Economic Freedom and The Environment for Economic Growth

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Since the publication of Adam Smith's inquiry into the nature and causes of the wealth of nations, economists have been trying to understand what causes economic growth. While Smith stressed the importance of gains from trade, economies of scale, and economic policy, modern growth theory is based on the work of Solow (1956). In the Solow model, the inputs of capital, labor, and technology provide the source of growth. More recent advances in growth theory (Lucas 1988; Romer 1990) interpret labor broadly to include human capital, and therefore, investments in education, training, "learning by doing," and other forms of human capital acquisition. Within this production function framework, growth is produced by the inputs. Thus, countries grow by acquiring more inputs—by increasing physical capital, improving the education and skill level of workers, and adopting improved technology.

While it is undeniably valuable to know how various inputs affect output, it also has become clear that simply expanding the availability of inputs does not always, by itself, lead to economic growth. The last decade has seen a renewal of interest in the effects of institutions and policies on economic growth. Building of the work on Bauer (1972) and North (1990), this "new growth theory" stresses the importance of an economic environment that is consistent with the development and efficient use of resources. Various studies have found that monetary and price stability, secure property rights, and openness to international exchange exert independent impacts on economic growth.[1] The proponents of the new growth theory argue that inappropriate institutions and policies can cause growth to fall well below its potential. In many ways, this recent view is simply a return to the earlier focus of Smith.

The recent developments have led analysts toward an examination of the environment conducive to economic growth. Relying on Gastil's (1978) data, Scully (1988, 1992) and Leblang (1996) have found that there is a positive correlation between economic and political freedom on the one hand and economic growth on the other. Goldsmith (1995) also finds that both economic and political freedoms are correlated with economic growth. Przeworski and Limongi (1993, 1997) find little evidence that political systems affect growth, but do not examine economic institutions. Gwartney, Lawson and Block (1996) have developed a measure of economic freedom that is independent of political freedom, and their analysis indicates that there is a simple correlation between economic freedom and growth. Barro (1996a) concludes that after adjusting for various economic factors, democracy has, if anything, a negative impact on economic growth. Building on this prior work, this paper seeks to identify more precisely the characteristics conducive to economic growth and the key institutional and policy factors that contribute to differences in growth rates across countries.

Section I outlines the characteristics of the Gwartney-Lawson-Block measurement of economic freedom. Sections II and III incorporate this measure of economic freedom and several other factors into an empirical model and analyze the model's explanatory power with regard to cross-country differences in economic growth. Section IV focuses on the potency of political freedom compared to economic freedom as a source of economic growth. These empirical results show strong support for the idea that economic freedom has a quantifiable positive effect on economic growth.

I. Measurement of Economic Freedom

The idea that economic freedom leads to economic growth is one of the most durable in all of economics. Adam Smith (1776) explained how the invisible hand of the marketplace enhanced the wealth of nations, and David Ricardo (1821) advocated free trade as a means of promoting economic

growth. This section discusses how the concept of economic freedom can be quantified. This quantification serves several purposes. First, if economic freedom can be measured, it is then possible to test directly the strength of the relationship between economic freedom and economic growth. Second, a quantification of economic freedom also makes it possible to compare its contribution with that of other factors contributing to economic growth. The measurement of economic freedom used in this paper is based on the index developed by Gwartney, Lawson, and Block (1996), which was subsequently updated by Gwartney and Lawson (1997) and published by the Economic Freedom Network, an organization of research institutes in 47 countries. This Economic Freedom Network index (henceforth, the EFN index) is based on the premise that the central elements of economic freedom are personal choice, freedom of exchange, and protection of private property.[2] The EFN index contains 17 components designed to identify the consistency of a nation's institutions and policies with economic freedom. See Appendix 1 for a listing of the 17 components.[3]

Data for each of the components were compiled for more than 100 countries and statistical procedures used to assign each country a component rating ranging between zero and ten. A higher component rating—a rating toward the ten end of the scale—was indicative of institutions and/or policies more consistent with economic freedom. The component ratings were then aggregated to derive a country summary rating for the years 1975, 1980, 1985, 1990, and 1995.

The EFN index is subdivided into four major areas: (1) money and inflation, (2) structure of the economy, (3) takings and discriminatory taxes, and (4) international trade. The components in the monetary area reflect the availability of *sound money* to the citizenry. The components in the economic structure area are indicators of *reliance on markets* rather than the political process to allocate goods and resources. In the takings area, the index is designed to measure the degree to which governments *treat individuals equally* rather than engage in transfer activities and impose discriminatory taxes.

