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Measuring Freedom: An Analysis of the Economic Freedom Index

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MEASURING FREEDOM: AN ANALYSIS OF THE ECONOMIC FREEDOM INDEX

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ABSTRACT

The creation and empirical use of economic freedom indices has produced a growing amount of literature over the last decade. A survey of this literature is provided, and the difficulty of measuring this concept, as well as the usefulness and limits of the various indices are discussed. The indices are reduced to their components, and testable models are used in order to determine which components are most important. Secure property rights are found to be the most important component driving the results. The results are consistent with previous studies, which indicate that greater economic freedom is related to greater growth and wealth. Not all of the components of an aggregate index have the same impact or even the same relationship. The aggregate indices are highly correlated at the international levels, lending support to the reliability of the measures, but there is no consensus on the appropriate aggregation method. Care should be put on the interpretation of the actual point estimates when the aggregate index is used empirically, but the relationships are robust and the indices are very useful and growing in importance.

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CHAPTER ONE

INTRODUCTION

"The moment the idea is admitted into society that property is not as sacred as the law of God, and that there is not a force of law and public justice to protect it, anarchy and tyranny commence." – John Adams, 1787[1]

THEORY AND RELEVANCE:

The debate, whether it be economic, political, or moral, between socialism and capitalism was a major theme over the last century across many disciplines. The writing and analysis of these continue, but with the apparent failure and eventual dissolution of the Soviet Union, they are not viewed as strict alternatives as they once were. In reality, economies tend to lie somewhere between, and what differs is the degree to which governments attempt to control economic decisions made by private citizens, and whether prices are allowed to allocate resources within a largely free market.[2]

Within the economics profession, theory has supported the idea that the level of economic freedom affects the incentives individuals face, and therefore, economic performance. In the last two decades, ground has been made in empirical work to support theory in this area. This has largely been made possible and supported by the creation of various economic freedom indices.

[1] A Defense of the Constitutions of Governments of the United States of America, 1787
[2] From Ashby and Sobel (2008)

Economic freedom is a fairly broad term, but it relates to the level in which property that individuals acquire through moral and legal means is protected, and the freedom in which these individuals can use, give, or exchange that property as they see fit. It has mainly been treated and thought of as it relates to other desirable outcomes such as general growth, health, life expectancy, entrepreneurship, and income equality. However, its relationship to growth and income level has dominated the literature.

The causes of economic growth have been at the center of economic inquiry. The importance of certain institutions, such as a fair and balanced judiciary, protection of property rights, and free markets, as they relate to growth and prosperity have been aspects explored for centuries. In some ways, it begins with Adam Smith arguing that individuals' freely pursuing their own interests leads to prosperity for society at large. Smith stated that, "little else is requisite to carry a state to the highest degree of opulence from the lowest barbarism, but peace, easy taxes, and a tolerable administration of justice; all the rest being brought about by the natural course of things."[3]

Although early modern economics primarily revolved around an inquiry into institutions, the economic development literature by the mid- to late 1900s was dominated by theories based on neoclassical growth and input-output models that attributed prosperity primarily to factors such as the abundance of resources, geographical location, and the availability of human and physical capital.[4] This development has reversed course some over the last couple of decades, with a large amount of literature based on the analysis of institutions as the primary factor affecting

[3] Adam Smith, The Wealth of Nations (cited from Sobel, Chap 2 of EFNA, 2008 edition)
[4] Chapter 2 EFNA, 2008 edition.p31

economic prosperity. Authors such as P.T. Bauer and Douglas North have contributed to this development, as well as work written in the Public Choice literature.[5]

Russell Sobel explains that, "Within this literature, 'institutions' are broadly defined as the formal and informal 'rules of the game' governing action and interaction among individuals, and the enforcement of those rules. Simply put, making analogous to the board game Monopoly, the behavior of the agents is influenced in predictable ways by the structure of the rules under which the game is played. Imagine, for example, that a new rule was created making it legitimate to steal the property cards of other players if they were not looking. The play and outcomes from a game of Monopoly would be significantly different under these different institutional rules as players would respond to them by altering their behavior. Not only would this rule change increase the rate of theft among players, it would also result in fewer properties being purchased, less investment on the properties, and more resources being devoted to trying to steal the property of other players."[6]

William Baumol (1990) introduced a theory of productive and unproductive entrepreneurship.[7] He suggested that entrepreneurs have a choice between spending their efforts toward private-sector wealth creation, or toward securing wealth redistribution through the political and legal process. The quality of the institutions, as well as certain policies, influences the potential payoffs between the two activities. Thus, if the political structure of a state creates incentives to lobby for wealth transfers rather than produce,

[5] See Douglas North, *Institutions, Institutional Change and Economic Performance*
[6] Chapter 2 EFNA, 2008 edition.p32
[7] Baumol, W.J, "Entrepreneurship" 1990

this is bound to have a negative effect on its growth. Baumol's theory of unproductive entrepreneurship is concentrated on the process of business creation. A similar concept is captured by the general term of rent seeking used often in public choice literature.

Rent seeking is the socially costly pursuit of wealth transfers, and the concept was introduced to the economics profession in 1967 by Tullock.[8] He argued that expenditures made to capture a wealth transfer were a form of social costs, and therefore, is not costless as was previously hypothesized in economic literature. The social cost arises because the resources used for transfers have a positive opportunity cost somewhere else in the economy. These costs are inherent in the process by which resources are shifted from positive to zero and negative-sum activities.

Clearly, certain government roles are conducive to desirable economic performance, while some serve as a hindrance. When institutions in a state provide for secure property rights, a fair and balanced judicial system, contract enforcement, and effective constitutional limits on government's ability to transfer wealth through taxation and regulation, it reduces the profitability of unproductive political activity.[9] These aspects capture what is meant by economic freedom and the efforts at the measurement of the various aspects of an economy that are consistent with this idea is the subject of this paper.

Broadly speaking, the literature on institutions generally has covered the legal institutions of a country, and recently it's heritage with some inquiry at whether a country

[8] See Tollison, "Rent Seeking" 1997 and Tullock, Toward a Mathematics of Politics 1967
[9] Baumol, W.J., "Entrepreneurship" 1990

is closer to English common law or French civil law.[10] The idea is that English common law gives stronger protections to private property and creditors, and therefore, we would expect more investment and output due to the incentives created when individuals can expect future returns from their work and investment. We have known since the beginning of modern economics that good institutions are correlated with good economic outcomes, but the more contentious question is what causes what? Is it the institutions, economic freedom in this case, that lead to better economic conditions or vice versa?

With a broad and longer run view, this should not be very controversial. It is hard to believe that the lack of property rights, absence of the rule of law, or an unstable monetary environment would be conducive to growth. It would follow that these institutions would be considered *a prior* on straight logical grounds, but this has also been supported by empirical work already mentioned such as Acemoglu, Johnson, and Robinson (2001). Their work examines how the colonial origins of a country and the institutions formed have affected economic performance on a long term basis. It is plausible that the colonial origin affected growth over the last couple of centuries, but it is hard to argue the reverse. Growth and prosperity did not cause colonial origins.

There are aspects of economic freedom though, that are closer to policy decisions such as the level of taxes and regulation. It is possible that some of the components included in a measure of economic freedom could be demanded after more prosperity. In the U.S., perhaps the rise in prosperity experienced in the 1980s and 1990s decreased the demand for regulation and restrictions, and the drop in growth during the recession of

[10] Acemoglu, Johnson and Robinson, "The Colonial Origins of Comparative Developments" 2001

2001 increased the demand for regulation. This may be the case with some of the components included in an aggregate economic freedom index.

Again, with the longer run view, this does not answer why the growth happened in the first place. If it is merely a function of capital and investment, where or how does this originate, if not by the institutions in place? Though on a shorter run basis, and especially in analyzing changes in this environment, studies have been conducted to determine the causal relationship.

This has been addressed using statistical methods in Heckelman (2000)[11] and Dawson (2002)[12] with relation to growth, and Kreft and Sobel (2005)[13] in regard to entrepreneurship. All came to the general conclusion that causality started with economic freedom. To test whether freedom causes growth, growth causes freedom, or the two are jointly determined, Heckelman (2000) uses a Granger-causality test to tease out the relationship, and concludes that economic freedom precedes growth. The same for Dawson (2002), and similar results are found with entrepreneurship. Heckelman (2000) did find contradictory evidence with a couple of the components when the index is broken down, which will be discussed again later in this paper.

There is no doubt that economic freedom has had popular proponents for many years. With F.A Hayek's *Road to Serfdom*, and Milton Friedman's *Capitalism and Freedom*, the broader concepts of freedom were espoused with great clarity to millions of readers, but this was not largely reflected in the professional economic journals. This is

[11] Heckelman, Jac C. Economic Freedom and Economic Growth: A Short-run Causal Investigation. 2000
[12] Dawson, John W. Causality in the Freedom-Growth Relationship. 2003
[13] Kreft, Steven and Russell Sobel. Public Policy, Entrepreneurship, and Economic Freedom. 2005

likely the result of the difficulty in measuring this reality, but with the increase in technology experienced over the last couple of decades, the collection of the data necessary to construct such an index has become much less costly, and the emergence of these indices has reduced this gap.

Economic freedom indices try to capture a large aspect of these institutions, a basket of many factors that create an environment of relative economic freedom or lack thereof. Each are created differently, but are trying to capture the same concept. The attempt is to put a quantitative number on the level of economic freedom in a country or state. Similar approaches have been taken by organizations to measure other areas of interest such as tort liability and taxation. The Pacific Research Institute publishes a Tort Liability Index and the Tax Foundation publishes a Tax Climate Index. [14]

The indices have primarily been produced and largely supported by free-market think tanks, and this is due to the value that empirical data can make to the their arguments, as well as the attention they have been able to attract to their organizations. Steve Forbes, referring to the PRI's U.S. Tort Liability Index, said "When you can measure something, you can reform it"[15], which can be applied to any index, including the economic freedom indices. It is one thing to say that more freedom means more prosperity, but even more convincing to say that it can be demonstrated empirically that societies that have adopted certain traits are more prosperous than those that do not.

