

Chapter 4

Methodology: Measuring the 10 Economic Freedoms

William W. Beach and Tim Kane, Ph.D.

The *Index of Economic Freedom* is a simple average of 10 individual freedoms, each of which is vital to the development of personal and national prosperity. For centuries, great philosophers of liberty such as Locke and Montesquieu have recognized the fundamental right of property as a bulwark of free people. Over time, scholars and practitioners have likewise recognized many other pillars of economic liberty, including free trade, investment rights, and labor freedom.

As the first comprehensive study of economic freedom ever published, the 1995 *Index of Economic Freedom* defined a method of measuring and ranking such vastly different places as Hong Kong and North Korea. Some of the 10 freedoms are external in nature, measuring the extent of an economy's openness to investment or trade. Most are internal in nature, assessing the liberty of individuals to use their labor or finances without restraint.

Since 1995, the *Index* has grown and improved as other, similar studies have joined

the effort. Each cross-country study offers a unique and profound contribution that has helped to shape the world being measured.¹

DEFINING ECONOMIC FREEDOM

Economic freedom is that part of freedom that is concerned with the material autonomy of the individual in relation to the state and other organized groups. An individual is economically free who can fully control his or her labor and property. This economic component of human liberty is related to—and perhaps a necessary condition for—political freedom, but it is also valuable as an end in itself.

The authors of the *Index* perceive economic freedom as a positive concept, recognizing that

¹ See, for example, James D. Gwartney and Robert A. Lawson with Russell S. Sobel and Peter T. Leeson, *Economic Freedom of the World, 2007 Annual Report* (Vancouver, B.C., Canada: Fraser Institute, 2007), and Richard E. Messick, *World Survey of Economic Freedom: 1995–1996* (New Brunswick, N.J.: Transaction Publishers, 1996).

its traditional definition as an *absence of government coercion or constraint* must also include a sense of liberty as distinct from anarchy. Governments are instituted to create basic protections against the ravages of nature so that positive economic rights such as property and contract are given social as well as individual defense against the destructive tendencies of others.

The definition of economic freedom therefore *encompasses all liberties and rights of production, distribution, or consumption of goods and services. The highest form of economic freedom provides an absolute right of property ownership; fully realized freedoms of movement for labor, capital, and goods; and an absolute absence of coercion or constraint of economic liberty beyond the extent necessary for citizens to protect and maintain liberty itself.* In other words, individuals are free to work, produce, consume, and invest in any way they please, and that freedom is both protected by the state and unconstrained by the state.

All government action involves coercion. Some minimal coercion is necessary for the citizens of a community or nation to defend themselves, promote the evolution of civil society, and enjoy the fruits of their labor. This Lockean idea is embodied in the U.S. Constitution. For example, citizens are taxed to provide revenue for the protection of person and property as well as for a common defense. Most political theorists also accept that certain goods—what economists call “public goods”—can be supplied more conveniently by government than through private means. Of particular interest are those economic freedoms that are also public goods, such as the maintenance of a police force to protect property rights, a monetary authority to maintain a sound currency, and an impartial judiciary to enforce contracts among parties.

When government coercion rises beyond the minimal level, however, it becomes corrosive to freedom—and the first freedom affected is economic freedom. Logically, an expansion of state power requires enforcement and therefore funding, which is extracted from the people. Exactly where that line is crossed is open to reasoned debate.

Throughout history, governments have imposed a wide array of constraints on economic activity. Constraining economic choice distorts and diminishes the production, distribution, and consumption of goods and services (including, of course, labor services).² The establishment of a price control is perhaps the clearest example of the distortionary effect of state coercion because of its well-known disruption of the equilibrium of supply and demand.

The 10 Economic Freedoms. Overall economic freedom, defined by multiple rights and liberties, can be quantified as an index of less abstract components. The index we conceive uses 10 specific freedoms, some as composites of even further detailed and quantifiable components. A detailed discussion of each of these factors and their component variables follows this overview.

- **Business freedom** is the ability to create, operate, and close an enterprise quickly and easily. Burdensome, redundant regulatory rules are the most harmful barriers to business freedom.
- **Trade freedom** is a composite measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services.
- **Fiscal freedom** is a measure of the burden of government from the revenue side. It includes both the tax burden in terms of the top tax rate on income (individual and corporate separately) and the overall amount of tax revenue as a portion of gross domestic product (GDP).
- **Government size** is defined to include all government expenditures, including consumption and transfers. Ideally, the state will provide only true public goods, with an absolute minimum of expenditure.
- **Monetary freedom** combines a measure of

² “The property which every man has in his own labour, as it is the original foundation of all other property, so it is the most sacred and inviolable.” Adam Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (New York: The Modern Library, 1937), pp. 121–122; first published in 1776.

price stability with an assessment of price controls. Both inflation and price controls distort market activity. Price stability without microeconomic intervention is the ideal state for the free market.

