

Freedom and Economic Growth: A Virtuous Cycle ?

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ABSTRACT

Freedom and Economic Growth - A Virtuous Cycle ?

This paper investigates the relationship between freedom and economic growth. Two components of freedom are considered - political and economic. While political freedom measures have frequently been used, this paper offers three separate variables to measure a major, and much neglected, determinant of economic growth - namely, economic freedom. The relationship of freedom with respect to welfare is examined through the use of **five** separate indicators of welfare: - per capita income growth, measured in constant dollars and PPP dollars; total factor productivity growth; growth in secondary school enrollment and decline in infant mortality. Data for over 90 countries are used for the time-period 1973-1990.

The results are robust and **invariant** to alternative specifications. In particular, both political and economic freedom are positively associated with economic growth. For example, a 1 point increase in political freedom (on a 7 point scale) leads to an increase in per-capita growth of approximately 1 percent; and an opening up of international capital markets (as proxied by the black market premium on the currency) leads to an increase of 1.6 percent in the per capita growth rate. These results hold regardless of whether the estimation is OLS or in the context of a simultaneous equation model. Further, the results hold for all three educational attainment variables (World Bank, World Development Report 1991, Barro-Lee(1992,1993) and Nehru et. al. (1993)).

One reason why these results differ markedly from the “no (or negative) freedom - growth” relationship observed in the literature is because of the improved specification of the growth model developed in this paper i.e. a model which incorporates **both** economic and political freedom. The incorporation of the two freedoms in the modelling also helps to explain the “anomalies” e.g. India with high political freedom grows slowly (low economic freedom) and the East Asian economies with low political freedom grow considerably faster (high economic freedom). One additional result is that no initial education externalities are found once political and economic freedom variables are introduced in the growth model. Instead, education is found to yield increasing returns **only** when economic freedom is present. This result suggests that an important explainer of growth in developing countries is the presence of an inter-action effect between economic freedom (economic openness) and education.

Introduction

The last decade has been witness to a virtual explosion in the number of countries that have moved towards a democratic form of government. Two continents - Latin America and Europe - have been transformed into (almost) exclusive democracies, while most of Asia, and parts of Africa, are converging towards a democratic norm. Not as emphasized, but equally important, is the economic revolution that has accompanied this political revolution.

While the effects of this revolution on freedom are unambiguous, the effects on economic growth are not. Both the political science, and the economics literature, have offered "mixed" conclusions i.e. some studies find the effects of democracy on growth to be negative, some find it positive, and some find no effect. ¹ The emphasis towards a negative effect increases as one moves towards policy makers and the popular media. For example, a successful leader of a very successful country, Singapore, recently stated: "I do not believe that democracy necessarily leads to development. I believe that what a country needs to develop is discipline more than democracy. The exuberance of democracy leads to indiscipline and disorderly conduct which are inimical to development." (Lee Kwan Yew(1992)).

Policy makers, especially in democratic developing countries, are envious of the authoritarian success of countries like Singapore. It is not uncommon, therefore, to find Indian policy makers (politicians and bureaucrats) explain their own failure by stating that Indian policies would be more growth-friendly if the shackles of freedom and democracy were absent. Obviously, there is a profound self-interest which guides political leaders towards a distrust of freedom, especially economic freedom.

The view in the popular media is perhaps best exemplified by the following quotes from a magazine which is critical of authoritarianism. In a cautious article entitled "Freedom and Prosperity"

(June 29, 1991) the Economist magazine stated "For the past 25 years Asia has had the world's fastest-growing economies. It has not had the best democracies. Just a coincidence ?In Asia, authoritarian governments may find it easier than democratic ones to haul countries out of poverty". However, the Economist in 1994 (Aug. 27, p17) reached a different conclusion: " Dictatorships with wise economic policies can achieve rapid economic growth: but they are rare, and, being dictatorships, will lack the economic strengths of stable democracy. Far from inhibiting growth, democracy promotes it."

A large part of the popular impression about the ill effects of democracy or the growth inducing effects of authoritarianism stems from observing the East Asian experience and contrasting it with that of democratic countries like India. The record is clear and harsh - India, a democratic country for all but three years since 1947 grew at a 1.9 percent per capita rate from 1960 to 1987; the three East Asian dictatorships - Singapore, South Korea and China (Taiwan) - grew at a 6.4 percent rate during the same time-period. The important exclusion here is that of Hong Kong -it had considerably greater political freedom than the other three East Asian countries and grew at the same rate as Singapore - 5.9 percent. While the Hong Kong experience points to the mixed nature of the evidence, the impression remains that authoritarianism is the preferred policy option. This conclusion is reinforced by authoritarian China's spectacular growth record since the late seventies.

Given the extraordinary improvement of freedom in the last decade, it is a moot question whether the world will have to forego some growth, and development, in order to enjoy the fruits of this newly found freedom. If so, what can policy makers do to help reduce the costs of freedom ? Alternatively, is it likely that a faster pace of growth comes with more freedom ? ² If so, are freedom and growth locked in a virtuous cycle ? These questions are the main motivation for the analysis.

Estimation of the partial impact of freedom on growth involves a hypothesis/model of the determinants of economic growth. Traditional, or "new" growth theory models,³ are deficient in two aspects: first, these models completely ignore the role of political and (especially) economic freedom. In contrast, the model of growth offered in this paper assigns a critical role to both types of freedom. Second, and following from the first omission, the growth theory models miss the important interactive (synergistic) role played by the simultaneous presence of both education and economic freedom. The results show that this interaction (rather than education per se or any other factor) possibly accounts for a large part of the observed "excess" in East Asian growth rates. Further, omission of this interaction term may have yielded the pervasive, and possibly spurious, result that there are externalities associated with education. Thus, this paper is both about a revised explanation of the process of economic growth and about the role of freedom. And this revised view suggests that the Solow model is an adequate explainer of growth, with the caveat that the flow of technology not be assumed exogenous (as in the Solow model).

The concept of freedom is obviously complex and not easily reducible to quantitative measurement. Yet extensive use of quantitative measures of freedom is made in this paper. Further complexity is generated by the fact that changes in freedom impact upon welfare change with "long and variable lags". This paper does not attempt to model the complex lag structure. Thus, the drawbacks of this study are apparent. However, these caveats should not detract from the strong finding that emerges from the extensive analysis presented in this paper and in Bhalla(1992): no matter how freedom is measured, and no matter how welfare change is defined, there is a strong and positive relationship between the two.

This is in striking contrast to some of the recent studies on the subject e.g. Alesina et. al. (1992) "Democracies do not appear to show a different growth path than non-democracies" (p.22); or Helliwell(1992) "Aggregate evidence does not support any significant linkage between the level of democracy and subsequent economic growth" (p. 19) or Przeworski-Limongi (1993) "we do not know whether democracy fosters or hinders economic growth" (p.64).

Why does this study offer different results ? Four reasons are possible: (i) different time-period of analysis, 1973-1990 (this study) vs. 1960-1988; (ii) use of a more appropriate educational attainment variable (this study) rather than educational enrollment variables; (iii) use of three economic freedom variables vs. none in the other studies; (iv) differences in instrument variables ⁴ and (v) use of PPP growth rates (most studies) rather than constant dollar growth rates (this study). The inclusion of economic freedom variables appears as the single most important difference between this and other studies. Tables 3 and 4 contain "sensitivity" results of models which include different specifications and variables. These alternative specifications reinforce the strong conclusion that political and economic freedom are jointly important in affecting economic growth.

This paper is concerned with freedom and growth. Democracy is a form of government strongly associated with greater freedom. As the analysis will make clear, the hypothesis to be tested is one between greater individual freedom (political, civil, and economic) and growth. Democracies vary in the type of individual freedom (especially economic freedom) they provide to their population. In particular, as emphasized by Hayek (1944), economic freedom is at least equally important as political freedom. Past studies, by not controlling for economic freedom, may have estimated an inappropriate relationship between (political) freedom and growth. This, therefore, is the first important departure of

this study from previous research. It analyses the independent individual impacts of political and economic freedom on economic growth.

Four other differences of this study need to be highlighted. First, it is likely that there is a simultaneous relationship between freedom and growth i.e. freedom is hypothesized to lead to higher growth, and higher growth can often lead to greater demands for more freedom. These joint effects need to be modelled in a statistically appropriate fashion. This paper does so. (Helliwell(1992) also estimates a simultaneous equation model, but reaches different results, perhaps because of exclusion of variables representing economic freedom). Second, there are other correlates of growth which if not appropriately controlled for can lead to the estimation of a spurious relationship between freedom and growth. The most important of these variables is the average educational level of the population. Three different measures of educational attainment are used to help estimate an unbiased relationship between freedom and growth. (Other studies have loosely proxied educational attainment with an inappropriate flow variable, namely the percentage of students enrolled in primary or secondary school in an “initial” year). Third, this paper makes an explicit attempt to estimate the relationship between freedom and growth including, and excluding, the unusual East Asian experience. Recognition of the unusual nature of East Asian growth can help to isolate the effects of individual determinants on economic growth. Finally, this paper uses **five** different welfare variables to proxy for economic development. These consist of two variables which measure per capita growth (in constant dollars and in PPP dollars a la Summers-Heston), total factor productivity growth, improvement in education (secondary school enrollment) and health (decline in infant mortality).

The plan of the paper is as follows. Section 2 discusses why a dichotomous variable representing democracy is flawed and why it is preferable to use variables relating to individual

freedom. It also discusses the need for a variable to correct for the likely two way causation between freedom and growth. Section 3 discusses data and measurement issues related to the complexity of freedom variables, and variables related to welfare improvement. In particular, it is suggested that economic freedom (a heretofore neglected variable) is an important determinant of economic growth. Section 4 discusses why it is important for growth models to adjust for the reality of the exceptional growth experience of six East Asian (Confucian) economies. It is suggested that if such adjustment is not made, then most estimates may yield biased results. Section 5 discusses the results obtained on the basis of the various specifications estimated here (eighteen) and in Bhalla(1992). Section 6 concludes and offers some forecasts based on the extraordinarily robust relationship that is obtained between freedom and growth.

Section 2 - Democracy, Freedom and Growth - A Model

Democracy vs. Freedom

There are both positive and negative effects of democracy on growth. The positive effects have to do with the presence of a liberal regime at the center - a form of government which respects various rights of individuals. The most important of these rights is probably the right to property. Other rights associated with democracy, but not necessarily required by this form of government, are the economic rights characterized by a market friendly system. The political right which democracy confers on its citizens is the right to change governments. This right, theoretically, can have a positive effect on growth because the rulers know that their retention of power is (partially) based on economic performance.

In theory, democracy need not confer any of the above mentioned economic rights on its citizens. In practice, democratic governments have allowed their citizens extremely varied amounts of economic freedom, and often erred on the low side. Nationalization of industries, foreign exchange controls, investment regulations and restrictions, wage and price controls etc. are all policies that democracies have arrogantly introduced and rigidly implemented. Parties in power have also attempted to stall, through non-democratic means, the evolution of opposition parties. Even the right to change governments has been delayed by a declaration of a "state of emergency" e.g. India and Sri Lanka in the seventies.

Just as democracies can have a wide range of freedom, so can non-democracies. Some non-democratic governments are associated with few economic or political freedoms (e.g. Eastern Europe prior to 1990); some with considerable amounts of economic freedoms (e.g. East Asian economies like Singapore, China(Taiwan) and Korea); and some with considerable amounts of freedom (both political

and economic) but no voting rights (Hong Kong). The high variance of freedoms associated with both democracies and authoritarian regimes means that a measured relationship between democracy and economic growth is likely to be heavily contaminated with error. It is preferable, therefore, to analyze economic growth with respect to important attributes of a "proper" democracy i.e. presence of political and economic freedom. And especially so if data on freedom are available on a somewhat continuous scale (in contrast to the dichotomous nature of a variable representing democracy).⁵

The above arguments pertaining to the role of freedom implicitly involve an acceptance of a particular process of economic growth. Rejected explicitly are growth processes associated with less freedom e.g. economic growth associated with authoritarianism, forced savings, planned industrialization, high tariffs etc. Such policies restrict economic freedom and prevent competition from playing its allocative role; these restrictive policies ensure that relative factor prices and technology prevailing in the domestic market are different (and inferior in the case of technology) than those prevailing internationally.

