

Chapter 2: Using Software in the Econometric Equation

by Neil Emerick

The data in *Economic Freedom of the World: 2003 Annual Report* can now be explored using a new software tool. The tool, created by Global Economic Software Ltd., will allow economists, journalists, students, and policy-makers, among others, to explore the index and to compare it with other sets of economic data (such as the World Bank Development Indicators), which are also included in the software.¹ Developed by free-market researchers who have worked for many years with the data used to construct the indexes for *Economic Freedom of the World* (EFW), the software is suitable for non-technical users as well as those statisticians intent on exploring more complex relationships between public policy and economic growth. It can also provide immediate information for those simply wishing to challenge public arguments not based on economic fact. Countries can be ranked and sorted in terms of economic freedom, and charts for enhancing presentations or articles can be generated easily. This article takes the reader through some research exercises in order to explore some of the software's features and to show off the usefulness of the EFW index.

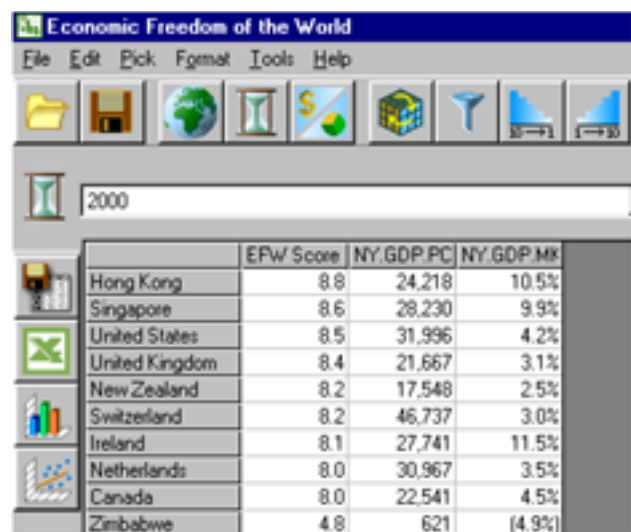
The best way to approach the software is with a specific question in mind. To start, then, we pose the question: How does economic freedom correlate with prosperity? To answer such a question, we need the largest possible sample set, so we draw upon all 123 countries in the database, transferring them to the main viewing grid (see figure 1). Secondly, we must identify which two variables we are interested in correlating. For this exercise, I choose the EFW's summary freedom indicator and the World Bank's data on income as GDP per capita in constant 1995 US dollars. Finally, I choose the year in which I am interested, in this case 2000.² While I have all the countries in the grid, I sort the data by clicking the "Sort" icon to find that Luxembourg is the richest country in the world (in terms of GDP per capita). To view this data in a more presentable form though, I highlight both

columns of data and create a chart by pressing the XY Scatter button. Adding an exponential trend-line, we get the chart for 2000 in figure 2 as an output.

Interestingly, this strong pattern is less pronounced than the one drawn for the year 1970 (figure 2, chart 1970), which has more of a "shotgun" distribution of data. A tempting conclusion would be that a Darwinian process has taken place in the last 30 years, with those countries pursuing economic freedom rapidly advancing their annual incomes, while those that did not do so languished. In other words, even with a somewhat random distribution at the beginning of the measurement period (1970), the effects of economic freedom pulled those nations with a high degree of economic freedom up the income scale while nations where economic freedom was weak were pushed down the relative income scale. The stark differences between the countries that enjoy economic freedom and those that do not have potentially sharpened the definition of this curve.

