**Institutions, Economic Freedom, and Cross-Country Differences in Performance**

**Presidential Address of the 2008 SEA Conference**[*]

**James Gwartney**[**]

I have spent most of my research time during the past two decades working on the *Economic Freedom of the World* (EFW) project. The purpose of this project was straightforward: the development of a comprehensive measure that would reflect the consistency of the institutions and policies of a large set of countries with economic freedom. In this presentation, I will briefly review the history of this project, outline the measure, and consider ten things we have learned as the result of this tool and the research that has utilized it. Most of my work in this area has been co-authored with Robert Lawson. Thus, I would like to begin by acknowledging Bob's huge contribution and expressing my appreciation to him for it.

## I. History of the EFW Project

The project was the result of a series of six Liberty Fund conferences during 1986-1994 that were hosted by Michael Walker, the President of the Canadian Fraser Institute and Milton and Rose Friedman. After participating in a 1984 Mont Pelerin Society session on George Orwell's Classic novel *1984*, Walker was convinced that it was important to differentiate between economic freedom and other factors such as political freedom, democracy, and civil liberties. In Walker's judgment, failure to correctly differentiate among these terms was a source of confusion that needed to be corrected. Over lunch following the MPS session, Walker convinced Milton and Rose Friedman to join him in hosting a series of conferences designed to clearly define and measure economic freedom. Neil McLeod, who was the president of The Liberty Fund Foundation at that time, was at the same luncheon table and he agreed to arrange for the necessary financing.

The participation of the Friedmans in this project was of crucial importance. This made it possible for the small Liberty Fund conferences, typically involving about 15 participants, to attract some of the world's best minds, including Gary Becker, Peter

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[**]James Gwartney is the Gus A. Stavros Eminent Scholar Chair at Florida State University

Bauer, Douglass North, William Niskanen, Alvin Rabushka, and Gordon Tullock, in addition to the Friedmans. I remember reading a letter in 1989 inviting me to this conference that would focus on how to measure economic freedom. My initial reaction was that this was a hair-brained idea. How could anyone measure something as complex and multi-dimensional as economic freedom? But then I noted the invitation was from Milton Friedman, so I immediately fired back my acceptance.

Obviously, the measurement of economic freedom was, and continues to be, a complex task, but there are historic parallels. In the 1920s, the architects of national income accounting faced a similar problem. National income was also highly complex and multi-dimensional. The initial measurement efforts were imperfect, and debate continues with regard to precisely how various items should be handled.

Measuring instruments are designed to help us better understand the real world. As Lord Kelvin stated 125 years ago:
"In physical science the first essential step in the direction of learning any subject is to find principles of numerical reckoning and practical methods for measuring some quality connected with it. I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the state of Science, whatever the matter may be." [PLA, vol. 1, "Electrical Units of Measurement", 1883-05-03]

Reflecting the views of its founder, Michael Walker, the Fraser Institute's motto was, "If it matters, measure it." This motto was an underlying inspiration for the development of the *Economic Freedom of the World* measure.

From the very beginning, transparency and objectivity were central elements of the EFW project. Milton Friedman constantly reminded participants that we were developing a scientific instrument. It was vitally important that the derivation of each component was carefully specified and the methods used to assign component values for each country clearly outlined. This means that the measure can be duplicated by others and, given the specifications of the index, it will not make any difference whether the data are assembled and the index derived by a libertarian or a socialist. Of course, the libertarian and socialist are likely to disagree about whether the high or low ratings are most desirable, but the calculation of the index should not be influenced by their very different subjective views.

All of the data incorporated into the EFW index are from external sources such as the *World Development Indicators*, the *Doing Business Indicators*, and the *Global Competitiveness Report*. Thus, we are merely second-hand dealers. We simply transform the foundational data for each of the components to a zero-to-ten scale and combine them in a sensible manner to derive both area and summary ratings for each of the 141 countries now included in the index.

## II. Overview of the EFW Index

The EFW index is designed to measure the consistency of a nation's institutions and policies with economic freedom. Conceptually, economic freedom is present when economic activity is coordinated by personal choice, voluntary exchange, open markets, and clearly defined and enforced property rights. The EFW measure might be thought of as an effort to identify how closely the institutions and policies of a country correspond with a limited government ideal, where the government protects property rights and arranges for the provision of a limited set of "public goods" such as national defense and access to money of sound value, but little beyond these core functions. To a large degree, a country's EFW summary rating is a measure of how closely its institutions and policies compare with the idealized structure implied by standard textbook analysis of microeconomics.

Currently, the index incorporates 42 different variables that are organized into five areas: (1) size of government, (2) legal structure and protection of property rights, (3) access to sound money, (4) international exchange, and (5) regulation of capital, labor, and business. The components in Areas 1, 3, and 4 are objective measures such as government consumption as a share of total consumption, standard deviation of the inflation rate, mean tariff rate, and revenues from trade taxes as a share of the trade sector. The structure of the components in these three areas has changed only slightly over time and the data for the variables are generally quite complete back to 1980.

Variations in institutions and policies are much more difficult to measure in Areas 2 and 5, legal structure and regulation. As a result, the components in these two areas rely heavily on survey data, expert evaluations, and generic case studies undertaken by the World Bank's *Doing Business* project.

The EFW measure is available at five-year intervals during 1970-1995 and annually since 2000. These data are continuously available for approximately 100 countries since 1980. Missing data and structural changes reduce the comparability across time periods. However, a chain-link measure has been developed for both area and summary ratings in order to minimize this problem and increase the reliability of the ratings across time. The data are updated each year and the annual *Economic Freedom of the World* report is now co-published by a network of institutes in 75 countries.

As with any multi-dimensional measure, there is an issue with regard to how the various components should be aggregated. Theory provides direction regarding elements that should be included in the five areas and the summary index, but it does not indicate how the various components should be weighted when deriving area or summary ratings. It would be nice if the components of economic freedom were independent of each other and a statistical tool such as regression analysis could be used to derive an appropriate weight for each component. However, the components are often interrelated, and even if they were independent, the number of observations would limit the use of statistical techniques to derive weights.