A "New" Model of Growth

This paper is both about a "new" model of growth as well as the role of freedom in generating growth. A heuristic model of the growth process can be stated as follows. A developing country has a manna advantage in that it is a late-comer. This implies that improved production possibilities are available on the "shelf" ready to be adopted, rather than to be achieved through research and development, as in the developed countries. This advantage leads to relatively faster growth i.e. convergence. However, the developing country needs the means to exploit its backwardness. Education can help attain development. But education may only be a necessary condition - otherwise, countries like Sri Lanka and India would have been success stories by now. What allows education to achieve its maximum return is economic openness, a subset of economic freedom i.e the freedom to import technology, a freedom constrained in most developing countries by the policy makers, or planners or bureaucrats. With economic openness, capital is allowed to seek the highest return domestically and internationally, and countries can move along the path of their dynamic comparative advantage. If two countries are equally open, then education differences are likely to matter - both because of the ability to select the appropriate technology and the ability to adapt the technology, if needed. ⁶ Thus, there is synergy between education and economic freedom. An interactive effect between the two leads to faster economic growth, and faster convergence.

In production function terms, the differences between the model outlined above and others can be illustrated as follows. Let the production function be written as

$$Y(t) = A(t)f(K(t),L(t)) \quad (1)$$

where Y represents income, K represents capital, L represents labor, and t is time. The neo-classical Solow model assumes $A(t)$ to be exogenous and available to all producers. In their modification of this model, Mankiw-Romer-Weil(1990), suggest that in the initial time-period, $A(t)$ varies amongst countries by a random term i.e. $A(0) = b + x$, where b is a constant and x represents random "fixed-effect" differences. Like Solow, the growth rate of A is assumed to be exogenous, and constant, across countries. The "new" growth theory literature (Romer(1986), Lucas(1988), Barro(1991)) rejects the assumption that $A(t)$ is exogenous, and suggests that its evolution is determined by the level of human capital in the economy. Human capital can lead to increasing returns because the productivity of all workers is enhanced when managers and co-workers have higher education. Considerable empirical support has been achieved for the proposition that higher amounts of initial human capital leads to higher economic growth i.e confirming the hypothesis of increasing returns (externalities) to education.

The literature on the "new" growth theory is voluminous, and several determinants of $A(t)$, in addition to education, have been offered. ⁷ The model offered above is in the same tradition. The difference is in the role accorded to education, and freedom. It is hypothesized that a considerable portion of the returns (increasing or otherwise) to education result from increased openness to international markets and technology; that for closed (non-economic freedom) economies - as most developing countries were till the late eighties - the contribution of education is limited. That the magnitude of education may have relatively little to do with the transfer of technology in the presence of government restrictions is abundantly confirmed by the example of Eastern Europe prior to 1990.

Once a country becomes developed i.e. catch-up is achieved, and technology is similar in all countries, the "traditional" determinants of growth (innovation, entrepreneurship, research and

development expenditures) become more relevant. Hence, this model of growth is more about developing, than developed, societies.

The role of freedom in the above model is as a determinant of $A(t)$, along with education. If policy makers restrict foreign technology or foreign competition, they are refusing to let (foreign) prices determine (domestic) resource allocation. In a non-free environment, domestic producers and/or consumers cannot allocate resources in the most profitable or welfare enhancing manner. Economic freedom results in increased economic opportunities; political and civil liberties help ensure that the "exploiters" of these increased opportunities are dictated by merit rather than fiat.

Summarizing, the argument in favor of a causative relationship from freedom to growth is one which emphasizes the prevalence of political and economic checks and balances in the system. The assumption is that a free society can help allocate resources more efficiently than a non-free society. Further, in a free society, errors by the government or leadership or bureaucrats can be corrected through the ballot, the press or the judicial system. In particular, political freedom means that a country need not be stuck with a bad policy - or a bad ruler. The removal of bad rulers (political freedom), or a movement towards efficient resource allocation (economic freedom) has the same result - better economic performance.⁸

Freedom and Growth - A Two Way Causation

This "new" growth model - one incorporating economic and political freedom in addition to other determinants - is the one estimated in this paper. If there is only one-way causation from freedom to growth, then unbiased estimates of the coefficients can be obtained by ordinary least squares (Table 2). However, a strong theoretical possibility exists of reverse causation from economic growth to

political freedom i.e. countries first obtain growth, and then move towards "luxury" items like freedom and democracy. This argument was first offered by Lipset(1959) via his observation that democracy and level of per capita income are positively related. At present, the example of East Asia is most often alluded to in this regard i.e. after attaining economic development, these countries have moved towards democratic systems. ⁹

An exogenous variable which directly affects freedom but not growth is required in order that possible simultaneous effects be purged. Such a variable is difficult to identify since most determinants of freedom affect growth as well. For example, higher education can be expected to lead to greater demands for democracy, and also to higher growth. The same argument holds for high initial levels of income.

Freedom and Growth - Identification

This paper constructs an "institutional (colonial) heritage" variable to identify the freedom equation. Until recently, several of the developing countries were under a colonial regime. It is reasonable to assume that the institutions now present in these countries are in part a function of the colonial regime - and in part a function of the indigenous culture, and "initial conditions". Towards this end, countries were classified into five "colonial heritage" categories: (i) British colonialism in sub-Saharan African countries e.g. Tanzania; (ii) British colonialism in non-sub-Saharan African countries e.g. Egypt, India; ¹⁰ (iii) American influence countries e.g. Panama, Liberia, Philippines, South Korea; (iv) Non-British (e.g. French, Dutch) colonial countries and (v) non-colonial independent countries e.g. Brazil, Thailand. ¹¹

In most senses of the term, the colonial heritage classification offered above is truly exogenous. Further, it is quite likely that the nature of colonial influence prior to the nineteen seventies (and starting

as early as the nineteenth century) had an impact on the kind of political institutions the colonized countries eventually adopted; and it is quite unlikely that this institutional heritage systematically affected future growth performance in any way.¹²

There is, however, one linkage between colonialism and subsequent growth. It can be argued that apart from their influence on political institutions, colonialism probably affected infrastructural development e.g. railroads, schools etc. Such differences in infrastructure are likely to affect future growth. However, the growth model used has two infrastructure control variables - initial per capita income in 1972, and initial educational attainment levels in 1972. Hence, the effect of colonial heritage estimated below is after controlling for the effects of colonial infrastructure development. The contention is that while the direct effect of colonialism on growth ended around the late fifties, and certainly by the late-sixties, the indirect effect of colonialism on institutions like democracy lingers on.

It is important to note that the investments resulting from different patterns of colonialism in the past do affect the level of income in the future. In this regard, colonialism variables are correlated with per capita income in the initial period of estimation, namely 1972. However, use of colonial heritage as an instrument is invalid if colonialism (till approximately the late nineteen forties) were to affect the growth rate from 1973 to 1990. It is highly unlikely that colonial heritage does that - if it did, one would have to observe either explosive, or implosive, growth rates in perpetuity.

Section 3 - Data and Measurement

Rights - Political, Civil and Economic ¹³

Broadly, freedom can be thought of as consisting of three separate rights: political rights, defined as "rights to participate meaningfully in the political process" i.e. rights which allow the leaders to be changed; civil rights, defined as the "rights to free expression, to organize or demonstrate, as well as rights to a degree of autonomy such as is provided by freedom of religion, education, travel, and other personal rights" (Gastil(1987)); and economic rights.

While political and civil rights have been extensively discussed, the same cannot be said of economic freedom. Indeed, there is a larger dichotomy - political freedom has been deemed politically correct, and economic freedom (first suggested by Hayek(1944) and then followed up by Scully-Slottje(1991) and Bhalla(1992)) deemed politically incorrect. Only recently has the tide begun to shift with both Freedom House (publisher of the political freedom rankings used in this paper) and the Heritage Foundation announcing plans to measure economic freedom on a systematic basis.

Economic freedoms generally reflect rights provided by a free (competitive) environment e.g. property rights, external and internal openness (right to buy and sell goods to whomever one wishes and at prices the competitive market determines); rights to set up investments without a licence, rights to foreign travel, rights to hire and fire (with due process); rights of domestic and international movement of labor and capital etc..

Omitting the freedom to immigrate, labor freedom means the right to work anywhere in national boundaries and at wages the impersonal market determines, rather than the "face-less"

bureaucrat. Capital freedom means the freedom to obtain the highest return on one's capital either domestically or abroad -hence, negative real rates of interest domestically would suggest a need for freedom to transfer one's capital abroad. Produce freedom implies a right to sell abroad at favorable prices, or to import from abroad if import products are cheaper.

The above broad definitions (but no less precise than political freedom) suggest several variables which can be used to capture components of economic freedom e.g. nature of property rights (land ownership, urban land ceilings, patent rights etc.), high trade taxes ¹⁴, unionization, licensing procedures, capital market controls, minimum wages etc. Each constraint on market behavior (excepting that of monopolists and actions that ignore externalities) constitutes an infringement of economic freedom.

Empirical Measures of Freedom

Given the diversity of rights , it is difficult to envision an all encompassing single measure. Consequently, four separate measures of liberty are used in the empirical analysis.

Political and Civil Rights - Gastil data:

Gastil (and now Freedom House) has conducted an annual survey of rights in most countries of the world since 1973. The survey ranks all countries (and territories) according to over thirty specific criteria. Some of the criteria for political rights are: whether the chief authority was elected by a meaningful process; whether there were fair election laws, whether there was a significant opposition vote etc. A partial listing of the criteria for civil rights includes: freedom of the press, freedom of assembly and demonstration, freedom to organize unions, personal social rights - including those to property, internal and external travel, choice of residence etc. Two indices, one each for political rights and civil rights, each ranging from 1 (worst) to 7 (best) are constructed.¹⁵ There exists a high degree of correlation between the two - over 0.9. Further, there is hardly any intra-country variability in the indices for a particular country-year. For example, in 1982 (mid-point year for the survey data which exists from 1973 to 1992) out of a total sample of 112 countries, there were 49 countries with the same estimate, 58 countries whose values were within a point and only 5 countries whose values differed by two points. Given this large association between the two, a simple average is used as a measure of political and civil liberties.¹⁶

How accurate are the Gastil indices ? One test is whether the indices conform to most "priors" in pair-wise comparisons, and in ranks. Table 1 lists the average value of political and civil liberties (1 lowest and 7 highest) for 1973-1992 for selected countries. The most free country in Africa is

Mauritius (5.8) with Botswana (5.6) only slightly behind. The least free Burundi (1.4) with Kenya (2.8) at a higher level and Nigeria(3.4) even higher. The results for Latin America also seem plausible -Haiti (2.1) with low freedom and Costa Rica (7.0) a free country with "maximum" freedom.

Economic Freedom

Three measures of economic freedom are used in this paper. One measure pertains to openness to the international goods market; the second pertains to openness to the international capital market; and the third pertains to the openness of the domestic capital market. Unfortunately, comparative data on other important aspects of internal economic freedom (e.g. freedom of labor movement, unionization, effectiveness of minimum wages, licensing procedures, etc.) are not available. However, it is likely that the three measures used are correlated with excluded aspects of internal economic freedom.