Finally, the components in the international area are designed to measure the presence of policies consistent with *free trade*. Sound money, reliance on markets, avoidance of takings and discriminatory taxes, and freedom of international exchange are the key elements of economic freedom captured by the EFN index.[4]

In order to achieve a high rating in the EFN index, governments must do some things but refrain from doing others. They must create a stable monetary environment and allow individuals to choose for themselves. But they must also keep taxes low, allow most production to take place in the private sector, and refrain from creating barriers to both domestic and international trade. The EFN economic freedom index thus measures the degree to which countries approach a textbook description of free markets. Furthermore, the index highlights the distinction between economic freedom on the one hand and political and civil liberties on the other. The nature of political decision-making may well exert an impact on economic growth, but political and economic freedom are two different—albeit related—concepts. A later section of the paper considers the distinction between the two and analyzes their independent impact on economic growth.

II. Economic Freedom and Growth

Preliminary analysis by Gwartney, Lawson, and Block (1996) indicated that their economic freedom index was correlated with economic growth. This section explores the relationship between the two in more detail.

Economic theory provides several reasons why one would expect that incomes in a freer economy will grow more rapidly and eventually rise to higher levels than those in economies that are less free. Secure property rights and low taxes will encourage individuals to engage more intensely in productive activity. Greater freedom of exchange will expand the realization of gains derived from

specialization and economies of scale. Freedom to enter and compete in markets will help to both promote efficiency in production and direct resources toward their most highly valued uses. Furthermore, entrepreneurial discovery of new and improved technologies, better methods of production, and opportunities that were previously overlooked is an important source of economic growth (Kirzner 1973, 1997; Schumpeter 1912). Economic freedom facilitates this process and thereby promotes growth.

At any point in time, however, it would not be surprising to observe a loose relationship between the *level* of economic freedom and growth of income. A measure of economic freedom in 1995, for example, does not reveal how long that level has been present. Based on the level alone, it is not possible to determine whether economic freedom has been increasing or decreasing in recent years. Neither is it possible to determine if there are good reasons to expect that there will be a change in the level of economic freedom in the near future. All of these factors will influence growth and therefore weaken the relationship between growth and level of economic freedom.

There is more reason to expect a consistent relationship between *changes* in economic freedom and growth. Credibility, however, is vitally important here. Because credibility must be earned, there will often be a time lag between a change in economic freedom and when the change exerts an impact on economic activity. For example, when a nation moves toward a more stable monetary policy or more liberal trade regime, it will take time to convince decision-makers that the change is permanent, rather than temporary. This will be particularly true if opposition to the more liberal policy remains strong or if the nation has a history of policy shifts and instability. Both historical factors and current political conditions will influence the length of time required to earn credibility. Thus, the time period between when there is a change in policy that influences economic freedom and its impact on the growth of output is likely to vary, and in some cases it may be quite lengthy. This long and variable

time lag will weaken the empirical relationship between changes in economic freedom and changes in the growth rate of output in the short run.

Given the presence of factors that will weaken the short-term relationship between economic freedom (both level and change) and economic growth, the potential relationship between the two should be examined over relatively lengthy periods of time. Throughout, we will follow this procedure.

Table 1 illustrates the relationship between economic freedom, as measured by the EFN index, and the growth rate of per capita real GDP during the 1980-1995 period.[5] We were able to obtain the required data throughout this time period for 82 countries.[6] Because we expect that changes in economic freedom may exert a lagged impact on growth, the 1975 *level* of economic freedom along with the *change* in the rating over the four subsequent five-year intervals are included as independent variables. All five of the economic freedom variables are significant at the 99% level. These variables alone produce an adjusted R^2 of .31, showing that economic freedom by itself explains a substantial amount of the variation across countries in the long-term growth rates.

Equation 2 of Table 1 adds the ratio of investment to GDP as an independent variable. The R^2 rises to .40, and all of the variables in the model are highly significant. This equation indicates that differences in economic freedom and the investment to GDP ratio explain 40 percent of the variation in cross-country growth rates. The third regression adds a measure of human capital to the regression equation. The human capital variable is the change in the estimated mean years of schooling between 1980 and 1995 for the population age 25 years and over. Based on the series developed by Barro and Lee, this variable proxies the growth of human capital in a country's labor force during the 1980-1995 time period.[7] The human capital variable has the expected sign, but it is statistically insignificant. Furthermore, it adds nothing to the overall explanatory power of the regression (the adjusted R^2

remained .40).

Changes in the dependency ratio during 1980-1995 is added to the model in Equation 4. The dependency ratio is equal to the number of persons younger than age 15 and older than age 65 divided by the number of persons of working age (persons age 15 to 65 years). The change in this variable is an indicator of the degree to which persons of working age have increased as a share of the total population. It is included because of the hypothesis that economic growth in some nations has been enhanced by a reduction in their dependency ratios and accompanying increase in persons of prime working age.[8] The change in the dependency ratio has the expected negative sign, but it is statistically insignificant. While neither the human capital nor the dependency ratio variables are significant, their inclusion into the model exerts little or no impact on the significance of the economic freedom and investment/GDP ratio variables.[9]

An analysis of Table 1 indicates that both economic freedom and investment in physical capital are important determinants of growth. Of course, the economic freedom index encompasses several elements of the economic environment, including monetary and price stability, access to alternative currencies, size of government, reliance on markets, low taxes, and openness to international markets. Regardless of the specification run, the economic freedom variables remain both robust and highly significant.