Even more important, there is reason to believe that the components of economic freedom work together like a team. Put another way, they may be linked like the wheels, motor, transmission, drive shaft, and frame of a car. Which of these components is most important for the operation of the car? The question cannot be easily answered because the parts work together. If any of these key parts break down, the car is immobile. Institutional quality may be much the same. If any of the key parts are absent, the overall effectiveness is undermined. Just as it is a bundle of interrelated parts underlying the operation of an auto, there is reason to believe that there is a bundle of interrelated components underlying the operation of economic freedom.

As the result of these two considerations, we organize the elements of the index in a manner that seems sensible to us, but we make no attempt to weight the components in any special way when deriving either area or summary ratings. Of course, the component and area ratings are available to researchers and if they believe that an alternative weighting procedure is more appropriate for their purposes, we encourage them to employ it. Over the past several years, we have investigated several alternative methods of weighting components, including principle component analysis and a survey of economists. In most cases, the summary index is not very sensitive to substantial variations in the weights. Thus, while this issue is an interesting one, variations in component weights exert only a small impact on the pattern of the area and summary ratings.

## III. Growth Theories and the EFW Measure

During the past two decades, there has been a surge of interest concerning the importance of institutions as a source of economic growth. Building on the work of the 1993 Nobel laureate Douglass North, new institutional economists argue that the institutional and policy environment is a major determinant of economic growth. Sound institutions will encourage productive actions and discourage predatory behavior. According to the institutional view, both the availability and productivity of resources will be influenced by the quality of a nation's institutions. While there is some debate about the precise characteristics of the institutions that are most appropriate for the achievement of rapid growth, there is considerable agreement that secure property rights, open markets, and minimal trade restrictions are key elements of a sound institutional environment.

Prior to 1990, growth theory was dominated by the neoclassical model initially developed by Robert Solow. Within this framework, growth is primarily the result of investments in physical and human capital and improvements in technology. While increases in inputs undoubtedly contribute to growth, new institutional economists argue that the neoclassical approach is incomplete. Why do investment rates vary across countries? What explains the cross-country differences in investment productivity? Without incorporating the quality of institutions, new institutional economists believe that the neoclassical framework fails to provide persuasive answers to these questions. Furthermore, there is good reason to believe that development of new products and production processes – Schumpeter's creative destruction – is an integral part of the growth process. But this is largely concealed by the neoclassical approach with its emphasis on equilibrium and static efficiency conditions.

In addition to the institutional and neoclassical growth theories, there is also the geographic/locational model that is generally associated with the work of Jeffery Sachs and Jared Diamond. According to this view, a temperate climate and ease of access to markets are critically important for growth and achievement of high levels of per capita income. In contrast, tropical climatic conditions both erode the energy level of workers and increase the risk of disabling and life-threatening diseases such as malaria. Thus, productive activities are more attractive and worker productivity is higher in temperate climates than in the tropics.

These three explanations are not logically inconsistent, so all may help explain cross-country differences in growth and income. However, it is not easy to disentangle the implications of the theories. For example, while per capita incomes are higher in temperate than tropical areas, there is considerable debate about why this is the case. Sachs and other proponents of the geographic/locational theory argue that the lower incomes of tropical areas are the result of the adverse impact of climate and location. On the other hand, proponents of the institutional theory such as Daron Acemoglu, Simon Johnson, and James Robinson argue that the lower incomes in the tropical areas reflect the failure of European settlers to establish protective institutions in areas where their mortality rates were high. But the high mortality rates were largely the result of the adverse climatic conditions. This makes it difficult to differentiate between the affects of climate and institutions.

Consider another case: there is a persistently strong positive relationship between rate of investment in physical capital and long-term growth. This relationship is supportive of neoclassical growth theory. However, cross-country investment rates are also closely related to various institutional factors. Once again, it is not easy to differentiate among alternative theories.

Compared to the key ingredients of the neoclassical and climate/locational theory, the quality of institutions is difficult to measure. As a result, the empirical testing of the institutional growth theory has lagged behind. While the EFW index may not reflect the precise factors stressed by all new institutional economists, it is reflective of key elements stressed by many (e. g., protection of property rights, enforcement of contracts, voluntary exchange, and open competition). This facilitates the testing of the institutional theory and analysis of its importance relative to the alternative theories. In my judgment, this is the major contribution of the *Economic Freedom of the World* project.

The EFW data have been used to address a number of key propositions related to institutional quality, growth, and income. I think we have learned a number of things and I would like to consider ten of them.

## IV. Ten things we have learned from the EFW project

### 1. Private investment as a share of GDP is higher in countries with more economic freedom than in those that are less free.

Transportation and communication costs have been declining for decades. These reductions make it easier for entrepreneurs to engage in productive activities in locations other than those where key inputs are found and final products are sold. If institutional factors influence the location of productive activities, private investment should flow toward countries with more attractive institutional environments.

Several researchers have investigated the relationship between various measures of institutional quality and total investment. This research indicates that total investment, as a share of GDP, is higher in countries with better institutions (i.e. those with greater legal protection of property rights, more stable monetary policies, and fewer trade restrictions). The EFW index has been used as the measure of institutional quality in some of this research. For example, John Dawson found that both the level and change in the EFW summary index exerted a positive impact on total investment as a share of GDP. He also found that there was a Granger causality relationship between the two (i.e. that increases in both the level and change of EFW Granger-caused higher rates of investment as a share of GDP.)

While research demonstrating the positive impact of economic freedom on total investment is important, the relationship between economic freedom and private investment is even more revealing. Government investment as a share of the economy is generally higher in countries with less economic freedom. Thus, the gap between the more-free and less-free economies is smaller for total investment than for private investment. For example, during 1980-2005, the total investment/GDP ratio for countries with an average EFW rating of 7 or more was 22.2 percent compared to 18.9 percent for those with average EFW ratings of less than 5. But the private investment gap was still larger. Private investment comprised 18.7 percent of GDP in countries with EFW ratings of 7 or more, but only 11.2 percent in countries with EFW ratings of less than 5 during 1980-2005.

Bob Lawson and I have investigated the relationship between economic freedom and private investment during 1980-2005, and for various sub-periods within that era. There was a strong positive relationship between economic freedom and private investment as a share of GDP. This was true even after adjustment for location in the tropics, share of population within 100 kilometers of a coastline, and distance to major markets, the geographic/locational factors that have been stressed by Jeffery Sachs. The positive relationship between economic freedom and private investment was true for all countries and for LDCs only. (See Appendix, Table A1, Columns 1 and 2.) It was present for the entire time span and for the sub-periods.