- **Investment freedom** is an assessment of the free flow of capital, especially foreign capital.
- **Financial freedom** is a measure of banking security as well as independence from government control. State ownership of banks and other financial institutions such as insurer and capital markets is an inefficient burden, and political favoritism has no place in a free capital market.
- **Property rights** is an assessment of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state.
- **Freedom from corruption** is based on quantitative data that assess the perception of corruption in the business environment, including levels of governmental legal, judicial, and administrative corruption.
- **Labor freedom** is a composite measure of the ability of workers and businesses to interact without restriction by the state.

Equal Weight. In the *Index of Economic Freedom*, all 10 factors are equally weighted in order not to bias the overall score toward any one factor or policy direction. As described earlier, economic freedom is an end in itself. The ability of economic freedom to establish a foundation for the rapid development of wealth for the average citizen explains contemporary interest, but it is not a valid rationale to weight some components over others. Nor would it be proper to weight the *Index* in a manner that caused the relation between democracy and economic freedom to be statistically stronger.

This is a common-sense approach. It is also consistent with the purpose of the *Index*: to reflect the balanced economic environment in every country surveyed. The *Index* has never been designed specifically to explain economic growth or any other dependent variable; that is ably done by empirical econometricians elsewhere.

Nor is it clear how the 10 economic freedoms interact. Is a minimum threshold for each one essential? Is it possible for one to maximize if others are minimized? Are they dependent or exclusive, complements or supplements? These are valid questions, but they are beyond the scope of our more fundamental mission. The *Index*, then, offers a simple composite based on an average of the 10 freedoms. It also offers the raw data for each factor so that others can study and weight and integrate as they see fit.

The Grading Scale. Each one of the 10 freedoms is graded using a 0 to 100 scale, where 100 represents the maximum freedom. A score of 100 signifies an economic environment or set of policies that is most conducive to economic freedom. The grading scale is continuous, meaning that scores with decimals are possible. For example, a country could have a trade freedom score of 50.3. Many of the 10 freedoms are based on quantitative data that are converted directly into a score. In the case of trade, a country with zero tariffs and zero non-tariff barriers will have a trade freedom score of 100. This will often be described using percent terminology.³

Period of Study. For the current *Index of Economic Freedom*, the authors generally examined data for the period covering the second half of 2006 through the first half of 2007. To the extent possible, the information considered for each factor was current as of June 30, 2007. It is important to understand, however, that some factors are based on historical information. For example, the monetary freedom factor is a three-year weighted average rate of inflation from January 1, 2004, to December 31, 2006.

Sources. In evaluating the criteria for each factor, the authors have used a range of authoritative sources. All sources are indicated in the narrative where appropriate. Because it would be unnecessarily cumbersome to cite all the sources used in scoring every single variable of each factor, unless otherwise noted, the major sources used in preparing the country

³ For detailed guidance on how the data in the *Index* can be used in statistical research, see <http://www.heritage.org/research/features/index/downloads.cfm#methodology>.

summaries may be found below, in the introduction to the country pages in Chapter 6, and in the list of Major Works Cited.

METHODOLOGY FOR THE 10 ECONOMIC FREEDOMS

Freedom #1: Business Freedom

Business freedom is a quantitative measure of the ability to start, operate, and close a business that represents the overall burden as well as the efficiency of government regulations. Regulations are a form of taxation that makes it difficult for entrepreneurs to create value.

Although many regulations hinder businesses, the most important are associated with licensing new companies and businesses. In some countries, as well as many states in the United States, the procedure for obtaining a business license can be as simple as mailing in a registration form with a minimal fee. In Hong Kong, for example, obtaining a business license requires filling out a single form, and the process can be completed in a few hours. In other countries, such as India and countries in parts of South America, the process involved in obtaining a business license requires endless trips to government offices and can take a year or more.

