different variables: longevity and literacy/education. Our results illustrate the point that is known from earlier studies[3] and indeed provides the whole rationale for producing the Human Development Index: that these two variables are not always closely correlated. We have attempted to explain separately the longevity and the literacy/education components of RICE - i.e. RICE-LONG and RICE-ED

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2 We also defined RICE using two alternative measures of 1995 per capita income: GNP; and GDP at purchasing power parity. The correlation coefficients between the three measures of RICE all exceeded 0.85. Hence, as is to be expected, sensitivity tests on the coefficients of specifications using as the dependent variable the alternative measures of RICE did not greatly affect the results in terms of size, sign and significance of coefficients. They did not affect our main findings at all.

3 For similar findings, see A. Sen, 1981, 'Public Action and the Quality of Life in Developing Countries', Oxford Bulletin of Economics and Statistics, 43 (4); and P. Dasgupta, 1990, 'Well-Being and the Extent of Its Realisation in Poor Countries', Economic Journal, 100 (Conference), 1-32.

respectively - only because this has helped to throw light on a minor puzzle that we have labelled the 'Africa-related' issue (see Section D).

In sum, while we are hungry for better measures of our dependent variable, we are not desperate. The situation in relation to the explanatory variables is less rosy.

C THE EXPLANATORY VARIABLES

In attempting to explain why some national political-economic systems are more efficient than others at converting material resources into human development, we had to compromise. We had an explicit theory and hypotheses, but could not always test them adequately because of the lack of adequate data series. To some degree, we had to use whatever data series (a) are available (b) appear reliable and (c) have some potential to throw light on plausible explanatory hypotheses. We decided to work with as large a sample of developing countries as possible. We ended up with 61. We did not use some other data series that would have necessitated a substantial reduction in sample size. Our universe was all countries defined by the World Bank as low or middle income. We excluded countries from the analysis only if data on them were not available.

In general, our explanatory variables are less satisfactory than our dependent variable (RICE) in the sense that they often are indirect proxies for the things we would like to measure. Given these limitations, it was something of a surprise that several turned out to be statistically significant, and that they jointly explain up to 55% of the observed inter-country variance in RICE.

Our models all incorporate a time lag. The dependent variable, RICE, relates to 1995. The explanatory variables are in most cases measured as an average for the 1980s (1980-89). We did not test alternative time lags; data constraints would make this difficult (see Annex One). There was a particular reason for measuring our independent variables over the 1980s. Income from mineral exports was hypothesised to be an important explanatory factor, and indeed proved to be. But world mineral prices are not very stable. The decade of the 1980s was a period of relative stability.

Most of the explanatory variables that we have used in our preferred regression model derive from the underlying hypotheses we were testing, or from inspection of early regression results. However, we used a clustering process to select from a wide range of potential explanatory variables that are political in the narrow sense of the term. First we identified fourteen potentially interesting political variables from two main cross-national political data sets: nine from Polity III[4] and five

[4] Autocracy (AUTOC), Democracy (DEMOC), Executive Recruitment Regulation (XRREG), Executive Recruitment Competition (XRCOMP), Executive Recruitment Openness (XROPEN), Executive Constraints (XCONST), Regulation of Participation (PARREG), Competitiveness of Participation (PARCOMP), Centralisation of State Authority (CENT).

from ICRG[5] (International Country Risk Guide). Fourteen is still large number. Because some of them are likely to be highly inter-correlated, it would not be sensible to enter them all into a regression equation: the resulting multi-collinearity would reduce the measured statistical significance of the resulting coefficients. Hence we tested for association between these fourteen political variables, aiming to group them into clusters and choose one variable from each cluster.[6]

There was a high degree of association between many of the political variables. There are 91 possible combinations of the 14 variables. About half the pairings (44 out of the 91) were significantly associated at the 5% level, and about a third at the 1% level. We grouped together those variables that were significant associated at the 5% level. This left eight out of the nine Polity III variables in one cluster, with Centralisation of State Authority (CENT) standing alone; and all five ICRG variables in a second cluster. In principle, one variable was to be chosen from each cluster in order to get circumvent the problem of strong correlations among the separate indicators and the consequent risk of multicollinearity. From the cluster of Polity III variables Democracy (DEMOC) was selected as an explanatory variable for our regression model, as was centralisation (CENT). For reasons explained below, we used a composite measure of all five of the ICRG variables (measuring the Quality of Government Institutions).

In more detail, the variables actually used in regression analysis are:

1. Population density

It seemed plausible that population density would contribute to RICE, through two separate mechanisms. On the supply side, a more dense population makes it both cheaper and easier for public authorities to provide (effective) education and health services. These benefits are realised both as service uptake is greater as access is easier for a larger share of the population the greater is population density, but also that the provision and supervision of services is less costly. There is at least some evidence, notably from the cases of exceptionally high human development in relation to income (e.g. Kerala state in India, Sri Lanka), of a complementary demand side relationship: dense population facilitates political mobilisation, and thus increases the political pressure for effective, widespread service provision. The population density variable POPDENSE is measured as the average number of people per square kilometre over the

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5 Risk of Repudiation of Contracts by Government, Risk of Expropriation, Corruption, Rule of Law, and Bureaucratic Quality.

6 We used a chi-square test for association, rather than correlation analysis, for two reasons. First, the correlation coefficient is a measure of the extent of a linear relationship between the two variables. It will pick up non-linear relationships only imperfectly. Second, the scores used in measuring some of the variables are categorical, i.e. the increment between 1 and 2 need not be the same as that between 2 and 3. They are therefore inappropriate for the correlation model.

1980s.[7] Visual inspection of the data indicated that Bangladesh is an anomaly: its population density is three times the level of the next country on the scale (see Figure 3 in Annex Five). This outlying observation was going to distort the regression results. We therefore omitted Bangladesh from the sample.

