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"Measuring Economic Freedom an Alternative Functional Specification and Subsequent Ranking"

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"Measuring Economic Freedom – an Alternative Functional Specification and Subsequent Ranking"

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Abstract: The Fraser Institute's "Economic Freedom of the World" index provides an aggregate measure of economic freedom by taking a simple arithmetic mean of scores over five sub-dimensions: (1) size of government, (2) legal structure and security of property rights, (3) access to sound money, (4) freedom to trade internationally, and (5) regulation of credit, labor, and business. By computing the aggregate score as a simple arithmetic mean, it is implicitly assumed that the different sub-dimensions are "perfect substitutes" for each other. As an alternative, we compute an aggregate economic freedom score, and resulting ordinal ranking, by taking a geometric mean of the five sub-dimensions. For this alternative specification, the marginal impact of each sub-dimension on the aggregate score is no longer independent of the other sub-dimension scores. Consequently, countries with inconsistent levels of economic freedom across sub-dimensions are "punished" to a greater degree than are countries with less variability across the sub-dimensions. For the ordinal ranking of countries which results from this alternate approach, 9 countries moved up 8 or more spots and 9 countries moved down 10 or more spots in the ranking. When ordered using a geometric mean instead of arithmetic mean, Qatar realizes the largest upward movement in the ranking (ranked 36th instead of 46th), while Sweden realizes the largest downward movement in the ranking (ranked 46th instead of 27th). Finally, we show that our alternative measure of economic freedom correlates with Per Capita GDP slightly more strongly than does the standard measure computed by the Frasier Institute.

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I. INTRODUCTION

Economic Freedom refers to the ability of individuals to engage in economic pursuits however they see fit. This includes (but is not limited to) an individual having full and complete property rights over resources that they are endowed with or that they have legally acquired. The level of economic freedom in a society is of critical importance for both individual and social outcomes. Economic Freedom (or a lack thereof) determines the ways in which market institutions allocate productive resources and consumption goods/services across households. This has a direct impact on not only the functioning of markets, but also economic well-being and economic opportunity for the individual.

This study examines the way in which economic freedom is measured by the Fraser Institute's "Economic Freedom of the World" index (EFWI).[1] We begin by briefly providing an overview of the history of the EFWI. We then discuss the construction of this index, and we note a potential shortcoming with respect to the mathematical properties of the way in which different dimensions of economic freedom are combined into a single summary measure. We propose an alternative aggregation method and compute a ranking of economic freedom across countries using this differing approach. Comparisons are made between measured levels of economic freedom (and the ordinal raking of countries with respect to economic freedom) under the standard EFWI and our alternate approach. Finally, by way of a simple univariate Ordinary Least Squares regression, we examine the degree to which economic freedom (as measured by both the EFWI and our alternative specification) correlates with Per Capita GDP across countries. We feel that our proposed alternative index provides a better and more meaningful measure of economic freedom.

[1] The precise way in which economic freedom is measured is subjective. An alternative measure of economic freedom is published by the Heritage Foundation – see Miller, Kim, and Roberts (2018). We chose to focus on the Fraser Institute's EFW index since, by our assessment, it is more familiar to academic researchers and more widely cited in the academic literature.

II. HISTORY OF THE ECONOMIC FREEDOM OF THE OF THE WORLD INDEX

The "Economic Freedom of the World" index, produced by the Fraser Institute, was first conceived at a 1984 Mont Pelerin Society meeting session in which George Orwell's book, 1984, was being discussed. The accuracy of Orwell's future predictions was the topic of discussion that led Milton Friedman to note a lack of readily available empirical data to support conjectures related to the impact of and trends in levels of economic freedom. The significant question of whether the level of economic freedom was growing or eroding is what led the founder then-Executive-Chairman of Canada's Fraser Institute, Michael Walker, and Rose and Milton Friedman to arrange a meeting sponsored by the Liberty Fund to discuss the implications of developing such a measure of economic freedom. This initial discussion led to a series of six meetings which generated ideas involving a range of ideas including a "survey-based" economic freedom index, however, that effort failed. Eventually, Gwartney, Block, and Lawson were asked to complete a publishable index, and in 1996 the original EFWI was produced: *Economic Freedom of the World: 1975-1995*, by Gwartney, Lawson, and Block (1996).

III. CONSTRUCTION OF THE EFWI

As noted by Gwartney, Lawson, and Hall (2017), "The cornerstones of economic freedom are personal choice, voluntary exchange, open markets, and clearly defined and enforced property rights. Individuals are economically free when they are permitted to choose for themselves and engage in voluntary transactions as long as they do not harm the person or property of others" (page 1). As currently constructed, the Fraser Institute's EFWI relies on three methodological principles. The first principle emphasizes the preferred use of objective components while recognizing that "some aspects of economic freedom, such as those involving property rights and regulation, are hard to measure objectively," resulting in the necessary use of "data based on

surveys, expert panels, and generic case studies." The second principle states that the "data used to construct the index ratings are from external sources such as the International Monetary Fund, World Bank, and World Economic Forum that provide data for a large number of countries. As a result, the value judgments of the authors are never used to alter the raw data or in the rating of any country." The third principle emphasizes the dedication to transparency.