Economic Freedom (a) - Economic Openness

Openness to world markets is a subset of economic freedom. The more economically open a society, the more economic freedom is likely to be present. As an agent, one should be free to import, export, manufacture, and consume tradeable goods at international prices. Thus, in a completely open society, the domestic price level for tradeables should be equivalent to the world price level, exclusive of taxes and transportation costs. The hypothesized relationship of economic freedom (openness) with growth is straightforward. When policies allow domestic prices to move towards international prices, the increase in the efficiency of resource allocation, and in the appropriateness of technology adoption, allows economic growth to accelerate. In other words, movements towards openness allows "catch-

up" to proceed at a faster pace. This phenomena can be reflected through use of a variable which measures the change in the relative prices of tradeable goods - the relative price being the domestic price of tradeables, in constant dollars, relative to the international price of tradeables, in constant dollars. As a crude proxy, the US price of tradeables is taken as a reference international price.¹⁷ (See Appendix I for further details).

Economic Freedom (b) - Black Market Premium on Domestic Currency

An additional measure of economic freedom, (and first used as such by Scully-Slottje(1991), and World Bank (1991)), is the black market premium (BMP) on a country's official exchange rates. This variable can be thought of as a proxy for freedom to move financial capital across borders. Such data are available on an annual basis from the Pick's Currency Yearbook. Black market premia can reflect distortions in the exchange rate. It can also reflect the presence of exchange controls and controls on imports - all variables connected with economic rights. In addition, however, black market premia can reflect short term political uncertainty. Given this caveat, black market premia is used (as a second measure) to reflect degrees of economic liberty.

Economic Freedom (c) - Confucian dummy

The East Asian economies have enjoyed spectacular growth over the last three decades and Section 4 discusses some of the oft-cited reasons for this "miraculous" performance. There are six countries - China, China(Taiwan), Hong Kong, Japan, Singapore and South Korea - that form part of East Asia and share a common cultural "Confucian" heritage.¹⁸ There is considerable evidence (see the literature cited in World Bank (1993)) to suggest that these six countries also enjoyed, in parallel to their common Confucian heritage, common economic realities over the last three decades. For various economic criteria - saving rates, investment rates, positive (and competitive) real interest rates, low

inflation rates, financial market development - all the six countries rank in the top tenth or top fifth of the developing countries. For example, each of the six countries had an average savings rate above 28 percent for the time-period 1973-1987. High saving rates (and other factors) can (and do) influence growth. Exceptional performance on several economic factors like savings, inflation etc. are likely to be the result of well developed domestic financial markets.

Unfortunately, for each domestic financial markets variable, there are several countries for which such data are missing. Hence, use of individual variables to capture this effect is not feasible. Instead, a short-cut and rough proxy for relative development of domestic financial markets is through the use of the Confucian dummy variable.

The parallel between the black market premium and Confucian dummy is straightforward. The former reflects restrictions on capital seeking the highest return internationally; the latter is indicative of whether capital is allowed to seek the highest return in the domestic market. Thus, use of a Confucian dummy (one if the country is one of the six East Asian economies mentioned above, zero otherwise) is a convenient proxy for greater internal economic freedom and/or an economic environment that facilitates financial development.

As with all proxies, other interpretations of the above three economic freedom variables are possible. For example, the black market premium could be narrowly construed as reflecting price distortions; the economic openness variable as reflecting the maintenance of an overvalued exchange rate; and the Confucian dummy as reflecting cultural differences. What makes the first two measures reasonable economic freedom proxies is the contention that such distortions/overvaluations could not be maintained for long time-periods without an extensive system of controls i.e without restraining

economic freedom. What makes the Confucian dummy an economic freedom variable is its extremely high correlation with variables which reflect development of the domestic financial market.

While some measurement error is possible, the maintained hypothesis is that the three measures of economic freedom do capture the underlying reality. The measure of economic openness is a summary of the change in price distortions of tradeables i.e. the change in the relative price of a large number of commodities. Partial adjustments to this measure - off setting tariffs and subsidies on some goods - are unlikely to be significant. Analogously, the black market premium (BMP) variable is not a measure prevailing in a given year, nor is it an average of values over several years. Rather, it is a constructed dichotomous variable, with a broad classification i.e countries are in a zero BMP category if their premia is in the bottom 25 percent of the developing countries considered (in reality this corresponds to a fifteen year average premia of less than 6 percent), and one otherwise.

Perhaps the most convincing reason to use the black market premia as a measure of economic freedom (alongwith, and analogously, the relative price based measure of openness, and the Confucian dummy) is because it accurately reflects aspects of economic control prevailing in the economy. This was first elaborated upon by Hayek (1944, p.92, italics mine):

" The extent of control over all life that economic control confers is nowhere better illustrated than in the field of foreign exchanges. Nothing would at first seem to affect private life less than a state control of the dealings in foreign exchange, and most people will regard its introduction with complete indifference. Yet the experience of most Continental countries has taught thoughtful people to regard this step as the decisive advance on the path to totalitarianism and the suppression of individual liberty.....Once the individual is no longer free to travel, no longer free to buy foreign books or journals, once all the means of foreign contact can be restricted to those of whom official opinion approves or for whom it is regarded as necessary, the effective control of opinion is much greater than that ever exercised by any of the absolutist governments of the seventeenth and eighteenth centuries."

Economic Performance - selected dependent variables

Five variables are used to measure various aspects of economic performance - three reflect income improvement while two reflect improvement in social sectors. The income variables are: per capita income growth (in constant 1987 dollars at official exchange rates), per capita income growth in PPP dollars a la Summers-Heston(1992), and total factor productivity growth (TFPG).¹⁹ The two social indicators are declines in infant mortality and increases in secondary school enrollment.²⁰

Section 4: The Exceptional Confucian (East Asian) Experience

It is extremely important for growth models (especially those pertaining to capture the reality of developing countries) to specifically account for the divergent, and seemingly extreme, behavior of the Confucian countries. This can be conveniently done so via the use of a dichotomous variable. Use of this variable achieves two purposes - first, it helps to achieve an unbiased estimate of the impact of the other included variables, and second, its coefficient can indicate the magnitude of "excess" growth still left unexplained by the estimated model. As the rest of this section will demonstrate, non-use of the Confucian dummy can lead to possibly erroneous evaluations of the determinants of growth.

The Confucian classification is useful because it alerts one to the dangers of basing general observations on growth on the specific experience of six countries which share one, or several, common economic phenomena. Explanations based exclusively on these countries are liable to blow up in the face of the analysts. The reason is simple - almost any factor can be "successfully" shown to be an important explanator as long as it was somewhat common to the Confucian growth experience. Econometrically speaking, this mishap occurs because of inadequate attention to a seemingly gargantuan identification problem.

Inadequate attention to identification has meant that analysts have "found" several important explanators for the East Asian "miracle". A brief description of each explanation follows:

(i) Authoritarianism: Excepting Hong Kong and Japan, the EAC countries have had non-free political regimes through most of the development period, 1960-90. It is an observed reality that all these countries have grown at growth rates above 5.5 percent, 1960-90. Thus, some casual observers have conjectured that perhaps the discipline of authoritarianism is a pre-requisite for growth now and freedom later.

The above reasoning is fraught with problems. The most important problem may be definitional - the observed negative relationship is not between freedom and growth, but rather between a type of government (dictatorship) and growth. Further, in these countries relatively small amounts of political freedom have co-existed with relatively large amounts of economic freedom. This makes any judgements about the relationship between freedom per se and growth problematical, to say the least. The to be tested causal relationship is not between authoritarianism and growth but between a complex freedom structure and successful economic performance. It is important, therefore, to adequately identify the contribution of the separate channels of influence of freedom on growth - a task attempted in the next section.

(ii) Land reform: A more equal initial distribution of land (wealth) made agricultural productivity grow which fuelled growth in the urban centers. Four countries - Japan, Korea, China and Taiwan(China) - had land reform in their early development period.

(iii) Managed growth: This is one of the most popular explanations, and has gained currency lately with the U.S. administration seemingly wanting to emulate the EAC growth experience by following the managed growth prescription. The premise is that government involvement in the private sector helps facilitate rapid growth. The assumption is that many more winners than losers are picked by the bureaucrats. Support for this argument is obtained from the robust empirical observation that all EAC countries (except Hong Kong) had managed government. See Wade(1991).

(iv) High saving rates: A "taste" for higher savings, and investment, has made rapid growth possible. All EAC countries (except Korea in the sixties) have had significantly higher savings, investment, and growth.

(v) Education: The new growth theory's emphasis on externalities to education has revived interest in the explanation that EAC countries grew well because in the early sixties they had significantly higher levels of education. The sample of sixty-eight developing countries for which education data were constructed by Bhalla-Lau-Louat (see Appendix II) shows an average education level of the labor force of 2.5 years in 1960, compared with 4.7 years for the EAC countries and 2.3 years for the non-EAC countries.

(vi) Female education: As argued by WDR 1991 (Chapters 2 and 3), Bhalla-Gill(1991) and Gill-Bhalla(1992)) the more important externality is one due to higher female levels of education. In 1960, the average level of female education was 1.9 years, with EAC countries registering 3.9 years and non-EAC countries 1.8 years. Bhalla-Kharas-Nabi(1993) advance the argument that female education and increased female participation in the urban labor force was an important explainer of the Malaysian growth experience. Indeed, they suggest that export led growth was often a case of female-led growth.

(vii) Confucianism: The reasoning is based on culture - the Confucian countries grew faster because of their cultural philosophy. This view has many followers, and many still evaluate Japanese success (both past and expected future growth) in these non-economic terms.

All the arguments, except perhaps the one pertaining to Confucianism, have been seriously offered in the literature - and all have merit. It is unclear on a heuristic basis as to which of the above seven explanations should be accepted. Especially since each explanation involves at least one of the three fallacies noted below in interpreting the EAC growth experience.

Fallacies about Confucianism, authoritarianism and growth

There are three major fallacies in proffering the East Asian Confucian experience in support of a "model of growth". The fallacies are - (i) interpreting a common factor amongst the Confucian countries as an important distinguishing variable; (ii) ignoring the differing experiences within the same common factor experience; and (iii) generalizing from the Confucian experience i.e. ignoring probability.

The first fallacy is an act of near tautology. Find a factor common to East Asian countries, and offer that as an explainer. The popularity of this method was outlined above with the discussion of seven explanations for the "unique" East Asian experience. Since nothing succeeds like success, any common factor among the EAC can be construed as the factor responsible for "excess" growth.

The second fallacy pertaining to East Asia is that the conclusion - less freedom equals more growth - is more in the nature of an act of commission by omission. Both North and South Korea faced an equal, and uncertain future, after the Korean war. Yet few observers argue that North Korea has been helped by authoritarianism.²¹ Ditto the case with East and West Germany. Some have argued (see Wade(1991)) that it is the specific kind of authoritarianism (and market intervention) practiced by the East Asian economies that has led them to success. Since this kind of authoritarianism is presumed to be sui generis, the reasoning is too close to a tautology to be of comfort.

Analogous to the South Korea-North Korea example is the case of pre reform-post reform authoritarian China. Over the 1960-1991 time period the Chinese economy registered an average growth rate of 6.0 percent, and a per capita growth of 4.2 percent.²² These statistics are indicative of spectacular performance - hence, the argument that authoritarianism in China has not been costly. One can argue that the Chinese path to development via "positive" authoritarianism is worthy of emulation.

However, if one looks at the pre-reform period, 1960-77, the average growth rate was 4 percent; post reform, 1978-1991, the economy grew at more than twice the rate at 8.4 percent. This confounds the dilemma, and makes one wish for precision in the measure of authoritarianism i.e. which authoritarianism should one applaud -pre-reform or post-reform ? It may be the case that the reforms contributed to success. If so, what evidence is there that political reforms are harmful to growth ? It is manifestly the case that China did not become free with market-oriented reforms. However, it is the case that reforms brought greater freedom. In terms of gains in economic freedom, the increase was large. Thus, the Chinese economy data are strongly supportive of the argument that greater freedom leads to greater, not lesser, growth.