We also investigated the relationship between economic freedom and foreign direct investment (FDI) as a share of GDP. Foreign direct investment is important because it is almost-all private investment and, to a large degree, it reflects entrepreneurial choices concerning the location of productive activities. Once again we found that countries with more economic freedom attracted more foreign direct investment. (See Appendix, Table A1, Columns 3 and 4.) This was true after adjustment for geographic variables and the relationship was robust across time periods and country groupings. Taken together, these findings provide strong evidence that countries with institutions and policies more consistent with economic freedom have higher private investment rates than those that are less free.

2. **The productivity of private investment is higher in countries with more economic freedom.**

The freer economies not only have higher private investment rates, but the productivity of that investment is also higher. In a May 2006 paper published in *Kyklos*, Randall Holcombe, Robert Lawson, and I interacted private investment as a share of GDP with the EFW rating and estimated the impact of a percentage point change in the private investment / GDP ratio on the long-term annual growth rate of real GDP for countries with different levels of economic freedom. This study covered the 1980-2000 period. The initial (1980) income level, tropical location, share of population near a coastline, public investment as a share of GDP, and the growth of human capital were also included as independent variables in the model. After adjustment for these control variables, the estimated impact of a one percentage point increase in private investment on GDP growth was 0.33 for countries with EFW ratings of 7 or more, compared to 0.27 for countries with EFW ratings between 5 and 7, and only 0.19 for countries with EFW ratings less than 5. Thus, the productivity of private investment is estimated to be about 22 percent higher for the freest group than the middle category, and more than 80 percent higher than for the least free group. The model was also run for LDCs only and the results were similar.

We also divided the countries into two groups – the half with the highest EFW ratings and the half with the lowest—and conducted this same analysis. Again, the results indicated that the productivity of private investment was significantly higher for countries with more economic freedom. This was true for both all countries and for LDCs only. Recently, we extended this analysis through 2005 and the same pattern continues to hold. (See Appendix, Table A2.)

3. **Countries with more economic freedom grow more rapidly than those that are less free.**

There are two paths through which institutional quality may impact long-term economic growth. First, institutions may influence the productivity of resources. If this is the case, there will be a positive relation between institutional quality and long-term growth even after the effects of differences in investment rates and changes in the educational levels of the work force have been taken into account. This higher productivity of resources associated with better institutions might be thought of as the direct effect. But there is also a second route whereby institutions may influence growth. Countries with better institutions may attract more investment. As was noted above, this is indeed the case. Models that include institutional measures along with investment rates will omit this second route and therefore they will understate the impact of institutional quality as a source of growth.

In the *Kyklos* article, Randall Holcombe, Bob Lawson and I used two alternative methods to estimate the impact of economic freedom through both the direct path associated with improvements in the productivity of resources and the indirect path associated with higher investment rates. Our findings indicate that failure to include the indirect path results in approximately a 50 percent under-estimate in the impact of economic freedom on long-term economic growth. Using data for 1980-2000, we estimated that a one unit increase in the 1980 EFW rating was associated with an increase in the annual growth rate over the two decades of approximately 1.5 percentage points when both the direct and indirect effects are taken into account. At the same time, an increase in EFW during the 1980s enhanced annual growth by nearly 2 percentage points over the two decades. These estimates are after adjustment for both human capital and the geographic/locational factors. Given that the average annual growth rate of the 94 countries for which the data were available was only 1.5 percent during the two decades, clearly the estimated impact of institutions consistent with economic freedom was sizeable.

Recently, we performed the same analysis for the 1980-2005 time frame. The pattern of the results was similar. While the estimated impact of economic freedom was somewhat smaller, it was still sizeable. For 1980-2005, our estimates indicate that a one-unit difference in a country's initial EFW rating enhanced its annual growth rate over this quarter of a century by 1.12 percentage points. A one-unit increase in EFW between 1980 and 1995 increased the annual growth rate over the 25-year time frame by 1.07 percentage points. Both of these estimates were significant at the 99 percent level of confidence. These results held for all countries and for LDCs only. (See Appendix, Table A3.) With regard to the geographic/locational variables, location in the tropics consistently exerted the expected negative impact on growth, but the variables for percent of the population within 100 kilometers of a coastline and the distance to major markets were generally insignificant.

Economic theory indicates that institutions and policies more consistent with economic freedom will lead to higher long-term growth. The positive relation between increases in EFW and higher growth rates is consistent with this view. Some have suggested that the causal relationship may run the other way: that more rapid growth may lead to more economic freedom. In order to investigate this possibility, in the *Kyklos* article we estimated the impact of changes in economic freedom during the 1980s on growth during the 1990s and found that increases in EFW during the 1980s were associated with higher growth rates during the 1990s. We then reversed the direction of the lag and estimated the impact of growth during the 1980s on the change in EFW during the 1990s. To my initial surprise, the relationship was negative: slower growth during the 1980s was associated with larger increases in EFW during the 1990s. When one thinks about it, however, this is not a surprising outcome. It reflects that constructive reforms are more likely to occur against a background of difficult economic conditions than during times of rapid growth.

In any case, it is clearly inconsistent with the reverse causality link between changes in economic freedom and growth.

4. **Countries with more economic freedom achieve higher levels of per capita income than those that are less free.**

Given that institutions and policies more consistent with economic freedom enhance private investment, the productivity of investment, and the rate of economic growth, one would expect countries with persistently higher economic freedom ratings to have higher income levels than those that are less free. This is indeed the case. The average EFW rating during 1980-2005 was derived and the countries grouped by quartile based on their EFW rating. The 2006 per capita incomes of countries in the freest quartile were more than twice those of the second freest quartile. Correspondingly, the income levels of countries in the second quartile were more than twice the third quartile, which were in turn substantially greater than the least economically free quartile. The per person incomes of countries in the freest quartile were slightly more than eight times the income levels of countries in the least free quartile. (See *Economic Freedom of the World, 2008 Annual Report*, Exhibit 1.6.)