Each country's aggregate score is computed based upon five sub-dimensions generally perceived by the classical liberal tradition as key components of an economically free society: (1) size of government, (2) legal structure and security of property rights, (3) access to sound money, (4) freedom to trade internationally, and (5) regulation of credit, labor, and business. A smaller government, more secure property and legal structure, more stable money, freer international trade, and less regulation will result in a higher score. The process by which each of the areas ratings are derived is described by the Fraser Institute:

> "Within the five major areas, there are 24 components in the index. Many of the components are themselves made up of several sub-components. In total, the index incorporates 42 distinct variables. Each component (and sub-component) is placed on a scale from 0 to 10 that reflects the distribution of the underlying data. When sub-components are present, the sub-component ratings are averaged to derive the component rating. The component ratings within each area are then averaged to derive ratings for each of the five areas." (Gwartney, Lawson, and Hall (2017), page 3)

After the component ratings within each area are averaged to derive ratings for each of the five areas, each country's aggregate score is computed as the simple arithmetic mean of its scores in the five areas (with each area weighted equally).

Consequently, a country with area scores of x_1, x_2, x_3, x_4, and x_5 would have an aggregate Economic Freedom of the World index score of:

$$EFWI_A = .2x_1 + .2x_2 + .2x_3 + .2x_4 + .2x_5 = \sum_{j=1}^{5}(.2)x_j \qquad (1)$$

Researchers have been engaged in an ongoing debate regarding whether it is or is not appropriate to even attempt to combine different dimensions of economic freedom into a single aggregate measure. Heckelman and Stroup (2005) argue that different subcomponents may impact measurable outcomes in opposite ways, so that any aggregate measure will obscure relationships between variables of interest. This led them and others to suggest that sub-dimensions of economic freedom should either not be aggregated or should not necessarily be weighted equally if aggregated – see also, Caudill, Zanella, and Mixon (2000) and Heckelman and Stroup (2000). However, even when alternative weighting approaches are used, it appears as if researchers always restrict attention to a linear weighting of the subcomponents (i.e., a weighted arithmetic mean) – for example, the original Economic Freedom of the World index created by Gwartney, Lawson, and Block (1996) actually had three different summary index rankings, each computed by placing different weights on the subcomponents.

Drawing a parallel to utility function used with consumer choice theory, the functional form in (1) assumes that each of the five areas are perfect substitutes for one another in regards to aggregate level of economic freedom.[2] Partial differentiation of (1) yields $\frac{\partial EFWI_A}{\partial x_i} = .2$, revealing that a one unit increase in the value of any one of the five area scores will increase the Economic Freedom Index score by .2, regardless of which score is altered and regardless of the initial value of this

[2] A weighted arithmetic mean would still assume that the different areas are perfect substitutes for one another, although the "marginal rate of substitution" between any pair of areas need not be equal to 1.

particular score or any of the other four area scores. Furthermore, a one unit change in any of the five area scores can be perfectly off-set by changes in the opposite direction of the other four area scores which sum to one (regardless of the initial values of any of the area scores). This can be seen by recognizing that the "Marginal Rate of Substitution" between any two areas, i and k, is equal to $MRS_{i,k}^{A} = -\left.\frac{\frac{\partial EFWI_A}{\partial x_i}}{\frac{\partial EFWI_A}{\partial x_k}}\right. = -\frac{.2}{.2} = -1$. There is no apparent *a priori* reason to suspect that the impact of the different areas – size of government; legal structure and security of property rights; access to sound money; freedom to trade internationally; and regulation of credit, labor, and business – should necessarily contribute to overall economic freedom in this highly restrictive way.

When it comes to seeing how the overall level of economic freedom might correlate with social and economic outcomes, it seems more intuitive and reasonable to expect that realizing "good outcomes" might require a country to have adequate economic freedoms in all areas (as opposed to being "highly free" in some areas and "highly unfree" in other areas). For example, if we expect a country with greater economic freedom to be more engaged in the global economy, what good would it be for entrepreneurs and workers in the country to have an extremely high level of economic freedom in regards to legal structure and security of property rights but virtually no freedom in regards to regulation of credit, labor, and business? It seems reasonable to suppose that – just as in consumer choice theory – averages should often be preferred to extremes. In numeric terms, having area scores of 6 and 6 in these two dimensions would seemingly offer an environment more conducive to free economic exchange and commerce than having area scores of either 10 and 2 or 3 and 9.

Borrowing the functional form of Cobb-Douglas utility from consumer choice theory, for a country with area scores of x_1, x_2, x_3, x_4, and x_5, we propose computing an aggregate Economic Freedom Index score as a geometric mean:

$$EFWI_G = x_1^{.2} x_2^{.2} x_3^{.2} x_4^{.2} x_5^{.2} = \prod_{j=1}^{5} x_j^{.2} \qquad (2)$$

Partial differentiation of (2) yields $\frac{\partial EFWI_G}{\partial x_i} = .2 \frac{\prod_{j \neq i} x_j^{.2}}{x_i^{.8}}$. This expression immediately reveals that the impact of a marginal change in the level of any one area score depends upon the values of all of the area scores. Moreover, for each area $\frac{\partial^2 EFWI_G}{\partial x_i^2} < 0$, revealing that all other areas fixed, for this alternative functional specification there are diminishing returns to greater economic freedom in each area. Finally, the Marginal Rate of Substitution between areas of economic freedom for the alternate measure is $MRS_{i,k}^{G} = -\left. \frac{\partial EFWI_G}{\partial x_i} \right/ \frac{\partial EFWI_G}{\partial x_k} = -\frac{x_k}{x_i}$.

A simple example will serve to illustrate how these two different formulas will give rise to aggregate scores and subsequent ranking which differ. Consider three countries with area rankings as summarized in Table 1 below.