The third fallacy involving the miracle growth of the EAC's is more serious - the problem lies with probability. Since authoritarianism was present in the EAC's, and all of them grew well, a simple probabilistic leap would indicate that authoritarianism is good for growth. However, for every single Confucian authoritarian success, there are at least 10 non- Confucian authoritarian failures.²³ For example, a little discussed fact is that the African continent has had both a considerably lower level of freedom and a lower level of growth. For the period 1973-1990, Sub-Saharan Africa averaged a PCL average of 2.5 and an average per-capita growth rate of -0.1 percent per annum; in contrast, the Confucian countries averaged a higher PCL level of 3.9 and an average per capita growth of 4.9 percent per annum. Within Sub-Saharan Africa, the example of Botswana is noteworthy - it had a high PCL average of 5.6, and a high per capita growth of 7.4 per cent per annum.

As Raaj Sah(1992) argues,the conclusion that authoritarianism is bad for growth is to be expected on a priori grounds. "A less centralized society has the advantage of a greater diversification of its performance across a larger number of preceptors. This is because diversification here dilutes the

impact of the ability, or the lack thereof, of each preceptor on the aggregate societal performance"

(p.71, italics added).

Section 5 - Results

The growth model outlined in Section 2 is tested with data from a large sample (over 90) of countries for the time-period 1973 to 1990. The beginning year 1973 is dictated by the availability of Gastil data on political and civil liberties. (However, the results are not sensitive to the choice of a larger time-period, 1960-1990; see below). Table 2 reports the results for three specifications of the model estimated both as OLS and TSLS.

The three specifications pertain to (i) a (misspecified) preliminary model without any regional dummies; (ii) model in (i) plus five regional dummies and (iii) the basic model which is the preliminary model in (i) and an economic freedom (quasi-regional) dummy for the "Confucian" countries.

The rationale for presenting the preliminary OLS model is that it most closely corresponds to the specifications reported in the literature i.e OLS without regional dummies. Inclusion of the regional dummies is to see if any of the coefficients are affected i.e. presence of omitted variable bias.

As Table 2 shows, the results are extremely robust across the three specifications, and whether or not instrument variables were used. In the "worst" equation (TSLS with regional dummies), the political and civil liberties variable is significant at the 11 percent level. The magnitude of this variable stays relatively constant at around 0.4 for the OLS regressions, and 1.15 for the TSLS regressions. The three economic freedom variables are also generally significant across equations.

Another robust result pertains to the coefficient for initial education. Once simultaneity considerations are introduced into the equation, the coefficient of this variable drops by more than half (from 0.56 to 0.1 and under) and it becomes insignificant. The only occasion in which initial education is significant is in the mis-specified OLS regression. The insignificance of initial education in the fully specified model suggests that the oft cited result of externalities to initial education (Romer(1986),

Lucas(1988) and Barro(1991)) might have been caused by the correlation of initial education with economic and/or political freedom. The lack of significance of initial education in the growth equation in no manner implies that human capital does not play an important role in economic development; but it does imply that externalities to initial education are not present or as pronounced as claimed by the "new" growth theory.

There are two alternate ways in which the role of initial education in affecting future growth can be viewed. First, that education acts via the political (and economic) freedom variables. Second, and as strongly supported by the results reported in Table 5, initial education has an important role when accompanied by large doses of economic freedom e.g. relatively high education can be taken advantage of via the successful introduction of foreign technology.

Apart from the six specifications reported in Table 2, twelve others are reported as part of a sensitivity analysis in Tables 3 and 4. The regressions are reported for the sake of completeness; the point estimates reported below generally refer to the basic model (final TSLS regression in Table 2). The sensitivity results strongly support the following conclusion: the joint specification of both economic and political freedom variables is what yields the markedly different, and robust, results obtained in this paper.

(i) Political and Civil Liberties

A strong, and consistent, result is that political and civil liberties matter. The effect varies in magnitude (from 0.7 to 1.4 in the growth rate equations) but is (almost) invariably significant at the 5 percent level. The coefficient magnitude implies that countries can increase their growth rates by about 1 per cent per annum, ceteris paribus, for each one point move in political freedom.²⁴ Or that a one standard deviation change (1.5 points in PCL) improves the average annual growth rate by 1.5 percent. Further, the positive and significant effect of political freedom occurs after the effect of three different economic freedom variables have been incorporated - this suggests that the relationship between political freedom and growth is neither accidental nor illusory.

(ii) Economic Freedom

(ii,a) Change in the Relative Price of Tradeables: This economic freedom variable is also a measure of openness. That openness contributes to growth is now part of the conventional wisdom. The most popular measure of openness has been export growth, which critics have claimed is inappropriate because of circularity or simultaneity considerations. Given the unique price based construction of this openness measure - movement of tradeables prices towards international prices - and lack of any simultaneity of this variable with growth, the results strongly reinforce the notion that a significant determinant of success is economic openness. The results suggest that each sustained 10 percent increase in openness (over approx. 10 to 15 years) leads to an annual increase of 0.3 per cent increase in per capita income growth.

(ii,b) Presence of Black Market Premium: This economic freedom variable is consistently significant. Its magnitude is relatively unaffected by the choice of economic growth proxy or education proxy.

(Tables 3 and 4). The robust result is that economies with few external capital controls (average BMP below 6 percent) grow at about a 1.5 per cent faster rate.²⁵

(ii,c) Confucianism - The results on internal economic freedom pertaining to domestic capital markets (Confucian dummy) are invariant with respect to the different variables, or specifications. The robust result is that per - capita economic growth during 1973-1990 was higher by 3 to 4 percentage points in these countries. Total factor productivity growth, however, was only higher by about 1.7 percent, (regression 3, Table 4) suggesting that higher use of factors (capital) accounted for almost 60 percent of the extra "miracle" growth in the Confucian countries.

(iii) Convergence: The results confirm a strong tendency towards convergence - initial per capita income is consistently, and significantly, negative in the regressions. A coefficient of 1.03 (regression 6, Table 2) suggests that convergence takes place at the rate of 1.2 per cent per year - a result somewhat less than the Barro-Lee(1993a) result of convergence at 3.1 per cent per year.²⁶ One possible explanation for this difference could be due to the time-period of analysis - Barro-Lee evaluate growth from 1960 onwards while the analysis here is for data post 1972. Though not reported, it is the case that the coefficient on (log) income per capita increases once freedom (political and economic) variables are introduced into the equation. For example, the coefficient of log per-capita income increases from 0.71 (without freedom variables) to 1.03 (with freedom variables). This change translates into an increase in the speed of convergence from 0.8 per cent per annum to 1.2 percent per annum. Thus, another explanation is that Barro-Lee overestimate the role of convergence because of mis-specification i.e. exclusion of political and economic freedom variables.

(iv) Education externalities

Very little support for education externalities, as typically estimated, are obtained. Regardless of which one of three educational attainment variables are used, initial education is not significant. But as noted earlier, initial education likely affects subsequent growth in an indirect manner e.g. via political and economic freedom (economic openness - see below).

In the discussion about the theoretical basis for the growth model estimated in this paper, an interaction effect between education and openness was alluded to. Estimation of an interaction term with conventional methods (e.g. a multiplicative term involving openness and education) was inconclusive - the coefficients had the right sign, but were insignificant (possibly due to multicollinearity). However, if the sample is stratified into open/not open economies according to the black market premium,²⁷ and the De Long-Summers equipment investment variable (which is likely to be a good proxy for openness since capital goods were mostly imported by the developing countries), then two results are obtained: (i) education is not significant in explaining relative growth rates among non-open countries; and (ii) education is somewhat significant in explaining relative growth rates among open economies. The movement of a country from a low education-low openness to a high education-high openness results in 3.93 percent and 2.56 percent gain in per-capita growth depending on whether black market premium or equipment investment is used as an openness variable. (Table 5). Relatively less of this gain results in a movement from low education to high education, while a larger percentage of the gain results from greater openness by itself. The logic behind these results is straightforward - only if a country is open, can it expect to fully take advantage (via education) of foreign technology. In a closed economy, education has only limited use.²⁸ These results also help explain the consistently high magnitude (around 4 percent) and significance (t statistic greater than 3) of the Confucian dummy in the regressions reported in Tables 2, 3 and 4. Recall that these countries score high on education and

economic freedom during the early stages of their development. It is (likely) not a coincidence that their estimated excess growth is not much different than the excess observed due to the joint presence of high education and high economic freedom.

Sensitivity Analysis

As well documented by Levine-Renelt(1992), growth regressions are extremely suspect to alternate specifications. Biases in estimation can occur due to simultaneity, measurement error or specification error. The use of the institutional heritage variable should correct for simultaneous equation bias; errors due to measurement or omitted variables can be assessed via alternative specifications.

The "basic" model used is the TSLS model reported as the final regression in Table 2. Tables 3 and 4 report on twelve separate specifications. These specifications involve different dependent and independent variables. Regardless of the specifications, the results are very similar i.e freedom variables (political and economic) retain their significance, and the education externality variable, educational attainment in the initial year, is never significant. Details follow.

(i) No imputation of missing observations: Data on economic openness are available for only 31 countries, while data for all other variables are available for a minimum of 68 developing countries. The best subset regression technique (see Kmenta(1990), p. 379-388) was used to impute values for openness for countries with missing data (Regressions in Table 2). This technique involves some assumptions and it is of interest therefore to estimate the model on the reduced, "no missing data" sample. Table 3, regression (1) contains the results. Little change is observed in the magnitude of the coefficients. Standard errors on all the coefficients are larger, and the PCL variable is significant at the 17 percent level.

(ii) Estimation inclusive of developed countries: As emphasized in Section 3, the growth model estimated is applicable mostly to developing countries. The growth literature, however, is agnostic

about the inclusion of developed country data. Regression (2), Table 3 includes data on 18 developed countries in addition to the 68 developing countries. Almost no change is observed in either the magnitude or significance of any of the coefficients.

(iii) Larger time-period, 1960-1990 : - The model can be estimated for the time-period 1960-1990. However, no data for the period 1960-1972 are available for political and civil liberties. If the average level of political and civil liberties for 1973-1990 are assumed to be broadly similar to that prevailing for the period 1960-1990 (a questionable assumption) then the larger time-period regression can be estimated. This regression is reported as Regression (3), Table 3. Some change is observed in the magnitude of the coefficients; however, the significance levels stay similar to the reference regression (time-period 1973-1990). The education variable retains its insignificance, and the political freedom, and economic freedom variables remain highly significant.

(iv) Investment as a determinant of growth: Most researchers (e.g. Romer (1990), Mankiw-Romer-Weil(1990), Helliwell(1990)), De Long-Summers(1991)) include some type of an investment variable in the growth equation. While investment undoubtedly affects growth, there is a strong possibility of reverse causation i.e. higher growth leads to greater investment. Regressions (4) and (5), Table 3, report the results with investment share in the time-period 1973-1990 as an exogenous variable, and as an endogenous variable, respectively. (Regression (5) uses the investment share in the earlier time-period, 1960-72, as an identifying variable). Whether investment is assumed exogenous (as done by the other studies) or endogenous, little difference is observed in either the magnitude, or significance, of the variables in the basic model. However, what is revealing is that the investment variable becomes highly insignificant once the exogeneity assumption is relaxed (Table 3, Regression 5).