[14] Full reports at http://liberty.pacificresearch.org/publications/us-tort-liability-index-2008-report-2 and http://www.taxfoundation.org/research/show/22658.html

[15] See back cover of U.S. Tort Liability Index: 2006 Report

Some of the early economic freedom indices were created by scholars creating their own such as Scully and Slottje (1991)[16], but this was only done for one year. The Freedom House has published an index in their series *World Survey of Economic Freedom*[17], but their purpose for the index and interpretation of economic freedom are different than others published. They stress the interrelationship with political rights and civil liberties.[18] They do not include measures for taxation or government spending.

On the international scale, two indices emerged in the mid 1990s that have dominated this arena. *The Index of Economic Freedom* was created by The Heritage Foundation and The Wall Street Journal in 1994 and has been published annually for the last 15 years. Around the same time the *Economic Freedom of the World Index* (EFW) was published by the Frasier Institute, and has been published annually for the last 8 years.

These international indices have become increasingly important within and outside of the economics profession. In a correspondence with one of the authors of the *Economic Freedom of the World*, Robert Lawson, stated that "the Free Market Foundation in South Africa has been effective in using the index with South African officials. They frequently are asked how a particular law will impact their rating. The IMF's World Economic Outlook publication featured our index prominently in its report on 'Building Institutions.' Also, the report has been used extensively in the Republic of

[16] Scully, G.W. and D.J. Slottje. "Ranking Economic Liberty Across Countries" 1991
[17] Full report at www.freedomhouse.org/template.cfm?page=15
[18] See Heckelman, Jac C. and Michael D. Stroup. "Which Economic Freedoms Contribute to Growth" 2000 for short summary of Freedom House study. Also see, Richard Messick, World Survey of Economic Freedom.

Georgia as a roadmap for economic reforms." He continued that, "we are cited hundreds of times annually in media reports and often officials are asked to comment in these stories."[19]

Robert Lawson also reported that they have received much feedback, not always positive. In the last few years, they have received feedback from officials from France, Hong Kong, and Pakistan. With the exception of Georgia, many more countries have taken steps that have increased their ratings, but he can't say these changes were necessarily driven by the existence of the index. He says the index is an academic project and that he doesn't follow the policy debates much.

There are numerous indices that are produced at the sub-national level. The Frasier Institute produces some through their relationships with think tanks in their Economic Freedom Network.[20] The *U.S. Economic Freedom Index* (USEF) was first published in 1998 and with the support of the Pacific Research Institute and Forbes has been updated twice in 2004 and 2008. The Mercatus Center at George Mason University has also recently published the *Freedom in the 50 States*, which has a measure of economic freedom and personal freedom. The index that will be discussed at length in Chapter 3 is the *Economic Freedom of North America* (EFNA) from the Frasier Institute, in order to provide insight and comparison for the results found at the international level. The following will be a brief survey of the literature that has used these indices, and then a discussion of the controversy on the appropriate weighting of components within the various indices. This will be followed by an analysis of the construction and comparison

[19] Email correspondence with Robert Lawson on November 21, 2009
[20] http://www.freetheworld.com/member.html

of the international indices. The aggregated indices will be reduced to their sub-components and their relationship to GDP and growth will be tested using linear regression. This will be done in order to test the sensitivity of the index, and contribute to the discussion on the interpretation of the results and what policy implications can be drawn. A similar approach will be used on the national level for the U.S. This will be followed with concluding remarks.

PREVIOUS LITERATURE:

Over the last decade, there have been many empirical studies that have used one or several of the economic freedom indices. A search on Google Scholar results in over 300 citations for Frasier's EFW index and over 200 citations for Heritage's IEF. Therefore, what follows is a brief overview. They have primarily been used empirically in relation to growth, entrepreneurship, other measures of well-being, and then less directly.

As already mentioned, causality test with respect to growth have been conducted by Heckelman (2000) and Dawson (2003). A comparison and overview of the two international indices, IEF and EFW, and their relationship with growth was also analyzed in Haan and Sturm (2000). Other studies examining the relationship between aggregate economic freedom are Dawson (1998), Hanson (2000), Ali and Crain (2001), Pitlik (2002), Adkins, Moomaw, and Savvides (2002), and Carlsson and Lundstrom (2002). A growing body of literature has explored the dynamics of entrepreneurship and the policies and institutions that either hinder or spur this activity, and economic freedom indices have been used to provide insight. On the international level, Bjornshov and Foss

(2008) looked at cross-country evidence using components of the Frasier Institute's EFW Index. They find a mixture of results, with the size of government being negatively correlated and sound money being positively correlated with growth, and no significant relationship with other components.

This relationship has also been studied within the United States. Using the EFNA index, Kreft and Sobel (2005) find that entrepreneurial activity is significantly impacted by the degree of economic freedom within a state. They argue that the relationship between economic freedom and economic growth is entrepreneurship created by low taxes, low regulations, and secure private property rights. These results are further supported by a similar approach conducted in a working paper by Kreft.[21]

Other measures of well-being such as educational attainment, the environment, and life expectancy in relation to economic freedom have been studied in Gwartney, Lawson, Holcombe (1999), and Grubel (1998). The indices have also been used less directly. Djankov, Gasner, McLiesh, Ramalho, and Schleifer (2008) used component data from Heritage's IEF and Frasier's EFW to study the effects of corporate taxes on investment and entrepreneurship. The effect of government's ownership of banks in Porta, Lopez-de-Silanes, Schliefer (2002) used data from the 1996 EFW.

Income inequality was examined in Berggren (1999) and Scully (2002) with international indices, and Ashby and Sobel (2006) used the EFNA index to study this within the U.S. states. A working paper by Boettke, Wright, Gordon, Ikeda, Leeson, and Sobel of the Mercatus center cites the USEF index by the Pacific Research Center in their

[21] Working paper from Kelley School of Business, Indiana University. Entrepreneurship and State Public Policy

analysis of how cultural and institutional aspects contributed to the recovery of the U.S. South after being severely damaged by Hurricane Katrina.

An important aspect to note at this point is that the construction of these indices, especially the EFW created by Gwartney and Lawson, as well as Heritage's IEF, have changed and been updated throughout the last decade. The main controversy has been the weights to apply to each component in order to create the aggregate index.

WEIGHTING:

Before the specific construction of these indices is covered, it is important to discuss the general construction of this type of index and the issue of how much weight to place on each data point or component. All of the economic freedom indices collect data that is thought to define an element of economic freedom, and then this data is usually grouped into a particular component. For instance, the Frasier Institute's EFNA index uses 10 data points such as government consumption spending, total tax revenue as percentage of GDP, top marginal income tax rate, minimum wage legislation, etc. Then they group these data points into 3 individual areas (components). From this point, they aggregate the components into one score for each state to represent the level of economic freedom. In this particular index, simple arithmetic averages are used within each component and among them to compute the aggregate score.

The major point of contention is what weight to place on each component or each data point within the components. As already cited, there have been a large number of empirical studies that have used these indices to study the relationship between economic freedom and other economic variables, mainly growth. Most have verified a positive

statistical relationship between economic freedom as measured and growth. Underpinning these results is the accuracy in which the index used is capturing economic freedom.

Berggren (2003) points out the apparent fact that the data points, components, as well as the weighting schemes, have changed over the years in the various editions that have been published. This alludes to the complexity and subjectivity of not only the proper weight to use, but also what components should be used. This has created debate on how much confidence we can place on the results from these studies.

The most comprehensive assessment and critique of the problems faced in the aggregation procedure has been Heckelman and Stroup (2005). They recount the evolution of the various weighting schemes that Gwartney and Lawson, authors of Frasier's EFW index, have used over the decade prior. One method surveyed a panel of experts, asking which particular elements of freedom they thought would be more important in determining a country's degree of economic freedom, and assigned weights to these elements based directly on the results of that survey. A separate method assumed that each element (data point) was equally important, and used a weight for each element that was the inverse of the standard deviation of that element across countries. They initially favored the survey method, but in later editions switched back to the element equality weights. In the 2000 edition, they used weights derived from the absolute value of the first principal components of the elements. Beginning in the 2002 edition and continuing to today, they turned to using simple averaging of the components, as well as within the components.

In Heckelman and Stroup (2000), some of the elements of economic freedom were not found to be significantly related to growth using bivariate and multivariate regression analysis. While they found most elements had a statistically significant positive relationship, they also found that some of the elements have a negative relationship. Because of this opposite relationship, it is unclear how the empirical analysis of the statistical relationship between the economic freedom index and growth could be properly interpreted. An increased presence of economic freedom in any specific element monotonically increases the overall value of the index but some elements of the index can be shown to hamper growth while others promote it.

These indices are created to measure the institutional characteristics consistent with economic freedom. Heckelman (2005) argues that measuring the quality of these institutions depends on the intended purpose of them. If it is merely to measure the intrinsic quality of economic freedom itself, then there is no need to compare the index with other socio-economic variable. If the objective is to assess the quality of the institutions as a means of some particular end, such as growth, then an interpretation of the relative quality of these institutions depends upon the degree to which the objective has been realized. Several studies as already mentioned have found no relationship and even negative relationship with growth for a couple of the variables. The problem is that allowing some variable values to subtract from the overall aggregate index would be failing to accurately measure the value of economic freedom, and therefore, alter the interpretation of the index.