Table 1 – Illustrative Example

	Area 1	Area 2	Area 3	Area 4	Area 5	EFWI-A	EFWI-G
Country A	5	5	5	5	5	5	5
Country B	7	6	5	4	3	5	4.79
Country C	9	8	6	2	1	5.2	3.87

The traditional EFWI (denoted by EFWI-A in Table 1) ranks "Country C" as having the greatest aggregate economic freedom of these three (with "Country A" and "Country B" being tied). In contract, our alternative Economic Freedom Index (denoted by EFWI-G in Table 1)

identifies "Country A" as having the greatest and "Country C" as having the least economic freedom of these three. Focusing on the area scores for "Countries A and B" directly reveals how across the different areas, averages are preferred to extremes for $EFWI_G$.

Indeed, a potential shortcoming of computing an aggregate score by simply taking an arithmetic mean is noted by the authors of the Economic Freedom of the World study themselves, when they write:

> "…there is reason to question whether the areas (and components) are independent or work together like the wheels, motor, transmission, driveshaft, and frame of a car. Just as these interconnected parts provide for the mobility of an automobile, it may be the combination of interrelated factors that brings about economic freedom. Which is more important for the mobility of an automobile: the motor, wheels, or transmission? The question cannot be easily answered because the parts work together. If any of these key parts break down, the car is immobile. Institutional quality may be much the same. If any of the key parts are absent, the overall effectiveness is undermined." (Gwartney, Lawson, and Hall (2017), page 5)

Consequently, by computing an aggregate index as the geometric mean of sub-dimension scores, we begin to circumvent this shortcoming of the current approach.

IV. RANKING BASED UPON GEOMETRIC MEAN

The data constructed and ultimately used to compute EFWI scores is made publicly available by the Frasier Institute on their webpage.[3] We used this data to compute our alternative index

[3] See: *https://www.fraserinstitute.org/sites/default/files/economic-freedom-of-the-world-data-for-researchers.xls*.

measure of economic freedom, $EFWI_G$ defined above, for the 159 countries included in this dataset for 2015. A summary of these results is provided by Table 2 (see the final page of this report). Countries are ordered based upon their value of $EFWI_G$, ranging from a high of 8.95 for Hong Kong to a low of 2.74 for Venezuela (as indicated in the column "EFWI-G"). The ordinal rank of each country according to $EFWI_G$ is explicitly stated in the column labeled "Rank-G."

To begin to make comparisons between the results of our approach and the standard methodology of the Frasier Institute's Economic Freedom of the World study, index scores computed as a simple arithmetic mean (i.e., $EFWI_A$) are reported in Table 2 in the column labeled "EFWI-A." The column labeled "Rank-A" states the ordinal rank of each country with respect to $EFWI_A$. The difference in ordinal rank based upon indices computed as a geometric mean versus an arithmetic mean is reported in the column labeled "Rank Change." Finally, the column labeled "Score Change" states the value of $EFWI_G - EFWI_A$ for each country.

In terms of ordinal rank, the Top 5 and Bottom 2 countries are exactly the same based upon either a geometric or arithmetic mean. Additionally, the ordinal ranking of 15 other countries remained unchanged. Qatar showed the largest upward movement in the ordinal ranking when using $EFWI_G$ instead of $EFWI_A$, moving up 10 spots from 46th place to 36th place. Three countries moved up 9 places in the ranking: South Korea (from 33rd to 24th); Bahamas (from 54th to 45th); and Namibia (from 87th to 78th). An additional five countries moved up 8 places: Armenia (from 29th to 21st); Rwanda (from 31st to 28th); United Arab Emirates (from 37th to 29th); Zambia (from 90th to 82nd); and Malawi (from 133rd to 125th).

When ranking countries based upon $EFWI_G$ instead of $EFWI_A$, Sweden fell 19 spots (more than any other country) from 27th down to 46th. The next two largest declines were realized by Haiti (falling 16 spots from 104th to 120th) and the Netherlands (falling 14 spots from 19th to 33rd).

Six additional countries fell by 10 or more places in the ranking: Honduras (down 12 spots from 55th to 67th); France (down 12 spots from 52nd to 64th); Belgium (down 12 spots from 43rd to 55th); Madagascar (down 11 spots from 110th to 121st); Denmark (down 11 spots from 16th to 27th); Luxembourg (down 10 spots from 28th to 38th).

Since, mathematically, the geometric mean of a set of numbers can never be greater than its arithmetic mean, the value of $EFWI_G$ as defined by (2) must be less than the value of $EFWI_A$ as defined by (1) for each country.[4] As reported in the column "Score Change," the decline in index value computed as $EFWI_G$ (instead of $EFWI_A$) was smallest in Barbados, Hong Kong, Namibia, and Bhutan, which each had $EFWI_G - EFWI_A$ equal to –.02. In total 18 of the 159 countries had a value of "Score Change" between –.02 and –.05. At the other extreme, 12 countries had a value of "Score Change" of –.31 or lower, with the largest declines realized by: Haiti (–.50); Madagascar (–.42); and Sweden (–.39).

Recall, as discussed in the previous section, when computing index values as geometric means instead of arithmetic means we are implicitly assuming that "averages are preferred to extremes." Consequently, countries with a significantly low level of economic freedom in any one dimension will be "punished" for this shortcoming, even if they have a relatively high level of economic freedom in the other four dimensions. In contrast, countries with little variation in economic freedom across the five dimensions will have a value of $EFWI_G$ relatively close to their value of $EFWI_A$. Table 3 provides some insight on this point, by stating each of the five area scores, $EFWI_G$, $EFWI_A$, and Score Change (plus difference between largest and smallest area score and variance of area scores) for Barbados, Hong Kong, Namibia, and Bhutan (the four countries with

[4] So long as a country does not have the same exact score in all five sub-dimensions, this inequality will hold strictly (as opposed to weakly).