Of course, this is a simplified analysis and it may reflect that both economic freedom and geographic/locational factors are correlated and that the observed relationship is the result of this correlation. In order to investigate this possibility, the 1980-2005 average EFW rating, the three, geographic/locational variables, and the stock of human capital per worker were regressed against 2006 per capita GDP. (See Appendix, Table A4.) In the equation including all countries, this set of institutional, geographic, and human capital variables explained 71 percent of the cross-country variation in per capita income. A one unit higher average EFW rating during the 25 year period was associated with an estimated increase in 2006 per capita GDP of almost $7,000 even after the effects of geography, location, and human capital are taken into account. The EFW variable was highly significant (t-ratio of 6.5 or more) in the equations for all countries and for LDCs only.

5. **Government spending as a share of the economy is not a very good measure of economic freedom or reliance on markets.**

During the 1970s and 1980s it was widely believed that economies with a smaller ratio of government spending divided by GDP were more free than those with higher government spending levels. Furthermore, this inverse relation was perceived of as a pretty good measure of the degree to which countries relied on markets rather than government decision-making to allocate goods and resources.

The problem with this view is that markets require an institutional framework that provides for the protection of property rights and enforcement of contracts. In addition, governments may use regulations and mandates to allocate resources rather than doing so through the tax and spending process. These factors also need to be considered when measuring the relative importance of markets and politics in the allocation process.

Countries with a smaller ratio of government spending to GDP may have (1) legal systems that fail to define and protect property rights and (2) regulatory regimes that impose restrictions and mandates that are inconsistent with both economic freedom and market allocation. Correspondingly, countries with high levels of government spending may nonetheless provide legal protection of private property and impose minimal regulation on market activities. As a result, the government spending/GDP ratio is often a misleading indicator of reliance on markets.

The EFW index illustrates this point. Consider the data for Denmark, Finland, Norway, and Sweden. The government spending/GDP ratio in all of these countries is 50 percent or more, which places them among the world's biggest spending governments. However, all four of these countries are ranked in the top ten (among 141 countries) in the legal structure area, which measures the presence of rule of law, protection of property rights, independence of the judiciary, and even-handed enforcement of contracts. Similarly, all four are ranked in the top ten in Area 5C, which measures the extent to which markets are open and only minimal regulatory restrictions are imposed on business. In the international exchange Area 4, these economies also rank among the world's freest. Clearly, these four economies are freer and rely more extensively on markets than many "small government" economies that fail to protect property rights, impose heavier regulations on market activities, and impose more severe trade restrictions. The EFW index helps us better understand this point.

6. **A legal system that protects property rights and enforces contracts in an even-handed manner is vitally important for the achievement of a high level of per capita income.**

Our modern living standards are almost entirely the result of investment, entrepreneurial discovery, and gains from de-personalized trade--trade between people who do not know each other and often never meet. As Adam Smith noted long ago, the division of labor is limited by the extent of the market. Much like a telephone or Internet system, a market economy is a network good. As the size of the market expands from the local town or village, to the region, nation, and beyond, network participants derive larger and larger benefits from trade, specialization, and economies of scale. For those connected to the global market, this system generates employment opportunities, high productivity per worker, and a vast array of consumer goods that are available at almost unbelievably low prices. This network system makes high-income levels and living standards possible.

But these gains from investment, extension in the size of the market, and de-personalized exchange cannot be achieved without a sound legal system. People who live in countries where property rights are insecure, contracts are poorly enforced, and legal and regulatory verdicts auctioned off to the highest bidder will not be integrated, at least not very well, into the market network. When a sound legal system is absent, the gains from trade will be limited to those derived from personalized exchange, trade among family members and persons in the local neighborhood or village who know each other or at least know about each other. Here, trade is based on personal knowledge, and contract enforcement is achieved through family ties and social pressures. Under these circumstances, the general gains from trade, specialization, and economies of scale will be small and income levels low.

Area 2, Legal Structure and Protection of Property Rights, of the EFW index indicates the consistency of a nation's legal structure with the protection of property rights, unbiased enforcement of contracts, independence of the judiciary, and rule of law. Economic analysis indicates that these factors are critical for the realization of gains from investment and de-personalized exchange. If this argument is correct, countries with persistently higher ratings in Area 2 should have considerably higher per capita income levels than those with low Area 2 ratings.

There were 111 countries for which the Area 2 rating was present for at least four of the years ending in either zero or five during 1980-2005. The average Area 2 rating during this 25-year period was derived for these countries and they were grouped according to their legal structure rating. There was a strong positive relationship between a country's Area 2 rating and per capita income. The 2006 per capita income of the 28 countries with Area 2 ratings of more than 7 was $33,351 compared to $2,587 for the 30 countries with a rating of less than 4. Thus, the per capita income of the countries with persistently high legal structure ratings was more than 12 times that of the countries with persistently low ratings. None of the 30 countries in the bottom group were able to achieve a per capita income of even $7,000, and only five (Peru, Algeria, El Salvador, Colombia and Syria) were able to achieve an income level of more than $4,000. In contrast, all of the countries with persistently high (more than 7) legal ratings had a per capita income of more than $16,000 and 23 of the 28 had income levels above $27,000.

Regression analysis was also used to investigate the impact of legal structure and other factors on per capita income. (See Appendix, Table A5.) When the average Area 2 rating for 1980-2005 was regressed against 2006 per capita GDP, this single variable "explained" 68.2 percent of the cross-country variation in per capita income. When the average monetary (Area 3) and international exchange (Area 4) are added to the model, the R-square increases to 73.6 percent and all of the variables are significant at the 90 percent confidence level. However, the coefficient for the legal structure variable is more than twice the size of the coefficients for the sound money and international exchange variables, indicating that the former exerts a substantially larger impact on per capita income than the other two variables. The higher t-ratio for the legal area variable compared to the other two areas is also supportive of this view.

Jeffery Sachs has shown that per capita incomes are substantially higher in temperate regions than in the tropics. His critics have argued that this relationship is primarily the result of institutional factors rather than climate and location. In order to investigate this issue, the three Sachs geographic/locational variables were included in the model, along with the legal, sound money, and international exchange area ratings from the EFW index. When the three Sachs variables are added, the R-square increases to 75.6 percent, but the distance to the major markets is the only one of the three geographic/locational variables that is significant. In contrast, all of the institutional/policy variables are significant at the 95 percent level. However, the coefficient (and t-ratio) for the legal variable remains substantially higher than for the sound money and international exchange variables, implying that the former exerts a larger independent impact on per capita income than either of the latter.

These results indicate that the quality of the legal system, monetary policy, freedom of international exchange, and location relative to major markets all exert a significant impact on per capita income. But they also indicate that the legal system is in a class by itself – that it is substantially more important than other key variables as a determinant of income.