The methodology used by the authors of *The U.S Economic Freedom Index* published by the Pacific Research Institute is unique among the indices, and their weighting is more complex. They construct the index in four major steps. First, they compiled a set of indicators for economic freedom and created 5 data sets. Second, the data sets were converted into 35 different indexes using different weighting techniques. Third, the indexes were compared to each other in terms of its ability to explain human migration across the 50 US states. Finally, the index with the greatest statistical link to migration was chosen as the best and was used to rank the US states in terms of economic freedom.

This index attempts to assign a valid weight to each component by using something other than what it might be regressed against such as growth or GDP. Many people migrate for many different reasons though, and it is difficult to control for these. Also, net migration is likely to be highly correlated with most other measures of well-being. Therefore, it is not clear that the aggregate index is not biased in a similar fashion to Heckelman and Stroup (2000), which was simply assigning a weight to each component on their ability to explain growth. Assigning greater weights to the components that best explain growth and then running the aggregate against growth though, biases the overall results in the direction that is being investigated. It is a 'circular thinking' that is criticized in Sturm, Leertouwer, and Haan (2002).

All of the methods used thus far have shortcomings. Surveys are always problematic, and there has been much criticism of the principle component methodology. Heckelman (2005) sums up much of the thought on this type of weighting. They state

that, “while it allows the data to determine the weighting, it fails to reflect any conceptual link between the economic theory behind the selection of the elements being aggregated and the aggregate index value itself.”[22] Principal component analysis may generate negative weights, which means we can no longer interpret the aggregate index as measuring overall economic freedom. This is because greater levels of a variable (that is supposed to signify an aspect consistent with economic freedom) are given a negative weight would actually reduce the aggregate index value.

The simple averaging approach has the advantage of simplicity and ease of understanding, but it also has problems as it is arbitrary. It applies equal weight to each of the components. However, considering that there are a different number of variables in each component, this means unequal weight is given to each variable.

The many different weighting schemes have created different empirical results when using an aggregate index. This is likely due to some of the elements in the economic freedom index impacting the socio-economic variable of interest with very different magnitudes, whether growth, entrepreneurship, or any other. With growth, some have actually showed a negative relationship. This problem has been highlighted in Heckelman and Stroup (2000) at the individual element (variable) level, and at the component level in Carlsson and Lundstrom(2002).

[22] From Heckelman and Stroup (2005)

CHAPTER TWO

INTERNATIONAL LEVEL

SUMMARY OF INDICES:

-The Index of Economic Freedom (IEF): The Heritage Foundation[23]

The IEF was an idea developed by The Heritage Foundation in the late 1980s and was first published in 1994. Their goal was to develop a systematic, objective, and empirical measurement of economic freedom in economies around the world.[24] Their methodology has gradually changed over the years as the data necessary for the construction of the index has grown over the 15 years the index has been published. In 2007, they updated the basic scale for each component from a ranking of 1 to 5, with lower scores reflecting more freedom, to a scale of 0 to 100, with higher scores reflecting more freedom.

The index now covers 183 countries and measures 10 separate components of economic freedom. As with all of the indices covered, the components are to provide a portrait of a country's economic policies and institutions, assigning a quantitative measure that establishes benchmarks by which to gauge strengths and weaknesses with regard to economic freedom. The 10 components are as follows:[25]

1. Business Freedom- This is to measure an individual's right to create, operate, and close an enterprise without interference from the state. The score is based

[23] Full report can be found at http://www.heritage.org/index/
[24] View Executive Summary, 2009 Edition
[25] Based off of 2009 Index, see Methodology appendix on page 441 of 2009 edition

on 10 factors, all weighted equally, using data from the World Bank's Doing Business study:

   a. Starting a business- number of procedures
   b. Starting a business- number of days
   c. Starting a business- cost as percent of income per capita
   d. Starting a business- minimum capital as percent of income per capita
   e. Obtaining a license- number of procedures
   f. Obtaining a license- number of days
   g. Obtaining a license- cost as percent of income per capita
   h. Closing a business- number of years
   i. Closing a business- cost as percent of estate
   j. Closing a business- recovery rate as cents on the dollar

2. Trade Freedom- This reflects the ability of a country to experience the gains from trade created in an environment open to imports of goods and services from abroad and for citizens to interact freely in the international marketplace. The trade freedom score is based on 2 inputs:
   a. The trade-weighted average tariff rate
   b. Non-tariff barriers
3. Fiscal Freedom- The freedom of individuals and businesses to keep and control their income and wealth for their own benefit and use. More than just taking personal and corporate tax rates, they have aimed to take into account other taxes that can be imposed. Governments impose taxes such as payroll,

sales, excise, tariffs, and value-added taxes. They attempt to capture these by measuring total government revenues from all forms of taxation as a percentage of total GDP. There are 3 factors used:

   a. The top tax rate on individual income
   b. The top tax rate on corporate income
   c. Total tax revenue as a percentage of GDP

4. Government Size- This component is straight-forward and uses the level of government expenditures as a percentage of GDP, and this includes government consumption and transfers. They state that some level of government expenditures represents true public goods, which would imply an ideal level greater than zero, but they believe it is too difficult to apply universally. Also, there are few countries, if any, that are below this level. Therefore, they treat zero government spending as the benchmark. Government expenditures necessarily compete with private agents and interfere in market prices by over-stimulating demand and potentially diverting resources through a crowding-out effect.
5. Monetary Freedom- Price stability and an assessment of price controls are combined to measure monetary freedom. Price stability without microeconomic intervention is the ideal state for the free market. The 2 inputs are as follows:

   a. The weighted average inflation rate for the most recent three years
   b. Price controls

6. Investment Freedom- In a free market, capital will flow to its best use where it is most needed, and therefore, areas that will likely produce the highest return. Restrictions on foreign investment diminish this process and limits both inflows and outflows of capital. There is a subjective nature to this measure. They explore questions such as whether there is a foreign investment code that defines the country's investment laws and procedures; whether foreign investment is encouraged through fair and equitable treatment of investors; equal treatment for foreign firms as domestic firms under the law; etc. They apply a score of either 100, 90, 80, 70, 60, 50, 40, 30, 20, 10, or 0.
7. Financial Freedom- This is a measure of banking security and the independence from government control. The idea is that state ownership of banks and other financial institutions such as insurers and capital markets is an inefficient manner to regulate capital that reduces competition and generally lowers the level of available services. The scoring is synonymous to that of investment freedom, using criteria such as the extent of state intervention in banks and other financial services, government influence on the allocation of credit, and the difficulty of opening and operating financial services firms.
8. Property Rights- This is an assessment of the ability of individuals to accumulate private property, which is an essential force in a market economy. The rule of law is vital for a free market to function, as it provides confidence for individuals to undertake commercial activities and save and invest for their future well-being. This component is again scored as investment and financial

freedom, with a score of 100 being applied to a country where private property is guaranteed by the government, the court system enforces contracts efficiently, and the justice system punishes unlawfully confiscating private property. Zero is applied to the other extreme, where private property is rarely protected and property is mostly either directly or indirectly controlled by the state.

9. Freedom from Corruption- This component is derived for most of the countries by using the Transparency International's Corruption Perceptions Index (CPI), which gives a score of 0 to 10 and then they convert it over to the 0 to 100 scale. The idea with corruption is simply that the more it exists the more it erodes economic freedom by introducing insecurity and uncertainty into economic relationships.
10. Labor Freedom- This is measure of a country's legal and regulatory framework as it applies to the labor market. The easier individuals can move in and out of occupations, the more efficiently labor moves to more productive and higher valued work. There are 6 equally weighted factors in this component:
    a. Ratio of minimum wage to the average value added per worker
    b. Hindrance to hiring additional workers
    c. Rigidity of hours
    d. Difficulty of firing redundant employees
    e. Legally mandated notice period

f. Mandatory severance pay

The authors of IEF point out that they apply an equal weight to each of the 10 components so that the overall score will not be biased toward any one component or policy direction. They state that the purpose of the index is to reflect the economic environment in every country surveyed in as balanced a way as possible. This is the same view that the authors of the EFW index take in their latest edition, which will be examined next.

-Economic Freedom of the World Index (EFW): The Frasier Institute[26]

The objective of the EFW published by the Frasier Institute is the same as the IEF. They define as consistent with economic freedom, institutions and policies that provide an infrastructure for voluntary exchange and protect individuals and their property from aggressors. In order to achieve a high EFW rating, a country must provide secure protection of privately owned property, even-handed enforcement of contracts, and a stable monetary environment. They also must keep taxes low, refrain from creating barriers to both domestic and international trade, and rely more fully on markets rather than the political process to allocate goods and resources.

The EFW was first published around the same time as the IEF, only a couple of years later in 1996. It has been published annually since 2000. The authors state that the index is based on 3 important methodological principles. First, objective components are always preferred to those that involve surveys or value judgments. This said, they felt in necessary to use data based on surveys due to the importance of legal and regulatory

[26] Full report can be found at http://www.freetheworld.com/release.html

institutions where the appropriate objective data is difficult to ascertain. Second, on that same theme, the data used to construct the index ratings are from external sources such as the IMF, World Bank, and World Economic Forum that provide data for a large number of countries. Third, transparency is present throughout.