Once a business is open, government regulation does not always subside; in some cases, it increases. Interestingly, two countries with the same set of regulations can impose different regulatory burdens. If one country, for instance, applies its regulations evenly and transparently, it lowers the regulatory burden because it enables businesses to make long-term plans more easily. If the other applies regulations inconsistently, it raises the regulatory burden by creating an unpredictable business environment. Finally, regulations that make it difficult and expensive to close businesses are disincentives for entrepreneurs to start them in the first place.

Methodology. The business freedom score for each country is a number between 0 and 100 percent, with 100 equaling the freest business environment. The score is based on 10 components, all weighted equally, based on

objective data from the World Bank's *Doing Business* study:

- Starting a business—procedures (number);
- Starting a business—time (days);
- Starting a business—cost (% of income per capita);
- Starting a business—minimum capital (% of income per capita);
- Obtaining a license—procedures (number);
- Obtaining a license—time (days);
- Obtaining a license—cost (% of income per capita);
- Closing a business—time (years);
- Closing a business—cost (% of estate); and
- Closing a business—recovery rate (cents on the dollar).⁴

Each of these raw components is converted to a 0 to 100 scale, after which the average of the converted values is computed. The result represents the country's business freedom score. For example, even if a country requires the highest number of procedures for starting a business, which yields a score of zero in that component, it could still receive a score as high as 90 based on scores in the other nine components.

Norway, for example, has a business freedom score of 89.1 percent. Norway receives scores of 100 in seven of the 10 components.

Each component is converted to a 100 percent scale using the following equation:

$$\text{Component Score}_i = 50 \frac{\text{component}_{\text{average}}}{\text{component}_i}$$

which is based on the ratio of the country data for each component relative to the world average, multiplied by 50. For example, on average worldwide, there are 18.89 procedures to close a business. Norway's 14 procedures is a component value better than the average, resulting in a ratio of 1.349. That ratio multiplied by 50 equals the final component score of 67.4 percent. The average country will receive a component score

⁴ The recovery rate is a function of time and cost. However, the business freedom factor uses all three subvariables to emphasize closing a business, starting a business, and dealing with licenses equally.

of 50 percent, whereas a country's maximum component score is limited to 100 percent.

For the 11 countries that are not covered by the World Bank's *Doing Business* study, the business freedom factor is scored by looking into business regulations based on qualitative information from reliable and internationally recognized sources.⁵

The method for business freedom dates to 2006. From 1995–2005, we used a subjective assessment with a score of 1–5. Those earlier scores have been converted with a simple formula to make them comparable. Observations with the top score were converted to 100, the next best to 85, and so on. This conversion formula is different from the one used for other subjective factors because those other factors are not bridging to a new, data-driven methodology.

Sources. Unless otherwise noted, the authors used the following sources in determining business freedom scores, in order of priority: World Bank, *Doing Business 2008*; Economist Intelligence Unit, *Country Report* and *Country Profile*, 2004–2007; and U.S. Department of Commerce, *Country Commercial Guide*, 2004–2007.

Freedom #2: Trade Freedom

Trade restrictions can take the form of taxes on imports and exports (known as tariffs), quotas or outright bans on trade, and regulatory barriers. The degree to which government hinders access to and the free flow of foreign commerce can have a direct bearing on the ability of individuals to pursue their economic goals.

Tariffs increase the prices that local consumers pay for foreign imports, and these price distortions change incentives, often pulling producers away from specializing in some goods and toward the blocked goods. By interfering with comparative advantage, trade restrictions impede economic growth. Also, tariffs make local citizens poorer by raising prices. In many cases, trade limitations put advanced-technology products and services beyond the reach

of local people, limiting their own productive development.

Methodology. The trade freedom score is based two inputs:

- The trade-weighted average tariff rate and
- Non-tariff barriers (NTBs).

Different imports entering a country can, and often do, face different tariffs. The weighted average tariff uses weights for each tariff based on the share of imports for each good. This is calculated by dividing the country's total tariff revenue by the total value of imports. Weighted average tariffs are a purely quantitative measure and account for the basic calculation of the score using the following equation:

$$TF_i = \frac{\text{Tariff}_{\max} - \text{Tariff}_i}{\text{Tariff}_{\max} - \text{Tariff}_{\min}} - NTB_i$$

where Trade Freedom_{*i*} represents the trade freedom in country *i*, Tariff_{*max*} and Tariff_{*min*} represent the upper and lower bounds for tariff rates, and Tariff_{*i*} represents the weighted average tariff rate in country *i*. The minimum tariff is naturally zero, and the upper bound was set as 50 percent. An NTB penalty is then subtracted from the base score. The penalty of 5, 10, 15, or 20 percentage points is assigned according to the following scale:

- **20%**—NTBs are used extensively across many goods and services and/or act to impede a significant amount of international trade.
- **15%**—NTBs are widespread across many goods and services and/or act to impede a majority of potential international trade.
- **10%**—NTBs are used to protect certain goods and services and impede some international trade.
- **5%**—NTBs are uncommon, protecting few goods and services, and/or have very limited impact on international trade.
- **0%**—NTBs are not used as a means to limit international trade.