2. Democracy

The measurement of democracy is a complex business with an indifferent record for product quality. We do not have a single, comprehensive international data series that is generally accepted to be reliable and to be measuring the right things. One main axis of dispute has deep theoretical and ideological roots. Should democracy be conceived and measured basically in electoral terms, i.e. according to the extent to which (national) governments are chosen through free elections held under universal adult suffrage? Or should one also to take into account 'deeper' indicators of the existence of (egalitarian) popular control of governments - for example, the existence of constraints on peaceful political activity; the influence of unelected civil and military bureaucracies; the extent of electoral and other kinds of political participation; the degree to which members of different population categories have effective access to elected office? Another main axis of dispute is related but often takes on a more pragmatic cast. Is democracy best scored in binary terms (i.e. a country is either a democracy or it is not), or do we have the data, the judgement, and the conceptual basis to produce reliable continuous measures, i.e. scoring countries on a scale of 0-10, or similar? There are a variety of international data bases founded on different procedures. Most of them correlate fairly closely at the aggregate level, but sometimes provide very contrasting scores for particular countries in any given year.[8]

We tried to deal with this problem by using two different data bases based on contrary principles. The democracy indicator used in our reported results (DEMOC) is from the Polity III data base. It is a relatively complex composite variable directly measuring three indicators of democracy: competitiveness of political participation; the openness of executive recruitment; and the constraints on the chief executive. The scale is 0-10, and our score is an average for each year in the 1980s. This variable proved statistically insignificant. Yet it seems plausible that the degree of democracy should influence RICE in a positive way. Perhaps the data series we had chosen had simply measured democracy inadequately? We therefore used an alternative,

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7 We took an average for the years 1980, 1985 and 1989. Note that average population density is not the perfect measure of our underlying concept: that figure would be the same for a country with population equally dispersed and another, identical in area and total population, where 90% of the population lived in 10% of the area. Yet the latter would yield more economies in service provision.

8 For some discussion of these issues, see, for example, M. Alvarez et. al., 1996, 'Classifying Political Regimes', Studies in Comparative International Development, 31(2). For evidence on the inconsistency of different data series, see Dean E. McHenry, 'Quantitative Measures of Democracy in Africa', Democratization, forthcoming.

binary measure of democracy, from a data series that goes back to 1950 for many countries (Alvarez et. al., 1996). We also took advantage of this historical depth to test the proposition that the influence of democracy on RICE is observable only over a longer time scale than the one we have otherwise used in this analysis. We formulated this alternative measure of the DEMOC variable in two different ways: as the number of years that countries had been scored as democracies (a) over the ten year period 1980-89 and (b) over the 26 year period 1965-90.

Use of these alternative measures of democracy did not change the earlier conclusion that democracy does not contribute to explaining RICE. We are not satisfied with any of the available data series providing democracy scores. We cannot at this point entirely reject the possibility that democracy might exercise some positive influence on RICE scores. Note however, that we are not satisfied with the way that we have been able to measure most of the explanatory variables. The fact that some of them turned out nevertheless to be statistically (very) significant is an indication that democracy is certainly not a strong determinant of RICE.

3. State-Society Relations

The main hypothesis that we set out to test initially was the relatively abstract proposition that RICE would be significantly influenced by a broad set of variables encompassed under the concept of 'the extent to which the state is dependent on the mass of its citizens for key resources'. This hypothesis stems from on-going work by Moore on the determinants of variations in the quality of governance in poor countries. That work has been oriented mainly around the fiscal dimension of state-society relations. The core proposition is that the quality of governance (defined in terms of both the efficiency/effectiveness of the state apparatus and the degree of responsiveness of the state to the needs of the mass of citizens) is to a significant extent shaped by the extent to which the state is fiscally dependent on 'earned income'. For these purposes, there are two dimensions of 'earned income': (a) the organisational effort that is put into raising resources from the mass of the population; and (b) the degree to which the state provides reciprocal services to its citizens in return for tax revenues.[9] Crudely, the core empirical proposition is that bad government is significantly the result of high levels of state fiscal dependence on minerals and/or aid.

There are various ways in principle of testing the fiscal dimensions of the broader argument about the malign effects of state independence of citizens for key resources. All the more direct and obvious specifications require data that simply are not available for many countries: reliable

[9] An early version of these ideas, focusing mainly on aid as a type of unearned income, is Mick Moore, 1998, 'Death without Taxes: Democracy, State Capacity, and Aid Dependence in the Fourth World', in M. Robinson and G. White (eds.), The Democratic Development State: Politics and Institutional Design, Oxford University Press.

figures on sources of government income and/or patterns of expenditure. The poorer the countries, the worse the data coverage.[10] And high fiscal dependence of governments on minerals or aid itself seems to be associated with poor public accounting. One cannot in practice use fiscal data series to test propositions about the quality of governance, because most cases of poor governance drop out of the sample for lack of data. We began by testing the fiscal dependence argument, but using relatively indirect indicators of the degree of fiscal dependence of governments on (a) minerals and (b) aid. There is no way of obtaining a cross-national data series on the contribution of minerals to government income. (One can do the exercise for some individual countries through Herculean efforts). We have used the best proxy: the percentage contribution of the Mining and Quarrying sector to GDP, averaged over the 1980s (UN National Accounts Statistics 1990).[11] The variable is a called MINERAL. We measured aid dependence (AID) in terms of the ratio of aid to GNP, averaged over the period 1980-9 (World Bank World Development Indicators 1998). It would have been preferable to measure the ratio of aid to government income or expenditure, rather than to GDP; that is implied by our underlying hypotheses. The lack of adequate data on government income and expenditure for poorer countries closed off that avenue.

4 The Quality of Government Institutions

The International Country Risk Guide (ICRG) provides a set of measures of the quality of public institutions that have been used extensively for quantitative research. All are based on 'expert judgement.' They are produced for international investors and lenders. Two of their component measures - Government Corruption (scaled 0-6) and Bureaucratic Quality (0-6) - purport to measure the quality of government performance in general. Three others relate more directly to contract enforcement, and thus the concerns of international investors: Risk of Expropriation (0-10); Rule of Law (0-6, measuring the extent to which there are established peaceful mechanisms for adjudicating disputes); and Risk of Repudiation of contracts by government (0-10). The five components are highly inter-correlated. When they (average for each year, 1980-89) were used as separate variables in early regressions, they were not generally statistically significant. We then followed Knack and Keefer[12] and combined them into one

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10 This is simply demonstrated by looking at the proportion of countries in different income groups for which the World Bank feels it can confidently cite recent figures on a statistic as basic as total central government revenue: 92% of high income countries; 72% of middle income countries; and 33% of low income countries (World Development Report 1997, Table 14 - relating to 1995).

