

Which Economic Freedoms Contribute to Growth?

Jac C. Heckelman and Michael D. Stroup*

I. INTRODUCTION

Recent studies have investigated the relationship between a country's overall measure of economic freedom and its economic performance over time. On the one hand, institutions promoting economic freedoms are thought to increase productivity (Dawson 1998) and investment opportunities (Besley 1995). However, while economic freedom may be certainly desirable from a normative perspective, De Hann and Siermann (1998) present evidence that the relationship between economic freedom and growth is not robust. This paper is an attempt to separate out those aspects of economic freedom which apparently fail to increase growth from those that are empirically correlated with growth.

Typically, a single overall measure of economic freedom, based on an aggregation of various underlying freedom indexes, is used in empirical studies on growth. In this paper, we follow a different tract. By disaggregating the specific components of economic freedom and measuring the relevant independent impact on growth exhibited by each component, we can derive an empirically weighted summary index of growth-promoting economic freedoms, rather than relying upon a subjective index of economic freedom used to project economic growth. A direct comparison of these indexes can then be made as well as a comparison of the resulting growth projections for each country. Our empirical results indicate that some characteristics of economic freedom that are widely

* Jac C. Heckelman, Assistant Professor of Economics, Wake Forest University, PO Box 7505, Winston-Salem, NC 27127. E-Mail: heckeljc@wfu.edu. Michael D. Stroup, Assistant Professor of Economics, Dept. of Economics and Finance, P. O. Box 13009, SFA Station, Stephen F. Austin State University, Nacogdoches, TX 75962. E-Mail: mstroup@sfasu.edu. The first author acknowledges the hospitality and generosity shown while a Visiting Research Fellow at the American Institute for Economic Research where he was when much of the work for this paper was completed. The content of and interpretations made in this paper are the sole responsibilities of the authors and should not be construed as reflecting the views of the American Institute for Economic Research.

expected to promote economic activity are not highly correlated with growth. The empirical results also reveal that the predictive capabilities of the summary freedom indexes is much less than the capabilities of an economic freedom index derived through growth-driven weights. That there is a difference in predictability is not the issue, but to what extent the weighted index is an improvement is worth noting.

For example, to test the importance of economic freedom for growth, Dawson (1998) considers the newly developed economic freedom indicators developed by Gwartney, Lawson and Block (1995, hereafter known as GLB). These are thought to be the most comprehensive listings available, providing information for 91 nations on a set of up to 17 categories. A potentially serious problem in the GLB methodology is that missing data prevents consistent aggregation of these categories into an overall summary rating. This can be alleviated by limiting the analysis only to those nations with a complete set of data, which has not been done in previous studies. But as GLB note, there is no objective way in which to aggregate the data into a single freedom measure, and they consider three widely differing procedures¹. If the aggregation procedure itself is not accurate, the overall measure will be biased, and its predictive ability could be compromised.

It is difficult to make a blanket statement as to whether or not economic freedom is important to growth if the results depend upon the method of aggregation. GLB claim to show a positive relationship exists between one of their summary ratings and the growth rate of per capita GDP. However, the economic freedom summary ratings covered the period 1993–1995, and the economic growth measures covered the period 1980–1994 (pp. 93–94). Any causal relationship could not have been from higher economic freedom creating higher growth, and can possibly be interpreted as the relationship runs backwards – higher growth leads to greater levels of economic freedom. To reach such a conclusion regarding freedom promoting growth, it is necessary to utilize freedom measures from the starting, rather than ending, year.

We show below that each of the summary ratings developed in GLB for 1980 fail to generate a significant relationship to growth for the period of 1980–1990. Reliance on their summary measures to predict economic growth might then lead us to prematurely conclude that freedom does not affect growth. While it may still be true that more economic freedom in general is beneficial to growth, not all economic freedoms have equal effect, and some may have counteracting effects. Our methodology is designed to help uncover

1. These methods are discussed in detail below.

which freedoms help growth and which hinder growth. Using simple hedonic regression analysis, we derive an empirical weighting routine based on partial multiple correlations, or more explicitly, the estimated distribution ratios of estimated marginal impacts.

II. A BRIEF COMPARISON OF ECONOMIC FREEDOM INDEXES

Table 1 below defines the seventeen different categories of economic freedom constructed in GLB (1995) which they arrange in four general categories: Money and Inflation, Government Operations and Regulations, Takings and Discriminatory Actions, and Restraints on International Trade. GLB arrive at their summary ratings by the following procedure. First, country performance data for each of the seventeen individual components are converted to a relative ranking scale of 0 to 10². The aggregated summary rankings, representing a relative measure of overall economic freedom for each country, are then constructed by weighting each underlying component measure in a manner thought to reflect the relative importance of each to economic performance. These weights are determined either by a survey of a panel of experts on economic freedom (Is1) or country experts (Is2), or by the inverse of the standard deviation of each component to force equality across all of the components³ (Ie)⁴. However, the importance of freedom to growth is an empirical question, and is what our study is designed for.