The 2009 edition of the index covers 141 countries, and is constructed by using 42 data points that are grouped into 5 major components. Each component score is converted into a scale between 0 to 10, a higher score reflecting more economic freedom, and each are equally weighted to compute the overall score. They have also created a chain-linked summary index that is useful for comparison over a longer time frame. The components are as follows:[27]

1. Size of Government: Expenditures, Taxes, and Enterprises- This is to measure the extent to which countries rely on the political process to allocate resources and goods and services. It is made up of 4 sub-components:
    a. General government consumption spending as a percentage of total consumption
    b. Transfers and subsidies as a percentage of GDP
    c. Government enterprises and investment
    d. Top marginal tax rate
        i. Top marginal income tax rate
        ii. Top marginal income and payroll tax rates

[27] See chapter 1 of 2009 annual report

2. Legal Structure and Security of Property Rights- This component is to measure the rule of law and the extent to which property is protected. The data used is from surveys by the Global Competitive Report, the International Country Risk Guide, and Doing Business. The subcomponents are:
    a. Judicial Independence
    b. Impartial Courts
    c. Protection of property rights
    d. Military interference in rule of law and the political process
    e. Integrity of the legal system
    f. Legal enforcement of contracts
    g. Regulatory restrictions on the sale of real property
3. Access to Sound Money- This is very similar to a combination of IEFs monetary freedom and investment freedom. Inflation or instability in the money supply can undermine gains from trade, and this component is to gauge the extent of this aspect. It is broke into 4 subcomponents:
    a. Money Growth
    b. Standard deviation of inflation
    c. Inflation: Most recent year
    d. Freedom to own foreign currency bank accounts
4. Freedom to Trade International- This is straight-forward, gains from trade are the essence of growth and vital to economic freedom. This especially applies

to international markets due to the increase in specialization in various parts of the world. This is created using 5 subcomponents:

a. Taxes on international trade
    i. Revenues from trade taxes as percent of trade sector
    ii. Mean tariff rate
    iii. Standard deviation of tariff rates
b. Regulatory trade barriers
    i. Non-tariff trade barriers
    ii. Compliance cost of importing and exporting
c. Size of trade sector relative to expected
d. Black-market exchange rates
e. International capital market controls
    i. Foreign ownership and investment restrictions
    ii. Capital controls

5. Regulation of Credit, Labor, and Business- This component captures many aspects of the environment of regulation. Regulation can in many ways be helpful to economic freedom when it contributes to more clearly defined property rights and a functioning market, but in most cases regulation tends to go further than this. The more regulations a country has in place is likely to restrict entry into markets and reduce the freedom to engage in the marketplace, and therefore, reduce economic freedom. This area is made up with 3 subcomponents that contain 17 data points:

a. Credit market regulation
    i. Ownership of banks
    ii. Foreign bank competition
    iii. Private sector credit
    iv. Interest rate controls/negative real interest rates
b. Labor market regulations
    i. Minimum wage
    ii. Hiring and firing regulations
    iii. Centralized collective bargaining
    iv. Mandated cost of hiring
    v. Mandated cost of worker dismissal
    vi. Conscription
c. Business regulations
    i. Price controls
    ii. Administrative requirements
    iii. Bureaucracy costs
    iv. Starting a business
    v. Extra payments/ bribes
    vi. Licensing restrictions
    vii. Cost of tax compliance

COMPARISON AND ANALYSIS:

In the most recent editions as described, it is apparent that both indices are similar in many aspects. Table 2.1 is a summary of the similarities in construction. Both have the same idea of what economic freedom entails; low regulation, low taxes, a stable monetary environment, labor mobility, secure private property, ease in starting a business, etc. Each index uses straight averaging in order to aggregate each component and then again for the overall score.

Both indices have made some changes since their inception, Frasier's EFW more so than IEF. As already mentioned, EFW has experimented with various weighting schemes and have increased the number of data points and components. Heritage has maintained a more consistent methodology, but has changed the scale of rating. They had formerly used a 1-5 point scale, which was criticized as obscuring important differences among nations, but have now changed this to a 0-100 scale. EFW uses a 0-10 scale, but is continuous (uses decimals) and therefore is just as rich. When making updates, EFW has updated their past data to allow for comparison over time. They both appear to have settled on a consistent method over the last few years. Also, in previous studies using these indices, EFW was missing many data points, but with time they have been able to fill this gap in data.

Table 2.1 clearly displays that there is great overlap and similarities between the indices in regard to what should be included. The only direct component that differs between the indices is the Freedom from Corruption that is used in the IEF, but not accounted for in EFW.

Table 2.1: Similarities between EFW and IEF

Economic Freedom of the World	Index of Economic Freedom
1.Size of Government -General Gov't consumption as % of total consumption -Transfers and subsidies as % of GDP -Gov't enterprise and investment -Top marginal tax rate -Top marginal tax rate -Top marginal income and payroll tax rates	3.Fiscal Freedom -Top tax rate on individual income -Top tax rate on corporate income -Total tax revenue as % of GDP 4.Government Size -Gov't expenditures as % of GDP
2.Legal Structure and Security of Property Rights -Judicial independence -Impartial courts -Protection of property rights -Military interference in rule of law/politics -Integrity of the legal system -Legal enforcement of contracts -Regulatory restrictions on the sale of real estate	8.Property Rights
3.Access to Sound Money -Money growth -Standard deviation of inflation -Inflation in most recent year -Freedom to own foreign currency bank accounts	5.Monetary Freedom -Weighted average inflation rate (3 most recent years) -Price controls 6.Investment Freedom
4.Freedom to Trade Internationally -Taxes on international trade -Regulatory trade barriers -Size of trade sector relative to expected -Black market exchange rates -International capital market controls	2. Trade Freedom -Trade-weighted average tariff rate -Non-tariff barriers
5.Regulation of Credit, Labor, and Business -Credit market regulations -Labor market regulations -Business regulations	7.Financial Freedom 10.Labor Freedom 1.Business Freedom

The Heritage Foundation's IEF is primarily based on the prevailing institutions and policies in place, whereas Frasier's EFW is reliant on macroeconomic outcomes. There are pros and cons to both. The IEF may be considered cleaner for determining if economic freedoms promote other socio-economic outcomes[28], but a serious downfall to the methodology is that the core data is not provided with the IEF, making replications difficult, if possible at all. There appears to be a large amount of subjectivity involved in the calculation of each element, whereas the EFW uses only third party data that can be verified. All of their raw data is available and all calculations can be replicated. Of course, each index has a subjective nature in deciding what variables to use, but the authors of the EFW providing all of their data is a significant advantage for the use of their index. This aspect, more than anything else, has contributed to it being used more often in academic literature.

Table 2.2: Top Ten Rankings for 2007[29]

Rank	EFW	Score	IEF	Score
1	Hong Kong	8.97	Hong Kong	90.0
2	Singapore	8.66	Singapore	87.1
3	New Zealand	8.30	Australia	82.6
4	Switzerland	8.19	Ireland	82.2
5	Chile	8.14	New Zealand	82.0
6	United States	8.06	United States	80.7
7	Ireland	7.98	Canada	80.5
8	Canada	7.91	Denmark	80.0
9	Australia	7.89	Switzerland	79.4
10	United Kingdom	7.89	United Kingdom	79.0

[28] See Heckelman, Jac C. and Michael Stroup (2000)

[29] The ranking are from the 2009 report for EFW and the 2008 report for IEF, which both reflect 2007 data

Table 2.3 displays some general correlation statistics of the indices since the year 2000. The IEF covers more countries than EFW, so all countries not covered by the EFW were dropped out of the comparison. Also, aggregate component scores are missing for some countries in both indices, and those countries were dropped as well. This left 117 countries covering 8 years from the year 2000 through 2007.

Table 2.3: Correlation Statistics

Overall Correlation		Correlation with IEF Lag			Correlation with EFW Lag		
2000-07	0.868	EFW		IEF	EFW		IEF
2007	0.891	2001-07	0.859	2000-06	2000-06	0.875	2001-07
2006	0.893	2007	0.885	2006	2006	0.893	2007
2005	0.900	2006	0.881	2005	2005	0.908	2006
2004	0.898	2005	0.891	2004	2004	0.899	2005
2003	0.872	2004	0.882	2003	2003	0.879	2004
2002	0.863	2003	0.856	2002	2002	0.881	2003
2001	0.850	2002	0.844	2001	2001	0.865	2002
2000	0.827	2001	0.834	2000	2000	0.837	2001
Corr. w/o Corruption		OECD Correlation			Standard Deviation		
2000-07	0.841	2000-07	0.853		Both Indices	2000-07	9.71
2007	0.890	2007	0.890				
2006	0.874	2006	0.902		EFW	2000-07	9.03
2005	0.886	2005	0.929			Min	28.90
2004	0.871	2004	0.875			Max	89.70
2003	0.831	2003	0.853				
2002	0.837	2002	0.911		IEF	2000-07	9.98
2001	0.818	2001	0.897			Min	29.45
2000	0.778	2000	0.805			Max	89.97

The two indices have not been as highly correlated as expected, but have become more so over the last decade. It is not clear why this is the case, and without the raw data being provided by Heritage's IEF, it is difficult to investigate fully. I suspect that this has been a result of data collection more than methodology. On the part of both indices, data has become more readily available, which has allowed fewer gaps in the component

scores. With regard to the IEF, the data collection has been less transparent and with the raw data not provided, it is likely they have modified their data collection due to criticism and honest improvements. It is proposed here that these two aspects have led to the convergence. The correlation over the last four years has been consistent and stable at .89 to .90.

As presented in Table 2.3, the indices were compared in several different manners in an attempt to determine whether the difference in the last several years, determined by the correlation, results more from differences in data collection or in aggregation methodology. The timing of the data was addressed by running the correlation with a lag. When each index is published, they determine some cutoff date in which the data they have will be applied, but they have numerous sources and all of which publish their data at different times. The correlation remained between .88 and .90 with each index lagged for one year.

A challenge to any index is the accuracy and reliability of the data collected. It seems reasonable to expect that data collected from developed countries or more democratic countries would be more reliable than underdeveloped or autocratic countries. To explore the sensitivity of this aspect, a correlation is calculated between the indices using only OECD[30] member countries. There is no overall increase in the correlation over this time period. There is a more significant difference during 2001 through 2003, but this dissipates after that period and there is very little difference over the last 4 years, suggesting that imperfections in the data collection may have improved.