We determine the extent of NTBs in a country's trade policy regime using both qualitative and quantitative information. Restrictive rules

⁵ Eleven countries are not covered by the World Bank's *Doing Business* study: Bahamas, Bahrain, Barbados, Burma, Cuba, Cyprus, North Korea, Libya, Malta, Qatar, and Turkmenistan.

that hinder trade vary widely, and their overlapping and shifting nature makes it difficult to gauge their complexity. The categories of NTBs considered in our penalty include:

- Quantity restrictions—import quotas; export limitations; voluntary export restraints; import–export embargoes and bans; counter-trade; etc.
- Price restrictions—antidumping duties; countervailing duties; border tax adjustments; variable levies/tariff rate quotas.
- Regulatory restrictions—licensing; domestic content and mixing requirements; SPSS; safety and industrial standards regulations; packaging, labeling, and trademark regulations; advertising and media regulations.
- Investment restrictions—exchange and other financial controls.
- Customs restrictions—advance deposit requirements; customs valuation procedures; customs classification procedures; customs clearance procedures.
- Direct government intervention—subsidies and other aids; government industrial policy and regional development measures; government-financed research and other technology policies; national taxes and social insurance; competition policies; immigration policies; government procurement policies; state trading, government monopolies, and exclusive franchises.

As an example, France received a trade freedom score of 81 percent, based on the weighted average tariff of 2.6 percent common to all EU countries. The tariff yields a base score 96 percent, but the existence of significant French NTBs reduces the nation's trade freedom score by 15 percentage points.

Gathering data on tariffs to make a consistent cross-country comparison can be a challenging task. Unlike data on inflation, for instance, countries do not report their weighted average tariff rate or simple average tariff rate every year; in some cases, the most recent time a country reported its tariff data could have been as far back as 1993. To preserve consistency in grading the trade policy factor, the

authors have decided to use the most recently reported weighted average tariff rate for a country from our primary source. If another reliable source reports more updated information on the country's tariff rate, the authors note this fact and may review the grading of this factor if there is strong evidence that the most recently reported weighted average tariff rate is outdated.

The World Bank produces the world's most comprehensive and consistent information on weighted average applied tariff rates. When the weighted average applied tariff rate is not available, the authors use the country's average applied tariff rate; and when the country's average applied tariff rate is not available, the authors use the weighted average or the simple average of most favored nation (MFN) tariff rates.⁶ The data for customs revenues and total imports may not be consolidated in just one source. In addition, in the very few cases in which data on duties and customs revenues are not available, the authors use data on international trade taxes instead.

In all cases, the authors clarify the type of data used and the different sources for those data in the corresponding write-up for the trade policy factor. Sometimes, when none of this information is available, the authors simply analyze the overall tariff structure and estimate an effective tariff rate.

Sources. Unless otherwise noted, the authors used the following sources to determine scores for trade policy, in order of priority: World Bank, *World Development Indicators 2007* and *Data on Trade and Import Barriers: Trends in Average Tariff for Developing and Industrial Countries 1981–2005*; World Trade Organization, *Trade Policy Reviews, 1995–2007*; Office of the U.S. Trade Representative, *2007 National*

⁶ The most favored nation tariff rate is the "normal," non-discriminatory tariff charged on imports of a good. In commercial diplomacy, exporters seek MFN treatment; that is, the promise that they will be treated as well as the most favored exporter. The MFN rule requires that the concession be extended to all other members of the World Trade Organization. MFN is now referred to as permanent normal trade relations (PNTR).

Trade Estimate Report on Foreign Trade Barriers; World Bank, *Doing Business 2008*; U.S. Department of Commerce, *Country Commercial Guide*, 2004–2007; Economist Intelligence Unit, *Country Report*, *Country Profile*, and *Country Commerce*, 2004–2007; and official government publications of each country.