2. The index values are either binary (0 or 10), ordinal over the entire scale (0,1, . . . ,10) or a mix in between depending on the nature of the particular category.
3. This is mainly to differentiate between the nature of the component indexes, such as binary, continuous, etc.
4. Throughout their analysis, GLB rely strictly upon the Is1 method, since 'In the judgement of the authors, the Is1 index is the most reliable indicator of differences across a wide range of countries' (p. xxi). However, most other scholars who use their summary ratings use the Ie method since this is the least subjective (Dawson 1998).

Table 1

Components of the Index of Economic Freedom

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- I. MONEY AND INFLATION (Protection of money as a store of value and medium of exchange)
 - A. Average Annual Growth Rate of the Money Supply During the Last Five Years Minus the Potential Growth Rate of Real GDP
 - B. Standard Deviation of the Annual Inflation Rate During the Last Five Years
 - C. Freedom of Citizens to Own a Foreign Currency Bank Account Domestically
 - D. Freedom of Citizens to Maintain a Bank Account Abroad

 - II. GOVERNMENT OPERATIONS AND REGULATIONS (Freedom to decide what is produced and consumed)
 - A. Government General Consumption Expenditures as a Percent of GDP
 - B. The Role and Presence of Government-Operated Enterprises
 - C. Price Controls – the Extent that Businesses are Free to Set Their Own Prices^a
 - D. Freedom of Private Businesses and Cooperatives to Compete in Markets^b
 - E. Equality of Citizens Under The Law and Access of Citizens to a Nondiscriminatory Judiciary^b
 - F. Freedom from Government Regulations and Policies that Cause Negative Real Interest Rates

 - III. TAKINGS AND DISCRIMINATORY TAXATION (Freedom to keep what you earn)
 - A. Transfers and Subsidies as a Percent of GDP
 - B. Top Marginal Tax Rate (and income threshold at which it applies)
 - C. The Use of Conscripts to Obtain Military Personnel

 - IV. RESTRAINTS ON INTERNATIONAL EXCHANGE (Freedom of exchange with foreigners)
 - A. Taxes on International Trade as a Percent of Exports Plus Imports
 - B. Difference Between the Official Exchange Rate and the Black Market Rate
 - C. Actual Size of Trade Sector Compared to the Expected Size
 - D. Restrictions on the Freedom of Citizens to Engage in Capital Transactions with Foreigners
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Note: Descriptions taken from Gwartney, Lawson, and Block (1995), page 16.

^a This variable is included in only the 1990 and 1995 Indexes and is not part of our study.

^b This variable is included in only the 1995 Index and is not part of our study.

GLB are not the only freedom indexes available, but they are the best for our purposes. The Heritage Foundation in conjunction with the Wall Street Journal (HFWSJ) have recently developed their own set of freedom indexes on 156 nations based exclusively on the prevailing institutions and policies in place⁵, and

- 5. Their categories include: Trade Policy; Taxation; Government Intervention in the Economy; Monetary Policy; Capital Flows and Foreign Investment Policy; Banking; Wage and Price Controls; Property Rights; Regulation; Black Market.

are not based on economic outcomes as are some of the GLB indexes⁶. This makes the HFWSJ indexes much cleaner for determining if economic freedoms promote growth. Unfortunately, their data only goes back to 1995 (covering 101 nations) and thus currently has only limited use as an explanatory factor in cross-national growth differences⁷. In the future we expect these indexes to be very valuable for this purpose, when enough years have passed to generate a relevant growth time span. We stress, however, the aggregation method used by HFWSJ of simple averaging is subject to the same criticism we have of GLB and our methodology can be used on these data as well. The most recent iteration of these indexes is described in O'Driscoll, Holmes and Kirkpatrick (2000) and are analyzed in a Granger-causality testing framework by Heckelman (2000).

Ratings for economic freedom have also been developed by Freedom House and published in their series *World Survey of Economic Freedom*. The Freedom House rankings are based on only six broad categories⁸ and the overall country score is a simple summation of the score for each category. The categories are each rated from 0–2 or 0–3, which limits the possible range of distinctions. The main purpose of their study is not to show the importance of economic freedom to growth, but rather they stress the interrelationship with their other work on political rights and civil liberties. They also fail to include measures for taxation, and government spending is only considered for borderline cases when a country's summation score is on the border between their designation of 'mostly not free' and 'not free'. Although the series is expected to be continued in the future, at this point of writing only the 1995–96 values have been published⁹.