[30] Organization for Economic Cooperation and Development

As already stated, another aspect explored was the observation that the IEF contains a corruption component, whereas this is not directly addressed in the EFW. The significance of this is examined by determining the correlation between the indices after dropping the corruption component. The correlation remains similar, but is reduced a small amount, implying that the corruption component provides some strength to the index. The trend throughout the observation period remains the same, but the corruption component does have a depressing affect on the IEF index and contributes to its lower score on average over this time period.

Figure 2.1: Overall Index Scores over 2000-2007

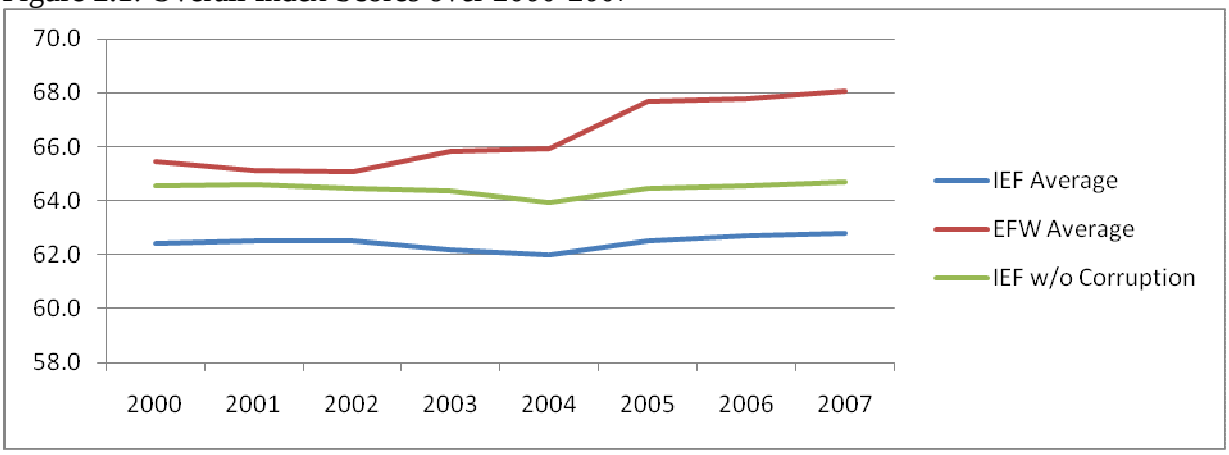


Figure 2.2: Standard Deviation over 2000-2007

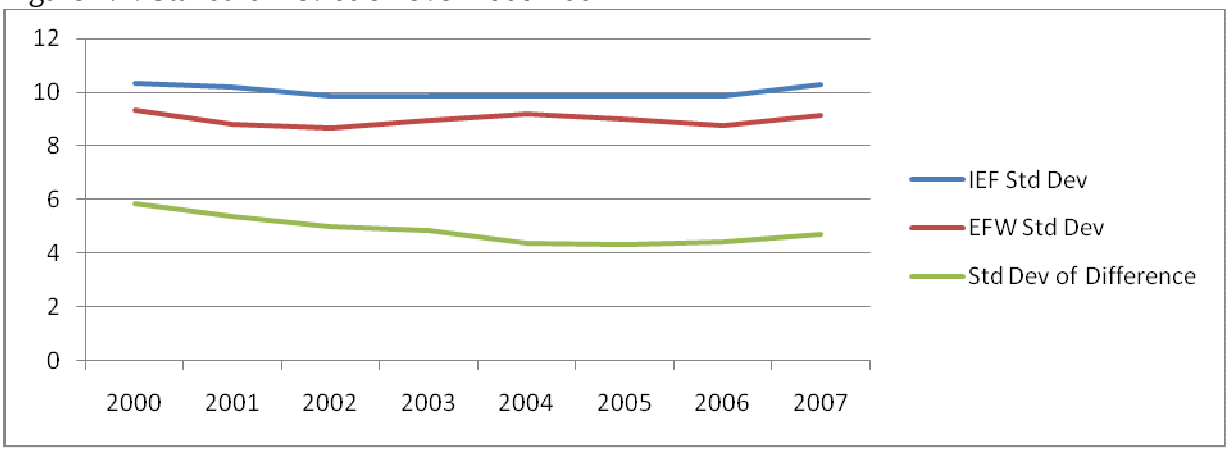
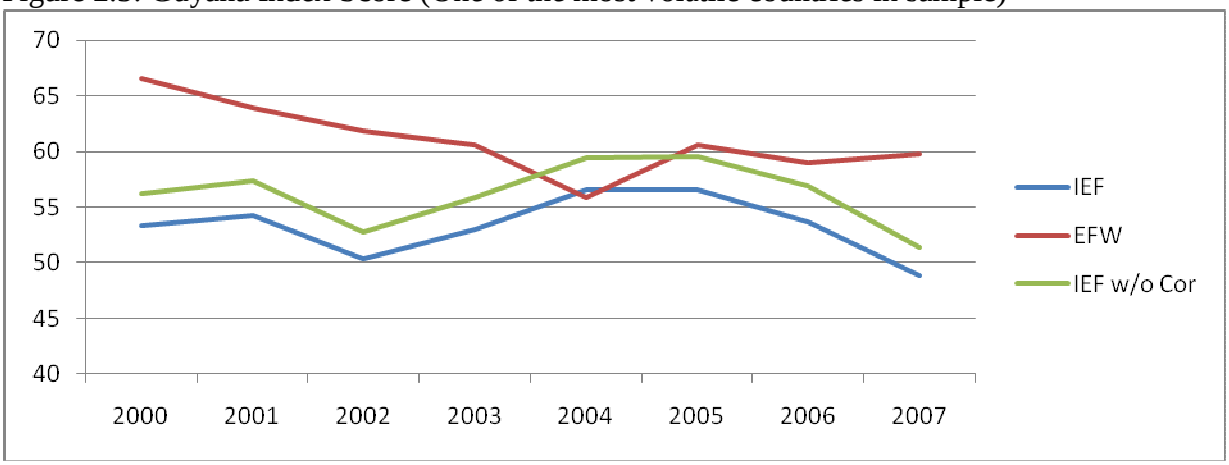
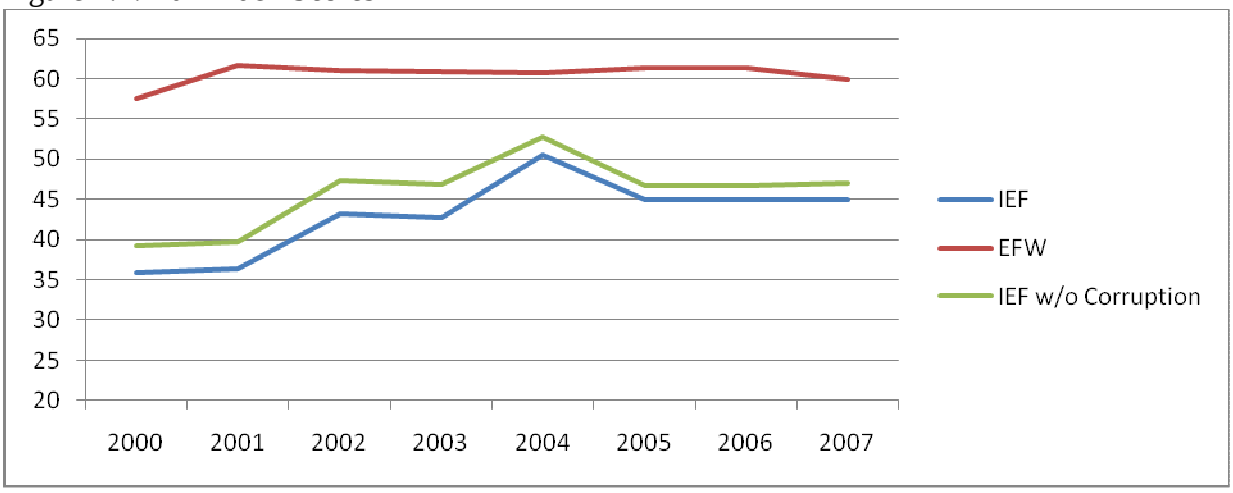


Figure 2.3: Guyana Index Score (One of the most volatile countries in sample)



A glance at the correlation results also seem to show that while there was an increase in the correlation through most of the period, there was a bounce up during the 2003-2004 periods, and the correlation has stayed fairly level since then. Both indices have been modified some throughout this period, but IEF does not have the labor freedom component prior to 2005. This area is a major component for both indices, and the addition of this has created a more stable correlation between the two.

Figure 2.4: Iran Index Scores



MODEL AND DATA:

As already noted, growth and economic freedom have been found to be highly correlated in most studies that have used the aggregate economic freedom score. Most of these studies have used data from the 1990s. Carlsson and Lundstrum (2002) explored the relationship further by testing a model using the individual components of the EFW index. They found that not all of the components are positively correlated with growth, including the size of government and freedom to trade internationally. Several of the studies that tested short term causality suggested that the size of government component didn't precede growth, but that growth may cause a larger size of government.

In order to investigate these indices further, several regression models were specified that are similar to those used in Dawson (1998) and Carlsson and Lundstrum (2002). The aim is to inquire at whether these results can be supported by using more recent data, and whether the results are sensitive to what index is used. An additional step is also taken by recalculating each index after dropping a component. It is thought that this can provide insight into whether the component dropped adds or detracts from the overall index, and explain whether a particular component is driving most of the results found in these studies. The models are as followed:

1. $GDP_i = \alpha + \delta_1 GDP99_i + \delta_2 SAV_i + \sum_{i=1}^{5} \beta_j \, EF_i^j + \varepsilon_i$

Where, GDP is the GDP per capita for country i

GDP99 is the level GDP for 1999 for country i

SAV is the gross savings as percent of GDP for country i

EF is the component score assigned to country i for component j

(The same model was specified using IEF and EFW components)

2. $G_i = \alpha + \delta_1 GDP99_i + \delta_2 SAV_i + \sum_{i=1}^{5} \beta_j \, CEF_i^j + \varepsilon_i$

Where, G is the growth rate for country i

CEF is the change in the component j score

3. $GDP_i = \alpha + \delta_1 GDP99_i + \delta_2 SAV_i + \beta EFW_i + \varepsilon_i$

This is repeated substituting EFW-1, EFW-2, EFW-3, EFW-4, and EFW-5

Where, EFW-1 is the aggregate score without the Size of Government

EFW-2 is the aggregate score without Property Rights

EFW-3 is the aggregate score without Sound Money

EFW-4 is the aggregate score without International Trade

EFW-5 is the aggregate score without the Regulation component

(The model was also specified using the IEF scores in place of the EFW)

Where, IEF-1 is the aggregate score without the Business Freedom

This is continued with each of the 10 IEF components.