Score Change of only –.02), Sweden, Madagascar, and Haiti (the three countries with the largest values – in absolute terms – of Score Change), and Togo, Algeria, and Portugal (the middle three countries of all 159 when ordered according to Score Change).

Table 3 – Illustration of How Variability in Area Scores Impacts EFWI-G and EFWI-A

	Area 1 (Size of Government)	Area 2 (Legal Structure and Property Rights)	Area 3 (Access to Sound Money)	Area 4 (Freedom to Trade Internationally)	Area 5 (Regulation of Credit, Labor, and Business)	EFWI-G	EFWI-A	Score Change	Difference Between Largest and Smallest Area Score	Variance of Area Scores
Barbados	6.30	5.76	6.72	7.09	6.49	6.46	6.47	–.02	1.33	.20
Hong Kong	8.55	8.08	9.51	9.23	9.49	8.95	8.97	–.02	1.43	.32
Namibia	6.45	6.51	6.64	6.39	7.81	6.74	6.76	–.02	1.42	.28
Bhutan	7.75	6.86	7.03	6.27	7.62	7.09	7.11	–.02	1.48	.29
Togo	6.13	3.69	7.01	5.45	6.22	5.57	5.70	–.13	3.32	1.25
Algeria	3.56	4.55	6.85	4.01	5.24	4.72	4.84	–.13	3.29	1.32
Portugal	5.61	6.95	9.68	8.42	7.00	7.40	7.53	–.13	4.07	1.94
Sweden	3.64	8.35	9.71	8.28	8.26	7.26	7.65	–.39	6.07	4.32
Madagascar	8.80	2.88	8.05	6.61	5.86	6.02	6.44	–.42	5.92	4.24
Haiti	7.63	2.48	7.76	7.78	7.01	6.04	6.53	–.50	5.30	4.18

Barbados, Hong Kong, Namibia, and Bhutan each have scores across the five dimensions which do not vary much. For each of these countries, the difference between highest area score and lowest area score is no larger than 1.48, and the variance of area scores for each of these four countries is .32 or less. In contrast, Togo, Algeria, and Portugal (the three countries in the middle of the ranking according to Score Change) each have greater variability with respect to their area scores. This can be seen by looking at either the difference between largest and smallest area score (which ranges between 3.29 and 4.07 for these countries) or variance of area scores (which ranges between 1.25 and 1.94 for these countries). Finally, the greatest variability with respect to area scores is indeed realized by those countries which consequently have the largest Score Change (in absolute terms) of all countries in the ranking. Sweden, Madagascar, and Haiti each have a

difference between largest and smallest area score that is 5.30 or more and a variance of area scores that is 4.18 or above. Moreover, these three countries each have one dimension in which the level of economic freedom is considerably lower than the other four dimensions (for Sweden this dimension is Size of Government; for Madagascar and Haiti this dimension is Legal Structure and Property Rights). These observations illustrate how an index score computed as geometric mean is much more penal when a country fails to perform sufficiently well in all dimensions of economic freedom (an attribute which we maintain is good for an aggregate measure of economic freedom to possess).

V. CORRELATION BETWEEN MEASURES OF ECONOMIC FREEDOM AND ECONOMIC OUTCOMES

Numerous researchers have examined issues related to how the level of economic freedom correlates with various social and economic outcomes. Indeed, as noted by Lawson (2006), "A primary purpose for the creation of the EFW index was to inject some much needed scientific fact into the ongoing debate about the merits of free-market economic systems versus interventionist systems. What had characterized this debate for most of its history was a paucity of data and evidence. With the creation of the EFW index we are now in a position to begin to address the problem of economic organization as scientists should by measurement of reality and testing of various hypotheses" (Lawson (2006), page 400). Hall and Lawson (2014) identify over 400 articles which cite at least one of the versions of the Frasier Institute's Economic Freedom of the World index, across diverse disciplines such as economics, political science, international relations, business, and sociology. They note, "198 articles used the EFW index and/or one of its areas or components as an independent variable in an empirical (i.e., regression) model" (Hall and Lawson (2014), page 4). Of the studies surveyed, over two-thirds (134 out of 198 articles) found

evidence that greater economic freedom is positively correlated with desirable outcomes (56 out of 198 articles identified mixed correlations, while only 8 out of 198 articles found greater economic freedom to be correlated with undesirable outcomes).

Berggren (2003) summarizes findings which show that greater economic freedom is positively correlated with higher rates of GDP growth and higher levels of GDP per capita. Related to this – and further stressing the importance of economic institutions for growth – Gwartney, Holcombe, and Lawson (2004) provide empirical support for a claim that greater economic freedom is positively correlated with higher growth rates and higher incomes, as a consequence of greater economic freedom influencing rates of investment and resource productivity.

Hanson (2003) also shows that greater economic freedom is positively correlated with higher levels of GDP per capita. But, he goes on to offer several critiques (e.g., bias resulting from positive between independent and dependent variables, as well as reverse causality) for why these results should perhaps be viewed with some skepticism. Heckelman (2005) provides a detailed response to Hanson's various criticisms, observing that, "most of his arguments are questionable, do not apply to much of the literature, or are not original, and that he is guilty of misinterpreting his own econometric evidence relating freedom to the level of GDP" (Heckelman (2005), page 492).