Other scholars have generated their own set of freedom indexes but this is typically done for only a single year. For example, Scully and Slottje (1991) consider a variety of freedoms which include not only economic freedoms but also political freedoms such as civil rights and freedom of the media. Their aggregated indexes therefore cannot be used to specifically determine if economic freedoms are conducive to growth. Although De Haan and Siermann

6. For example IB, IIF and IVC.

7. In addition, there are also some subjective evaluations implicit in their measures which prevents other researchers from extending their series backwards (or to other nations) while attempting to preserve their internal consistency. For example, one ingredient to their Trade Policy variable is the degree of 'corruption in the custom service', but this is not precisely measured, nor is the relative weight of this factor given.

8. These categories are: Freedom to: Own Property; Earn A Living; Operate A Business; Invest One's Earnings; Trade Internationally; Participate in a Market Economy.

9. As with HFWSJ, their sources are not detailed enough to allow an independent researcher to replicate or extend their results and there is also a large degree of subjectivity in the measures.

(1998, p. 367) directly concede this point, the title of their paper and their interpretation of their generated results ignores this consideration. Scully and Slottje (1991) develop summary indicators based on nine different weighting schemes. Using sensitivity analysis, De Haan and Siermann (1998, p. 372) show that whether or not

'economic (sic) freedom is very important in explaining cross-country differences in growth performance quite clearly depends upon the indicator of economic (sic) freedom chosen'

which underscores our concern for the GLB indices we use.

The GLB indexes are probably the most commonly used. In addition to Dawson (1998) mentioned above, Grubel (1998), Farr, Lord and Wolfenbarger (1998), and others (including of course Gwartney and Lawson themselves in a series of studies), have also made use of their data. Grubel (1998) makes the same mistake as GLB in considering a correlation between the freedom indexes for 1995 and growth from 1985–1996. He erroneously implies a causal connection when he concludes that his evidence

'show(s) clearly and unambiguously that . . . growth rates are higher the greater is a country's economic freedom' (p. 289).

Farr et al. (1998) use Granger-causality tests and find that there is a dual relationship between economic freedom and prosperity, but the relationship is stronger for prosperity preceding freedom rather than the other way around. For some unexplained reason, they use the average value of GNP per capita over a five year interval, rather than the growth rate, and therefore the conclusions must be tentative. Their variable measure is unable to distinguish between a country experiencing *declining* GNP and one with an expanding economy, and thus it could be that freedom hampers growth if countries with high levels of freedom had high levels of GNP at the start.

Although we utilize the GLB indexes, their category choices are not above criticism. As mentioned above, some of their categories measure economic outcomes, rather than policies per se. For example, a low standard deviation of inflation, intended to capture the efficacy of money, does not properly represent a dimension of economic freedom if this outcome was created by central control of prices. There is also some arbitrariness within each category. For example, in their consideration of income taxation GLB do not explain why only the top marginal tax rate is relevant in determining the degree of tax progressivity. Of course, any listing is bound to incorporate some degree of subjectivity, and unlike the HFWSJ and Freedom House measures, the raw data used to construct each component index is objective and verifiable. With these caveats in mind, we now proceed to our methodology.

To facilitate comparison across the component measures, we consider only those nations with a complete set of data points. We also use the GLB relative ranking scale (0–10) for each variable rather than the raw data, since this automatically normalizes regression coefficients which makes direct comparisons of marginal impacts possible. Weights can then be determined on a simple relative scaling procedure. The normalization also removes undue influence from potential outlier observations, a typical occurrence when comparing industrialized nations and LDCs. Finally, since the GLB scales are determined by the relative ranking of a country's raw data compared to all the other nations which have a value for that variable, even though we are losing information by not including every country in the regression, all available data was used to construct the scaled index. In this way, we can retain as much information as possible.

III. THE EMPIRICAL ANALYSIS

GLB have collected data in five year intervals starting in 1970 through 1995. Not surprisingly, later years have a more complete set of data. In order to consider the effect of economic freedoms on growth, we take the latest year that would still enable a growth comparison over a reasonable length of time. We chose 1980 values and measured growth for 1980–1990 using Heston-Summers (1996) Producer Price Parity data, specifically their series of real GDP per capita adjusted for terms of trade. This leaves us with 49 complete cross-sectional observations.

1. Bivariate and Multivariate Analysis of the Components of the Economic Freedom Indicators

We first consider each of the scaled indexes in turn. *Table 2* reports simple bivariate regressions for each of the indexes. Recall all the indexes are on the same 0–10 scale so we can compare the coefficient magnitudes directly. First note that not all of the indexes generate a positive coefficient, bearing out our conjecture that a lack of certain economic freedoms may still be consistent with greater growth. The negative relationships are limited to variables in GLB groups I (Money and Inflation) and III (Takings and Discriminatory Taxes), where only component IIIB (Top Marginal Tax Rate) generates a statistically significant coefficient. All indexes in Group II (Government Operations and Regulations) and IV (Restrictions on International Trade) are positively related to growth. However, none of the Group II indexes would be considered signif-

inant, whereas three of the four indexes in Group IV exhibit strong signs of importance. The most important positive contributor to growth is found by IVB (Difference Between the Official Exchange Rate and the Black Market Rate), both in terms of marginal impact and significance level.