4. $G_i = \alpha + \delta_1 GDP99_i + \delta_2 SAV_i + \beta CEFW_i + \varepsilon_i$

This is also repeated substituting CEFW-1, CEFW-2, CEFW-3, CEFW-4, and CEFW-5 for each component removed from the EFW.

Where, CEFW is the change in the aggregate score

(The same definitions and model were conducted for the IEF)

The data used in the regressions cover the year 2000-2006. Ideally, a longer time period could be used, but the objective is to provide a direct comparison between these two indices and this is the time frame that annual scores have been produced for both. The indexes cover up to 2007, but data for the dependent variables, GDP per capita and growth rates, as well as the control variable, gross saving, could not be obtained for 2007. In addition to having annual scores for both indices during this period, there are no gaps in the index data during these periods. This seven year period allowed for 722 observations using GDP and 615 using growth.

Table 2.4: Summary Statistics

	GDP p/ Capita	Growth	1999 GDP (mil)	Gross Savings	EFW	CEFW	IEF	CIEF
Min	32.97	-15.31	200	-40.21	2.89	-20.96	29.45	-14.90
Max	81982.22	95.28	9417100	57.59	8.97	18.47	89.97	18.82
Std Dev.	15403.44	4.58	991063	9.51	0.90	3.50	9.98	3.50

The index data was from their respective websites. The GDP and growth data are from the ERS International Macroeconomic data set provided by the United States Department of Agriculture. The rest of the data was gathered from the World Development Indicators 2008 provided from the World Bank.

RESULTS:

Table 2.5: EFW Model 1 and 2 Results[31]

Regressed on GDP p/Cap				Regressed on Growth in GDP p/Cap			
Variable	Coef.	Std Err.	P-Value	Variable	Coef.	Std. Err.	P-Value
GS (1)	-781.35**	238.02	0.001	CGS (1)	0.011	0.013	0.411
PR (2)	4469.84**	267.11	0.000	CPR (2)	0.014	0.010	0.159
SM (3)	937.13**	252.07	0.000	CSM (3)	0.049**	0.012	0.000
IT (4)	555.24	403.27	0.169	CIT (4)	0.077**	0.024	0.002
RG (5)	492.86	450.91	0.275	CRG (5)	0.06**	0.020	0.004
SAV	30.85	33.76	0.361	SAV	0.081**	0.014	0.000
GDP99	0.002	0.0003	0.000	GDP99	-1.22E-07	1.38E-07	0.378
R^2	0.6556			R^2	0.1111		
Adj R^2	0.6522			Adj R^2	0.1009		
#Obs	722			#Obs	615		

Table 2.6: EFW Model 3 and 4 Results

Regressed on GDP p/Cap					Regressed on Growth in GDP p/Cap				
Variable	Coef.	Std Err.	P-Value	Adj R^2	Variable	Coef.	Std Err.	P-Value	Adj R^2
EFW	9090.53**	448.15	0.000	0.4602	CEFW	0.221**	0.036	0.000	0.1013
SAV	141.38**	40.89	0.001		SAV	0.08**	0.014	0.000	
GDP99	0.003**	0.0004	0.000		GDP99	-1.3E-07	1.4E-07	0.347	
EFW-1	8455.42**	314.93	0.000	0.5763	CEFW-1	0.189**	0.031	0.000	0.1008
SAV	80.23**	36.45	0.028		SAV	0.078**	0.014	0.000	
GDP99	0.003**	0.0004	0.000		GDP99	-1.3E-07	1.4E-07	0.350	
EFW-2	6282.64**	559.06	0.000	0.2779	CEFW-2	0.224**	0.038	0.000	0.1016
SAV	208.48**	47.07	0.000		SAV	0.085**	0.014	0.000	
GDP99	0.004**	0.0004	0.000		GDP99	-1.4E-07	1.4E-07	0.319	
EFW-3	9569.43**	502.03	0.000	0.4385	CEFW-3	0.147**	0.033	0.000	0.0766
SAV	138**	41.83	0.001		SAV	0.078**	0.014	0.000	
GDP99	0.003**	0.0004	0.000		GDP99	-1.4E-07	1.4E-07	0.304	
EFW-4	8314.67**	431.29	0.000	0.4405	CEFW-4	0.157**	0.030	0.000	0.0874
SAV	171.72**	41.51	0.000		SAV	0.08**	0.014	0.000	
GDP99	0.003**	0.0004	0.000		GDP99	-1.4E-07	1.4E-07	0.304	
EFW-5	8321.54**	429.2	0.000	0.4427	CEFW-5	0.182**	0.033	0.000	0.0916
SAV	137.24**	41.59	0.001		SAV	0.08**	0.014	0.000	
GDP99	0.003**	0.0004	0.000		GDP99	-1.4E-07	1.4E-07	0.319	

[31] **indicates statistically significant at 99% confidence, * at 95% confidence

Table 2.7: IEF Model 1 and 2 Results

Regressed on GDP p/Cap				Regressed on Growth in GDP p/Cap			
Variable	Coef.	Std Err.	P-Value	Variable	Coef.	Std. Err.	P-Value
BF (1)	-36.75	29.09	0.207	CBF (1)	-0.0046	0.016	0.767
TF (2)	123.38**	20.87	0.000	CTF (2)	-0.0003	0.0016	0.869
FF (3)	-161.26**	22.05	0.000	CFF (3)	0.0075	0.0178	0.673
GS (4)	-78.84**	15.20	0.000	CGS (4)	-0.0004	0.0051	0.936
MF (5)	58.35*	25.54	0.023	CMF (5)	0.0284*	0.0129	0.028
IF (6)	-53.09**	19.55	0.007	CIF (6)	0.0123	0.0082	0.132
FiF (7)	-18.21	17.93	0.310	CFiF (7)	0.0025	0.0055	0.650
PR (8)	78.55**	23.30	0.001	CPR (8)	0.0125	0.0112	0.269
FfC (9)	337.1**	24.71	0.000	CFfC (9)	-0.0026	0.0059	0.665
LF (10)	removed	n/a	n/a	CLF (10)	removed	n/a	n/a
SAV	42.09	25.79	0.103	SAV	0.083**	0.015	0.000
GDP99	0.002**	0.0004	0.000	GDP99	-1.76E-07	1.42E-07	0.216
R^2	0.8087			R^2	0.0665		
Adj R^2	0.8057			Adj R^2	0.0495		
#Obs	722			#Obs	615		

Table 2.8: IEF Model 3 and 4 Results

Regressed on GDP p/Cap					Regressed on Growth in GDP p/Cap				
Variable	Coef.	Std Err.	P-Value	Adj R^2	Variable	Coef.	Std Err.	P-Value	Adj R^2
IEF	832.04**	41.56	0.000	0.4551	CIEF	0.0907*	0.0365	0.013	0.0553
SAV	152.75**	41.04	0.000		SAV	0.0816**	0.0145	0.000	
GDP99	0.0032**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.201	
IEF-1	805.82**	42.66	0.000	0.4328	CIEF-1	0.0886**	0.0335	0.008	0.0566
SAV	164.22**	41.83	0.000		SAV	0.0824**	0.0145	0.000	
GDP99	0.0034**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.210	
IEF-2	770.43**	41.8	0.000	0.4236	CIEF-2	0.089*	0.0347	0.011	0.056
SAV	149.64**	42.24	0.000		SAV	0.0821**	0.0145	0.000	
GDP99	0.0034**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.192	
IEF-3	821.53**	34.22	0.000	0.5290	CIEF-3	0.0869**	0.0335	0.010	0.0562
SAV	146.12**	38.14	0.000		SAV	0.0814**	0.0145	0.000	
GDP99	0.0029**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.202	
IEF-4	790.51**	30.27	0.000	0.5645	CIEF-4	0.0809*	0.0329	0.014	0.0552
SAV	134.05**	36.71	0.000		SAV	0.0827**	0.0145	0.000	
GDP99	0.0028**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.203	
IEF-5	778.01**	39.72	0.000	0.4465	CIEF-5	0.0664*	0.0320	0.038	0.0525
SAV	154.4**	41.35	0.000		SAV	0.0818**	0.0145	0.000	
GDP99	0.003**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.203	
IEF-6	861.13**	44.10	0.000	0.4455	CIEF-6	0.0742*	0.0365	0.043	0.0522
SAV	141.81**	41.46	0.000		SAV	0.0808**	0.0145	0.000	
GDP99	0.003**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.216	
IEF-7	889.71**	45.33	0.000	0.4473	CIEF-7	0.0868*	0.0384	0.024	0.0537
SAV	126.12**	41.48	0.002		SAV	0.0804**	0.0145	0.000	
GDP99	0.0032**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.193	
IEF-8	779.9**	49.69	0.000	0.3678	CIEF-8	0.0685	0.0350	0.051	0.0517
SAV	179.92**	44.12	0.000		SAV	0.0813**	0.0145	0.000	
GDP99	0.0037**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.200	
IEF-9	722.57**	50.27	0.000	0.3406	CIEF-9	0.0828*	0.0354	0.020	0.0542
SAV	195.97**	45.01	0.000		SAV	0.0814**	0.0145	0.000	
GDP99	0.0039**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.200	
IEF-10	830.22**	40.92	0.000	0.4603	CIEF-10	0.098**	0.0364	0.007	0.0570
SAV	153.38**	40.83	0.000		SAV	0.0815**	0.0145	0.00	
GDP99	0.0033**	0.0004	0.000		GDP99	-2E-07	1.4E-07	0.211	

The first observation of these results is that the overall economic freedom index, whether EFW or IEF, is positively correlated with GDP and growth. The measure of fitness between with EFW and IEF and GDP is close, with an adjusted R-squared of .46

using the EFW and .455 with IEF, suggesting that the model explains roughly 46 percent of the variation in GDP per capita. The model suggest that a one unit increase in the EFW leads to a $9000 increase in GDP per capita, and a 10 point increase in the IEF (which is equivalent to one point in the EFW) leads to $8300 increase in GDP per capita. This positive correlation is consistent with past literature.