An increase of one unit in the initial *level* of economic freedom in 1975—five years prior to the primary period under consideration—was associated with approximately a 0.45 percent increase in the economic growth rate during the 1980-1995 period. Both the coefficients and t-ratios indicate that *changes* in economic freedom exerted an even more potent impact. Although the dependent variable is the annual growth rate of per capita GDP during 1980-1995, the *changes* in economic freedom during 1975-1980 and each of the three subsequent five-year intervals were strong enough to exert a

statistically significant impact on the average growth rate over the fifteen year period. Holding other things constant, a one unit increase in economic freedom during the five years immediately prior to 1980 was associated with approximately a 1 percentage point increase in growth during the following 15 years. Because it takes time to earn credibility, the positive relationship between a change in economic freedom and the growth rate over a lengthy time period subsequent to the change is an expected result.

The impacts of the changes in economic freedom during 1980-1985 and 1985-1990 were of similar size. Even after changes in the physical and human capital and the other economic freedom variables are held constant, a unit change in economic freedom during each of the five-year periods during the 1980s was associated with a 1 percent or more increase in growth of per capita real GDP throughout the period. The size of the coefficients indicates that a one unit change in economic freedom during each of the five-year intervals of the 1980s exerts approximately the same impact on economic growth as a ten unit increase (for example, from 20% to 30%) in investment as a share of GDP. This certainly suggests that changes in economic freedom exert a strong impact on long-term growth rates. Even increases in economic freedom over the last five year period (1990-95) were large enough to exert a statistically significant effect on the average growth rate for the entire 15 year period. These results are consistent with the view that the institutional and policy environment of an economy is a major explanatory factor underlying long-term cross-country differences in economic growth.

In order to provide perspective on the magnitude of the effect of economic freedom on economic growth, note that the mean of the EFN index ranged from a low of 4.4 (in 1975) to a high of 5.6 (in 1995) and the standard deviation was either 1.3 or 1.4 during each of the years. Thus, with about two-thirds of the countries falling within one standard deviation on either side of the mean, a country that improved its economic freedom by moving from the bottom one-sixth of the countries up to

the average could expect its long-term growth rate to increase by approximately 1.4 percentage points. Similarly, a country that moved from the bottom sixth to the top sixth could expect to increase its economic growth rate by about 2.8 percent. Differences of this magnitude are not unreasonable considering the variation in growth rates across countries. For the 1980-95 time period examined here, average annual growth rates for the whole period ranged from 7.5 percent to *minus* 4.1 percent—a total range of 11.6 percentage points—with a standard deviation of 2.4 percentage points. The estimated impact of economic freedom on growth is large, but the estimates are reasonable considering the substantial differences in actual growth rates over prolonged periods of time.

How sensitive are the results to the time period under consideration? Tables 2 and 3 report regression results for similar specifications, this time using ten-year time periods. Table 2 considers the effect of economic freedom and other factors on GDP growth from 1975 to 1985. When comparing Tables 1 and 2, there are some differences worth noting. When the investment/GDP ratio is included in the model, the *level* of economic freedom at the beginning loses its statistical significance.[10] However, changes in economic freedom both between 1975 and 1980 and between 1980 and 1985 are once again highly significant in all of the various specifications of the model.[11]

As in Table 1, the investment to GDP ratio remains significant, and the economic freedom variables along with investment/GDP yield an R^2 of .40. Once again, both the human capital and dependency ratio variables are insignificant. Neither do they add to the explanatory power of the model.

Table 3 provides results for specifications like those of Table 2, but for the 1985-95 time period. During this time period, all of the economic freedom measures, including the level variable in 1985, were significant at the 99% level. The investment/GDP ratio was also highly significant. Taken together, the economic freedom variables and the I/GDP ratio once again explain approximately 40

percent of the cross-country variation in growth rates during 1985-1995. As for the prior time periods, the human capital and dependency ratio variables remain insignificant.

The results presented in this section indicate that economic freedom, as measured by the EFN index, exerts a strong and robust impact on economic growth. Using other specifications and other variables not reported here, the changes in the economic freedom variables remain statistically significant regardless of the time period analyzed, and regardless of what other variables are included in the model.[12] Our analysis indicates that differences in economic freedom along with differences in investment in physical capital explain about 40 percent of the variation in cross-country growth rates during the last two decades.[13]

III. Does Growth Cause Economic Freedom?

The strong correlation between economic growth and economic freedom shown in the previous section naturally raises a question of causality. Perhaps economic freedom is correlated with growth because countries that grow faster tend to become freer. The idea that causation may go in both directions appears quite reasonable. If countries that become freer grow faster, this positive experience with increased freedom might lead them to increase their economic freedom even more in the future. If so, economic growth in one period should be positively correlated with economic freedom in the future. To test this proposition within the empirical framework of the previous section, the regressions in Table 2, with the average annual growth rate from 1975 to 1985 as the dependent variable, were run again, but the change in economic freedom variables from 1985 to 1990 and from 1990 to 1995 were included as additional independent variables. If economic growth is correlated with future economic freedom, those variables should be statistically significant. The results are reported in Table 4.