Table 2

Bivariate Relationships Between Economic Freedom Index Components and Growth

Index	Coefficient	Std. Error	T-ratio	R-square
IA	0.325	1.255	0.259	0.001
IB	2.292	1.318	1.739	0.060
IC	-0.253	0.802	-0.315	0.002
ID	-0.533	0.851	-0.626	0.008
IIA	1.471	1.406	1.047	0.023
IIB	1.532	1.850	0.828	0.014
IIF	0.804	1.407	0.572	0.007
IIIA	0.039	1.324	0.029	0.000
IIIB	-4.132	1.655	-2.497	0.117
IIIC	-1.178	0.814	-1.448	0.043
IIVA	2.322	1.200	1.935	0.074
IVB	2.869	1.307	2.196	0.093
IVC	2.343	1.293	1.811	0.065
IVD	0.270	1.278	0.211	0.001

Notes: Each regression also includes a constant term.

Index definitions are given in *Table 1*.

To the degree that the various indexes can be grouped into general headings, they may represent similar motivations on the part of the nation's government and similar economic activity. Thus, there is likely to be high correlation among the indexes in each group, in which case the simple bivariate relationships presented in *Table 2* may be misleading. Correlation statistics suggest this may be especially true for the Group IV variables¹⁰. It is likely that Restraints

10. In the interest of preserving space, the intra-group index correlations are not presented here but are available on request from the authors.

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on International Trade are important, but it is not clear if each of the individual indexes is important by itself or if their interrelationships with each other con- found such a simple interpretation.

We now turn to the multivariate regression output, from which we will generate the weights to create new overall country summary ratings. All 14 indexes are included as explanatory variables for the growth rate. The significance of any individual coefficient signifies if that index has statistical importance for explaining growth, holding constant the values for the remaining indexes. Estimates from the multivariate regression using Ordinary Least Squares are pre- sented in *Table 3*.

Table 3

Multivariate Relationship Between Economic Freedom Index Components and Growth

	Coefficient	Std. Error	T-ratio
Constant	-33.973	18.975	-1.790
IA	- 1.617	1.697	-0.953
IB	3.234	2.088	1.549
IC	0.189	1.264	0.150
ID	- 0.432	1.470	-0.294
IIA	1.339	1.900	0.705
IIB	0.859	2.396	0.358
IIF	- 1.777	2.019	-0.880
IIIA	3.736	2.004	1.864
IIIB	- 4.740	1.995	-2.377
IIIC	- 0.662	0.940	-0.705
IVA	1.187	2.105	0.564
IVB	4.217	1.871	2.255
IVC	0.975	1.406	0.693
IVD	- 0.731	2.058	-0.355
R-square	0.456		
Adj. R-square	0.232		
F-value	2.036		

Note: Index definitions are given in *Table 1*.

Several of the coefficients change sign compared to their isolated effect estimated in *Table 2*, though most remain insignificant. Only component IVB (Difference Between the Official Exchange Rate and the Black Market Rate) retains its positive significance among the Group IV indexes, suggesting the bivariate results among the Group IV indexes were driven by the high correlation that components IVA (Taxes on International Trade as a Percent of Exports Plus Imports) and IVC (Actual Size of Trade Sector Compared to the Expected Size) each had with Component IVB. Component IIIB (Top Marginal Tax Rate) remains significantly negative, but component IIIA (Transfers and Subsidies as a Percent of GDP), which had by far the lowest significance value in the bivariate regressions, is now significant when controlling for the other freedom indexes. Component IB (Standard Deviation of the Annual Inflation Rate), which was previously significantly correlated with growth, can now no longer be considered significant at conventional levels. Components IIIB and IVB retain the largest negative and positive influences, respectively, both by coefficient size and t-ratio. The importance of IIIB and IVB appear to be robust.