7. **Economies that are more open tend to have higher rates of private investment.**

As transportation and communication costs have fallen substantially through time, production in regions far from sources of key inputs and markets where output will be sold is now more feasible than ever before. As a result, entrepreneurs and investors have more discretion with regard to the location of production facilities. However, trade restrictions that make it more costly to import resources and export products will significantly reduce the attractiveness of a country as a potential location for production. Thus, theory indicates that countries with lower trade restrictions will have higher private investment rates than those that are relatively closed.

The EFW data set facilitates the testing of this proposition. The ratings in Area 4, Freedom of International Exchange, indicate the degree to which countries impose tariffs, exchange rate controls, and other regulations that retard international exchange. Private investment was 18.3 percent of GDP in countries with an average trade openness area rating of 7 or more during 1980-2005, compared to 14.5 percent in countries with openness ratings between 5 and 7 and only 11.3 percent in countries with ratings of less than 5. The pattern for Foreign Direct Investment (FDI), almost all of which is private, was similar.

Regression analysis was used to investigate the independence and robustness of the linkage between trade openness and investment. (See Appendix, Table A6.) The average Area 4 rating during 1980-2005 was regressed against private investment as a share of GDP during the same period in models that also included the three geographic/locational variables stressed by Sachs, as well as the Area 3 (sound money), and Area 2 (legal structure) measures from the EFW index. The trade openness variable was significant at the 95 percent level in all of these equations. The regressions were also run for LDCs only, and the openness variable remained highly significant in all of the models. The models were also run substituting Foreign Direct Investment rather than private investment as the dependent variable. (See Appendix, Table A7.) The pattern of the results was the same. Trade openness was a highly significant determinant of FDI in all of these models.

As we previously discussed, countries with more economic freedom have higher private investment rates. The consistency and robustness of trade openness as a determinant of investment in all of these models indicates that it is a major contributing factor to this relationship. I expected that inclusion of Area 2 (legal structure) into the model would weaken and perhaps undermine the impact of Area 4 as a determinant of private investment (and FDI). But this was not the case. Surprisingly, the legal area was not significant in these investment equations. Trade openness (Area 4) was found to exert a positive impact on the legal structure Area 2 rating, even after the impact of geography and location are taken into account. This suggests that trade openness may exert an impact on the quality of the legal system. This is a fruitful topic for future research.

### 8. Heavy regulation leads to political corruption.

Michael Walker often states that, "Regulation is the raw material of corruption." Regulations are a blunt instrument and they often place political officials in a position to either grant favors or impose costs on market participants. Economic theory indicates that this incentive structure will encourage them to exchange favors for bribes and other forms of compensation.

The EFW data shed some light on this topic. Area 5C indicates the degree to which regulation is imposed on business. The components in this area cover a wide range of business regulations including price controls and the regulatory cost of permits, licenses, filing government reports, starting a business, energy use restrictions, production procedures, and compliance with tax law. One of the components of area 5C involves the extent to which bribes and illegal side payments are present. Because this component is directly related to corruption, it was omitted and a business regulation area rating 5C* re-calculated. The Corruption Perception Index (CPI) of International Transparency provides a widely used measure of corruption. The correlation coefficient between 5C* and the CPI was 0.76. This indicates that extensive regulation of business is associated with a high degree of political corruption.

Area 4 of the EFW indicates the degree to which international exchange is regulated. Countries imposing high tariffs, restrictive import quotas, exchange rate and capital market controls, and costly custom clearance procedures will receive lower ratings in Area 4. When Area 4 and Area 5C* were regressed against the Corruption Perception Index, these two variables "explained" 59 percent of the cross-country variation in corruption as measured by International Transparency. Both the trade and business regulation variables were highly significant although the size of the coefficient and t-ratios indicated that the latter exerted a stronger impact than the former.

Of course, the association between heavy regulation and political corruption may reflect that both are related to a third factor such as "trust in the integrity of fellow citizens". If integrity is absent, this may lead to both political corruption and demands for regulation. There may also be feedback effects between the two: regulation that leads to more corruption may also lead to popular support for still more regulation. However, when political officials have substantial regulatory powers to favor some and punish others, they will have a strong incentive to use these powers to extract bribes, campaign contributions, well-paid jobs, and other benefits in exchange for their favoritism. As George Stigler once put it, the number of saints is not so large that the Bureau of the Census includes them as a separate category.

9. **Movements toward institutions and policies more consistent with economic freedom are associated with larger reductions in poverty.**

Seth Norton, Joe Connors and I have recently investigated the relationship between economic freedom and the one-dollar per day and two-dollar per day poverty rates. Because these poverty rate measures were largely unavailable for high-income industrial countries, these countries were omitted from this analysis. Unsurprisingly, countries with higher EFW ratings had lower poverty rates and this was true after adjustment was made for geographic, locational, and receipt of development aid. No doubt, this pattern is largely reflective of the linkage between economic freedom and per capita income. The freer economies grow more rapidly and achieve higher income levels, which lead to lower poverty rates.

The impact of changes in EFW on poverty is a more interesting and more revealing issue. We estimated the impact of a change in EFW during 1980-1995 on the one and two-dollar poverty rates during 1980-2005 within a regression model that also included independent variables for the initial EFW rating, the three, geographic/locational variables, and foreign aid assistance. (See Appendix, Table A8.) The estimates indicate that a one-unit increase in EFW during 1980-1995 reduced the one-dollar poverty rate by 4.2 percentage points during 1980-2005. For the two-dollar poverty rate, the estimated impact of a one-unit increase in EFW during 1980-1995 was a 6.7 percentage point reduction in the poverty rate during 1980-2005.

10. **Poor legal structure, trade barriers, and regulation of business are major factors contributing to the poor performance and poverty of sub-Saharan African countries.**

Per capita incomes are low and poverty rates high in sub-Saharan Africa. The growth process is primarily about discovery of better ways of doing things, gains from trade, and investment. However, gains from these sources will be stifled by uncertain protection of property rights, biased law enforcement, trade restrictions, and regulations that restrict entry into markets and impose heavy costs on business. Areas 2, 4, and 5C of the EFW index provide insight on the quality of institutions and policies in these areas. The ratings of sub-Saharan Africa in these vitally important areas are highly revealing.