A comparison of Tables 2 and 4 shows that the results are affected very little by including future changes in economic freedom as additional independent variables. All of the coefficients and their t-ratios in Table 4 are close to their values in Table 2, and the two new variables representing future economic freedom are never statistically significant. All have t-ratios less than 1. Because higher growth from 1975-85 is not correlated with more economic freedom after 1985, the evidence suggests that higher economic growth does not cause an increase in future economic freedom.

An even simpler regression model provides further evidence. A regression was run with the average annual growth rate in per capita GDP from 1985 to 1995 as the dependent variable (the same dependent variable as in Table 3) and with the change in economic freedom from 1975 to 1985 as the only independent variable. The coefficient for the change in economic freedom variable was 1.03 (with a t-ratio of 3.51) and the adjusted R^2 was .12. These findings illustrate a strong correlation between the change in economic freedom in the earlier decade and the growth rate of GDP in the next decade. Then the variables were lagged the other way, so the change in economic freedom from 1985 to 1995 became the dependent variable and the GDP growth rate from 1975 to 1985 was used as the independent variable. This produced a coefficient of -1.39 (with a t-ratio of 0.27) and a negative adjusted R^2. Economic growth in the earlier decade had no effect on economic freedom in the following decade.

There is a plausible argument that faster economic growth could lead to increases in economic freedom, but we find no evidence that this is so. The evidence shows that the causation runs in one direction only: Increases in economic freedom lead to more rapid economic growth, but higher growth does not enhance future economic freedom. This finding has important policy implications because it suggests that positive growth effects from economic freedom will not necessarily lead to more economic freedom. Rather, explicit political decisions must be made to create the economic

institutions that are conducive to growth, and the past successes of economic liberalization do not make it any more likely that a country will continue to enhance its economic freedoms.

IV. Political and Economic Freedom

The EFN economic freedom index deliberately excludes measures of political freedom, but political freedom may also be related to economic growth. The most widely used measure of political freedom across countries is the Freedom House rating of political and civil liberties which has been published annually for almost four decades. The political freedom ratings consider such factors as whether public officials are elected, the participation of citizens in the electoral process, and the freedom of opposition parties to organize and compete. An independent media, freedom to organize and assemble, and protection of religious and ethnic minorities are important elements of the Freedom House civil liberties ratings. Each country is rated on a one to seven scale, with a rating of one assigned to the countries that are "most free." Because the political and civil liberties ratings are highly correlated, we combined the two into a single index. Taken together, they provide a measure of the extent that citizens are free to organize, persuade, and compete in an open political process.

Using the Freedom House measure, Table 5 explores the impact of political freedom on economic growth and compares effects of political freedom with those of economic freedom. Regression 1 in Table 5 is exactly like regression 1 in Table 1, except that political freedom variables are substituted for the economic freedom variables. A comparison of the two regressions shows that economic freedom is much more closely correlated with economic growth than political freedom. While the level of political freedom in 1975 is positively correlated with economic growth from 1980 to 1995 and its significance is similar to that for the level of economic freedom, the changes in the political freedom variables are both less significant and less robust than their economic freedom

counterparts. In fact, the changes in political freedom during 1980-1985 and 1990-1995 are both insignificant and the latter even has the wrong sign. Furthermore, when the political freedom variables are used as independent variables, the R^2 is .12, compared with an R^2 of .31 for the economic freedom variables.

Equation 2 of Table 5 adds the economic freedom variables to those in regression 1. With both the economic and political freedom variables in the model, four of the five economic freedom variables are significant at the 99% level and the fifth is significant at the 90% level of confidence. By way of comparison, only two of the five political freedom variables are significant, and these only at the 90% level. This provides further evidence that the components of the economic freedom index are more closely correlated with economic growth than the components of the political freedom index. Furthermore, note that the adjusted R^2 jumps from .12 to .33 when the economic freedom variables are added, whereas when the political freedom variables are added to the economic freedom variables (comparing Table 1, Equation 1 with Table 5, Equation 2), there is only a slight increase (from .31 to .33) in the R^2. In contrast with economic freedom, these results indicate that political freedom explains little of the variation in growth rates across countries.