11 To reduce the labour input, we took the average of 3 years - 1980, 1985 and 1989.

12 S. Knack and P. Keefer, 1995, 'Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures', Economics and Politics, 7(3).

composite measure (on a scale of 0 – 10) by simple aggregation.[13] We call this QUALPOL - the general quality of government institutions. The higher the score the better the quality.

5. Centralisation of Government Decision Making

As explained above, this variable was used in part because it was not correlated with others in the Polity III database. It formed a separate 'cluster'. While it was positively related to RICE and appeared significant in early regressions (i.e. more centralisation, higher RICE), its effects evaporated when other variables were added. Note that it appears to be a poor measure of actual centralisation: the scores are determined by formal administrative arrangements, with no allowance for differences in country size.

6. The 'Africa-related' Dummy

Visual inspection of the data in Table 1 and examination of early regression results suggested that there was something we were not picking up in our theory and regression model. It manifested itself most clearly in the fact that a high proportion of countries with the lowest RICE scores were in Francophone Africa. We used four different 'Africa-related' dummy variables to try to capture this effect. The countries that are covered by each alternative formulation are shown in Table 2 in Annex Three:

- Africa - simply being in AFRICA
- Francophone Africa - FRAFRICA
- Dependent: In accordance with the ideas about state-society relations sketched out above, we hypothesised that international political and military dependence might be a significant factor here. To the extent that governments can rely on political and military support from a former colonial power, they have less incentive to treat citizens well or to cultivate internal political support. This would likely lead to low RICE scores. Nine countries, all African, were classified as being dependent in this sense (DEPEND).[14]
- West Africa - WAFRICA

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13 Knack and Keefer (p. 212) simply aggregated the five individual scores, finding that it made no difference to their results to use this procedure or to re-scale three of the measures onto a 0-10 scale and them combine them into a composite 0-10 scale. We followed the latter procedure.

14 The classification was made by consulting three experts on contemporary Africa, without telling them the purposes behind it. The countries classified as dependent are Burkina Faso, Cameroon, Côte D'Ivoire, Gabon, Madagascar, Mali, Niger, Congo Brazzaville and Senegal. All are former French colonies. The following former French African colonies in the sample were not classified as dependent: Guinea, because the country broke away (and was expelled from) from the Francophone club under the leadership of Sekou Toure and has never returned; and Morocco and Tunisia because, while in some respects close the French government, they have also maintained close relations with other Western governments, notably the US, and have generally kept domestic politics relatively separate from relationships with Paris.

D MAIN RESULTS

For a sample size of 61, regression equations of the following form were specified and estimated using Ordinary Least Squares (OLS):

$$Y = \alpha + \beta_i X_i + \varepsilon$$

Where $i = (1\ldots.9)$

The following is a complete listing of the variables that were at various points used in regression analysis:

- Y = Three different formulations of the dependent variable: RICE, RICE-LONG (relating only to the longevity component of HDI*), and RICE-ED (relating only to the literacy/education component of HDI*).
- X_1 = AID (aid as % of GNP)
- X_2 = MINERAL (mineral exports as % of GNP)
- X_3 = QUALPOL (index of general quality of government institutions)
- X_4 = POPDENSE (population density)
- X_5 = Four different formulations of the 'Africa-related' dummy variable: AFRICA, FRAFRICA, DEPEND and WAFRICA
- X_6 = DEMOC (democracy, measured in three different ways)
- X_7 = CENT (centralisation of government)
- X_8 = DLAC (dummy for Latin America and Caribbean)
- X_9 = DASIA (dummy for Asia)

Explanatory variables X_6 to X_9 were dropped when early regression equations and examination of partial residual plots indicated that they were statistically insignificant. This gave us our 'preferred model', that was re-estimated, with five explanatory variables and four different definitions of X_5, the 'Africa/location' dummy, and three different definitions of the dependent variable. Partial residual plots suggested that, in the case of the AID and MINERAL variables, there were clusters of influential points ('outliers') which could be exerting substantial influence on the results (Figures 1 and 2 in Annex 5). The model was estimated with and without these clusters of influential points.

The results of 25 multiple regression equations are summarised in Tables 3 to 6 of Annex Four. Note that we are interested in the equations in which RICE-LONG and RICE-ED are used as dependent variables only to the extent that they help us interpret the significance of the 'Africa-related' dummy variable. We do not otherwise comment on them. The main results are as follows:

1. The coefficients on MINERAL and POPDENSE, especially the former, were consistently negative and significant, at least at the 5% level.
2. The AID variable was negatively related to RICE and significant in some cases. However, it is evident from the scatter plot of the residuals from the regression (Figure 2 in Annex Five) that two particular observations are significantly driving this result. These are the observations relating to the Gambia and Guinea-Bissau, two very small countries with the highest aid levels in the sample - 37% and 46% of GNP respectively. These two 'AID influential points' were removed from the data set and the model re-estimated (n=59). AID is now no longer a significant explanatory variable, even at the 10% level. We have presented most of our further sets of results both including and then excluding these two influential points. We can conclude that very high levels of aid dependence are associated with low RICE scores, but that this relationship does not hold over the range of aid dependence: low aid dependence does not imply high RICE scores.[15] Overall, these results imply that there may be some validity in the hypothesis that (high) aid dependence leads to low RICE scores via the causal processes sketched out in Section C.
3. There are five MINERAL influential points – Botswana, Gabon, Saudi Arabia, Oman, Angola – that appear to drive the conclusion that MINERAL is a significant determinant of RICE (Figure 2 of Annex Five). When they are removed from the data set (regression 2), leaving a sample size of 56, MINERAL is no longer significant. However, we do not believe they should be removed. They are an important part of the story about the effect of high mineral dependence. The coefficient on the MINERAL variable comes through as being significantly negative in regressions 1 and 2 due to the very low RICE performance of this group of highly mineral dependent economies. Comparison of Figures 1 and 2 in Annex Five illustrates that they are not anomalous influential points in the same way that the Gambia and Guinea-Bissau AID observations are. There are enough mineral 'outliers' to demonstrate that it is not merely a case of a couple of exceptions driving the results. There is good evidence here that mineral dependence leads to low RICE scores.
4. One of our variables, QUALPOL, generated a surprise. We found that it is consistently, significantly but negatively correlated with RICE: the higher that government institutions are scored from the perspective of international investors and lenders, the worse the governments perform in converting national income into human development. It was no great surprise that QUALPOL was not positively related with RICE: the priorities of international investors, and the way that states respond to them, are different from those of poor people, and generally