(v) Equipment Investment : De Long-Summers(1991) argue convincingly that what is appropriate in a growth equation is not a variable representing total investment, but rather the magnitude of a particular type of investment - namely, equipment investment. Table 3, regression (6) uses their data on equipment, and non-equipment investment. Like other alternative specifications, little difference is observed in either the magnitude or significance of the freedom variables (e.g. magnitude of PCL changes marginally from 1.14 to 1.0, its t-statistic from 2.53 to 2.26). However, unlike the De Long-Summers specification, the equipment investment variable now becomes insignificant (t-statistic of 1.18). This is suggestive of the fact that equipment investment is a reasonable proxy for economic openness.

(vi) Effect of Inequality on Growth: There is a revived interest in the relationship between growth and inequality. However, unlike the earlier interest in the Kuznet's curve or the effect of growth on inequality, interest now is with the reverse effect. (See Persson-Tabellini(1994) and Alesina-Rodrik(1992)). Regression (1) Table 4, reports the results for a regression with inequality in the early seventies, as represented by a Gini coefficient (data are from Fields (1989) and are the same as used by Alesina-Rodrik). Again, the results pertaining to the basic variables are relatively unaffected (but note that this regression has only 29 observations). However, initial inequality appears to be insignificant in affecting subsequent growth - coefficient of -3.70 (correct sign) but a t-value of only 0.76. (Additional results (not reported here) suggest that the inequality variable is highly sensitive to the inclusion/exclusion of the East Asian economies. See discussion on Confucian fallacies above).

(vii) Alternative dependent variable - Total factor productivity growth: - The results for the effect of freedom on total factor productivity growth (TFPG) are similar with their effect on per-capita growth- Regression 2, Table 4. (See World Bank(1991), Bhalla(1992), for details on the estimation of TFPG).

The only variable whose significance changes from the basic specification is economic openness - its t-statistic falls to 0.96 and its magnitude to 0.12. However, both the other two economic freedom variables - black market premium and Confucian economies - as well as political freedom remain significant. The magnitude on the Confucian dummy declines significantly to 1.71 from 3.98 suggesting that larger use of inputs, particularly capital, caused the contribution of this variable to be significantly higher in the growth equation . This result suggests that freedom leads to greater capital accumulation as well as greater productivity. The coefficient of initial education, like the result on economic growth, is insignificant.

(viii) Alternative dependent variable - Output growth as measured by PPP - Most of the empirical literature on the "new" growth theory has eschewed the use of conventional constant dollar data on growth and instead used the Summers-Heston (1988,1993) estimates on per-capita growth. The pioneering estimates on purchasing power parity (PPP) are invaluable when the goal is to compare levels of income across countries. It is not clear how much extra information the PPP growth rates provide, since an important input into the computation of PPP growth rates are the constant dollar growth rates themselves. Further, the PPP growth rate calculations are hampered by the omission of extra "new" data on several economies. For example, in 1970 only 22 countries were sampled for new information, with only one country in Africa; in 1975, the coverage increased to 60 countries, but only 3 of these were in Africa. In 1980, the coverage was increased to 62 countries, with 15 countries in Africa. In 1985, the coverage remained large (62 countries) but unfortunately, no countries in Latin America were sampled.

Given this spotty, and varied inter-temporal coverage, (the cross-sectional coverage remains exhaustive) the belief is that for growth rates one might be better off with the conventional data.

However, since PPP growth data have very often been used, Regression 3, Table 4 reports the results using the latest version of the Summers-Heston data. Again, the results are only marginally different from the alternative constant dollar data regressions. And the coefficient on initial education is still insignificant.

(ix) Alternative educational attainment variables: Models based on two alternative measures of educational attainment, Nehru-Swanson-Dubey(1993) and Barro-Lee(1992),²⁹ are reported as Regressions 4 and 5 in Table 4. Little difference is observed in the results and initial education level still remains insignificant.

Social Welfare

Analogous to the growth model, a reduced form model for social welfare changes is as follows:³⁰

$$\text{Social Welfare Change} = f(\text{Init. education, Economic Growth, political and civil liberties}) \quad (2)$$

Two variables of welfare change are considered - infant mortality decline and secondary school enrollment.³¹ The time-period of analysis is 1973-1990 and the results are reported in

Table 6. Three results are noteworthy:

(a) political and civil liberties are significant in explaining improvements in welfare - the magnitude of the coefficient (approx. 0.2 and 0.1 for mortality and secondary education, respectively) suggests that for each 1 point (17 percent) improvement in political freedom, there is approximately a 17 percent increase in the rate of infant mortality decline, and approximately a 10 percent increase in the rate of secondary educational enrollment.

(b) income growth is significant in the infant mortality decline equation but not in explaining secondary school enrollment changes; (c) initial education levels are strongly significant in both the equations. The elasticities are also similar at roughly unity.³² These results suggest that there is an externality to initial education - but it comes about in social welfare changes, rather than in economic growth.

Section 6: Conclusions

The purpose of this study was to empirically address the question " Does freedom lead to improved economic performance ?". Analysis of this question involved the suggestion of a "new" growth model; a model which explicitly incorporated the role of political and economic freedom in generating growth. The estimation of a model involving political freedom required use of an identification variable to remove the simultaneity bias between freedom and growth. Such a variable, colonial heritage, was offered and successfully used. Three variables for economic freedom: black market premium on domestic currency, movement in the relative price of tradeables, and a Confucian dummy representing in large part greater domestic capital market freedom (developed financial markets) were also tested.

The results pertaining to the impact of political and economic freedom on economic growth are robust. After controlling for the impact of variables like (log) initial per-capita income, initial education (three different educational attainment series), the variables pertaining to political and economic freedom are positively, and significantly, associated with improvements in economic welfare (measured by five different variables).

Data from over 90 countries for the time-period 1973-1990 were used; the results, surprisingly, are strongly in favor of the proposition that political and civil liberties, and economic freedom, help improve economic performance. Specifically, if countries are ranked a la Gastil in terms of political and civil liberties into seven categories (with USA as 7 and Burundi as 1) then, empirically, each single point increase in freedom (approximately 17 percent) leads to an increase in per-capita growth of 1 percent, and total factor productivity growth of 0.7 percent. Note that these effects are partial effects i.e. after the effects of other variables are removed. Regarding economic freedom, all three variables

tested were found to be significant. Lack of black market premium (proxy for open international capital markets) results in a 1.6 percent faster growth rate; each 10 percent (permanent) increase in domestic tradeables prices towards international prices results in a 0.2 percent increase in the growth rate.

Inclusion of both economic and political freedom in the growth model helps explain some of the “anomalies” observed by researchers; e.g. if political freedom is important, then why have countries like India, Sri Lanka, and Costa Rica grown at a considerably slower pace than the authoritarian regimes of East Asia. If a growth model has both economic and political freedom, then the mystery resolves itself; i.e. the above democracies all had low economic freedom, and the East Asian dictatorships had high economic freedom. The partial ceteris paribus effect of political freedom (and economic freedom) remains strongly positive.

Estimation of this "new" model also helps in explaining the externality to education result obtained in recent research. In particular, it is found that once freedom variables are incorporated, the positive externality effect of initial education becomes insignificant. One possible explanation of this “different” and unexpected result is that in contrast to studies that find initial education to be a significant determinant of future growth, this study incorporates economic freedom variables in the model. And the presence of these variables likely renders the coefficient on initial education to be insignificant.

At a theoretical level, it was suggested that education is likely to play an important role in the appropriate selection, and transfer, of foreign technology. This view of education is supported by the data - while education by itself does not yield increasing returns (as claimed by recent results on the "new" growth theory), there is a strong inter-active effect between education and economic freedom

(economic openness, both domestic and foreign) i.e. the joint presence of education and openness does yield increasing returns.

A simple model relating social welfare (infant mortality decline and increase in secondary school enrollment) to political and civil liberties was also tested. The results suggest that each 1 point increase in freedom leads to a 17 percent faster decline in infant mortality and a 11 percent faster increase in secondary school enrollment.

This paper has conducted extensive tests, using a large body of data, on the relationship between freedom and welfare. The conclusion is straightforward and against the conventional wisdom - more freedom is unambiguously good for both growth and social development. Since most developing countries (and Eastern Europe) were near the bottom end of the freedom range in 1987, improvement in freedom augurs well for future post-Berlin Wall economic performance. This is in direct contrast to the conventional view that freedom either is unrelated to, or hampers growth.

The results suggest that economic development is likely to be successful if countries follow the right economic and political policies. In other words, countries should get their prices right, and their politics right. The right policies can be defined ex ante - economic policies which allow the maximum freedom to individuals. As a short-cut such policies should insure that domestic tradeable prices are close to international tradeable prices, investors should be allowed freedom, and exchange rates should be allowed to move freely. The right political policies are ones that provide the maximum freedom to individuals. The short-cut to this goal is the provision of a free press and a "free-wheeling" democracy. In conclusion, free markets, and free societies, are the important ingredients to rapid economic development.

Finally, there is a forecast that follows from the above results. In recent years, countries across the developing world -Africa, Latin America, Asia and Eastern Europe - have proceeded to open up their markets and their politics. The education level in most of these countries is relatively high, at least compared to the early sixties and seventies. Thus, the nineties for the less developed countries should be the beginning of sustained and successful economic development. This high growth is likely to result in even more freedom. Growth and freedom can indeed be locked into a virtuous cycle.

Table 1

Political and Civil Liberties, 1973-1992 - Selected Countries

Country	Average PCL
<u>Africa</u>	
Botswana	5.57
Burundi	1.43
Kenya	2.80
Mauritius	5.78
Nigeria	3.35
<u>East Asia</u>	
China	1.66
Indonesia	2.82
Malaysia	4.30
<u>Middle East</u>	
Egypt	3.22
Malta	6.13
Syria	1.65
<u>Latin America</u>	
Costa Rica	7.00
Haiti	2.07
Jamaica	4.20
<u>South Asia</u>	
India	5.43
Pakistan	3.28
Sri Lanka	4.85

Notes:

- (a) Figures refer to the average of political and civil liberties for the time-period 1973-1992.
- (b) Both the political liberty and civil liberty indices are ranked from 1 (worst) to 7 (best). These indices are reversed from the original (Gastil) where 1 is best and 7 is worst.
- (c) See Appendix III for data for other countries.

Source : Freedom House, Freedom in the World

TABLE 2

Growth and Political and Economic Freedom - Basic Model (OLS & TSLS)

VARIABLES	<u>Ordinary Least Squares</u>				<u>Two Stage Least</u>	
	Basic Model				Basic	
Model.						
Constant	4.74 (2.52)	5.74 (3.31)	4.89 (1.79)	5.04 (2.33)	4.64 (2.10)	5.07 (2.88)
Log of Initial 1972 per capita income	-0.76 (2.22)	-0.64 (1.97)	-0.86 (2.89)	-1.03 (2.45)	-0.84 (2.05)	-1.03 (3.02)
Education Mean yrs. education in 1972	0.56 (3.21)	0.13 (0.91)	0.37 (2.40)	0.20 (0.71)	-0.06 (0.24)	0.12 (0.54)
<u>Freedom</u>						
Black Market Premium (0,1)	-1.82 (3.57)	-1.51 (3.30)	-1.43 (3.25)	-2.11 (3.49)	-1.54 (2.98)	-1.57 (3.23)
Economic Openness	0.28 (1.93)	0.16 (1.24)	0.25 (2.03)	0.43 (2.33)	0.30 (1.54)	0.34 (2.34)
Political and Civil Liberties	0.38 (1.74)	0.40 (2.08)	0.53 (2.79)	1.34 (2.29)	1.15 (1.58)	1.14 (2.52)
Confucian countries (0,1)			3.64 (4.68)			3.98 (4.57)
Regional Dummies	No	Yes	No	No	Yes	No
Adj. R-Squared	0.41	0.64	0.57	0.22	0.55	0.49
RMSE	1.90	1.47	1.62	2.18	1.66	1.76
# of obs.	68	68	68	68	68	68

Notes:

- (a) Dependent variable - per capita income growth, 1987 constant dollars.
 (b) The five regional dummies are (i) Sub-Saharan Africa; (ii) Latin America; (iii) East Asia; (iv) Europe, Middle East and North Africa; and (v) South Asia.
 (c) The Confucian dummy consists of the following six countries: China, China(Taiwan), Hong Kong, Japan, South Korea and Singapore.
 (d) For definition of the various variables, see Appendix I.