When the investment/GDP ratio, the change in the dependency ratio, and the change in human capital are added to the model, the adjusted R^2 rises to .45. The inclusion of the political freedom variables does not substantially alter the impact of the other variables. In the broader model, the investment/GDP ratio is highly significant (99% level of confidence), as are the changes in economic freedom during 1975-1980 and 1980-1985. The initial levels of both political and economic freedom, the changes in political freedom during 1975-1980 and 1985-1990, and the change in economic freedom between 1990 and 1995 were also significant at lower levels of confidence. The change in the human capital variable was also marginally significant, while the dependency ratio remained

insignificant in this broader model.

Taken as a whole, Table 5 indicates that political freedom is much less potent than economic freedom as a determinant of economic growth. While there is a positive relationship between political freedom and growth (Equation 1), this relationship is considerably weaker than was true for economic freedom. More importantly, independent of economic freedom, political freedom explains only a small portion of the variation in growth rates across countries.[14] This indicates that adoption of policies consistent with economic freedom—greater reliance on markets, freedom of exchange, openness of the economy, and monetary stability—is more important as a source of economic growth than the nature of the political regime.

V. The Economic Environment Conducive to Growth

The creation of an environment conducive to economic growth is a complex process involving several interrelated factors. The EFN economic freedom index captures some of those factors, but other factors undoubtedly play a role as well. The index does not measure some aspects of economic freedom—most notably, the degree to which nations protect property rights and adhere to a rule of law. Keefer and Knack (1997) give empirical evidence that these factors are crucially important, and Leblang (1996) draws the same conclusion using different data. Also important are factors emphasized by neoclassical growth models: investment in human and physical capital, and the use of appropriate technology. But when institutional factors are taken into account, investment and technology are undoubtedly less important from a policy standpoint. If nations create an environment conducive to economic growth, they will attract investors and provide people with the incentive to enhance their human capital.

Investment in capital goods, education, and technology alone will not produce economic

growth. The experience of the former centrally-planned economies illustrates this point. These economies had both very high rates of capital formation and rapid improvements in schooling levels. Despite this growth of inputs and the optimistic expectations of many growth economists, the economic performance of centrally- planned economies was unimpressive. Slow growth and poor living standards eventually led to the collapse of the major centrally-planned systems. In contrast, this paper shows that there is a strong and robust relationship between increases in economic freedom, as measured by the EFN index, and economic growth. This relationship is present even after measures of physical and human capital are taken into account. Furthermore, the causation runs only in one direction—from increases in economic freedom to a more rapid rate of economic growth. Our findings also show that economic freedom has substantially more explanatory power than political freedom and civil liberties as a determinant of economic growth.

For obvious reasons, empirical work has a tendency to emphasize things that are easy to quantify over other factors that may be more important, but harder to quantify. It is relatively easy to measure capital and labor, for example, compared to the institutional features of the economic environment within which capital and labor are employed. Despite the difficulties involved in its measurement, however, our analysis indicates that an institutional environment supportive of economic freedom is a key determinant of economic growth. More economic freedom produces more economic growth.

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Footnotes

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[1] See Barro (1996b), Easterly and Rebelo (1993), Knack and Keefer (1995), Kreuger (1993, 1997), Landau (1986), and Torstensson (1994) for papers that have focused on various of these factors as sources of growth.

[2] The EFN index is an outgrowth of a series of conferences conducted by the Fraser Institute of Vancouver, British Columbia. Several leading economists, including Nobel Prize winners Milton Friedman, Gary Becker, and Douglass North, participated in the conference series and contributed to the development of the index. The Freedom House (Messick 1996) and Heritage Foundation (Johnson, Holmes, and Kirkpatrick 1998) have also developed indexes of economic freedom. In addition, the International Institute for Management Development (1997) and World Economic Forum (1997) publish a cross-country measure of "competitiveness." While there are substantial differences in methodology among these measures, Hanke and Walters (1997) have shown that the country ratings from all of these sources were highly correlated in the mid-1990s. The EFN index, however, is the only one that is available for a lengthy time period (1975-1995). Thus, it is the only one that can be used to examine the impact of changes in economic freedom on changes in income levels over a substantial period of time.

[3] Most of the components of the EFN index are objective variables derived from regularly published sources. In the few instances where subjective evaluations would influence the component rating (for example, equal treatment under the law and freedom of entry into business), the ratings were based on the evaluations of other researchers. Thus, the methodology minimizes the significance of "judgment calls" and subjective evaluations on the part of the authors.

[4] See Gwartney, Lawson, and Block (1996) for additional details concerning the construction of the index.

[5] The data for growth rate of real GDP, investment as a share of GDP, and dependency ratio are from the World Bank, *1997 World Indicators*, CD-Rom. The human capital measure (mean years of schooling of persons age 25 years and older) are from Barro and Lee (1993). The original Barro-Lee data provided data through 1990. Data from the late 1980s were used to project the figures to 1995. The economic freedom data are from Gwartney and Lawson (1997).