As with all the indexes, it is important not to reach conclusions beyond the limitations of the data. The finding of a significantly negative relationship between lower top marginal income tax rates and economic growth does not necessarily imply that lower income taxes *in general* reduces growth, as we do not know how well this variable is correlated with a country's overall progressivity of taxation or its average tax rate. Although they are not significantly different from zero, and therefore from each other, it is perhaps not too surprising that IC (Freedom of Citizens to Own a Foreign Currency Bank Account Domestically) and ID (Freedom of Citizens to Maintain a Bank Account Abroad) are of opposite sign, as freedom to invest abroad is more likely to enhance growth in the nation receiving the investment. The negative finding on IA (Growth of the Money Supply Minus the Potential Growth Rate of Real GDP) implies monetary expansions are beneficial to growth, but note that the harm from monetary expansion is the inflationary pressures it creates, and inflation is controlled for by inclusion of IB (Standard Deviation of the Annual Inflation Rate). Thus, monetary expansions are not harmful when they do not lead to additional inflation¹¹. Recall from *Table 2* that IA had the expected positive sign in the bivariate analysis when inflation controls were absent. The slightly negative influence of IVD (Restrictions on Capital Transactions with Foreigners) is perhaps a surprising result.

11. As expected, there is a fairly strong correlation of 0.6 between these two measures.

The multivariate analysis suggests only three of the 14 components are estimated to have an independent contributing affect on growth using standard levels of statistical significance. To the degree that individual components within a grouping are capturing related information, the regression estimates may suffer from multicollinearity, inflating the estimated coefficient standard errors and biasing downward certain t-statistics. This raises the question of whether aggregating the individual indexes into their respective four groupings will better reveal significant correlations to growth. F-tests reveal that only the Group III and IV indexes are jointly significant, which are the only two groupings to contain a component index that is individually statistically significant. Group I and Group II indexes are not jointly significant, either as two separate groups of variables or even taken together as a single group¹². These results suggest multicollinearity is not a strong concern for interpreting the significance of the individual components. Still, we do not suggest the components which fail to reach standard levels of statistical significance have no economic importance. As such, we do not drop any of the component indexes from our growth equations, and use all available information in creating our summary ratings.

2. *Creating Weights from the Multivariate Regressions*

The coefficients from the multivariate regression are now used to construct weights for our summary rating. Because the point estimates are not exact, we consider the distribution of the estimates by utilizing t-statistics which compares the coefficient relative to its standard error. *Ceteris paribus*, the greater the estimated parameter variance, the less precise are the coefficient estimates, and less confidence we have on measuring its impact, so the smaller the weight assigned to that component. The weights are determined by calculating the contribution of each t-statistic to the sum of the absolute values of all the t-statistics. In this way, we can construct an overall index for each country based on the components of economic freedom which are weighted stronger toward those freedoms which were found to have a higher significance level for impacting on growth (either positively or negatively). Thus, countries having more of the 'positive growth' economic freedoms and relatively less of the 'negative growth' economic freedoms are expected to experience greater growth.

12. The computed F-test statistics are available upon request.

Table 4

Relative Weights for Freedom Index Components

Index	Adjusted Gwartney, Lawson and Block weights			
	Hedonic	Equality	Survey 1	Survey 2
IA	- 6.96	7.39	5.77	8.94
IB	11.30	7.39	6.50	8.03
IC	1.09	4.84	3.68	5.57
ID	- 2.15	5.22	3.31	10.75
IIA	5.15	7.39	7.61	0.91
IIB	2.61	9.81	7.98	13.47
IIF	- 6.42	7.13	4.17	6.35
IIIA	13.60	7.39	13.37	0.65
IIIB	- 17.35	9.43	15.58	5.83
IIIC	- 5.15	4.84	4.42	6.48
IVA	4.12	7.39	8.22	6.22
IVB	16.46	6.88	7.61	8.94
IVC	5.06	7.39	4.54	7.51
IVD	- 2.59	7.52	7.24	10.36
Correlations				
GLB Equality	- 0.097			
GLB Survey1	- 0.044	0.656		
GLB Survey2	- 0.159	0.156	- 0.355	

Notes: Index definitions are given in *Table 1*. Hedonic weights determined from *Table 3*.

The hedonic regression weights for each component index based upon the regression analysis in *Table 3* are listed in *Table 4* along with the GLB weights from their three methodologies for comparison purposes. Recall that the GLB summary indexes were based on applying subjective survey weights to the component indexes (Is1 or Is2) or by forcing equality of the component indexes by weighting the indexes by the inverse of their standard deviations (Ie). Since we are unable to include IIC, IID, and IIE in our regressions (recall from *Table 1* these variables were not computed by GLB prior to 1990 or 1995), we rescale the GLB weights as the percentage of each component's raw weight to the re-

maining total (minus the three lost indexes) so the weights still sum to 100¹³. None of these weighting schemes are highly correlated with each other, with only the Ie and Is1 methods used in GLB generating a correlation coefficient above 0.5. In fact, the two survey methods are actually the most inverted to each other, underlying the problem of subjective evaluations. Our regression weighting routine is negatively correlated with each of the GLB methods, suggesting that the indexes which the experts feel most contribute to the importance of economic freedom in general, are actually the ones that have the smallest impact on growth or actually deter growth.