TABLE 3

Growth and Political and Economic Freedom - Sensitivity Analysis (a)

VARIABLES	Regressions	1	2	3	4	5	6
Constant		7.93 (3.14)	5.15 (3.32)	4.21 (2.80)	4.47 (2.94)	5.91 (2.68)	7.36 (3.38)
Log of Initial 1972 per capita income		-1.33 (2.01)	-1.03 (3.35)	-0.80 (2.76)	-1.49 (4.71)	-1.23 (2.32)	-1.38 (2.99)
Education Mean yrs. education in 1972		0.12 (0.54)	0.02 (0.10)	0.16 (1.03)	0.07 (0.36)	0.05 (0.18)	0.02 (0.12)
<u>Freedom</u>							
Black Market Premium (0,1)		-1.89 (2.17)	-1.43 (3.44)	-1.36 (3.31)	-1.20 (2.75)	-1.74 (2.31)	-1.86 (3.11)
Economic Openness		0.30 (1.99)	0.36 (2.97)	0.29 (2.21)	0.24 (1.79)	0.41 (2.16)	0.24 (1.79)
Political and Civil Liberties		0.95 (1.40)	1.23 (3.35)	0.93 (2.96)	1.20 (2.99)	1.34 (2.36)	1.00 (2.26)
Confucian countries (0,1)		4.01 (2.46)	4.40 (5.78)	3.38 (4.98)	3.10 (3.94)	3.77 (3.32)	3.87 (3.37)
Additional Variable (1)					0.16 (3.46)	0.02 (0.14)	0.16 (1.18)
Additional Variable (2)							0.02 (0.45)
Adj. R-Squared		0.24	0.47	0.52	0.61	0.46	0.53
RMSE		1.95	1.63	1.40	1.55	1.88	1.64
# of obs.		31	86	68	68	53	54

Notes:

- (a) Dependent variable - per capita income growth, 1987 constant dollars.
(b) See Notes on Sensitivity Analysis (after Table 4) for details on the additional variables used in Tables 3 and 4.

TABLE 4

Growth and Political and Economic Freedom - Sensitivity Analysis (b)

VARIABLES	Regressions	1	2	3	4	5	6
Constant		9.30 (2.88)	4.84 (1.40)	2.71 (1.86)	4.59 (2.58)	1.82 (0.72)	5.01 (2.96)
Log of Initial 1972 per capita income		-1.95 (1.45)	-0.80 (1.33)	-0.78 (2.78)	-0.86 (2.80)	-0.63 (1.55)	-0.98 (2.83)
Education Mean yrs. education in 1972		0.09 (0.37)	-0.08 (0.29)	0.07 (0.38)	0.06 (0.32)	-0.61 (1.15)	0.20 (0.74)
<u>Freedom</u>							
Black Market Premium (0,1)		-1.95 (1.45)	-1.44 (2.66)	-1.32 (3.29)	-1.30 (2.52)	-1.26 (1.88)	-1.53 (3.21)
Economic Openness		0.09 (0.44)	0.50 (2.75)	0.12 (0.96)	0.32 (1.91)	0.46 (2.29)	0.31 (2.06)
Political and Civil Liberties		1.01 (1.44)	1.25 (2.07)	0.73 (1.97)	0.93 (2.18)	1.96 (2.05)	0.95 (1.64)
Confucian countries (0,1)		3.98 (2.45)	4.84 (3.81)	1.71 (2.37)	4.59 (4.46)	5.40 (3.52)	3.88 (4.48)
Additional Var. (1)		-3.70 (0.76)					
Adj. R-Squared		0.48	0.29	0.18	0.47	0.18	0.53
RMSE		1.76	2.03	1.45	1.83	2.13	1.69
# of obs.		29	68	68	77	62	68

Notes:

- (a) Dependent variable - per capita income growth, 1987 constant dollars.
(b) See Notes on Sensitivity Analysis (next page) for details on the additional variables used in Tables 3 and 4.

Sensitivity Analysis - Notes for Tables 3 and 4

The basic model used is the two stage least squares model reported as the final regression in Table 2. This model is estimated for the time-period 1973-1990 and uses data for 68 countries defined as developing in 1960 (including Japan). The educational attainment data is from Bhalla-Lau-Louat(1990). The per capita initial income in 1972, and the per capita growth rate, are calculated on the basis of World Bank / IMF data on constant dollar values. Any modification to this structure is reported as part of sensitivity analysis below.

Regressions in Table 3:

- (1) Uses only 31 observations which have original (rather than imputed) data on the relative price of tradeables, or economic openness.
- (2) Uses data on 18 developed countries which increases the sample to 86 observations.
- (3) Uses data from 1960 onwards, rather than 1973 onwards as with the basic model. This estimation has the drawback that the political and civil liberties data for 1960-1990 is assumed to be the same as that from 1973-1990.
- (4) Uses the share of investment in GDP (IGDP) as an additional explanatory variable.
- (5) Assumes that IGDP is not exogenous and uses IGDP from 1960-1972 as an instrument for IGDP 1973-1990.
- (6) Uses the investment (equipment and non-equipment) data from De Long-Summers(1991) as additional explanatory variables. These investment data are assumed to be exogenous (as do De Long-Summers) to the growth process.

Sensitivity Analysis - Notes for Tables 3 and 4 (contd)

Regressions in Table 4:

- (1) Uses inequality in income distribution around 1972 (Gini coefficient, Fields (1989)) as an additional explanatory variable.
- (2) Uses the latest data from Summers-Heston on purchasing power parity basis (growth rates and initial income in 1972).
- (3) Uses total factor productivity growth (calculated from production function estimation, see World Bank (1991) and Bhalla(1993)) as the dependent variable.
- (4) Uses the educational attainment data as reported by Barro-Lee(1992). As reported in the text, use of the new Barro-Lee(1993b) data does not affect the results.
- (5) Uses the educational attainment data as reported by Nehru-Swanson-Dubey (1992).
- (6) The instrument used in the basic model to identify political and civil liberties was based on colonial heritage. This variable classified British colonialism into two: sub-Saharan Africa and non sub-Saharan Africa. In this regression, British colonialism appears as a single variable.

TABLE 5

Inter-Active Effect Effect of Education and Freedom on Growth

	Low Economic Freedom (BMP > 15.41)	High Economic Freedom (BMP <=15.41)
Low Education (Educ <= 3.16)	-0.33 (18)	0.59 (16)
High Education (Educ > 3.16)	0.47 (14)	3.60 (20)
	Low Economic Freedom (Eqinv <= 2 % of GDP)	High Economic Freedom (Eqinv > 2 % of GDP)
Low Education (Educ <= 3.16)	0.16 (19)	0.26 (7)
High Education (Educ > 3.16)	0.18 (10)	2.72 (18)
	Low Political Freedom (PCL <= 3.24)	High Political Freedom (PCL > 3.24)
Low Education (Educ <= 3.16)	-0.35 (25)	1.35 (9)
High Education (Educ > 3.16)	1.87 (9)	2.22 (25)

Notes:

- (a) All the freedom variables are separated into low and high categories on the basis of the median observation for the countries selected. The education level is the years of education in the initial year, 1972.
- (b) Equipment investment data are from De Long-Summers (1993).
- (c) The figures represent the average per-capita growth rate of the countries in the sample for the period 1973-1990. The number of countries is indicated in the parantheses.

Table 6

Social Welfare Change and Freedom

Variable	<u>Infant Mortality</u> <u>Decline</u>	<u>% Secondary School</u> <u>Enrollment</u> <u>Changes</u>
Constant	-0.93 (2.69)	-2.86 (12.72)
Per-Capita Income growth	-0.19 (2.94)	0.03 (0.80)
Mean years of education, 1972	-0.38 (4.36)	0.45 (8.13)
Average level of PCL	-0.21 (1.83)	0.12 (1.61)
Adj. R-squared	0.59	0.73
# of obs.	67	66

Notes:

- (a) Dependent variables are the average of the change in the logistic of infant mortality, and secondary school enrollment, 1973-1990.
- (b) The data on mean years of education of the labor force in 1972 are from Bhalla-Lau-Louat.
- (c) Data on political and civil liberties are from Gastil, and are the average for the time-period 1973-1992.

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Appendix I

Construction of Variables

(i) Economic Growth: Given data on output, population and labor, per-capita and per worker growth rates can easily be derived (time-period 1973-1990). The PPP dollar growth rates are based on the Summers-Heston(1993) data (latest set available) and pertain to the time-period 1973-1992.

(ii) Political and civil liberties (PCL): Simple average of the variable reflecting (a) political and (b) civil liberties. The data are from 1973 to 1992.

(iii) Black market premium (BMP): This is a dummy variable which takes on the value of zero if the average premium (defined as the percentage difference between the official and unofficial exchange rates) was less than 6 percent during 1973-1990, and 1 if greater. Six percent represents approximately the 25th. percentile of the distribution of the average premium.

(iv) Economic Openness: It is hypothesized that economic openness is correlated, if not synonymous, with economic liberty. Bhalla-Lau(1992) use this variable in assessing the impact of openness on productivity growth. This measure reflects the movement towards international prices of the tradeable goods in an economy. National income series on construction, services and GDP were used to derive an index of tradeables (defined as GDP minus Construction minus Services). Actual tradeable price data from Kravis et. al (1975 and 1980) were used to convert a relative to US index series (US is defined as the most open economy) to a relative to US price series.

This primary relative price series (call it z_0) is used to construct the changes in economic openness series. Three steps are involved: (a) First, percentage changes are calculated and assigned to z_01 if the change was progressive (increase in prices if z_0 below 1 and decrease in prices if z_0 above 1); and assigned to z_02 if the change was regressive (decrease in prices if z_0 below 1 and increase in prices if z_0 above 1). Note that this assignment means that when z_01 is non-zero z_02 is zero and vice-versa. (b) Empirically, the coefficients of z_01 and z_02 are found to be of (statistically) equal magnitude and opposite in sign. (See WDR(1991), p. 159; z_0 has a plus sign and z_02 a negative sign). (c) Consequently, the two effects can be added and the term ($z_01 - z_02$) yields the change in openness in any given year. (This result is equivalent to the statement that improvement in openness is the same irrespective of whether the relative prices in a country moved from 2 to 1 or from 0.5 to 1). The average of this series yields the economic openness term in Appendix III, and is the value used in the regressions.

(v) Education of labor force in 1972: Three variables are used (separately) to measure the average education of the labor force in 1972. See Appendix II.

(vi) Total factor productivity growth (TFPG): The definition of productivity growth is straightforward - it is that portion of growth that is "unexplained" by growth in inputs. The inputs considered are physical capital, labor and land.

Construction of physical capital is based on the perpetual inventory method using gross investment data, a depreciation rate of 5 percent, and the assumption that the initial capital stock was zero in 1945. These estimates of capital are then adjusted by a capacity utilization rate (derived by the convex hull

method) to obtain estimates of utilized capital. Several instruments are then used to obtain an "instrumented" estimate of capital growth. See Bhalla-Lau(1992) for details.

(vii) Social Indicator Variables: Data on infant mortality and secondary school enrollment (percentage) are used and transformed into a logistic. This is done since both infant mortality and secondary school enrollment are subject to a floor (approximately zero) or a ceiling (100 percent). The average annual change in this logistic is used in the regressions.