[6] The data set includes all countries for which the data were available for each of the independent variables of Table 1. Regressions not reported in the paper confirm that the results for the less comprehensive models (for example, models like those of Table 1, equations 1 and 2) are robust when run for a larger set of countries. In order to facilitate comparability, however, all of the regression equations for the 1980-1995 time period are for the same 82 countries for which all of the variables used in the regressions were available. The data set is a good sampling of the world's countries, with the exception of former Eastern bloc and other centrally-planned economies. Russia, Eastern European nations, North Korea, and Cuba are not represented, for example. They were omitted because of lack of data, but it may make sense to exclude them in any event to remove a possible source of bias emanating from the transitional nature of these economies during the last decade.

[7] We also tested the human capital estimates developed by the World Bank (Nehru and Dhareshwar 1996) within the framework of the basic model. Because this measure of human capital was persistently less significant than that of Barro and Lee, we only report the results for the latter.

[8] Krugman (1994) stresses the importance of changes in the dependency ratio as an explanatory factor underlying the rapid growth of several Asian economies during recent decades. Also see Williamson and Higgins (1997) and Mason, Lee, and Miller (1997) for additional evidence on the contribution of changes in the dependency ratio to economic growth.

[9] When the dependency ratio was included in the model and the human capital variable omitted, the t-ratio for the change in the dependency ratio rose, but the variable was still insignificant at commonly accepted levels. The dependency ratio may not be a very good measure of the share of the population involved in productive activity across countries. For example, at extremely low levels of income, the productive-age population may be comprised mostly of

persons age 15 years to 55 years. However, as growth leads to higher levels of income, improvements in health and increases in life expectancy, the productive-age population may expand to encompass persons age 20 years to 65 or even 70 years. Cross-country differences of this type reduce the reliability of the dependency ratio as an indicator of the proportion of population involved in productive activity. This unreliability may explain why the dependency ratio was not a more robust determinant of economic growth.

[10] In Table 1, the initial level of the economic freedom variable was for the five years prior to the beginning of the period over which GDP growth was analyzed. The economic freedom index data only go back to 1975, so it was not possible to include economic freedom in 1970 in Table 2 to make the specification identical to that of Table 1.

[11] In the broader models of Table 2, the level of economic freedom in 1975 was not statistically significant in explaining growth from 1975 to 1985. One possible explanation is that the world oil shock in the early 1970s had impacts on national growth rates that overwhelmed their economic freedom status. Nevertheless, changes in economic freedom still had a large impact on economic growth.

[12] While we did not run as many regressions as Sala-i-Martin (1997), we did consider models with independent variables for per capita GDP at the beginning of the period, a dummy indicating LDCs, and an alternative measure of the human capital variable. None of these variables were statistically significant and their inclusion in the model did not alter the pattern of significance for the economic freedom variables.

The insignificance of the per capita income and LDC variables indicates that the impact of economic freedom on the growth of real GDP is independent of initial level of income and development. These findings are consistent with the view that both high-income developed economies and LDCs can enhance their growth rates by adopting policies and institutions more consistent with economic freedom. But there is also a corollary. LDCs that fail to liberalize their economies will fall below their potential and they will fail to grow as rapidly as freer economies, including those with a higher per capita GDP. Thus, there is no guarantee of convergence. This is consistent with Quah's (1996) findings that growth rates across countries tend to be distributed bimodally.

[13] See Easton and Walker (1997) for additional evidence that economic freedom contributes to the growth process and enhances the explanatory power of growth models that include physical and human capital as sources of growth.

[14] These findings are highly consistent with those of Barro (1996a) and Przeworski and Limongi (1993, 1997).

Table 1: Economic Freedom and Other Determinants of Economic Growth: 1980-1995

Independent Variables	Dependent Variable = Annual Rate of Change in Per Capita Real GDP: 1980-1995 *(t-ratios in parenthesis)*			
	(1)	(2)	(3)	(4)
Economic Freedom: 1975	0.61*** (3.15)	0.45** (2.43)	0.31 (1.44)	0.17 (0.81)
Change in Economic Freedom: 1975-80	1.02*** (3.07)	0.89*** (2.87)	0.96*** (2.79)	0.77** (2.38)
Change in Economic Freedom: 1980-85	1.63*** (4.71)	1.37*** (4.16)	1.26*** (3.75)	0.80** (2.37)
Change in Economic Freedom in 1985-90	1.08*** (2.97)	1.03*** (3.06)	0.79** (2.06)	0.46 (1.23)
Change in Economic Freedom in 1990-95	0.95*** (3.59)	0.73*** (2.92)	0.54* (1.83)	0.49* (1.76)
Investment/GDP: 1980-95		0.14*** (3.63)	0.11*** (2.71)	0.07 (1.65)
Human Capital: 1980			0.13 (1.30)	-0.13 (1.01)
Change in Human Capital: 1980-95			0.56* (1.97)	0.63** (2.34)
Dependency Ratio: 1980				-0.07*** (3.42)
Change in Dependency Ratio: 1980-95				-0.05** (2.02)
Constant	-3.10	-5.18	-5.09	2.81
Adj R^2	.31	.40	.42	.49
n	82	82	82	82

* Significant at 90% level.
** Significant at 95% level.
*** Significant at 99% level.