3. Presentation and Comparison of the Country Ratings

We now present the country ratings for our sample based on the regression weighting routine described above, along with the GLB summary ratings in *Table 5*. The within sample rankings are listed beside each summary rating. The correlations between our regression based ranking of economic freedoms conducive to growth and the overall ranking of economic freedom found by the GLB weights are quite low, ranging from 0.102 (Is1 for numerical ranking) to 0.262 (Ie for ordinal in-sample ranking).

Table 5

Country Ratings Based on Economic Freedoms' Contribution to Growth
with Comparison to Gwartney, Lawson and Block (1995) Relative Rankings

	Aggregation Method							
	Hedonic		GLB Equality		GLB Survey 1		GLB Survey 2	
South Korea	333.4	(1)	4.0	(29)	4.0	(27)	3.2	(42)
Philippines	325.9	(2)	4.7	(18)	4.8	(16)	3.8	(27)
Italy	313.5	(3)	3.8	(34)	3.6	(37)	3.8	(27)
Singapore	301.2	(4)	7.0	(2)	7.1	(1)	6.4	(8)
Cyprus	286.7	(5)	3.6	(41)	3.6	(37)	3.2	(42)
Indonesia	284.9	(6)	4.9	(16)	5.0	(15)	4.6	(21)
South Africa	283.3	(7)	4.4	(24)	4.6	(18)	3.7	(33)
Spain	263.8	(8)	4.0	(29)	3.9	(30)	3.8	(27)
Japan	262.4	(9)	6.4	(6)	5.9	(7)	6.4	(8)
Taiwan	259.2	(10)	5.4	(12)	5.3	(12)	5.4	(13)

13. We are able to replicate the GLB summary indexes using this procedure.

	Aggregation Method							
	Hedonic		GLB Equality		GLB Survey 1		GLB Survey 2	
Finland	250.8	(11)	5.0	(15)	4.6	(18)	5.2	(16)
Portugal	247.7	(12)	3.3	(44)	3.1	(43)	3.0	(45)
Austria	229.3	(13)	5.2	(13)	4.6	(18)	5.4	(13)
Netherlands	227.9	(14)	6.4	(6)	5.4	(11)	7.5	(5)
Malaysia	223.9	(15)	6.0	(9)	5.6	(9)	6.7	(7)
United Kingdom	222.1	(16)	4.7	(18)	4.5	(21)	5.3	(15)
Sri Lanka	214.8	(17)	3.7	(38)	3.5	(40)	3.3	(41)
Belgium	213.8	(18)	6.8	(4)	5.7	(8)	8.0	(2)
Ireland	203.4	(19)	4.5	(22)	4.2	(25)	4.8	(17)
Turkey	201.2	(20)	2.0	(48)	2.3	(47)	1.4	(48)
Egypt	199.2	(21)	3.5	(42)	2.8	(46)	3.9	(26)
Switzerland	197.6	(22)	7.3	(1)	7.1	(1)	7.9	(3)
Sweden	195.7	(23)	4.0	(29)	3.4	(41)	4.4	(23)
Germany	193.9	(24)	6.6	(5)	6.0	(6)	7.6	(4)
Denmark	182.8	(25)	4.3	(26)	3.8	(32)	4.6	(21)
United States	182.7	(26)	6.9	(3)	6.2	(5)	8.2	(1)
Greece	179.5	(27)	3.8	(34)	3.8	(32)	3.5	(35)
New Zealand	177.7	(28)	5.1	(14)	4.8	(16)	5.6	(12)
Israel	176.9	(29)	2.4	(47)	2.3	(47)	2.6	(47)
Tunisia	170.0	(30)	3.2	(46)	3.1	(43)	2.7	(46)
Australia	166.9	(31)	6.0	(9)	5.5	(10)	6.8	(6)
Bolivia	166.6	(32)	4.4	(24)	4.5	(21)	4.3	(24)
Norway	166.2	(33)	3.8	(34)	3.4	(41)	4.0	(25)
Chile	165.2	(34)	4.1	(27)	3.9	(30)	3.8	(27)
France	162.6	(35)	4.6	(21)	4.2	(25)	4.7	(19)
India	126.2	(36)	3.8	(34)	3.8	(32)	3.2	(42)
Canada	125.5	(37)	4.7	(18)	5.3	(12)	3.7	(33)
Guatemala	125.1	(38)	6.4	(6)	6.8	(3)	6.0	(11)
Kenya	118.2	(39)	4.0	(29)	4.0	(27)	3.8	(27)
Malta	117.8	(40)	4.5	(22)	4.0	(27)	4.8	(17)
Argentina	116.8	(41)	3.3	(44)	3.6	(37)	3.4	(37)
Mexico	101.8	(42)	3.7	(38)	3.8	(32)	3.4	(37)
Cote d'Ivoire	90.8	(43)	4.0	(29)	4.1	(26)	3.5	(35)
Fiji	89.7	(44)	4.9	(16)	5.0	(15)	4.7	(19)
Zambia	86.8	(45)	3.4	(43)	3.1	(43)	3.4	(37)

WHICH ECONOMIC FREEDOMS CONTRIBUTE TO GROWTH?