[15] We are dealing here with a small window into a complex pattern of relationships. It is possible, for example, that some aid donors are active agents, and (try to) ensure that aid is used to promote human development.

involve different processes and different parts of the state apparatus. That there should be a significant negative relationship between the two was however unexpected. Are we correct in asserting that the ICRG scores of QUALPOL, reflecting as they do the concerns of international investors, are significantly different from the scores of governance quality that might result from a different or broader perspective on the functions of government? There is strong supporting evidence. The most reputable general measure of the general quality of government institutions for (a sample of) poor and middle income countries are those produced for 35 countries in the mid-1990s by Evans and Rausch.[16] Their most general score of the quality of public bureaucracy is their Weberian State Scale. We compared this with the equivalent ICRG measure of the general quality of government institutions - Bureaucratic Quality, one of the five components of QUALPOL. (Recall that all five components of QUALPOL are highly correlated with one another). We re-scaled Evans and Rausch's Weberian State Scale and ICRG measure of Bureaucratic Quality (for 1995) and then used a chi-squared test to examine how similarly the two sources had ranked these 35 countries in terms of overall quality of government institutions. The association between the two measures - purportedly measures of very similar concepts for the same countries at the same point in time - was statistically insignificant (16%). This is strong evidence that the 'governance' factors that matter to international investors and lenders are significantly different from those that relate to poverty reduction. This reminds us that 'good governance' is itself a political and contested concept.

5. All four alternative definitions of the 'Africa-related' dummy variable were negatively related to RICE and statistically significant, but at very different levels. The Africa location (AFRICA) and dependency (DEPEND) definitions were significant at around 6% to 7%. The Francophone (FRAFRICA) definition was more significant. But the West Africa definition (WAFRICA) was significant to a very high degree (more than 0.1%). In other words, a West African location itself results in a reduction in the efficiency with which material resources are converted into human welfare. All else being equal, one needs a higher level of national income in West Africa than elsewhere to achieve a given level of human development. There is a very plausible explanation for this result. The West African environment, to a greater extent than most areas of the world, is characterised by endemic tropical diseases.[17] However, these disease and health-mediated

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16 P. Evans and J. Rausch, 'Bureaucracy and Growth: A Cross-National Analysis of the Effects of 'Weberian' State Structures on Economic Growth', Berkeley, 1997.

17 For a useful discussion of location and disease incidence, see J. L. Gallup, J. D. Sachs and A. D. Mellinger 'Geography and Economic Development' in B. Pleskovic and J. Stiglitz (eds.) World Bank Conference on Development Economics 1998, Washington D. C., 1999. They provide maps of disease incidence only for malaria. Other parts of the tropics face similar problems of intensive disease concentration. The reason this does not come through in our analysis is probably that we have a large number of observation points (countries) located West Africa. The tropical areas of Asia and Latin America cover fewer countries. And some of these countries (e.g. Brazil) have large populations living in non-tropical areas.

processes do not appear to comprise the full story. When we attempted to explain separately the longevity (RICE-LONG) and the literacy/education components (RICE-ED) of RICE, the West Africa dummy (WAFRICA) is very significant in both cases. West African location appears to reduce the efficiency with which material resources are converted into both longevity and literacy/education.

E CONCLUSIONS AND IMPLICATIONS

1. The results reported in Regressions 20 and 21 (Table 6, Annex Four) are our best estimate of the determinants of RICE. National political-economic systems convert material resources into human development most effectively when:
   a) Government is not highly dependent on mineral resources for revenue (result significant at 0.1% level).
   b) Government institutions are poorly rated from the perspective of international investors and lenders (result significant at 2% level).
   c) The population is dense (result significant at 2% level).
   d) The country is not located in West Africa (result significant at more than 0.01% level).
2. These results are at least consistent with - and to some degree support - the general proposition that states that are dependent on the mass of their citizens for critical resources are more likely treat citizens relatively well and to govern well.
3. Previous research has drawn our attention to the particular cases and categories of successful human development strategies in poor countries, including (a) variants of mobilising socialism (China, Cuba, Tanzania) (b) labour intensive growth leading to fast rising real wages (Taiwan and South Korea) and (c) the exceptional 'welfare' cases with deep historical roots (Sri Lanka, Kerala state in India, Costa Rica) (e.g. Sen, 1981). We have focused here on the more typical situation and sought common patterns valid across the globe. We have asked a different type of question, and thus reached a different type of conclusion: that changes in state-society relations, involving more fiscal dependence of states on their own citizens, rather than on external or easily-monopolised resources, might make a significant contribution to poverty alleviation in many poor countries.
4. Our results should not be read to imply that 'better governance', in the specific sense in which it is defined here, is, in addition to economic growth, the best or only way of improving human development performance or alleviating poverty in any specific situation. Neither should they be read as indicating a priority for 'better governance' over asset or income redistribution or a range of other approaches. We have at best explained 55% of the variance in human

development performance in relation to income. That leaves 45% unexplained, and plenty of scope for a range of other explanations and interventions. Our results simply indicate that, for many countries, a greater dependence of states on their own citizens is likely to promote human development and reduce poverty. Had we been able to incorporate into our analysis measures of access to justice, quality of policing and degrees of citizen security, it is likely that the connection between governance and well-being would be greater even than we have shown it to be here.