Table 2: Economic Freedom and Other Determinants of Economic Growth: 1975-1985

Independent Variables	Dependent Variable = Annual Rate of Change in Per Capita Real GDP: 1975-1985 *(t-ratios in parenthesis)*			
	(1)	(2)	(3)	(4)
Economic Freedom: 1975	0.36* (1.77)	0.22 (1.26)	0.17 (0.94)	0.10 (0.54)
Change in Economic Freedom: 1975-80	0.95** (2.49)	0.88** (2.69)	0.72** (2.17)	0.61* (1.80)
Change in Economic Freedom: 1980-85	1.46*** (3.87)	1.30*** (4.00)	1.26*** (3.91)	1.08*** (3.12)
Investment/GDP: 1975-85		0.19*** (5.44)	0.20*** (5.33)	0.19*** (4.82)
Human Capital: 1975			0.14 (1.62)	-0.04 (0.30)
Change in Human Capital: 1975-85			-0.29 (0.71)	-0.35 (0.88)
Dependency Ratio: 1975				-0.04 (1.63)
Change in Dependency Ratio: 1975-85				-0.03 (0.95)
Constant	-0.29	-4.16	-4.36	2.80
Adj R^2	.18	.40	.41	.42
n	82	82	82	82

* Significant at 90% level.
** Significant at 95% level.
*** Significant at 99% level.

Table 3: Economic Freedom and Other Determinants of Economic Growth: 1985-1995

Independent Variables	Dependent Variable = Annual Rate of Change in Per Capita Real GDP: 1985-1995 *(t-ratios in parenthesis)*			
	(1)	(2)	(3)	(4)
Economic Freedom: 1985	1.02*** (5.59)	0.84*** (4.71)	0.89*** (4.43)	0.73*** (3.60)
Change in Economic Freedom: 1985-90	1.59*** (4.42)	1.52*** (4.52)	1.63*** (4.34)	1.45*** (3.99)
Change in Economic Freedom: 1990-95	1.10*** (3.99)	0.86*** (3.24)	0.93*** (3.10)	0.90*** (3.12)
Investment/GDP: 1985-95		0.15*** (3.75)	0.14*** (3.17)	0.08* (1.87)
Human Capital: 1985			-0.05 (0.51)	-0.32** (2.45)
Change in Human Capital: 1985-95			0.39 (0.90)	0.65 (1.55)
Dependency Ratio: 1985				-0.07*** (3.14)
Change in Dependency Ratio: 1985-95				-0.04 (1.31)
Constant	-4.94	-7.09	-7.20	0.45
Adj R^2	.31	.40	.40	.40
n	91	91	91	91

* Significant at 90% level.
** Significant at 95% level.
*** Significant at 99% level.

Table 4: The Effect of Future Freedom on Present Growth

Independent Variables	Dependent Variable = Annual Rate of Change in Per Capita Real GDP: 1975-1985 *(t-ratios in parenthesis)*			
	(1)	(2)	(3)	(4)
Economic Freedom: 1975	.35 (1.55)	0.20 (1.01)	0.12 (0.54)	0.00 (0.01)
Change in Economic Freedom: 1975-80	1.04** (2.62)	0.93*** (2.74)	0.68* (1.92)	0.53 (1.46)
Change in Economic Freedom: 1980-85	1.55*** (3.59)	1.36*** (3.70)	1.23*** (3.55)	0.97** (2.46)
Change in Economic Freedom in 1985-90	0.40 (0.94)	0.31 (0.85)	0.13 (0.03)	-0.18 (0.42)
Change in Economic Freedom in 1990-95	0.07 (0.22)	-0.02 (0.08)	-0.14 (0.45)	-0.19 (0.58)
Investment/GDP: 1975-1985		0.20*** (5.42)	0.20*** (5.26)	0.18*** (4.66)
Human Capital: 1975			0.15 (1.42)	0.0 (0.01)
Change in Human Capital: 1975-1985			-0.26 (0.62)	0.30 (0.73)
Dependency Ratio:				0.04 (1.62)
Change in Dependency Ratio: 1975-1985				-0.04 (1.08)
Constant	-0.44	-4.27	-4.3	-4.17
Adj R^2	0.15	0.38	.40	0.38
n	82	82	82	82

*Significant at 90% level.
**Significant at 95% level.
***Significant at 99% level.