	Aggregation Method							
	Hedonic		GLB Equality		GLB Survey 1		GLB Survey 2	
Ghana	80.3	(46)	1.8	(49)	2.3	(47)	1.0	(49)
Zimbabwe	69.0	(47)	3.7	(38)	3.7	(36)	3.4	(37)
Malawi	34.7	(48)	4.1	(27)	4.5	(21)	3.8	(27)
Uruguay	1.5	(49)	6.0	(9)	6.3	(4)	6.4	(8)
Mean	186.1		4.6		4.4		4.6	
Median	182.8		4.4		4.2		4.0	

Notes: Rankings for Hedonic method based on weights in *Table 4*. Numbers in parenthesis represent relative ranking for each country within sample.

Many of the top rated nations from our methodology have an overall GLB economic freedom rating below the midpoint mark. This suggests that although they do not have high levels of economic freedom in general, they do have relatively high freedom for those components of the freedom index that strongly contribute to economic growth, and are more restrictive on those freedom components which may negatively affect growth. Our top rated nation is South Korea, which is slightly below average for overall freedom, and rated toward the very bottom of our sample using the country experts' weights (Is2). Likewise, the lowest rated nation in our sample is Uruguay, which has an above average rating for economic freedom and is in the Top 10 of our sample under all three GLB weighting schemes.

Far East Asian nations comprise 4 of our top 5, and 7 of our top 10 rated nations for growth-promoting economic freedoms. Of these, only Singapore and Japan are in the top 10 of the GLB ratings. African nations dominate the bottom of our rankings, comprising 5 of the 7 nations considered worst for growth-promoting economic freedoms. Ghana, ranked 46th out of the 49 nations, is either dead last or tied for last in the GLB rankings.

By construction, our hedonic regression summary index of economic freedom is designed to lend more importance to those components of the GLB freedom index that are more strongly correlated with economic growth, whether in a positive or in a negative direction. The eight lowest rated nations all experienced declining real output during our sample period and most are also rated low by GLB. The exceptions are Uruguay, ranked last under our hedonic method, which is ranked in the Top 10 by GLB, and Malawi which they rank in the middle of the pack. Still, our rankings are not perfectly correlated with growth. In fact, two of our top 10 rated nations, Phillipines and South Africa, experienced negative real growth over our sample time period. These countries are ranked in the middle by GLB.

Table 6

Bivariate Relationships Between Aggregated Economic Freedom Ratings and Growth

Aggregation Method	Coefficient	Std. Error	T-ratio	R-square
Hedonic	0.257	0.041	6.278	0.456
GLB Equality	2.590	2.966	0.876	0.016
GLB Survey1	1.982	3.257	0.608	0.008
GLB Survey2	1.298	2.309	0.562	0.007

Note: Each regression also includes a constant term.

We can also more directly compare how the various weighting schemes predict cross-national growth rate differences. As shown in *Table 6*, none of the GLB aggregated summary freedom indexes for 1980 show a significant relationship to growth over the 1980–1990 period, and they typically explain less of the variation in growth than do many of the individual component indexes by themselves (see *Table 2*), suggesting the GLB weighting procedures obscure some of the underlying relationships. Our methodology shows that, given the proper framework, differences in economic freedoms between nations can explain almost half of the variation in growth.

IV. CONCLUSIONS

We have designed a methodology that directly represents the connection between various measures of economic freedom and a nation's growth rate. Rather than relying upon ad-hoc aggregations of the freedom measures into an overall index which is then tested for a correlation against growth, our aggregation procedure is directly based upon the relevance of each measure for growth, as determined by multivariate regression analysis. Each nation is then ranked based upon this endogenously determined growth-promoting freedom index. Our freedom weights, and consequently the overall summary scores, are not highly correlated with traditional weighting schemes. In our analysis, we find that not every type of freedom measure considered by Gwartney, Lawson and Block is positively correlated with growth, suggesting that reliance on their aggregated scores in growth equations may lead to misspecification bias.

Our methodology is not the only reasonable way to proceed. But it does suggest that scholars should not blindly rely upon the reported GLB aggregated rankings without a clear understanding of what they represent. They are de-

signed to show how more economic freedom, of any sort, will spur growth, but this is not the case. Researchers and policy-makers will benefit from focusing their attention on those specific freedoms which do contribute to growth. While we commend GLB for developing a wide range of freedom measures that are tracked over time (and back in time) we suggest the relationship between freedom and growth is more complex than for which they allow. Further investigation into which particular freedoms contribute to growth, and which hamper growth, is certainly merited.