There are 34 sub-Saharan African countries currently included in the EFW index. The mean ratings for the sub-Saharan African countries in legal structure (Area 2), international exchange (Area 4) and regulation of business (Area 5C) are well below the mean values of other regions. The Sub-Saharan countries dominate the bottom 40 among the 141 countries in each of these three areas. They comprise 23 of the bottom 40 in the legal system area. They also make up 21 of the bottom 40 in the international exchange area and 18 in business regulation. In contrast, there is virtually no representation of sub-Saharan Africa in the top 40 in any of these three areas.

Think for a moment about the impact of the high trade restrictions. The countries of sub-Saharan Africa are approximately the geographic size of the typical U.S. state. Before resources and products can cross these national boundaries, they are subject to both taxes and customs clearance that often takes two or three weeks. This is a costly, time-consuming, and onerous ordeal that exerts a corrupting influence on both business and government. Most important, it is a major deterrent to gains from specialization, economies of scale, entrepreneurship and investment. If trade restrictions of this type were present among the states, the U.S. would also be a poor country.

The trade restrictions alone would be enough to undermine prosperity, but when coupled with legal systems that fail to protect property rights and regulations that restrict entry and drive up the cost of doing business, the results are catastrophic. Given the importance of these factors as sources of growth and high-income status, it is hard to see how living standards in Africa can improve much without substantial improvement in these key areas.

## V. Conclusion

During the past 15 years, economists have become increasingly aware that institutional factors exert a strong impact on both the level and productivity of investment, the rate of economic growth, and the variation in income levels across countries. Some even argue that "institutions rule." I am not willing to defend that position, but I do think it is clear that institutions matter and they matter a great deal.

## APPENDIX

**Table A1.** Economic Freedom and Private Investment

| | Dependent Variable: Private Investment/GDP, 1980-2005 | | Dependent Variable: FDI/GDP, 1980-2005 | |
|---|---|---|---|---|
| Independent Variable | All Countries | LDCs | All Countries | LDCs |
| | (1) | (2) | (3) | (4) |
| EFW Rating, Average 1980-2005 | 1.93 *** | 2.91 *** | 0.33 * | 0.62 *** |
| | (3.98) | (4.46) | (1.67) | (2.57) |
| Coastal Population (% within 100km) | 0.83 | 0.22 | 0.06 | -0.70 |
| | (0.62) | (0.12) | (0.11) | (1.06) |
| Tropical Location (% area in Tropics) | -2.09 ** | -1.89 | 0.18 | 0.41 |
| | (1.82) | (1.52) | (0.40) | (0.92) |
| Distance to Major Markets[a] | -0.24 | -0.41 | -0.15 ** | -0.23 ** |
| | (1.25) | (1.56) | (1.94) | (2.42) |
| Intercept | 4.95 | 0.13 | 0.56 | -0.49 |
| | (1.59) | (0.04) | (0.44) | (0.37) |
| $R^2$ (adjusted) | 0.35 | 0.37 | 0.07 | 0.11 |
| Number of Countries | 104 | 75 | 100 | 73 |

[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table A2.** Economic Freedom and the Productivity of Investment

| Independent Variables | Dependent Variable: Annual Growth Rate of Per Capita GDP, 1980-2005 | | | |
|---|---|---|---|---|
| | All Countries | | LDCs | |
| | (1) | (2) | (3) | (4) |
| Per Capita GDP, 1980[a] | -0.10 *** | -0.07 *** | -0.11 | -0.08 |
| | (4.59) | (3.42) | (1.58) | (1.05) |
| Coastal Population (% within 100km) | 0.15 | 0.31 | 0.03 | 0.60 |
| | (0.31) | (0.60) | (0.05) | (0.82) |
| Tropical Location (% area in Tropics) | -1.27 *** | -1.39 *** | -1.02 * | -1.13 ** |
| | (2.96) | (3.04) | (1.92) | (1.99) |
| Distance to Major Markets[b] | -0.08 | -0.07 | -0.01 | 0.04 |
| | (1.12) | (0.95) | (0.13) | (0.34) |
| Private Investment/GDP, 1980-2005 (EFW > 7) | 0.25 *** | | 0.29 *** | |
| | (6.09) | | (5.51) | |
| Private Investment/GDP, 1980-2005 (5 < EFW < 7) | 0.16 *** | | 0.19 *** | |
| | (4.71) | | (4.67) | |
| Private Investment/GDP, 1980-2005 (EFW < 5) | 0.07 | | 0.10 | |
| | (1.35) | | (1.64) | |
| Private Investment/GDP, 1980-2005 (Top Half of EFW) | | 0.20 *** | | 0.21 *** |
| | | (5.29) | | (4.86) |
| Private Investment/GDP, 1980-2005 (Btm Half of EFW) | | 0.14 *** | | 0.17 *** |
| | | (3.17) | | (3.23) |
| Public Investment/GDP, 1980-2005 | 0.18 *** | 0.17 *** | 0.21 *** | 0.22 *** |
| | (4.07) | (3.54) | (3.88) | (3.62) |

| | | | | |
|---|---|---|---|---|
| Growth of Human Capital, 1980-2000 | 0.64 | 0.20 | 0.84 * | 0.42 |
| | (1.56) | (0.48) | (1.79) | (0.86) |
| Intercept | -1.53 ** | -1.26 | -2.78 ** | -3.02 ** |
| | (1.80) | (1.41) | (2.29) | (2.27) |
| $R^2$ (adjusted) | 0.50 | 0.43 | 0.50 | 0.42 |
| Number of Countries | 90 | 90 | 71 | 71 |

[a] In thousands of U.S. dollars.