Appendix II

Educational Attainment

Presently, three different data sets exist on the educational attainment of the population. These data sets are potentially of great use for research on human capital, growth theory, production functions etc.

(i) Bhalla-Lau-Louat : This series was constructed in two stages. The first stage involved estimation for the World Bank's 1990 World Development Report, Lau-Jamison-Louat(1991). The methodology employed in this pioneering study was as follows: school enrollment data from the sixties and seventies were used to project enrollment backwards to 1902. Total number of person-school-years in the working age population were then computed using the perpetual inventory method.

The above methodology was revised by Bhalla-Lau-Louat(1990); especially see Louat(1991). Enrollment data from 1950 were used, when available; an improved backcasting method was employed; and most importantly, mortality data were used to adjust the education cohorts. Male and female enrollments were used separately; the reported figure is a simple average of the two.

This is the only education series which reports data for both female and male education. Unfortunately, lack of migration data meant that the education series could not be adjusted for this important phenomenon. This non-adjustment leads to biased estimates for Hong Kong and Israel. For these two countries, Census data as reported in Pscharapoulos-Arrigada(1986) were used to "benchmark" the figures. The education figures are for the working-age population 15-65 years.

(ii) Nehru-Swanson-Dubey (1993): This series replicates the Bhalla-Lau-Louat methodology with one addition - the enrollment data are adjusted for drop-out rates. Separate data for male and female education are not available, though the figures reported are for the entire working age population, 15-64 years. The figures are not adjusted for migration and are therefore likely to be in error for Israel (no figures are reported for Hong Kong).

(iii) Barro-Lee (1992): Census data are used for population above 25 years of age. Separate data for male and female education are not available though the reported figure is for the entire population.

The results in this paper are invariant with respect to the education series chosen. A revised version of Bhalla-Gill(1992) contains an analysis of the similarities and differences in the three series. A peculiar feature of the Barro-Lee series is that for several countries (especially in Latin America) it shows a declining level of average education. For some African countries, the education level in the Barro-Lee data is either too low (0 and 0.4 years for Egypt in 1960 and 1965) or too high (6.74 for Tanzania in 1960).

Appendix III

Country	Data					
	lydu	bmp	zopen	zydu	zysh	tfpg
algeria	7.72	147.70	.	0.78	1.78	-1.88
argentina	7.93	49.39	-0.34	-0.78	-0.63	-0.86
bangladesh	4.87	117.61	.	1.92	3.28	0.93
barbados	8.41	9.31	.	1.66	0.50	.
benin	5.88	2.16	.	-0.16	-0.91	-1.80
bolivia	6.65	37.36	-5.50	-0.75	-1.29	-1.34
botswana	6.02	18.19	.	7.42	5.95	.
brazil	7.22	32.28	0.02	1.78	2.51	-0.36
burkina faso	5.43	2.16	.	1.44	2.14	-0.05
burma	5.33	341.69	.	1.01	2.75	.
burundi	5.16	20.40	.	1.54	1.72	-2.06
cameroon	6.47	2.16	-3.55	1.71	2.67	1.12
central afr	6.10	2.16	.	-1.25	-1.05	0.00
chile	7.30	44.79	-6.14	1.08	-0.13	-0.71
china	4.75	79.66	.	5.64	5.72	1.02
colombia	6.77	7.91	0.45	1.97	1.95	-0.23
congo	6.55	1.62	.	2.15	2.20	1.58
costa rica	7.30	55.98	-1.69	1.06	1.07	-2.05
cote d'ivoir	6.95	2.16	.	-1.53	-1.23	-1.18
dominican r	6.35	36.92	.	1.03	1.01	.
ecuador	6.65	22.05	.	2.19	2.20	.
egypt	5.85	40.77	.	4.05	4.41	1.23
el salvador	6.90	58.22	-1.63	-0.39	-0.03	-3.09
ethiopia	4.86	82.70	.	-1.36	0.13	-0.13
gabon	8.31	1.86	.	-0.67	3.67	-3.40
gambia	5.61	8.21	.	0.78	0.72	.
ghana	6.21	324.50	.	-1.21	-1.42	-1.30
greece	8.18	6.93	.	1.79	1.82	0.16
guatemala	6.75	21.05	.	0.05	0.20	-1.62
guyana	6.29	265.10	.	-1.71	-1.64	.
haiti	5.85	12.82	.	-0.76	0.01	-3.05
honduras	6.70	85.83	.	0.17	1.18	.
hong kong	8.13	-0.52	.	5.48	6.04	2.05
hungary	7.33	186.84	-0.75	1.96	3.22	0.98

Country	lydu	bmp	zopen	zydu	zysh	tfpg
india	5.46	30.85	-1.49	2.40	1.26	0.61
indonesia	5.50	737.27	1.57	4.17	4.45	-1.27
iran	8.24	335.82	.	-1.58	0.81	.
iraq	8.36	92.19	.	-5.63	0.41	.
israel	8.84	16.62	.	1.39	1.30	0.54
jamaica	7.47	27.53	-4.46	-1.24	-2.11	-2.88
japan	9.45	2.34	-3.06	3.25	3.15	0.45
kenya	5.81	18.69	-3.24	0.79	-0.49	-0.20
korea,s	6.97	18.15	-0.29	7.30	6.26	1.66
lesotho	4.93	6.82	.	3.49	5.70	.
liberia	6.64	0.00	.	-2.99	-2.62	-2.13
madagascar	5.88	26.96	-3.75	-2.51	-3.20	-2.14
malawi	5.00	43.00	.	0.49	-0.64	-0.06
malaysia	7.00	1.18	1.36	4.21	3.55	-0.61
mali	5.41	3.94	.	0.63	0.57	0.29
malta	7.43	3.21	.	6.63	5.89	3.55
mauritania	6.38	85.17	.	-1.04	-1.46	-4.37
mauritius	6.85	5.20	.	4.53	4.26	0.42
mexico	23	5.05	-1.39	1.44	1.00	-1.74
morocco	6.38	9.14	-3.85	2.07	2.21	-0.57
nepal	4.93	35.55	.	1.05	1.30	.
nicaragua	7.69	2124.60	.	-4.16	-2.38	-4.08
nigeria	5.76	96.65	.	-0.30	-2.11	-4.07
pakistan	5.36	45.85	-3.08	2.87	2.61	1.36
panama	7.50	0.00	.	0.40	1.58	0.36
papua n.gui	6.84	14.85	.	-0.60	-1.35	.
paraguay	6.47	26.25	.	2.34	2.84	.
peru	7.10	45.04	-2.11	-1.22	-0.23	-0.65
philippines	6.25	10.85	0.39	0.83	1.40	-1.34
portugal	7.89	4.84	-5.84	2.31	2.78	-0.57
rwanda	5.65	37.81	.	-0.42	0.71	-1.88

Country	lydu	bmp	zopen	zydu	zysh	tfpg
senegal	6.60	2.16	-7.73	-0.56	-0.29	-0.29
sierra leone	5.09	164.60	.	-0.56	-2.65	.
singapore	8.12	0.85	.	5.36	5.41	0.56
south africa	7.79	4.05	.	-0.15	0.35	.
spain	8.67	2.58	-5.02	2.12	1.56	-0.22
sri lanka	5.52	61.15	-3.74	3.25	2.26	-0.69
sudan	6.55	103.05	.	-0.39	-0.92	-0.91
swaziland	6.63	12.37	.	0.29	-0.43	.
syria	6.69	108.44	0.22	1.88	2.19	-1.48
taiwan	7.57	0.00	.	6.46	5.93	1.72
tanzania	5.13	127.16	.	-0.20	1.48	-1.37
thailand	6.18	0.25	0.46	5.21	4.23	1.14
togo	6.02	2.16	.	-0.71	-0.23	-2.12
trinidad	8.33	38.20	.	-0.64	-1.60	.
tunisia	6.80	33.10	.	2.17	1.95	.
turkey	6.77	23.41	.	2.42	2.07	0.43
uganda	5.99	295.82	.	-1.38	0.20	-0.83
uruguay	7.58	12.47	.	1.14	0.97	.
venezuela	8.06	33.52	-9.07	-0.93	0.80	-3.00
yugoslavia	7.57	18.88	.	1.53	2.54	0.31
zaire	5.76	104.03	.	-2.60	-2.45	-3.50
zambia	6.05	111.12	-4.75	-2.76	-4.18	-1.21
zimbabwe	6.55	65.30	0.25	-0.23	0.29	-1.07

Country	pcl	educ1	educ2	educ3	insth	zimrh	zenrh
algeria	2.13	2.36	1.28	2.16	4	-4.21	-0.55
argentina	4.78	5.71	7.60	6.22	5	-3.06	0.25
bangladesh	3.68	2.52	1.08	2.46	2	-1.86	-1.45
barbados	6.95	.	11.17	.	2	-6.40	1.72
benin	1.53	1.09	0.27	.	4	-1.77	-1.85
bolivia	4.30	3.34	4.56	3.84	5	-3.07	-0.69
botswana	5.57	.	2.31	.	1	-5.30	-1.21
brazil	4.72	2.93	3.96	2.89	5	-2.83	-0.76
burkina faso	2.76	0.26	.	.	4	-1.59	-3.40
burma	1.40	.	1.41	1.49	2	-2.82	-1.29
burundi	1.43	0.97	.	.	1	-1.43	-3.47
cameroon	2.20	2.18	1.48	1.40	4	-1.90	-1.43
central afr	1.57	1.03	0.57	.	4	-1.61	-2.05
chile	3.07	5.76	7.07	5.81	5	-7.82	0.36
china	1.66	3.20	.	3.14	5	-4.29	-0.19
colombia	5.45	3.11	4.77	3.21	5	-3.79	-0.23
congo	1.72	2.89	.	.	4	-0.52	.
cote divoire	2.53	0.89	.	0.72	4	-1.8	-1.61
costa rica	7.00	4.96	6.51	5.78	5	-6.48	-0.28
dominican rep	5.63	.	4.70	.	5	-2.25	-0.43
ecuador	4.70	.	4.80	3.88	5	-3.18	-0.10
egypt	3.22	3.37	1.53	3.37	2	-4.83	0.25
el salvador	4.53	3.23	3.40	3.31	5	-3.68	-1.14
ethiopia	1.47	0.28	.	0.18	4	-1.11	-2.27
gabon	2.13	2.76	.	.	4	-2.00	-1.72
gambia	5.45	.	0.51	.	1	-1.81	-1.89
ghana	2.45	2.76	2.73	2.74	1	-1.52	-0.53
greece	5.75	6.08	6.27	7.78	5	-4.86	1.74
guatemala	4.20	2.25	2.48	2.54	5	-2.66	-1.80
guyana	3.85	.	6.06	.	2	-2.68	0.37
haiti	2.07	1.97	1.44	1.76	4	-2.10	-1.93
honduras	4.57	.	2.89	3.03	5	-3.21	-1.18
hong kong	4.93	6.73	6.19	.	2	-5.18	0.47
hungary	3.00	7.05	8.77	.	5	-4.27	0.81