To gain some insights on how our alternative measure of economic freedom correlates with economic outcomes, we ran a pair of univariate regressions with Per Capita GDP as the dependent variable and "Economic Freedom" as the independent variable (one using $EFWI_G$ and, for a point of comparison, one using $EFWI_A$). Per Capita GDP was constructed using GDP and Population data from the Penn World Tables. The most recent year for which this data is currently available is 2014. Thus, we first needed to compute values of $EFWI_G$ for 2014. (Values of $EFWI_G$, $EFWI_A$,

and Per Capita GDP for the 155 countries included in both the "Economic Freedom of the World" database and the Penn World Tables for the year 2014 are reported in Table 4, at the end of this paper.)

More precisely, the equation which we estimated using OLS regression is of the base form:

$$y = b_0 + b_1 x$$

$$PerCapitaGDP = b_0 + b_1 EFWI$$

Running this regression with $EFWI = EFWI_G$ gives an estimate of

$$PerCapitaGDP = -60{,}546.35 + 11{,}945.45 EFWI_G.$$

The R^2 for this regression is 0.27703. Both coefficient estimates are highly significant. When this regression is instead run with $EFWI = EFWI_A$, we obtain an estimate of

$$PerCapitaGDP = -63{,}892.04 + 12{,}171.27 EFWI_A.$$

The R^2 for this regression is 0.27495. Both coefficient estimates are again highly significant.

Based upon a direct comparison of these results, it appears as if our alternative measure of economic freedom correlates with Per Capita GDP ever so slightly better than the standard measure of economic freedom (based upon the ever so slightly larger value of R^2). However, this observation does *not* suggest that our alternative measure is a superior measure of economic freedom. As noted by Bologna and Hall (2014, page 126): "Arguments that an alternative measure or weighting of economic freedom correlates better with economic outcomes and is therefore a better measure of *economic freedom* than the EFW index is invalid because the only relevant criteria is whether the data used to measure economic freedom accurately captures infringements on economic freedom. Scholars may prefer other measures…but there is no way to formally test which measure is 'better.'"

In practical terms, the results of the two different regressions reported above do not differ much from one another. This is because of the high degree of correlation between our new proposed aggregate measure and the standard established aggregate measure. The value of the correlation coefficient between $EFWI_A$ and $EFWI_G$ is 0.994660. This high degree of correlation should not be surprising, since we are not completely overhauling the approach to measuring economic freedom or even considering different approaches to measure different sub-dimensions – rather, all we have proposed is a slightly different (and, in our opinion, more reasonable) functional form for aggregating the different sub-dimensions.

VI. CONCLUSION

Academic researchers have attempted to quantify economic freedom for decades. One of the most well-known and wide used measures is the Frasier Institute's Economic Freedom of the World index. This index is constructed by first assessing the level of economic freedom in multiple distinct dimensions, and then simply taking an arithmetic mean over the sub-dimension scores. More precisely, the specification of $EFWI_A$ in (1) assumes that each area of economic freedom is perfectly substitutable for every other area. Again, we cannot think of any *a priori* reason to suspect that the impact of the different areas should contribute to overall economic freedom in this highly restrictive way. We believe that it is more reasonable and intuitive to suppose that the realization of desirable economic and social outcomes may very well require a society to have adequate economic freedoms in all areas. Thus, the specification of $EFWI_G$ in (2) would provide a superior aggregate measure of economic freedom, since countries are penalized to a greater degree if they are particularly lacking economic freedom in any one single dimension. Because of these mathematical properties of our proposed alternative measure (coupled with the preliminary

observation that $EFWI_G$ correlates with Per Capita GDP slightly better than does $EFWI_A$), we feel that our proposed index is better than the previously constructed measure.

Using data from the Frasier Institute, we constructed a ranking of Economic Freedom based upon this alternate functional specification. While the ordinal position of most countries did not drastically change (the Top 5 and Bottom 2 countries are the same under either approach), there were some "big movers," both upward and downward in the ranking. Countries which moved up the most spots in the ranking were: Qatar, South Korea, Bahamas, and Namibia. The countries which moved down the largest number of places were: Sweden, Haiti, the Netherland, Honduras, France, and Belgium.

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Table 2 – Comparison of EFWI-G to EFWI-A (2015)