Separating the indices into each component explains even more of the variation, but consistent with the results found in Carlsson and Lundstrum (2002) and Heckelman and Stroup (2000), some of the components that make up the index are found to be negative. As displayed in Table 2.1, the Size of Government component in the EFW is equivalent to the Fiscal Freedom and Government Size components of the IEF, and with both indices, a negative coefficient is found with these in relation to GDP per capita, and they are statistically significant. This is further supported when looking at the adjusted R-squared of the indices after a component had been dropped. With both the EFW and IEF, the stronger model, as measured by the adjusted R-squared, is after the government size components are dropped.

A change in the aggregate indices are found to be statistically significant to growth, but the explanatory power of the models is clearly weaker. Also, a change in government size is not found to be significant to growth in this case. Property rights and legal structure is clearly the area that has the largest impact. It is clear from the results that property rights are crucial. The property rights component has the largest coefficient with the EFW in Model 1, and also the model is weakest when that component was removed.

Heckelman (2005) suggested that when using an economic freedom index in empirical work, especially in relation to growth, we should be careful in our interpretation of the aggregate score, and that the components or data points should be analyzed separately. This is because some of the components have a negative coefficient. The results here support this conclusion.

The results with government size are somewhat surprising. Although the coefficient suggest that the economic significance of this component is much less than most of the other components, it is still hard to believe that an increase in government size would lead to an increase in prosperity. An explanation of the government size component though, is that the causal relationship is reversed. This is what was found in Heckelman (2000), which was that the short-run causal relationship between government intervention and growth was that growth preceded government intervention. Although the causal relationship is not being examined directly, these results are consistent with this.

In Peltzman (1980), it was hypothesized that the leveling of income differences, basically the growth of the middle class, was a major source of the growth of government. This theory would indicate that wealthy developed nations can afford and demand more redistribution through government. Therefore, higher growth may lead to a larger size of government, but it is not suggested that this is beneficial to long term growth.

The range of countries used in the sample varies greatly, from wealthy societies such as the U.S. and Europe to poorer nations such as Zimbabwe. It is suggested that the increase demand for more government is less likely to hold within countries that already

have large governments. To investigate this further, Models 1 and 2 with the EFW are reran, but using only countries that have a GDP per capita over $30,000 as of 2007. Table 2.8 displays the results when using only these countries. With many fewer observations, the model is weaker. The results indicate that the relationships are sensitive to the sample selection. The sign doesn't change on the government size component, but it is no longer statistically significant. This will also be tested further when economic freedom among the U.S states is examined.

Table 2.9: EFW Model 1 and 2 Results (Only Wealthy Nations)[32]

Regressed on GDP p/Cap				Regressed on Growth in GDP p/Cap			
Variable	Coef.	Std Err.	P-Value	Variable	Coef.	Std. Err.	P-Value
GS (1)	-780.37	543.82	0.154	CGS (1)	-0.0063	0.0112	0.576
PR (2)	2840.48**	856.64	0.001	CPR (2)	-0.0454	0.0289	0.120
SM (3)	-10109.68**	3679.15	0.007	CSM (3)	-0.1536	0.1406	0.277
IT (4)	-2268.34*	1072.26	0.036	CIT (4)	0.016	0.0493	0.746
RG (5)	2080.84	1178.51	0.080	CRG (5)	0.0626*	0.0312	0.048
SAV	358.3**	110.36	0.002	SAV	-0.0744**	0.0273	0.008
GDP99	0.0003	0.0003	0.344	GDP99	-1.57E-07*	7.18E-08	0.031
R^2	0.3862			R^2	0.1506		
Adj R^2	0.3501			Adj R^2	0.0912		
#Obs	127			#Obs	108		

[32] Only Countries with at least $30,000 in GDP per capita in 2007 are included.

CHAPTER THREE

NATIONAL LEVEL

SUMMARY OF INDEX:

-Economic Freedom of North America (EFNA): The Frasier Institute

The EFNA index was first published in 2002 and The Frasier Institute is now on the 5th edition of the index. It covers the United States and Canada, and in the last edition, includes Mexico where data collection has proved more difficult. In this study, only the rating of U.S. States will be analyzed. The index rates economic freedom on a 10 point scale, just as their international index, and at two levels, the sub-national and the all-government. The aim of the all-government level is to capture the impact of restrictions on economic freedom by all levels of government (federal, state/provincial, and municipal/local), and the sub-national includes the impact of only state/provincial and local governments. The impact of economic freedom at the all-government level is greater than the impact at the sub-national level because it captures a broader range of limitations on economic freedom.

The theory of economic freedom at the national or regional level is no different than that already covered at the international level, but different components to proxy economic freedom have been used. The authors of the EFNA have used a very similar approach for this index as was used on the international level with EFW, but some aspects had to be changed or left out. Some categories of the world index had too little variance from one jurisdiction to another at this level. The stability of the legal system,

which is used in EFW, does not differ much among the U.S. states. The same can be said for private ownership of banks, avoidance of negative interest rates, monetary policy, the freedom to own foreign currency, the right to international exchange, structure of capital markets, and black-market exchange rates.

Table 3.1: U.S. Rankings[33]

Rank	State	Score	Rank	State	Score
1	Delaware	8.5	44	Alaska	6.4
2	Texas	7.8	44	New York	6.4
5	Colorado	7.6	45	Vermont	6.3
5	Georgia	7.6	46	Rhode Island	6.2
5	North Carolina	7.6	47	Hawaii	6.1
7	Nevada	7.5	48	Montana	6.0
7	New Hamphire	7.5	48	New Mexico	6.0
10	Indiana	7.4	49	Maine	5.8
10	Tennessee	7.4	49	Mississppi	5.8
10	Utah	7.4	50	West Virginia	5.3

The index has 10 data points that are grouped into 3 major components. Each data point is equally weighted within the component and each component is equally weighted. The areas are as follows:

1. Size of Government
    a. General consumption expenditures by government as a percentage of GDP
    b. Transfers and subsidies as a percentage of GDP
    c. Social security payments as a percentage of GDP
2. Takings and Discriminatory Taxation
    a. Total tax revenue as a percentage of GDP

[33] Based on 2008 report. For full report see www.freetheworld.com/efna.html

b. Top marginal income tax rate and the threshold at which it applies

c. Indirect tax revenue as a percentage of GDP

d. Sales taxes collected as a percentage of GDP

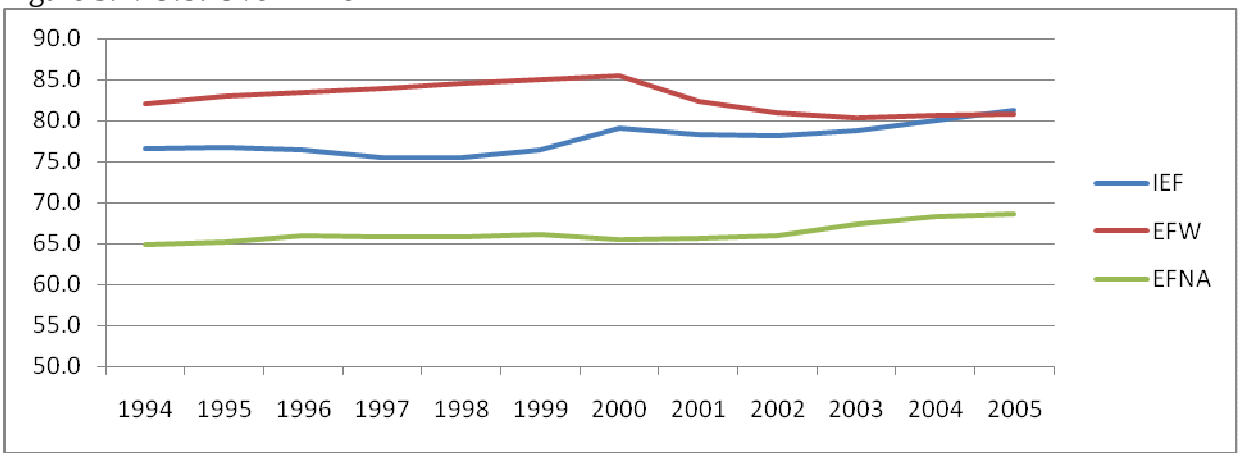
3. Labor Market Freedom

a. Minimum wage legislation

b. Government employment as a percentage of total state employment

c. Union Density

Figure 3.1: U.S. Over Time[34]



MODEL AND DATA:

In the 2008 Annual Report of the EFNA, Karabegovic and McMahon run several regressions using the aggregate EFNA score with relationship to GDP and growth among the U.S. States and Canadian Provinces. Building off of their analysis and in the same approach taken with the international indices, this aggregate index will be reduced to its components and regressed against GDP and growth.