[b] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table A3.** Economic Freedom, Geography, Investment, and Economic Growth, 1980-2005

| Independent Variable | All Countries | | | | LDCs | | | |
|---|---|---|---|---|---|---|---|---|
| | Dependent Variable: Private Investment/ GDP, 1980-2005 | Dependent Variable: Annual Growth Rate of Per Capita GDP, 1980-2005 | | | Dependent Variable: Private Investment/ GDP, 1980-2005 | Dependent Variable: Annual Growth Rate of Per Capita GDP, 1980-2005 | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Per Capita GDP, 1980[a] | | -0.09 *** | -0.10 *** | -0.10 *** | | -0.06 | -0.12 | -0.12 |
| | | (4.21) | (5.07) | (5.07) | | (-0.72) | (1.63) | (1.63) |
| EFW Rating, 1980 | 1.56 *** | | 0.89 *** | 1.12 *** | 2.23 *** | | 0.87 *** | 1.25 *** |
| | (2.66) | | (3.96) | (5.20) | (2.64) | | (2.77) | (4.08) |
| Change in EFW Rating, 1980-1995 | 2.03 *** | | 0.77 *** | 1.07 *** | 2.42 *** | | 0.76 *** | 1.14 *** |
| | (2.97) | | (3.15) | (4.62) | (3.15) | | (2.61) | (4.27) |
| Change in EFW Rating, 1995-2005 | 0.60 | | -0.07 | 0.02 | 0.56 | | -0.08 | 0.01 |
| | (0.83) | | (0.28) | (0.08) | (0.70) | | (0.28) | (0.03) |
| Coastal Population (% within 100km) | 0.95 | | 0.18 | 0.32 | -0.20 | | 0.58 | 0.55 |
| | (0.65) | | (0.37) | (0.65) | (0.10) | | (0.78) | (0.74) |
| Tropical Location (% area in Tropics) | -1.85 | | -1.07 *** | -1.34 *** | -2.32 * | | -0.97 * | -1.34 ** |
| | (1.53) | | (2.54) | (3.22) | (1.68) | | (1.82) | (2.51) |
| Distance to Major Markets[b] | -0.21 | | -0.06 | -0.09 | -0.48 * | | 0.06 | 0.02 |
| | (1.01) | | (0.84) | (1.30) | (1.68) | | (0.59) | (0.16) |
| Private Investment/GDP, 1980-2005 | | 0.61[c] *** | 0.15 *** | 0.15[d] *** | | 0.45[e] *** | 0.16 *** | 0.16[f] *** |
| | | (8.46) | (3.99) | (3.99) | | (5.98) | (3.36) | (3.36) |
| Public Investment/GDP, 1980-2005 | | 0.27 *** | 0.28 *** | 0.28 *** | | 0.31 *** | 0.33 *** | 0.33 *** |
| | | (4.80) | (5.31) | (5.31) | | (4.32) | (4.44) | (4.44) |

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Growth of Human Capital, 1980-2000 | | -0.43 | -0.67 | -0.67 | | -0.22 | -0.60 | -0.60 |
| | | (0.80) | (1.29) | (1.29) | | (0.34) | (0.97) | (0.97) |
| Intercept | 6.43 | -8.66 *** | -6.01 *** | -5.07 *** | 5.00 | -7.10 *** | -7.25 *** | -6.47 *** |
| | (1.62) | (6.69) | (3.91) | (3.30) | (1.06) | (5.69) | (3.84) | (3.41) |
| $R^2$ (adjusted) | 0.31 | 0.52 | 0.60 | 0.60 | 0.31 | 0.51 | 0.59 | 0.59 |
| Number of Countries | 85 | 80 | 80 | 80 | 63 | 61 | 61 | 61 |

[a] In thousands of U.S. dollars.

[b] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

[c] Fitted values from equation (1)

[d] Residual values from equation (1)

[e] Fitted values from equation (5)

[f] Residual values from equation (5)

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table A4.** Economic Freedom, Geography, Human Capital and 2006 Per Capita GDP

| Independent Variables | Dependent Variable: Per Capita GDP, 2006 | | | |
|---|---|---|---|---|
| | All Countries | | LDCs | |
| | (1) | (2) | (3) | (4) |
| EFW Rating, Average 1980-2005 | 6,934.40 *** | 7,063.50 *** | 5,270.60 *** | 5,217.10 *** |
| | (8.69) | (9.54) | (6.51) | (7.11) |
| Human Capital Stock in 2000 | 2,742.00 | 2,933.00 | 6,359.00 ** | 6,203.00 ** |
| | (0.87) | (0.94) | (1.98) | (2.03) |
| Coastal Population (% within 100km) | 925.00 | | -384.00 | |
| | (0.44) | | (0.16) | |
| Tropical Location (% area in Tropics) | -6,313.00 *** | -6,059.00 *** | -2,027.00 | -2,141.00 |
| | (3.32) | (3.35) | (1.15) | (1.33) |
| Distance to Major Markets[a] | -0.83 *** | -0.85 *** | -0.54 | -0.52 * |
| | (2.60) | (2.73) | (1.58) | (1.69) |
| Intercept | -27,793.00 *** | -28,462.00 *** | -28,727.00 *** | -28,406.00 *** |
| | (4.86) | (5.17) | (5.16) | (5.49) |
| $R^2$ (adjusted) | 0.71 | 0.72 | 0.59 | 0.59 |
| Number of Countries | 114 | 114 | 83 | 83 |

[a] The minimum air distance in kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table A5.** Legal Structure and 2006 Per Capita GDP

| Independent Variable | Dependent Variable: Per Capita GDP, 2006 | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| Openness to International Trade (EFW Area 4), 1980-2005 | | 1,723.20 * | 1,955.50 ** |
| | | (1.92) | (2.21) |
| Sound Money (EFW Area 3), 1980-2005 | | 2,075.50 *** | 1,577.10 ** |
| | | (2.93) | (2.25) |
| Legal Structure (EFW Area 2), 1980-2005 | 5,752.60 *** | 4,105.10 *** | 3,397.80 *** |
| | (15.39) | (7.31) | (5.56) |
| Coastal Population (% within 100km) | | | 1,280.00 |
| | | | (0.59) |
| Tropical Location (% area in Tropics) | | | -2,693.00 |
| | | | (1.30) |
| Distance to Major Markets[a] | | | -0.77 ** |
| | | | (2.18) |
| Intercept | -18,356.00 *** | -34,179.00 *** | -24,289.00 *** |
| | (8.15) | (8.59) | (4.92) |
| $R^2$ (adjusted) | 0.68 | 0.74 | 0.76 |
| Number of Countries | 111 | 98 | 98 |