REFERENCES

- Besley, T. (1995). Property Rights and Investment Incentives: Theory and Evidence from Ghana, *Journal of Political Economy*. 103: 903–937.
- Dawson, J. (1998). Institutions, Investment, and Growth: New Cross-country and Panel Data Evidence, *Economic Inquiry*. 36: 603–619.
- De Haan, J. and C. L. J. Siermann (1998). Further Evidence on the Relationship Between Economic Freedom and Economic Growth, *Public Choice*. 95: 363–380.
- De Vanssay, X. and Z. A. Spindler (1994). Freedom and Growth: Do Constitutions Matter? *Public Choice*. 78: 359–372.
- Farr, W. K., R. A. Lord, and J. L. Wolfenbarger (1998). Economic Freedom, Political Freedom, and Economic Well-being: a Causality Analysis, *Cato Journal*. 18: 247–262.
- Grubel, H. G. (1998). Economic Freedom and Human Welfare: Some Empirical Findings, *Cato Journal*. 18: 287–304.
- Gwartney, L., R. Lawson, and W. Block (1996). *Economic Freedom in the World, 1975–1995*. Vancouver: Fraser Institute.
- Heckelman, Jac C. (2000). Economic Freedom and Economic Growth: A Short-run Causal Investigation, *Journal of Applied Economics*. 3: 71–91.
- Heston, A. and R. Summers (1996). International Price and Quantity Comparisons: Potentials and Pitfalls, *American Economic Association Papers and Proceedings*. 86: 20–24.
- O’Driscoll, J., K. R. Holmes and M. Kirkpatrick (2000). *2000 Index of Economic Freedom*. Washington, D. C.: The Heritage Foundation and New York: The Wall Street Journal.
- Scully, G. W. and D. J. Slottje (1991). Ranking Economic Liberty Across Countries, *Public Choice*. 69: 121–152.
- Messick, Richard E. (ed.) (1996). *World Survey of Economic Freedom, 1995–1996*. New Brunswick: Transaction Publishers.

SUMMARY

The literature on economic freedom and growth has utilized summary measures of freedom to determine its general significance for economic growth. We believe the summary measures lead to misspecification problems. We utilize Heston-Summers growth data to determine which of the disaggregated categories of economic freedom lead to growth and find that only a few of the indexes significantly affect growth. These growth regressions generate new weights for aggregating the indexes into an overall summary measure. This new measure can be interpreted as deriving a relative ranking of nations that have a relatively higher presence of growth promoting economic freedoms and more restrictions on those economic freedoms that inhibit growth.

ZUSAMMENFASSUNG

Die Literatur hat bisher bei der Erforschung von wirtschaftlicher Freiheit und Wachstum summarische Meßinstrumente benutzt, um deren allgemeine Bedeutung für das Wirtschaftswachstum herauszufinden. Wir glauben, daß diese Meßinstrumente zu irreführenden Spezifikationen führen. Wir benutzen Wirtschaftsdaten von Heston-Summers, um herauszufinden, welche der disaggregierten Kategorien von wirtschaftlicher Freiheit zu Wachstum führen und finden, dass nur wenige der Indexe Wachstum signifikant beeinflussen. Diese Wachstumsregressionen erzeugen neue Gewichtungen, um die Indexe zu einem summarischen Meßinstrument zu aggregieren. Dieses neue Meßinstrument kann so interpretiert werden, daß es eine relative Rangordnung von Nationen schafft, die eine relativ größere Präsenz von wachstumsfördernden Wirtschaftsfreiheiten und mehr Restriktionen hinsichtlich jener Wirtschaftsfreiheiten haben, die Wachstum beeinträchtigen.

RÉSUMÉ

Pour déterminer l'impact de la liberté économique sur la croissance des nations, les chercheurs dans ce domaine ont généralement utilisé des instruments de mesure sommaires. A notre avis ces mesures entraînent des problèmes de spécification. Dans cette étude, nous nous servons des données de croissance de Heston-Summers pour déterminer quelles catégories constituantes des indices de liberté économique influent le plus sur la croissance économique. Nos résultats indiquent que, quand elles sont désagrégées, peu de ces indices produisent des impacts significatifs sur la croissance économique. Les régressions de croissance dont nous nous sommes servi ont produit de nouveaux indices pondérés qui peuvent s'agréger en un indice global de la liberté économique. Sur la base de cette nouvelle mesure, nous pouvons dériver un classement relatif des nations qui connaissent une plus grande présence de libertés économiques promotrices de croissance, et ont mis en place plus de restrictions sur les libertés économiques qui entravent la croissance.