[34] Average Score is used for EFW during years 1995-2000. EFNA is average of all state scores at All-Government level

The same linear regression models that were tested on the international level are specified again, but now using the EFNA index. The control variables are the level GDP at the beginning of the period, which was used previously, and the percentage of a state's population 25 years or older that has attained at least a high school diploma (HG).

Data was collected for the time period of 1990 through 2005. The index component data is provided through the Frasier Institute's website. GDP and growth data were gathered from the Bureau of Economic Analysis. The educational attainment data was published by the Digest of Education Statistics and found through the National Center for Education Statistics.

Table 3.2: Summary Statistics

	GDP p/Capita	Growth	EFNA	CEFNA	HG	GDP89
Min	18094	-0.13	4.90	-0.11	64.30	10702
Max	59520	0.11	8.50	0.08	90.27	734406
Std Dev.	6585	0.02	0.57	0.02	5.35	130270

Examining economic freedom within the U.S. provides a couple of advantages over international studies. First, the data is much fuller, and the time period examined can be longer. Second, because of the relative stability and similarities among the states, the results are much less prone to be affected by outliers and turbulent economic conditions that many third world countries produce.

RESULTS:

The results are presented in Table 3.3 and Table 3.4. Again, economic freedom is significantly correlated to GDP per capita, and an increase in economic freedom correlates with an increase in growth. What is different from the international results is

that each component is positively correlated, with the exception that the labor freedom component is not statistically significant when regressed to GDP per capita.

Table 3.3: Models 1 and 2 Results[35]

Regressed on GDP p/Cap				Regressed on Growth in GDP p/Cap			
Variable	Coef.	Std Err.	P-Value	Variable	Coef.	Std. Err.	P-Value
GS (1)	2441.25**	240.54	0.000	CGS (1)	0.5137**	0.0286	0.000
TT (2)	1635.39**	235.31	0.000	CTT (2)	0.0404**	0.0142	0.005
LF (3)	-106.64	332.95	0.749	CLF (3)	0.1085**	0.0366	0.003
HG	617.22**	32.82	0.000	HG	-0.0004**	0.0001	0.004
GDP89	0.0108**	0.0014	0.000	GDP89	-8.19E-09	5.57E-09	0.142
R^2	0.5078			R^2	0.3839		
Adj R^2	0.5047			Adj R^2	0.3797		
#Obs	800			#Obs	750		

Table 3.4: Model 3 and 4 Results

Regressed on GDP p/Cap					Regressed on Growth in GDP p/Cap				
Variable	Coef.	Std Err.	P-Value	Adj R^2	Variable	Coef.	Std Err.	P-Value	Adj R^2
EFNA	4613.28**	298.49	0.000	0.4862	CEFNA	0.5398**	0.0347	0.000	0.2423
HG	643.3**	31.84	0.000		HG	-0.0006**	0.0002	0.000	
GDP89	0.0123**	0.0013	0.000		GDP89	-7.45E-09	6.1E-09	0.226	
EFNA-1	3810.76**	313.24	0.000	0.4367	CEFNA-1	0.273**	0.0315	0.000	0.0882
HG	701.49**	33.32	0.000		HG	-0.0004**	0.0002	0.015	
GDP89	0.0162	0.0014	0.000		GDP89	-5.85E-09	6.7E-09	0.385	
EFNA-2	4002.7**	295.56	0.000	0.4571	CEFNA-2	0.7034**	0.0362	0.000	0.3339
HG	600.23**	33.15	0.000		HG	-0.0003	0.0002	0.065	
GDP89	0.0112**	0.0013	0.000		GDP89	-4.38E-09	5.8E-09	0.447	
EFNA-3	4040.67**	244.33	0.000	0.5028	CEFNA-3	0.3805**	0.0272	0.000	0.2050
HG	638.59**	31.34	0.000		HG	-0.0006**	0.0002	0.000	
GDP89	0.0119**	0.0013	0.000		GDP89	-8.72E-09	6.3E-09	0.167	

The results at this level are consistent with previous studies in that it show that higher economic freedom correlates with higher GDP per capita and higher growth. The negative relationship found at the international level between the size of government component and GDP per capita doesn't hold up within the U.S. States. In fact, the size of

[35] The growth model uses data from 1991-2005 instead of 1990-2005.

government has the largest coefficient. It is positively correlated with GDP per capita and an increase in this component, meaning a smaller government size, correlates with higher growth. Labor freedom appears to have the smallest effect on GDP per capita, but a change in this component does have an effect on growth.

All of the results hold up when ran against a three year moving average of GDP as well. This was suggested and performed in the 2008 edition of the EFNA in order to control for business cycles that might naturally affect annual data. Consistent with their results using the aggregate index, the results presented here do not change significantly using the moving average instead of annual GDP.

CHAPTER FOUR

CONCLUSION

On the international and national level, a greater level of economic freedom is found to be correlated with greater wealth, and an increase in economic freedom means an increase in growth. The relationship is complex though, and not every component that makes up the international indices is positively correlated. It is not clear if the relationship found with the size of government among underdeveloped countries is the same as developed countries. The results in this area are likely affected by a reverse casual relationship.

The IEF and EFW are strongly correlated, and regarding the U.S, the trend is the same between the two international indices and the average of the EFNA. The IEF has a lower ranking of all countries on average, and little inconsistency could be detected.

A criticism of these indices has been that they are created with a political axe to grind; that since those who construct them are in favor of free markets, they are biased and are able to take the data they want, while leaving out other data, and support the conclusion they are seeking. It is true that some data is left out, because it must be so. This is the case with all social science. It is not possible to account for all the possible variables that affect people's behavior.

Each index studied here purports to use 3rd party data to make the results as objective as possible. An advantage to using EFW over IEF is simply the fact that they provide the raw data used to construct the index. This is a valuable contribution to academic research. What variables and attributes of a society that constitutes economic

freedom has to be based on judgment. This judgment must be based on solid reasoning and sound economic theory. It is a statistical reality that studies using these indices are producing results that are consistent with theory. It does appear that countries/states that have relatively more economic freedom as measured have higher well-being, and therefore, critics of this variety would have to explain why this is the case.

It is possible that economic freedom is increased because of growth, but it is normally thought, as well as supported by empirical studies, that growth, income levels, and well-being in general are the results, and not the cause, of business activity and gains from trade, which are enhanced by the institutions in place. Within a large spectrum of countries, government size may be an exception to this. It was found to be negatively correlated when using a large number of countries with great variation, but not so among the U.S. States and is not significant within a smaller sample of developed nations.

Certainly, it is likely some variables are duplicated and/or left out, but no author of these indices has claimed otherwise. It is not claimed that each sector within an index is completely endogenous to each other. There may be some overlap between the sectors, but this does not diminish from the usefulness of an index. The attempt is broad, which is to look at the institutional makeup of a country or region and be able to state with some accuracy, backed with empirical knowledge, as to how economically free the people are in this country, relative to other countries or states. It is one thing to observe that American citizens are freer than the people living in North Korea, but by how much? Clearly, the gap is large in that instance, but what about the difference between Germany

and Austria, or even South Carolina and West Virginia? The economic freedom index contributes to this comparison.

It was said by Lord Kelvin, the 19th-century British Physicist, 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 stage of science, whatever matter may be."[36] The economic freedom indices are a logical attempt at measuring the institutions and policies that are conducive to trade, and therefore, they make it possible to understand with more precision why we would expect some states to grow faster than others and by how much.

A valid critique can be made on the precision of the measurements made in these economic freedom indices. Because of the varying relationships between the components of the index and the dependent variables, GDP and growth in this instance, it is suggested that the aggregate index be interpreted carefully. It is possible to institute policy that would increase the aggregate score but have no effect on growth because it would depend on what component is being affected. It is suggested that studies analyze the components separately.

It is largely agreed that private property, low taxes, and other variables in economic freedom are good for investment and improvement, but how large of an effect is more controversial. There are many aspects, an infinite amount, that are not and cannot

[36] Quote cited in PRI's 2008 report of The U.S. Economic Freedom Index

be controlled for, and therefore, we may not put much stock in the point estimates, but these quantitative results do provide us many qualitative conclusions. They give us empirical support that economic freedom does matter, and can have significant results.

By breaking down the indices into each component, we are able to determine what aspects are more important in determining the relationship. It has been demonstrated here that property rights are crucial. As Tom Bethell states in his book, *The Noblest Triumph*, that "when property is privatized, and the rule of law is established, in such a way that all including the rulers themselves are subject to the same law, economies will prosper and civilization will blossom."[37]

It may not point to an easy or quick policy solution to perceived problems in the world, but nor does it claim to do so. It is akin to the study of history. Having an understanding of the human condition may not tell us the exact magnitude we should expect from some event, but it does guide our understanding of the general trends in particular countries and across countries, and the consequences we may expect of certain events. It is doubtful whether any of these indices are useful for forecasting. Even with modern technology, it still takes years for the data to trickle in and be calculated. Because of this lag, it is likely that the index will capture the reality that stock and bond markets have already reflected to some extent.

Institutional analysis aids in our understanding of the world. We expect higher growth and welfare where markets work, and we know that markets work better under

[37] Found on page 3 in The Noblest Triumph: Property and Prosperity through the Ages. 1998 (Paperback)

certain conditions and environments. It works where there is a rule of law and people are able to keep the fruits of their labor.

The Economic Freedom Index serves as a valuable tool for cross country and regional comparisons. It provides a framework for understanding the institutions that are correlated to greater prosperity. It is useful to view over time and provides insight into the general trend of growth or well-being that we can expect a nation to experience due to an institutional or policy change. What it does not provide are answers on how to implement appropriate institutional change. Some are more straight-forward such as lowering marginal tax rates done through policy, but how do we create a legal environment that is conducive to investment? Regardless, any answer or improvement will take many years or even generations to implement. The answer to whether the agents that institute policies are actually interested in the long run effects of more economic freedom is a question better answered within the public choice literature.

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