Rank-G	Rank-A	Rank Change	Country	EFWI-G	EFWI-A	Score Change
1	1	0	Hong Kong	8.95	8.97	-0.02
2	2	0	Singapore	8.78	8.81	-0.03
3	3	0	New Zealand	8.41	8.48	-0.07
4	4	0	Switzerland	8.40	8.44	-0.04
5	5	0	Ireland	8.09	8.19	-0.10
6	7	1	Mauritius	7.97	8.04	-0.07
7	8	1	Georgia	7.97	8.01	-0.05
8	9	1	Australia	7.94	7.99	-0.05
9	6	-3	Unt. Kingdom	7.93	8.04	-0.12
10	10	0	Estonia	7.87	7.95	-0.09
11	13	2	Lithuania	7.86	7.92	-0.06
12	12	0	United States	7.86	7.95	-0.09
13	11	-2	Canada	7.84	7.94	-0.10
14	15	1	Chile	7.71	7.77	-0.06
15	14	-1	Cyprus	7.68	7.79	-0.11
16	18	2	Latvia	7.67	7.76	-0.08
17	22	5	Taiwan	7.64	7.70	-0.06
18	20	2	Romania	7.63	7.73	-0.09
19	21	2	Malta	7.58	7.70	-0.12
20	23	3	Germany	7.58	7.69	-0.12
21	29	8	Armenia	7.50	7.60	-0.10
22	26	4	Austria	7.50	7.66	-0.16
23	31	8	Rwanda	7.47	7.57	-0.10
24	33	9	Korea, South	7.47	7.54	-0.08
25	30	5	Panama	7.46	7.59	-0.13
26	17	-9	Finland	7.46	7.74	-0.29
27	16	-11	Denmark	7.46	7.77	-0.31
28	25	-3	Norway	7.45	7.67	-0.23
29	37	8	Unit. Arab Em.	7.43	7.50	-0.06
30	24	-6	Guatemala	7.41	7.69	-0.28
31	34	3	Portugal	7.40	7.53	-0.13
32	35	3	Costa Rica	7.40	7.52	-0.12
33	19	-14	Netherlands	7.39	7.74	-0.35
34	38	4	Israel	7.39	7.49	-0.10
35	36	1	Spain	7.39	7.51	-0.12
36	46	10	Qatar	7.38	7.43	-0.05
37	32	-5	Albania	7.38	7.54	-0.17
38	28	-10	Luxembourg	7.36	7.64	-0.28
39	45	6	Mongolia	7.34	7.43	-0.09
40	47	7	Seychelles	7.32	7.42	-0.10
41	42	1	Czech Rep.	7.29	7.47	-0.17
42	39	-3	Jordan	7.28	7.47	-0.19
43	40	-3	Japan	7.28	7.47	-0.19
44	50	6	Botswana	7.28	7.37	-0.09
45	54	9	Bahamas	7.27	7.30	-0.03
46	27	-19	Sweden	7.26	7.65	-0.39
47	44	-3	Peru	7.26	7.44	-0.18
48	49	1	Bahrain	7.25	7.38	-0.13
49	41	-8	Philippines	7.24	7.47	-0.23
50	48	-2	Bulgaria	7.23	7.39	-0.16
51	51	0	Poland	7.20	7.34	-0.14
52	58	6	Jamaica	7.19	7.30	-0.11
53	56	3	Hungary	7.15	7.30	-0.15
54	53	-1	Slovak Rep	7.13	7.31	-0.18
55	43	-12	Belgium	7.13	7.44	-0.31
56	62	6	Iceland	7.13	7.23	-0.10
57	57	0	Italy	7.12	7.30	-0.18
58	65	7	Malaysia	7.12	7.19	-0.06
59	60	1	Uganda	7.12	7.25	-0.13
60	61	1	Gambia, The	7.12	7.24	-0.12
61	66	5	Kazakhstan	7.10	7.18	-0.08
62	59	-3	Nicaragua	7.09	7.28	-0.19
63	70	7	Bhutan	7.09	7.11	-0.02
64	52	-12	France	7.07	7.33	-0.26
65	68	3	Uruguay	7.05	7.16	-0.10
66	67	1	Macedonia	7.04	7.17	-0.13
67	55	-12	Honduras	7.01	7.30	-0.29
68	64	-4	Cambodia	7.00	7.21	-0.21
69	71	2	Kenya	6.96	7.11	-0.16
70	63	-7	Dominican	6.94	7.21	-0.27
71	75	4	Laos	6.92	6.98	-0.05
72	77	5	Tanzania	6.87	6.92	-0.05
73	72	-1	Croatia	6.82	7.02	-0.20
74	73	-1	Indonesia	6.80	6.99	-0.19
75	69	-6	El Salvador	6.78	7.13	-0.34
76	76	0	Mexico	6.77	6.95	-0.18
77	74	-3	Slovenia	6.75	7.00	-0.25
78	87	9	Namibia	6.74	6.76	-0.02
79	80	1	Kyrgyz	6.70	6.89	-0.19
80	83	3	Tajikistan	6.68	6.80	-0.12
81	81	0	Turkey	6.68	6.82	-0.15