ANNEX ONE: HAVE WE MEASURED RICE APPROPRIATELY?

There are three main questions about whether RICE is the best way of measuring our underlying concept (the relative efficiency of national political-economic systems at converting material resources into human development):

- Human development is a broad concept. Here we are measuring it only in terms of longevity and literacy/education outcomes. The main reason that the UNDP measures it this way is that there are no reliable, widely-available data series on any of the other variables that one might like to incorporate, including for example variables relating to patterns of social and gender relations. This is not such a problem for our purposes because what we are trying to explain is the relative performance of public institutions in service delivery. We are primarily interested in education and health services. Indeed, a measure of human development that incorporated variables less clearly and directly influenced by government action would not be appropriate for our purposes.[18]
- The weightings attached to the components of HDI* - a half for longevity, a third for adult literacy, and a sixth for a composite of primary, secondary and tertiary school enrolments - are essentially arbitrary. How do we know that is a good measure of their relative importance? The best response is purely pragmatic: we could test alternative weightings in the search for 'better' regression results, but any such 'trawl' is suspect on methodological grounds. It is more honest to stick with the standard measures.
- We have measured our dependent variable as the difference between actual and 'predicted' human development performance over a single point of time (1995). The explanatory variables are single period measures: average levels over a period of consecutive years (mostly 1980-1989). In principle, might it not be better also to specify and measure the causal hypotheses in terms of change-change in both the dependent and the explanatory variables rather than simply as periods or points? We would then, generically, be hypothesising not only that the level of dependent variable in time period Tb was a function of the level of the explanatory variables in time Ta, but that changes in the dependent variables over the period Tb-Td were the results of changes in the explanatory variables over the period Ta-Tc. This procedure would permit and force us to be more precise about the time dimensions of the relationships we are exploring, and to test alternative specifications. This change-change specification cannot be pursued because of the absence of sufficient historical depth in our data series, especially the components of HDI*.

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[18] However, we would in principle wish our index of publicly-provided human development services to include a measure of the quality of law, policing and judicial services.

There are two reasons why we do not much regret this. The first is purely pragmatic: published data series on literacy and longevity in many developing countries are based to a significant extent on interpolation, i.e. on estimates, assuming steady growth, made on the basis of occasional point measurement. Data series that appear to have historical depth may be misleading and, because they, like so many population-related numbers have been increasing steadily for decades, may generate apparent correlations over time that are a product of the estimation procedures themselves. The second reason is more substantive. We know that, over the short and medium terms, levels of education and health in most developing countries are often insensitive to changes in income levels. Mortality, for example, continues to decline even when national incomes fall.[19] This is because there is an institutional dynamic to improved health and education performance that is not easily deflected in the short term. To some degree, nurses continue to inject and schools to educate even when the economy is in crisis; and their performance does not accelerate drastically when the economy booms. In sum, when we are examining the relationship between human development performance and average GNP per capita, we are dealing with a long term relationship. The benefits, in terms of statistically-valid explanation, to slightly deeper historical data are unlikely to be very large in the present case.

[19] This was not the case in parts of the former Soviet Union over the 1990s. For the general point, see UNDP, Human Development Report 1999, p.3.

ANNEX TWO: AN ALTERNATIVE REGRESSION MODEL

The purpose of our analysis is to explain variations in RICE. RICE is however derived, through regression analysis and estimation of residuals, from the variable HDI*. From a statistical perspective, we have used a two step procedure that can be described as a half-partial regression – a mixture of simple and partial regression. An alternative way of conducting the analysis is to undertake single step multiple regression analysis, in which we try to explain variations in HDI*, using our measure of income as one of the explanatory variables. Fernando Limongi suggested to us that the method we chose might bias the results in certain ways, and that the single step procedure would be preferable. At the conceptual and theoretical level we prefer the two step procedure, that involves a clear specification of what it is we are trying to explain, i.e. variations between countries in RICE. However, we also re-estimated our model as a single step multiple regression to test Limongi's hypothesis. The dependent variable was HDI*. The explanatory variables were AID, MINERAL, DEPEND, POLQUAL, POPDENSE and LNGNP (the natural logarithm of Gross National Product per capita at Purchasing Power Parity). The results, which are presented in full in Table 7 of Annex Four, were similar to those obtained from our preferred model using the half-partial regression method. We conclude that the statistical results obtained using the two procedures are virtually identical, and that our two step procedure is preferable because it reflects more directly and clearly the underlying conceptual framework.

ANNEX THREE: DATA SET

Table 1: The Sample Countries, and Values of the Explanatory and Main Independent Variables					
Country	**RICE**	**AID**	**MINERAL**	**QUALPOL**	**POPDENSE**
	(Explan-atory variable)	(Aid as % GDP)	(Mineral exports as % of GDP)	(Quality of government institutions - scale 0-10)	(Population density)
Vietnam	0.23	2.0	0	4.5	545
Sri Lanka	0.21	8.2	2	4.5	733
Philippines	0.14	1.5	2	2.7	550
Jamaica	0.14	7.4	7	4.5	630
Honduras	0.12	6.5	2	3.5	116
Kenya	0.12	8.7	0	6.1	104
Paraguay	0.11	1.5	0	3.6	28
Jordan	0.10	13.6	0	4.5	89
Costa Rica	0.09	4.8	0	6.2	154
India	0.08	0.9	2	5.8	769
Trinidad & Tob.	0.08	0.1	23	5.2	680
Peru	0.08	1.3	12	3.2	45
Dominican Rep.	0.08	2.7	4	4.4	393
Malawi	0.08	16.8	0	4.9	229
El Salvador	0.07	8.3	0	2.7	683
Congo Brazza.	0.07	4.2	18	3.9	17
Ecuador	0.07	1.1	13	4.9	98
Zambia	0.07	11.0	9	4.0	27
Tanzania	0.07	20.1	0	4.7	74
Nigeria	0.06	0.6	15	3.1	272
Indonesia	0.06	1.2	19	3.1	269
Bolivia	0.06	7.6	14	2.0	16
Uruguay	0.06	0.2	0	5.1	51
Syrian Arab Rep.	0.06	4.9	11	3.6	167
Panama	0.05	1.0	0	3.7	87
Malagasy	0.04	9.1	16	5.1	52
Colombia	0.02	0.2	3	5.3	88
Ethiopia	0.02	8.3	0	3.9	125
Argentina	0.02	0.1	2	4.7	33
Zimbabwe	0.02	4.3	7	4.8	64
Mexico	0.01	0.1	3	4.7	117
Thailand	0.01	1.1	3	5.7	298
Ghana	0.00	6.2	0	3.7	166
Chile	0.00	0.2	8	5.5	48
Cameroon	0.00	3.1	11	5.4	64
Venezuela	-0.01	0.1	16	5.5	58
Egypt Arab Emirates	-0.01	5.2	14	4.7	139
Tunisia	-0.01	20.1	10	4.5	139
Brazil	-0.01	0.1	2	6.6	48
Turkey	-0.01	0.5	2	5.2	194
Pakistan	-0.03	2.7	0	4.3	373
Haiti	-0.03	7.6	1	3.0	637
Guatemala	-0.03	1.7	0	2.9	220