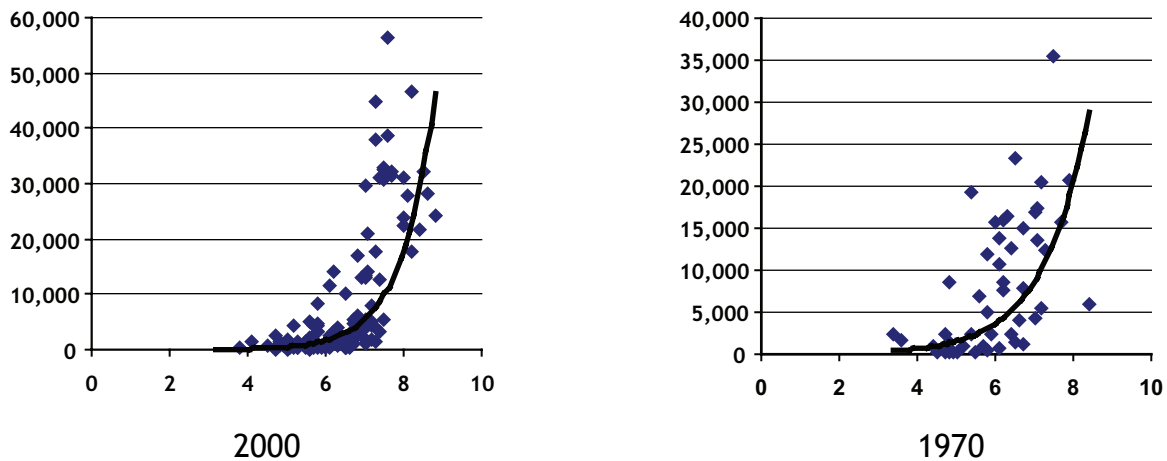
The conclusion of the last exercise leads to another question: To what degree has economic freedom

Figure 1: Main Information Screen



	EFW Score	NY GDP PC	NY GDP MK
Hong Kong	8.8	24,218	10.5%
Singapore	8.6	28,230	9.9%
United States	8.5	31,996	4.2%
United Kingdom	8.4	21,667	3.1%
New Zealand	8.2	17,548	2.5%
Switzerland	8.2	46,737	3.0%
Ireland	8.1	27,741	11.5%
Netherlands	8.0	30,967	3.5%
Canada	8.0	22,541	4.5%
Zimbabwe	4.8	621	(4.9%)

Figure 2: Economic Freedom compared to GDP per capita, 2000 & 1970



generally been improved in the last 30 years? The software provides an excellent way to answer this question. Continuing on from the previous exercise, we stick with the EFW summary freedom figure and the World Bank’s data on income as GDP per capita, and now create three aggregate bands of countries separated into Poor, Middle Income, and Rich. Using the “Create Groups from Bands” option in the software, we cut the database along income levels creating three “groups,” each representing the average of 41 countries. For the year 2000, the Poor are currently earning \$452 per capita per year, while the Rich are enjoying an average yearly income of \$21,594 per capita. Interestingly, the Rich reside in countries with an average score for economic freedom of 7.3 while the Poor suffer under governments with an average score of only 5.6.

To proceed with our question, we need to see the data in an historical perspective, so we select all the years in the database, which stretch back as far as 1970. Next, we rotate the axes so that “Time” is running along the column tops. In the drop-down (third)

axis at the top, we switch to the EFW Score Overall, which gives us the display shown in figure 3.

To answer our question, we can see there *has* been a general trend to freedom from the 1980s onwards, though this was less pronounced in the poorer countries than in the rich. Over the same period, the average yearly income per capita in rich countries went from \$11,937 in 1970 to \$21,594 while, in poor countries, it dropped from \$477 per capita to \$452 in 2000. So, what are the poor countries doing wrong? Which policies may be stopping them from getting rich? We cannot tell simply by looking at the general level of economic freedom. Rather, we need to look at specific policy areas and identify which seem to cause most harm. Again, creating aggregate groups within the software can help give us a general feeling for what might be the problem.