82	90	8	Zambia	6.67	6.75	-0.08
83	88	5	Serbia	6.66	6.75	-0.09
84	89	5	Thailand	6.64	6.75	-0.11
85	79	-6	Paraguay	6.62	6.91	-0.29
86	78	-8	Lebanon	6.62	6.91	-0.29
87	84	-3	Swaziland	6.61	6.79	-0.18
88	82	-6	Liberia	6.61	6.80	-0.19
89	86	-3	Brunei Daruss.	6.60	6.76	-0.16
90	85	-5	Montenegro	6.59	6.77	-0.18
91	91	0	Fiji	6.59	6.68	-0.09
92	93	1	Cape Verde	6.57	6.66	-0.09
93	94	1	Sri Lanka	6.57	6.65	-0.08
94	97	3	Kuwait	6.55	6.62	-0.07
95	96	1	South Africa	6.54	6.63	-0.09
96	92	-4	Suriname	6.52	6.67	-0.15
97	95	-2	India	6.52	6.63	-0.11
98	103	5	Ghana	6.50	6.53	-0.03
99	100	1	Russia	6.50	6.60	-0.10
100	101	1	Lesotho	6.49	6.58	-0.10
101	98	-3	Oman	6.48	6.62	-0.14
102	108	6	Barbados	6.46	6.47	-0.02
103	102	-1	Moldova	6.42	6.56	-0.14
104	99	-5	Bosnia & Herz.	6.40	6.61	-0.21
105	105	0	Belize	6.38	6.50	-0.13
106	107	1	Nepal	6.37	6.49	-0.11
107	106	-1	Trinidad & Tob.	6.33	6.50	-0.17
108	109	1	Guyana	6.32	6.45	-0.13
109	114	5	Azerbaijan	6.31	6.38	-0.07
110	112	2	China	6.31	6.40	-0.09
111	118	7	Tunisia	6.29	6.32	-0.03
112	111	-1	Pap. New Guinea	6.29	6.42	-0.13
113	120	7	Morocco	6.26	6.29	-0.03
114	119	5	Vietnam	6.24	6.30	-0.06
115	113	-2	Colombia	6.20	6.40	-0.19
116	115	-1	Nigeria	6.16	6.38	-0.23
117	122	5	Saudi Arabia	6.13	6.24	-0.10
118	116	-2	Greece	6.09	6.36	-0.27
119	124	5	Senegal	6.06	6.16	-0.10
120	104	-16	Haiti	6.04	6.53	-0.50
121	110	-11	Madagascar	6.02	6.44	-0.42
122	117	-5	Bangladesh	5.97	6.32	-0.35
123	121	-2	Timor-Leste	5.95	6.29	-0.33
124	123	-1	Yemen, Rep.	5.83	6.17	-0.33
125	133	8	Malawi	5.82	5.86	-0.04
126	130	4	Cote d'Ivoire	5.81	5.88	-0.07
127	125	-2	Burundi	5.80	6.08	-0.28
128	126	-2	Bolivia	5.76	6.03	-0.27
129	129	0	Mali	5.73	5.90	-0.17
130	131	1	Ecuador	5.72	5.88	-0.17
131	132	1	Burkina Faso	5.71	5.87	-0.16
132	127	-5	Pakistan	5.70	5.92	-0.22
133	136	3	Gabon	5.66	5.76	-0.10
134	128	-6	Cameroon	5.65	5.92	-0.27
135	135	0	Benin	5.63	5.77	-0.14
136	134	-2	Sierra Leone	5.63	5.78	-0.16
137	141	4	Togo	5.57	5.70	-0.13
138	139	1	Niger	5.57	5.74	-0.17
139	137	-2	Brazil	5.57	5.75	-0.18
140	142	2	Guinea-Bissau	5.56	5.65	-0.09
141	143	2	Mozambique	5.54	5.62	-0.09
142	146	4	Ethiopia	5.49	5.53	-0.05
143	140	-3	Egypt	5.49	5.73	-0.25
144	138	-6	Guinea	5.47	5.75	-0.29
145	144	-1	Zimbabwe	5.41	5.61	-0.20
146	145	-1	Mauritania	5.34	5.56	-0.22
147	150	3	Iran	5.23	5.31	-0.07
148	148	0	Angola	5.20	5.40	-0.21
149	149	0	Ukraine	5.19	5.38	-0.19
150	153	3	Syria	5.18	5.22	-0.04
151	151	0	Myanmar	5.14	5.26	-0.12
152	147	-5	Congo, Dem. R.	5.14	5.45	-0.31
153	152	-1	Chad	5.02	5.26	-0.24
154	154	0	Libya	4.81	4.96	-0.14
155	155	0	Argentina	4.77	4.88	-0.11
156	157	1	Congo, Rep. Of	4.73	4.81	-0.08
157	156	-1	Algeria	4.72	4.84	-0.13
158	158	0	Central Afr. Rep.	4.27	4.62	-0.35
159	159	0	Venezuela	2.74	2.92	-0.18