Uganda	-0.05	8.9	0	3.1	214
Papua N. Guinea	-0.07	11.7	13	6.7	23
Guinea-Bissau	-0.07	45.9	0	3.1	94
Malaysia	-0.07	0.6	10	7.3	143
Morocco	-0.08	5.2	4	4.7	145
Mali	-0.08	23.4	2	2.7	18
Angola	-0.09	2.7	28	4.3	19
Sierra Leone	-0.09	6.6	8	5.4	150
Cote d'Ivoire	-0.11	2.8	1	6.5	93
Gambia	-0.13	36.9	0	5.6	226
Oman	-0.15	1.4	41	5.4	19
Senegal	-0.16	14.4	0	4.9	99
Saudi Arabia	-0.16	0.0	47	5.5	17
Burkina Faso	-0.17	13.1	0	5.1	86
Niger	-0.18	14.9	9	6.0	15
Gabon	-0.21	2.1	41	5.3	9
Guinea	-0.21	12.1	0	4.7	61
Botswana	-0.23	7.6	48	6.9	6

Table 2: Country Classification for Location/ Africa Dummy Variables				
	Africa	Depend	Francophone Africa	West Africa
Angola	✓	-	-	-
Botswana	✓	-	-	-
Burkina Faso	✓	✓	✓	✓
Cameroon	✓	✓	✓	✓
Congo Brazzaville	✓	✓	✓	✓
Cote d'Ivoire	✓	✓	✓	✓
Egypt Arab Em.	✓	-	-	-
Ethiopia	✓	-	-	-
Gabon	✓	✓	✓	✓
Gambia	✓	-	-	✓
Ghana	✓	-	-	✓
Guinea	✓	-	✓	✓
Guinea-Bissau	✓	-	-	✓
Kenya	✓	-	-	-
Madagascar	✓	✓	✓	-
Malawi	✓	-	-	-
Mali	✓	✓	✓	✓
Morocco	✓	-	✓	-
Niger	✓	✓	✓	✓
Nigeria	✓	-	-	✓
Senegal	✓	✓	✓	✓
Sierra Leone	✓	-	-	✓
Tanzania	✓	-	-	-
Tunisia	✓	-	✓	-
Uganda	✓	-	-	-
Zambia	✓	-	-	-
Zimbabwe	✓	-	-	-

ANNEX FOUR: REGRESSION RESULTS

Table 3: Regression results – DEPEND dummy

Regression		n	Dependent variable	α	β_1 (AID)	β_2 (MINERAL)	β_3 (QUALPOL)	β_4 (POPDENSE)	β_5 (DEPEND)	R^2	F
1	*Preferred Model(PM)*	61	RICE	0.124 (1%)	-3.4E-03 (0.8%)	-2.9E-03 (0.3%)	-2.0E-02 (3%)	1.3E-04 (2%)	-5.7E-02 (6%)	0.469	9.718
2	*PM minus AID Influential points*	59	RICE	0.114 (3%)	-2.8E-03 (17%)	-2.8E-03 (5%)	-1.9E-02 (5%)	1.3E-04 (2%)	-6.1E-02 (6%)	0.454	8.827
3	*PM minus MINERAL Influential points*	56	RICE	9.0E-02 (7%)	-2.8E-03 (3%)	1.3E-03 (45%)	-1.7E-02 (7%)	1.3E-04 (2%)	-6.8E-02 (3%)	0.381	6.153
4	*Preferred Model*	61	RICE-LONG	7.8E-02 (11%)	-3.6E-02 (0.7%)	-3.1E-03 (0.2%)	-1.5E-02 (12%)	2.1E-04 (0.000%)	1.7E-03 (96%)	0.479	10.125
5	*PM minus AID Influential points*	59	RICE-LONG	6.8E-02 (19%)	-2.5E-03 (22%)	-3.0E-03 (4%)	-1.4E-02 (16%)	2.2E-04 (0.000%)	-4.2E-03 (90%)	0.459	8.999
6	*Preferred Model*	61	RICE-ED	0.170 (3%)	-3.2E-03 (12%)	-2.6E-03 (9%)	-2.5E-02 (9%)	4.4E-05 (61%)	-0.116 (2%)	0.275	4.181
7	*PM minus AID Influential points*	59	RICE-ED	0.161 (6%)	-3.0E-03 (36%)	-2.7E-03 (9%)	-2.4E-02 (13%)	4.8E-05 (59%)	-0.118 (3%)	0.286	3.875

Significance levels given in parentheses.