What are the rich countries doing right that poor countries are not? Which policy areas need to be addressed to set them on growth paths similar to those of the rich countries? One way to answer is this is to find the large differences between the scores of Rich

Figure 3: EFW Score Overall

	1970	1975	1980	1985	1990	1995	2000
Poor	5.2	4.7	4.8	4.8	4.8	5.1	5.6
Middle Income	5.5	5.4	5.0	5.1	5.3	5.8	6.2
Rich	6.5	5.8	6.0	6.2	6.5	7.0	7.3

Table 1: Greatest Differences in Economic Freedom between Rich and Poor

Area/Component of the EFW Index	Poor	Rich	EFW Difference
2. A. Military interference in rule of law and the political process	4.4	9.1	-4.7
5. A. (i) Ownership of banks: Percentage of deposits held in privately owned banks	2.7	7.2	-4.5
3. D. Freedom to own foreign currency bank accounts domestically and abroad	4.0	8.4	-4.4
1. C. Government enterprises and investment as a percentage of GDP	2.4	6.6	-4.2
2. C. Protection of intellectual property	3.1	7.1	-4.0

and Poor countries for economic freedom. Starting with a fresh grid, we choose all of the EFW freedom indicators. This grid now contains 35 measurements of economic freedom, from “size of government expenditure” to “inflation variation.” We rearrange the columns and rows such that the year (2000) is on our main (third) axis, with statistics running down the left of our grid, and the two country groups (Poor, Rich) settled along the top axis. To measure differences we export the data to Microsoft’s Excel™, which we do by highlighting the two columns, Poor and Rich, and clicking on the Excel icon. The entire grid is now exported to Excel and we create a difference column by placing a formula (i.e. =B8-C8) in an empty column, copying the formula down the sheet for all variables. If we then sort the data by this difference, the components shown in table 1 rise to the top:

Such exercises often reveal what appears obvious, yet this is a reflection of the accuracy and importance of the index published in *Economic Freedom of the World*. In poorer countries, the governments simply do not get the basics right and this shows up in the index’s measures. With onerous government and corruption of the local money, poverty is the inevitable outcome.

Similarly, the opposite is true: smaller government, rule of law, sound money, and general economic freedom will almost certainly guarantee wealth for its citizens. People left alone will generally prosper.

Finally, we look at an area of increasing importance to the debate about economic freedom, the accusation that capitalism works against other social goods. In fact, the opposite is true. Using the software we can show how well the freedom scores predict concomitant social benefits such as long life and literacy rates. Again, we use the “Create Groups from Bands” option and the EFW summary indicator to split the database into five new bands: Unfree, Less Free, Reasonably Free, Mostly Free, and Free. Next we bring in World Bank development indicators showing literacy rates, the percentage of the population with improved sanitation facilities, improved water sources, and their life expectancy at birth. Table 2 shows dramatically how well economic freedom correlates with good social outcomes. That is, the more free you are, the more healthy, more literate, and longer-lived you are likely to be.

In summary, indexes allow disparate countries and policy mixes to be compared using a common

Table 2: How Economic Freedom Compares with Other Social Goods

Country Groups	EFW Score	Illiteracy Rate (adult total)	Percent of population with access to improved sanitation facilities	Percent of population with improved water source	Life expectancy at birth
Unfree	4.8	31.20%	50.20%	66.30%	55.0
Less Free	5.8	28.40%	70.00%	76.90%	63.0
Reasonably Free	6.5	17.50%	76.80%	79.10%	64.9
Mostly Free	7.1	9.10%	86.30%	87.80%	71.6
Free	7.8	11.10%	98.70%	94.30%	77.4

metric. Such indicators are useful for correlating freedoms with other socially important factors such as economic growth, pollution rates, education levels, health, and so on. However, it is by using the data in conjunction with the number-crunching power of a computer that the relationships and patterns inherent in the data are more easily revealed. Reducing the cost of research and speeding up the process, this new software will assist university graduates, think-tank researchers, and even the popular press to become more familiar with the index concept. Furthermore, as the time required to process data falls, so the amount of research can increase. More papers citing the index and more researchers working with the data should mean an increasing amount of econometric evidence

in favour of what classical liberals already know: that the single greatest reason for economic growth is economic freedom.

Notes

- 1 The software can be ordered at:
<http://www.globaleconomicsoftware.com>.
- 2 Because of publishing constraints, the analysis in this article uses data from the indexes published in *Economic Freedom of the World: 2002 Annual Report*. The 2003 data will be included with the software released at the same time as this publication.