Table 4 – EFWI-G, EFWI-A, and Per Capita GDP (2014)

Rank-G	Country	EFWI-G	EFWI-A	Per Capita GDP
1	Hong Kong	8.84	8.88	51,808
2	Singapore	8.65	8.69	72,583
3	New Zealand	8.39	8.46	34,735
4	Switzerland	8.32	8.35	58,469
5	Canada	8.15	8.20	42,352
6	Australia	7.97	8.02	43,071
7	Georgia	7.95	8.00	9,362
8	Ireland	7.88	8.00	48,767
9	Lithuania	7.81	7.88	28,208
10	United Kingdom	7.80	7.92	40,242
11	Mauritius	7.79	7.90	17,942
12	Chile	7.79	7.84	21,581
13	United States	7.78	7.85	52,292
14	Romania	7.74	7.82	20,817
15	Latvia	7.72	7.80	23,679
16	Taiwan	7.71	7.77	44,328
17	Malta	7.64	7.76	31,644
18	Estonia	7.62	7.71	28,538
19	Armenia	7.59	7.70	8,586
20	Qatar	7.56	7.64	144,340
21	Finland	7.53	7.78	40,401
22	Austria	7.52	7.68	47,744
23	Germany	7.50	7.61	45,961
24	Luxembourg	7.49	7.69	95,176
25	Korea, South	7.48	7.55	35,104
26	Portugal	7.45	7.59	28,476
27	Denmark	7.42	7.73	44,924
28	Jordan	7.40	7.58	10,456
29	Spain	7.40	7.52	33,864
30	Unit. Arab Em.	7.40	7.49	64,398
31	Guatemala	7.40	7.68	6,851
32	Panama	7.39	7.52	19,702
33	Costa Rica	7.39	7.49	14,186
34	Slovak Rep	7.38	7.55	28,609
35	Israel	7.36	7.48	33,270
36	Nicaragua	7.36	7.48	4,453
37	Norway	7.35	7.50	64,274
38	Japan	7.34	7.49	35,358
39	Cyprus	7.33	7.39	28,602
40	Hungary	7.32	7.46	25,758
41	Czech Rep.	7.30	7.47	31,856
42	Netherlands	7.29	7.64	47,240
43	Peru	7.29	7.49	10,993
44	Macedonia	7.28	7.36	13,151
45	Poland	7.27	7.42	25,156
46	Albania	7.27	7.48	10,664
47	Belgium	7.27	7.59	43,668
48	Bahamas	7.26	7.30	23,452
49	Seychelles	7.26	7.39	25,822
50	Mongolia	7.26	7.35	11,526
51	Dominican Rep.	7.24	7.40	12,511
52	Botswana	7.22	7.30	16,175
53	Bahrain	7.21	7.36	41,626
54	Gambia, The	7.20	7.32	1,544
55	Bulgaria	7.20	7.37	17,462
56	Philippines	7.18	7.41	6,659
57	Rwanda	7.17	7.30	1,565
58	Kazakhstan	7.15	7.25	23,450
59	Italy	7.14	7.33	35,807
60	France	7.14	7.41	39,374
61	Sweden	7.13	7.50	44,598
62	El Salvador	7.12	7.38	7,843
63	Uganda	7.09	7.25	1,839
64	Montenegro	7.09	7.22	14,567
65	Brunei Daruss.	7.02	7.18	68,499
66	Iceland	7.02	7.10	42,876
67	Malaysia	7.01	7.08	23,158
68	Uruguay	7.00	7.10	20,396
69	Jamaica	6.99	7.14	7,449
70	Bhutan	6.97	6.99	6,880
71	Liberia	6.94	7.16	838
72	Kenya	6.94	7.09	2,769
73	Cambodia	6.93	7.16	2,995
74	Oman	6.90	7.11	38,527
75	Kyrgyz Republic	6.90	7.06	3,359
76	Honduras	6.88	7.18	4,424
77	Mexico	6.86	6.99	15,853
78	Namibia	6.86	6.89	10,911
79	Laos	6.85	6.92	5,544
80	Croatia	6.84	7.04	21,675
81	Indonesia	6.83	7.02	9,707
82	Zambia	6.82	6.93	3,726
83	Turkey	6.78	6.91	19,236
84	Slovenia	6.72	6.98	30,488
85	Tanzania	6.72	6.78	2,213
86	Tajikistan	6.70	6.83	2,747
87	Swaziland	6.70	6.86	8,029
88	Paraguay	6.70	6.95	8,284
89	Serbia	6.68	6.76	13,441
90	Kuwait	6.67	6.78	63,886
91	Lebanon	6.67	6.94	13,999
92	Barbados	6.62	6.63	14,220
93	Bosnia & Herz.	6.61	6.79	10,028
94	Moldova	6.57	6.68	4,811
95	Trinidad & Tob.	6.57	6.77	31,196
96	Greece	6.54	6.83	25,990
97	South Africa	6.52	6.60	12,128
98	Russia	6.49	6.61	24,039
99	Suriname	6.46	6.62	15,655
100	Cape Verde	6.45	6.56	6,290
101	Tunisia	6.45	6.49	10,365
102	Thailand	6.45	6.54	13,967
103	Ghana	6.44	6.47	3,570
104	Sri Lanka	6.44	6.55	10,342
105	Fiji	6.41	6.51	7,909
106	Saudi Arabia	6.40	6.54	48,025
107	Lesotho	6.39	6.51	2,409
108	Nepal	6.39	6.49	2,173
109	Azerbaijan	6.32	6.40	15,887
110	China	6.29	6.38	12,473
111	Belize	6.28	6.47	8,393
112	Colombia	6.26	6.46	12,599
113	Morocco	6.25	6.28	7,163
114	Yemen, Rep.	6.23	6.57	3,355
115	India	6.21	6.29	5,224
116	Vietnam	6.17	6.24	5,353
117	Senegal	6.17	6.27	2,247
118	Nigeria	6.13	6.38	5,501
119	Haiti	6.12	6.61	1,562
120	Madagascar	6.07	6.43	1,237
121	Bolivia	6.02	6.21	6,013
122	Cote d'Ivoire	5.97	6.02	3,352
123	Sierra Leone	5.90	6.05	1,419
124	Ukraine	5.89	5.95	10,335
125	Mali	5.89	6.02	1,434
126	Bangladesh	5.88	6.30	2,885
127	Burkina Faso	5.84	6.02	1,565
128	Malawi	5.83	5.89	949
129	Benin	5.82	5.94	1,922
130	Cameroon	5.78	6.03	2,682
131	Brazil	5.76	5.93	14,871
132	Burundi	5.75	5.97	772
133	Pakistan	5.74	5.92	4,646
134	Mozambique	5.70	5.78	1,137
135	Ecuador	5.59	5.68	10,968
136	Togo	5.59	5.84	1,384
137	Gabon	5.58	5.65	14,161
138	Niger	5.56	5.82	852
139	Mauritania	5.52	5.68	3,409
140	Ethiopia	5.51	5.53	1,323
141	Egypt	5.44	5.73	9,909
142	Guinea	5.41	5.65	1,429
143	Zimbabwe	5.38	5.59	1,869
144	Myanmar	5.28	5.41	5,344
145	Guinea-Bissau	5.24	5.37	1,251
146	Syria	5.17	5.22	4,200
147	Angola	4.96	5.13	7,968
148	Algeria	4.86	5.01	12,812
149	Iran	4.81	4.99	15,547
150	Chad	4.76	4.97	2,013
151	Congo, Dem. R.	4.49	5.03	1,217
152	Central Afr. Rep.	4.49	4.99	594
153	Congo, Rep. Of	4.45	4.62	4,426
154	Argentina	4.43	4.49	20,222
155	Venezuela	3.38	3.45	14,134