[a] The minimum air distance in kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table A6.** Openness to International Trade and Private Investment, 1980-2005

| Independent Variable | Dependent Variable: Private Investment/GDP, 1980-2005 | | | | | |
|---|---|---|---|---|---|---|
| | All Countries | | | LDCs | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Openness to Intl. Trade (EFW Area 4), 1980-2005 | 1.42 *** | 1.07 ** | 1.15 ** | 1.72 *** | 1.48 *** | 1.44 ** |
| | (3.67) | (2.27) | (2.07) | (3.37) | (2.68) | (2.25) |
| Sound Money (EFW Area 3), 1980-2005 | | 0.57 | 0.60 | | 0.67 | 0.67 |
| | | (1.30) | (1.33) | | (1.24) | (1.19) |
| Legal Structure (EFW Area 2), 1980-2005 | | | -0.13 | | | 0.01 |
| | | | (0.35) | | | (0.02) |
| Coastal Population (% within 100km) | 2.43 * | 2.13 | 2.45 * | 2.28 | 1.64 | 2.08 |
| | (1.82) | (1.58) | (1.76) | (1.23) | (0.86) | (1.03) |
| Tropical Location (% area in Tropics) | -1.93 * | -1.63 | -1.67 | -2.19 | -1.96 | -1.85 |
| | (1.69) | (1.41) | (1.30) | (1.62) | (1.44) | (1.24) |
| Distance to Major Markets[a] | -0.07 | -0.01 | -0.01 | -0.31 | -0.29 | -0.27 |
| | (0.38) | (0.04) | (0.04) | (1.09) | (1.01) | (0.93) |
| Intercept | 6.45 ** | 4.36 | 4.31 | 6.16 ** | 3.31 | 3.20 |
| | (2.37) | (1.37) | (1.33) | (1.97) | (0.84) | (0.77) |
| $R^2$ (adjusted) | 0.34 | 0.33 | 0.32 | 0.28 | 0.27 | 0.27 |
| Number of Countries | 86 | 84 | 82 | 65 | 63 | 61 |

[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table A7.** Openness to International Trade and Foreign Direct Investment, 1980-2005

| | Dependent Variable: FDI/GDP, 1980-2005 | | | | | |
|---|---|---|---|---|---|---|
| Independent Variable | All Countries | | | LDCs | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Openness to Intl. Trade (EFW Area 4), 1980-2005 | 0.51 *** | 0.65 *** | 0.70 *** | 0.59 *** | 0.67 *** | 0.63 *** |
| | (3.50) | (3.58) | (3.20) | (4.12) | (4.27) | (3.47) |
| Sound Money (EFW Area 3), 1980-2005 | | -0.20 | -0.21 | | -0.15 | -0.14 |
| | | (1.25) | (1.26) | | (1.08) | (1.00) |
| Legal Structure (EFW Area 2), 1980-2005 | | | -0.03 | | | 0.10 |
| | | | (0.22) | | | (0.78) |
| Coastal Population (% within 100km) | 0.26 | 0.33 | 0.25 | -0.34 | -0.21 | -0.45 |
| | (0.53) | (0.68) | (0.50) | (0.70) | (0.43) | (0.85) |
| Tropical Location (% area in Tropics) | 0.46 | 0.36 | 0.27 | 0.43 | 0.36 | 0.43 |
| | (1.13) | (0.86) | (0.57) | (1.22) | (1.01) | (1.10) |
| Distance to Major Markets[a] | -0.06 | -0.08 | -0.07 | -0.15 ** | -0.16 ** | -0.17 ** |
| | (0.79) | (1.09) | (0.98) | (1.98) | (2.17) | (2.17) |
| Intercept | -1.35 | -0.68 | -0.74 | -1.01 | -0.42 | -0.68 |
| | (1.31) | (0.58) | (0.62) | (1.16) | (0.40) | (0.62) |
| $R^2$ (adjusted) | 0.17 | 0.18 | 0.17 | 0.24 | 0.25 | 0.25 |
| Number of Countries | 83 | 81 | 79 | 63 | 61 | 59 |

[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table A8.** Impact of Institutions on Poverty Rates

| Independent Variable | Percentage Point Reduction in $1 Poverty Rate, 1980-2005 | | | Percentage Point Reduction in $2 Poverty Rate, 1980-2005 | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Initial Poverty Rate, 1980 | 0.25 *** | 0.36 *** | 0.41 *** | 0.13 ** | 0.20 *** | 0.24 *** |
| | (2.90) | (4.00) | (3.71) | (2.33) | (3.57) | (3.80) |
| Initial EFW Rating, 1980 | 2.76 | 2.87 | 3.24 | 5.51 *** | 6.31 *** | 6.75 *** |
| | (1.32) | (1.33) | (1.45) | (2.62) | (2.96) | (3.15) |
| Change in EFW, 1980-1995 | 4.10 ** | 4.27 ** | 4.23 ** | 6.18 *** | 6.99 *** | 6.73 *** |
| | (2.15) | (2.16) | (2.10) | (3.31) | (3.64) | (3.51) |
| Change in EFW, 1995-2005 | -0.79 | -1.73 | -1.49 | 1.15 | 1.22 | 1.93 |
| | (0.34) | (0.75) | (0.63) | (0.49) | (0.54) | (0.84) |
| Coastal Population (% within 100km) | | 1.86 | 1.15 | | -0.14 | -1.65 |
| | | (0.37) | (0.22) | | ('0.03) | (0.33) |
| Tropical Location (% area in Tropics) | | -9.27 *** | -9.35 *** | | -9.21 *** | -8.76 *** |
| | | (2.73) | (2.58) | | (2.83) | (2.55) |
| Distance to Major Markets[a] | | 1.08 | -0.84 | | -1.21 * | -0.92 |
| | | (1.57) | (1.14) | | (1.80) | (1.32) |
| Average Aid/GDP, 1980-2005[b] | | | -26.15 | | | -43.72 |
| | | | (0.80) | | | (1.49) |
| Intercept | -16.92 | -9.26 | -11.63 | -32.81 ** | -28.50 ** | -31.22 ** |
| | (1.30) | (0.73) | (0.89) | (2.46) | (2.26) | (2.47) |
| $R^2$ (adjusted) | 0.08 | 0.23 | 0.22 | 0.14 | 0.30 | 0.32 |
| Number of Countries | 65 | 64 | 62 | 65 | 64 | 62 |

[a] The minimum air distance in thousands of kilometers from a country to any one of the following major markets: New York, Tokyo, or Amsterdam.

[b] A country's average was calculated if it had no less than 5 missing data points over the 1980-2005 time period.  Source: World Bank, *World Development Indicators.*

*, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.