Country	pcl	educ1	educ2	educ3	insth	zmrh	zenrh
india	5.43	2.78	2.85	2.17	2	-2.42	-0.73
indonesia	2.82	3.13	3.83	2.71	4	-4.00	-0.84
iran	2.35	.	1.52	1.67	5	-2.01	-0.26
iraq	1.14	.	1.44	2.08	5	-2.28	-0.11
israel	5.85	8.86	9.24	4.40	3	-4.80	1.05
jamaica	5.85	6.66	4.50	6.97	2	-5.32	0.39
japan	6.78	8.88	8.68	10.69	3	-5.04	2.68
kenya	2.80	2.45	2.02	2.25	1	-2.31	-1.54
korea,s	3.50	6.06	6.26	4.80	3	-5.81	1.30
lesotho	3.03	.	4.61	.	1	-2.11	-1.49
liberia	2.57	1.55	1.24	1.10	1	-1.89	-1.53
madagascar	2.97	2.53	.	2.15	4	-2.45	-1.34
malawi	1.53	3.23	3.11	3.41	1	-1.49	-3.26
malaysia	4.30	6.78	4.93	4.10	2	-5.46	-0.00
mali	1.57	0.49	0.37	0.32	4	-1.30	-2.55
malta	6.13	6.41	7.64	.	2	-3.60	1.03
mauritania	1.78	0.25	.	.	4	-1.84	-2.33
mauritius	5.78	5.99	4.78	5.23	1	-5.56	-0.14
mexico	4.28	3.93	4.76	4.02	5	-3.49	-0.18
morocco	3.57	1.81	.	1.21	4	-3.60	-1.08
nepal	3.72	.	0.14	.	2	-1.53	-1.44
nicaragua	3.28	3.53	3.14	.	5	-3.68	-0.66
nigeria	3.35	1.24	.	1.28	1	-2.03	-1.56
pakistan	3.28	1.63	1.62	1.38	2	-1.90	-1.67
panama	2.93	5.69	6.17	5.39	3	-4.10	0.37
papua n.gui	5.84	.	1.05	.	2	-3.62	-2.04
peru	4.25	5.31	5.13	4.49	5	-2.89	0.17
philippines	3.93	6.80	6.34	5.79	3	-2.74	0.57
portugal	5.72	4.98	1.87	4.48	5	-6.78	0.05
rwanda	1.97	2.19	0.81	2.08	1	-0.92	-3.36

Country	pcl	educ1	educ2	educ3	insth	zimrh	zenrh
senegal	3.90	0.91	3.02	0.77	4	-2.60	-2.01
sierra leone	2.85	.	1.24	1.02	1	-1.83	-1.86
singapore	3.35	5.62	4.96	4.38	2	-5.75	0.46
south africa	2.82	.	5.83	.	1	-3.18	.
spain	5.50	5.61	5.33	5.81	5	-5.27	1.78
sri lanka	4.85	7.80	6.45	5.10	2	-5.17	0.29
sudan	2.40	0.83	0.62	0.69	1	-2.19	-1.69
swaziland	2.85	.	3.15	.	1	-1.63	-0.46
syria	1.65	4.11	2.56	3.18	5	-4.34	0.02
taiwan	3.25	5.72	5.49	.	3	.	.
tanzania	2.05	1.17	4.39	1.06	1	-0.68	-3.36
thailand	4.15	5.36	5.15	4.49	5	-5.03	-1.03
togo	1.80	1.78	0.88	.	4	-2.38	-1.18
trinidad	6.35	.	6.46	.	2	-3.09	0.80
tunisia	2.78	.	1.39	2.65	4	-5.84	-0.84
turkey	4.68	3.35	2.66	2.87	5	-5.06	-0.53
uganda	2.35	1.64	1.92	2.04	1	0.69	-2.77
uruguay	4.20	.	6.74	5.75	5	-4.72	0.46
venezuela	6.32	3.95	4.30	4.00	5	-2.14	-0.26
yugoslavia	2.47	5.95	7.24	.	5	-3.86	1.37
zaire	1.60	3.11	1.94	2.38	4	-1.87	-1.09
zambia	3.00	2.21	3.23	2.17	1	-0.99	-1.61
zimbabwe	3.13	3.48	3.81	3.48	1	-3.70	-1.45

Definitions of Variables:

- (i) lydu: Log of income per capita, constant 1987 dollars, in 1972
- (ii) bmp : Average black market premium, 1973-1990. A dummy variable based on this variable is used in the regressions; this dummy has a value 1 if the bmp is less than 6 percent, and zero otherwise.
- (iii) zopen: Economic openness; average percentage change in the relative price of tradeables, 1973 onwards. End date varies with availability of data. See Appendix I for details.
- (iv) zydu : Average rate of per capita growth, constant 1987 \$, 1973-1990.
- (v) zysh : Average rate of per capita PPP growth, 1973-1990.
- (vi) tfpg : Average rate of total factor productivity growth, 1973-1987.
- (vii) pcl : Average of political and civil liberties, Gastil data, 1973-1992.
- (viii)educ1: Mean years of education of the labor force in 1972, Bhalla-Lau-Louat data, population 15-65 years.
- (ix) educ2: Mean years of education of the labor force in 1972, Barro-Lee data, pop. > 25 years.
- (x) educ3: Mean years of education of the labor force in 1972, Nehru et. al. data, pop. 15-65 years.
- (xi) insth: Institutional or Colonial heritage classification;
 - insth = 1, British rule, Africa
 - insth = 2, British rule, Non-Africa
 - insth = 3, American influence
 - insth = 4, Non-British rule
 - insth = 5, Independent
- (xii) zimrh: Average percentage change in the logistic of infant mortality 1973-1990.
- (xiii)zenrh: Average percentage change in the logistic of secondary school enrollment, 1973-1990

Notes:

¹ See Dasgupta(1990),Sirowy-Inkeles(1990),World Bank (1991) and Przeworski-Limongi(1993) for a sampling of this rapidly burgeoning literature.

² This conclusion was explicit in Hayek (1944) and implicit in Friedman(1962). However, as Sirowy-Inkeles(1988) document in their review, and Przeworski-Limongi(1993) concur, little empirical support has been found(to date) for this "radical" proposition.

³ The traditional Solow model emphasizes the role of factor inputs; the "new" growth theory models a la Romer(1986), Lucas(1988) and Barro(1991) emphasize the increasing returns externality associated with higher initial levels of education.

⁴ The only other study to use an instrument variable to identify the political freedom and growth relationship is Helliwell(1992); his identifying variable is Bollen's (1990) estimate of political freedom in 1965. Thus, Helliwell's instrument suffers from the drawback that it is more in the nature of a lagged variable.

⁵ Gastil(1973) recognized the problems associated with evaluating countries on the basis of the form of government and instead offered measures of freedom - in particular, measures of political and civil rights. His measures are the ones most used in the literature and also are used in this paper.

⁶ A prime example of this is the introduction of high yielding varieties of wheat and rice which were developed in the late sixties. These varieties needed adaptation to succeed in local conditions - and the education level of domestic researchers, as well as the education level of the farmers, were important in affecting the improvement in agricultural productivity.

⁷ See the special issue of the Journal of Monetary Economics, Dec. 1993 for a sampling of the various determinants.

⁸ The political freedom role has been emphasized by Sen (1983) and Sen-Dreze(1991). Sen argues that the presence of a free press (greater freedom) has contributed significantly to the absence of famines (better economic performance) in India.

⁹ As Section 4 documents, the East Asian experience has been used to support almost any thesis of development.

¹⁰ The rationale for separating the British colonial experience into two categories is because of the assumption that the effectiveness of colonialism in affecting institutional development was dependent on initial conditions; e.g. the initial level of education of the indigenous population. In any case, the results are unaffected if British colonialism is combined as one variable - see Regression (6), Table 4.

¹¹ A separate colonialism category for Japan was created i.e. Korea, and China (Taiwan). None of the results are affected by this alternative specification.

¹² One possible counter-argument is that the colonizers conquered (choose ?) their colonies on the basis of future growth potential. If so, one would need to argue, based on growth performance in the 1970s and 1980s, as to which colonialists (British, French, Dutch etc.) had more accurate vision in the nineteenth century.

¹³ The terms rights, liberties and freedom are used inter-changeably in this paper.

¹⁴ Non-trade taxes diminish freedom, but public good expenditures can enhance economic freedom. The net influence of domestic taxation and domestic expenditure on economic freedom is a subject for future research.

¹⁵ The original Gastil rankings are the exact opposite i.e. 1 is best and 7 is worst but have been transformed for this paper in order that a positive sign in the regressions indicates a positive relationship.

¹⁶ An alternative measure of freedom is available i.e. Humana(1986). Unfortunately, this index is only available for 1985. For that year, its correlation with the Gastil average for political and civil liberties is quite high - 0.86. Thus, it is unlikely that the results are affected by the choice of a particular freedom variable.

¹⁷ This measure was first developed by Bhalla and Lau for use in the World Bank's World Development Report (1991). See Appendices I and II for details.

¹⁸ The possible role of Confucianism in affecting growth is not unlike that of the Protestant ethic. Since this is a paper about developing countries, the role of the latter is ignored.

¹⁹ TFPG is based on the following estimate of the production function:

$$Y = .415 * K + .043 * T + d*ui + ei$$

(15.9) (1.25)

where Y, K, T reflect percentage changes in output per worker, capital per worker and land per worker. Dummy d is a dummy which takes on the value 0 and 1 for 1960-1973, and 1974-1987 respectively. ui reflects individual country dummies and ei is the error term. The coefficient of ui for the time-period 1974-1987 is the estimate of TFPG used in this paper. Further, this estimate is inclusive of human capital. See Appendix I for construction of data on capital.

²⁰ Infant mortality decline and increases in secondary school enrollment are both represented by the change in the logistic of the variable. For example, the logistic of infant mortality at a point in time is given by

$$\text{imrl} = \ln[(\text{infant Mortality}/1000)/\{1 - (\text{Infant Mortality}/1000)\}]$$

The preference for the logistic is based on the assumption that improvements in the indicators are more difficult the closer one gets to the floor (around 0 for infant mortality) or the ceiling (100 percent for secondary school enrollment).

²¹ Indeed, as suggested by Farrukh Iqbal, one could ask that if South Korea proves that authoritarianism works, what does North Korea prove ?

²² Incidentally, these growth rates, along with the World Bank assessment of Chinese per capita income as \$ 370 in 1990, suggest that China had a per capita income of approximately \$ 92 in 1960, 1987 prices. This figure is put in perspective by noting that with this income, China ranks as the poorest developing country in 1960 followed by Lesotho (\$93), Burundi (\$99) and Ethiopia (\$103). The Summers-Heston data are not so ridiculous - out of 118 countries China ranks 66 from the bottom.

²³ As Dasgupta plaintively asks " How is one to choose a benign dictator"?

²⁴ Note that a one point move in political freedom is about 16 percent.

²⁵ Note that these regressions report long-term effects. A country not only has to have a low black market premium, but should have done so, on average, for the entire 1973-1990 time-period.

²⁶ The formula for converting the coefficient on initial log per-capita income into a speed of convergence is given in Barro-Sala-i-Martin (1992). It is given by $(1 - \exp(-bT))/T = -c$, where c is the estimated coefficient, b is the convergence rate and T (equal to 18 years, 1973-1990) is the observation interval.

²⁷ Lack of enough observations prevented the use of this method with the economic openness (relative prices) variable.

²⁸ The result on inter-action is consistent with the Solow growth model. This model assumes that technology is costlessly available to all countries. The emphasis here is that governments do not allow this manna to flow so easily, and that education is needed to take full advantage of new technology.

²⁹ The Barro-Lee data used and reported in Appendix III is based on their 1992 paper. Revisions to these data are reported in Barro-Lee (1993b). Use of the revised Barro-Lee data does not affect any of the conclusions - initial education remains insignificant (0.25, t-statistic of 1.18) and PCL remains significant (0.76, t-statistic of 1.93).

³⁰ Unlike the growth equation, this model does not have an "initial per-capita income" variable. This is because there is no theory of "convergence" relating to infant mortality or secondary education. Any convergence due to natural limits is already included in the specification of the logistic form for the dependent variable. Further, lack of relevance of simultaneity means that political and civil liberties can enter the regression in their normal (non instrumented) form.

³¹ See Bhalla-Gill(1992) for the specification and estimation of a detailed model of social welfare changes.

³² In Bhalla-Gill(1992) it is shown that female education has a greater bearing on welfare changes (both infant mortality and secondary school enrollment) than male education.