Dependent Variables:
RICE: Income Conversion Efficiency for composite index comprising longevity and education indices
RICE-LONG: Income Conversion Efficiency for longevity index
RICE-ED: Income Conversion Efficiency for education index

Table 4: Regression results – AFRICA dummy											
Regression		**n**	**Dependent variable**	α	β_1 (AID)	β_2 (MINERAL)	β_3 (QUALPOL)	β_4 (POPDENSE)	β_5 (AFRICA)	R^2	**F**
8	*Preferred Model(PM)*	61	RICE	0.134 (1%)	-2.383E-03 (10%)	-2.763E-03 (0.5%)	-2.071E-02 (3%)	1.206E-04 (3%)	-4.617E-02 (7%)	0.466	9.595
9	*PM minus AID Influential points*	59	RICE	0.126 (2%)	-1.618E-03 (48%)	-2.722E-03 (1%)	-1.967E-02 (4%)	1.23E-04 (3%)	-4.936E-02 (7%)	0.45	8.683
10	*Preferred Model*	61	RICE-LONG	9.355E-02 (5%)	-1.811E-03 (20%)	-2.82E-03 (0.3%)	-1.356E-02 (13%)	1.734E-04 (0.2%)	-5.989E-02 (2%)	0.530	12.421
11	*PM minus AID Influential points*	59	RICE-LONG	7.934E-02 (11%)	7.24E-04 (74%)	-2.638E-03 (1%)	-1.253E-02 (17%)	1.746E-04 (0.02%)	-7.194E-02 (0.7%)	0.529	11.883
12	*Preferred Model*	61	RICE-ED	0.174 (4%)	-2.955E-03 (23%)	-2.706E-03 (10%)	-2.787E-02 (7%)	6.783E-05 (47%)	-3.245E-02 (45%)	0.207	2.873
13	*PM minus AID Influential points*	59	RICE-ED	0.172 (5%)	-3.96E-03 (31%)	-2.805E-03 (9%)	-2.681E-02 (10%)	7.146E-05 (46%)	-2.679 (56%)	0.199	2.635

Table 5: Regression results - FRAFRICA dummy											
Regression		**n**	**Dependent variable**	α	β_1 (AID)	β_2 (MINERAL)	β_3 (QUALPOL)	β_4 (POPDENSE)	β_5 (DFAF)	R^2	**F**
14	*Preferred Model(PM)*	61	RICE	0.128 (0.7%)	-3.044E-03 (1%)	-2.914E-03 (0.2%)	-1.927E-02 (3%)	1.161E-04 (3%)	-7.548E-02 (0.5%)	0.466	11.452
15	*PM minus AID Influential points*	59	RICE	0.112 (2%)	-1.379E-03 (49%)	-2.8E-03 (0.3%)	-1.742E-02 (6%)	1.195E-04 (3%)	-8.7E-02 (0.3%)	0.506	10.845
16	*Preferred Model*	61	RICE-LONG	7.8E-02 (12%)	-3.537E-03 (0.8%)	-3.1E-03 (0.2%)	-1.5E-02 (13%)	2.1E-04 (0.000%)	1.422E-03 (96%)	0.479	10.125
17	*PM minus AID Influential points*	59	RICE-LONG	6.78E-02 (20%)	-2.326E-03 (28%)	-2.984E-03 (0.4%)	-1.34E-02 (17%)	2.15E-04 (0.000%)	-9.78E-03 (75%)	0.460	9.032
18	*Preferred Model*	61	RICE-ED	0.178 (2%)	-2.551E-03 (19%)	-2.777E-03 (6%)	-2.409E-02 (9%)	1.899E-05 (82%)	-0.15 (0.1%)	0.355	6.055
19	*PM minus AID Influential points*	59	RICE-ED	0.157 (5%)	-4.325E-03 (89%)	-2.674E-03 (7%)	-2.145E-02 (14%)	2.39E-05 (78%)	-0.164 (0.1%)	0.357	5.889

Table 6: Regression results – WAFRICA dummy											
Regression		**n**	**Dependent variable**	**α**	**β_1** (AID)	**β_2** (MINERAL)	**β_3** (QUALPOL)	**β_4** (POPDENSE)	**β_5** (W. Africa)	**R^2**	**F**
20	*Preferred Model(PM)*	61	RICE	0.132 (0.4%)	-1.893E-03 (13%)	-2.918E-03 (0.1%)	-2.049E-02 (2%)	1.177E-04 (2%)	-9.282E-02 (0.000%)	0.550	13.460
21	*PM minus AID Influential points*	59	RICE	0.132 (0.6%)	-2.349E-03 (20%)	-2.958E-03 (0.1%)	-2.001E-02 (2%)	1.173E-04 (2%)	-9.285E-02 (0.000%)	0.536	12.250
22	*Preferred Model*	61	RICE-LONG	8.513E-02 (7%)	-2.259E-03 (0.9%)	-3.035E-03 (0.2%)	-1.382E-02 (12%)	1.899E-04 (0.01%)	-6.544E-02 (2%)	0.533	12.562
23	*PM minus AID Influential points*	59	RICE-LONG	7.838E-02 (12%)	-1.529E-03 (42%)	-2.991E-03 (0.2%)	-1.34E-02 (15%)	1.938E-04 (0.1%)	-6.448E-03 (2%)	0.513	11.188
24	*Preferred Model*	61	RICE-ED	0.179 (2%)	-1.527E-03 (48%)	-2.801E-03 (6%)	-2.715E-02 (6%)	4.559E-05 (59%)	-0.12 (0.7%)	0.237	4.723
25	*PM minus AID Influential points*	59	RICE-ED	0.187 (2%)	-3.169E-03 (31%)	-2.924E-03 (6%)	-2.661E-02 (8%)	4.079E-05 (64%)	-0.121 (0.7%)	0.298	4.504

Table 7: Regression results: One-Step Model with WAFRICA dummy											
Regression	**N**	**Depen-dent variable**	α	β_1 (AID)	β_2 (MINERAL)	β_3 (QUALPOL)	β_4 (POPDENSE)	β_5 (WFARICA)	β_6 (LNGNP)	R^2	**F**
One -Step Model (OSM)	*61*	HDI*	-0.447 (0.000%)	-2.247E-03 (9%)	-2.773E-03 (0.3%)	-1.888E-02 (3%)	1.130E-04 (3%)	-0.100 (0.000%)	0.157 (0.000)	0.854	52.585 (0.000)
OSM minus AID Influential points	*59*	HDI*	-0.408 (0.2%)	-3.428E-03 (11%)	-2.79E-03 (0.3%)	-1.785E-02 (5%)	1.081E-04 (4%)	-0.104 (0.000%)	0.152 (0.000)	0.846	47.678 (0.000)