Table 5: Political Freedom As a Determinant of Economic Growth: 1980-1995

	Dependent Variable = Annual Rate of Change in Real Per Capita GDP: 1980-1995 *(t-ratios in parenthesis)*		
	(1)	(2)	(3)
Level of Political Freedom: 1975	0.53** (3.43)	0.14 (0.80)	0.14 (0.67)
Change in Political Freedom: 1975-80	0.63* (1.95)	0.57* (1.85)	0.42 (1.28)
Change in Political Freedom: 1980-85	0.21 (0.55)	-0.23 (0.64)	-0.31 (0.93)
Change in Political Freedom: 1985-90	0.83** (2.25)	0.58* (1.75)	0.53* (1.71)
Change in Political Freedom: 1990-95	-0.07 (0.28)	-0.26 (1.11)	0.09 (0.37)
Level of Economic Freedom: 1975		0.65*** (3.04)	0.29 (1.31)
Change in Economic Freedom: 1975-80		1.07*** (2.96)	0.74** (2.13)
Change in Economic Freedom: 1980-85		1.61*** (4.50)	0.88** (2.48)
Change in Economic Freedom: 1985-90		0.68* (1.67)	0.36 (0.96)
Change in Economic Freedom: 1990-95		0.93*** (3.08)	0.54* (1.82)
Investment/GDP: 1980-1995			-0.08* (1.88)
Human Capital: 1980			-0.16 (1.10)
Change in Human Capital: 1980-1995			0.52* (1.90)
Dependency Ratio: 1980			-0.06*** (2.67)
Change in Dependency ratio: 1980-1995			0.05* (1.88)
Constant	-1.75	-3.89	0.89
Adj R^2	.12	.33	0.49
n	82	82	82

* Significant at 90% level.
** Significant at 95% level.
*** Significant at 99% level.

Appendix 1: Components of the Index of Economic Freedom

I. **MONEY AND INFLATION** (Protection of money as a store of value and medium of exchange)

A. Average Annual Growth Rate of the Money Supply During the Last Five Years Minus the Potential Growth Rate of Real GDP

B. Standard Deviation of the Annual Inflation Rate During the Last Five Years

C. Freedom of Citizens to Own a Foreign Currency Bank Account Domestically

D. Freedom of Citizens to Maintain a Bank Account Abroad

II. **ECONOMIC STRUCTURE** (Use of markets relative to government)

A. General Government Consumption Expenditures As a Percent of Total Consumption (Private & Government)

B. The Role and Presence of Government-Operated Enterprises

C. Price Controls—the Extent that Businesses are Free to Set Their Own Prices (This variable is included in only the 1990 and 1995 Indexes.)

D. Freedom of Private Businesses and Cooperatives to Compete in Markets (This variable is included only in the 1995 Index.)

E. Equality of Citizens Under The Law and Access of Citizens to a Nondiscriminatory Judiciary (This variable is included only in the 1995 Index.)

F. Freedom from Government Regulations and Policies that Cause Negative Real Interest Rates

III. **TAKINGS AND DISCRIMINATORY TAXATION** (Freedom to keep what you earn)

A. Transfers and Subsidies as a Percent of GDP

B. Top Marginal Tax Rate (and income threshold at which it applies)

C. The Use of Conscripts to Obtain Military Personnel

IV. **RESTRAINTS ON INTERNATIONAL EXCHANGE** (Freedom of exchange with foreigners)

A. Taxes on International Trade as a Percent of Exports Plus Imports

B. Difference Between the Official Exchange Rate and the Black Market Rate

C. Actual Size of Trade Sector Compared to the Expected Size

D. Restrictions on the Freedom of Citizens to Engage in Capital Transactions with Foreigners

Appendix 2: List of 82 Countries Included in Table 1	
1 Algeria	42 Kenya
2 Australia	43 Malawi
3 Austria	44 Malaysia
4 Bahrain	45 Mali
5 Bangladesh	46 Mauritius
6 Barbados	47 Mexico
7 Belgium	48 Nepal
8 Benin	49 Netherlands
9 Bolivia	50 New Zealand
10 Botswana	51 Nicaragua
11 Brazil	52 Niger
12 Cameroon	53 Norway
13 Canada	54 Pakistan
14 Chile	55 Panama
15 Colombia	56 Paraguay
16 Congo	57 Peru
17 Costa Rica	58 Philippines
18 Cyprus	59 Portugal
19 Denmark	60 Rwanda
20 Dominican Republic	61 Senegal
21 Ecuador	62 Sierra Leone
22 El Salvador	63 Singapore
23 Fiji	64 South Africa
24 Finland	65 South Korea
25 France	66 Spain
26 Germany	67 Sri Lanka
27 Ghana	68 Sweden
28 Greece	69 Switzerland
29 Guatemala	70 Syria
30 Haiti	71 Taiwan
31 Honduras	72 Tanzania
32 Hong Kong	73 Thailand
33 Iceland	74 Togo
34 India	75 Trinidad/Tobago
35 Indonesia	76 Tunisia
36 Iran	77 Turkey
37 Ireland	78 United Kingdom
38 Israel	79 United States
39 Italy	80 Uruguay
40 Jamaica	81 Venezuela
41 Japan	82 Zambia