Significance levels given in parentheses

ANNEX FIVE: SCATTERPLOTS OF RAW DATA

Figure 1: Scatter Plot of RICE on AID

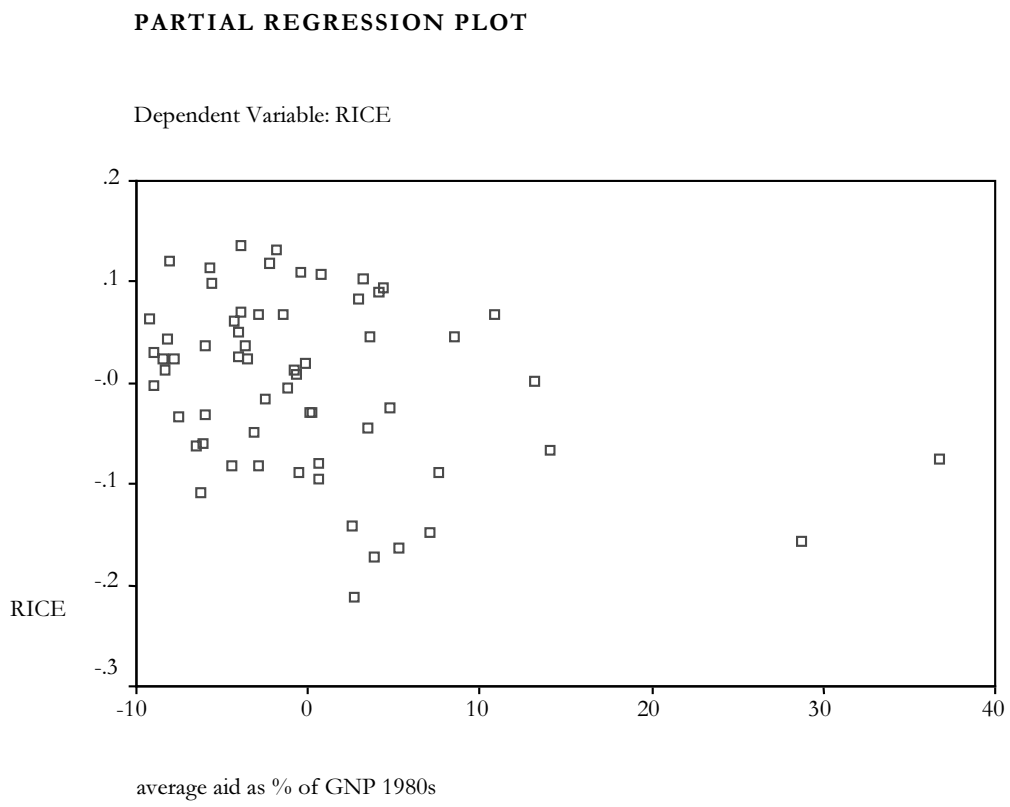

Figure 2: Scatter Plot of RICE on MINERAL

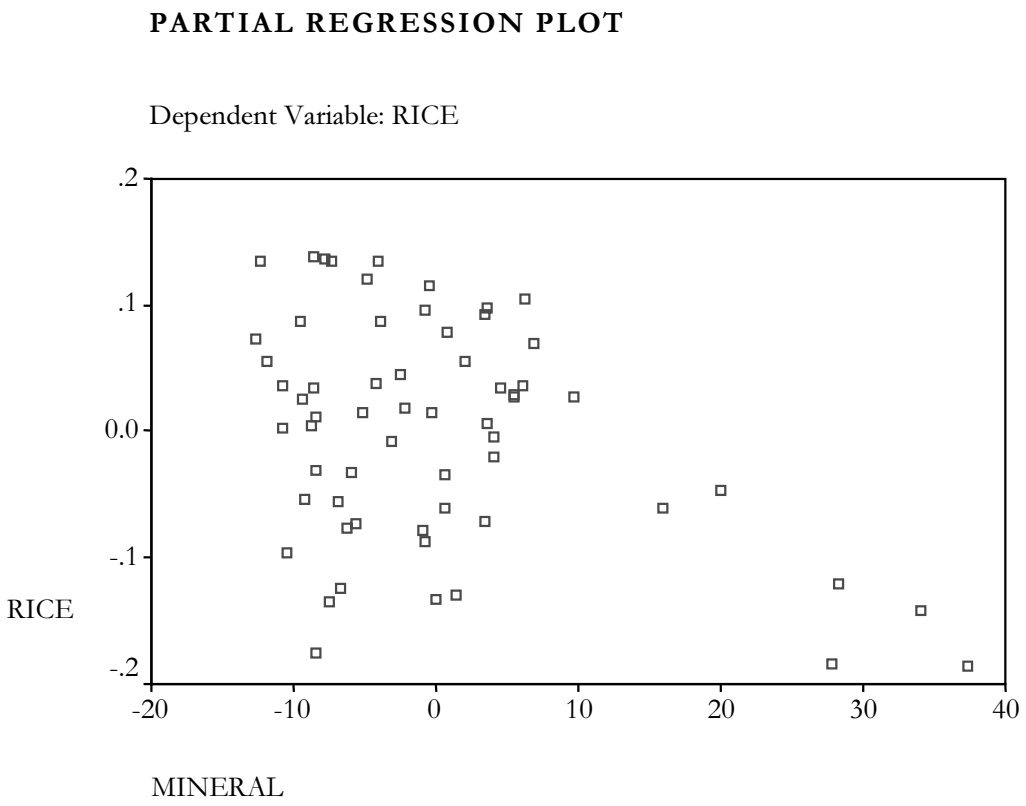

Figure 3: Scatter Plot of RICE on POPDENSE