Freedom #3: Fiscal Freedom

A government can impose fiscal burdens on economic activity by generating revenue for itself, primarily through taxation but also from debt that ultimately must be paid off through taxation. Fiscal freedom is a quantitative measure of these burdens in which lower taxation translates as a higher level of fiscal freedom. The *Index* methodology includes the top marginal tax rates on individual and corporate income, as well as a measure of total tax revenue as a portion of GDP.

The marginal tax rate confronting an individual is, in effect, the price paid for supplying the next economic effort or engagement in an entrepreneurial venture. What remains after the tax is subtracted are the rewards of the effort. The higher the price of effort or entrepreneurship, the lower the rewards—and the less often such effort will be undertaken. Higher tax rates interfere with the ability of individuals to pursue their goals in the marketplace.

While individual and corporate income tax rates are important to economic freedom, they are not a comprehensive measure of the tax burden. First, they do not include the many other taxes such as payroll, sales, and excise taxes, tariffs, and the value-added tax (VAT). One way to capture all taxation is to measure total government revenues from all forms of taxation as a percentage of total GDP.

Methodology. Fiscal freedom is composed of three quantitative components in equal measure:

- The top tax rate on individual income,
- The top tax rate on corporate income, and
- Total tax revenue as a percentage of GDP.

In scoring the fiscal freedom factor, each of these numerical variables is weighted equally

as one-third of the factor. This equal weighting allows a country to achieve a score as high as 67 percent based on two of the components even if it receives a score of 0 percent on the third.

The economics of public finance are unambiguous on the effect of taxation, using simple supply and demand. A doubling of the tax rate quadruples the economic cost to society of lost market activity. This is known as deadweight loss because it is not value gained by government, but simply prosperity that is destroyed. This happens because the price wedge created by taxation separates optimal supply and demand and diminishes the quantity of goods exchanged. In the extreme, raising tax rates will decrease tax revenue itself, as famously demonstrated by the Laffer curve.

Therefore, the scoring of fiscal freedom is calculated with a quadratic cost function. Each of the component pieces of data is converted to a 100-point scale using this quadratic equation:

$$FF_{ij} = 100 - \alpha (\text{Component}_{ij})^2$$

where Fiscal Freedom(FF)_{*ij*} represents the fiscal freedom in country *i* for component *j*; Component_{ij} represents the raw percentage value (a number between 0 and 100) in country *i* for component *j*; and α is a coefficient set equal to 0.03. The minimum score for each component is zero, which is not represented in the printed equation but was utilized because it means that no single high tax burden will make the other two components irrelevant.

As an example, the Bahamas has no tax on individual or corporate income, so two of the components equal 100. However, overall tax revenue from other forms of taxation are sizable. As a portion of GDP, tax revenue in the Bahamas is 19.6 percent, or 0.196, yielding a revenue component score below 86.4. When the three component freedoms are averaged together, you get the Bahamas' overall fiscal freedom score of 96.2 percent, one of the world's best fiscal freedom scores.

Sources. Unless otherwise noted, the authors used the following sources for information on taxation, in order of priority: Ernst & Young, *The Global Executive* and *Worldwide Corporate Tax*

Guide, 2006–2007; Deloitte, Country Snapshot, 2006–2007, and Corporate Tax Rates at a Glance; International Monetary Fund, Staff Country Report, Selected Issues and Statistical Appendix, 2004–2007; investment agencies; and other governmental authorities (embassy confirmations and/or the country’s treasury or tax authority).

For information on tax revenue as a percentage of GDP, the authors’ primary sources were Organisation for Economic Co-operation and Development data (for member countries); African Development Bank; International Monetary Fund, Staff Country Report, *Selected Issues and Statistical Appendix, 2004 to 2007*; Asian Development Bank, *Key Indicators of Developing Asian and Pacific Countries 2006*; official government publications of each country; and individual contacts from government agencies and multinational organizations such as the IMF and World Bank.

Freedom #4: Government Size

The burden of excessive government is a central issue in economic freedom, both in terms of generating revenue (see fiscal freedom) and in terms of expenditure. This factor considers the level of government expenditures as a percentage of GDP. Government expenditures, including consumption and transfers, account for the entire score. Due to the inconsistent quality and availability of data on revenue generated by state-owned enterprises, that variable is no longer considered, and previous years’ scores were adjusted to reflect this methodological refinement.

Government expenditures are often justified in terms of “public goods” that are provided efficiently by the state rather than by the market. There is also a justification for correcting market failures through government action. Economists recognize another kind of systemic failure as well: a tendency for government failure whereby the state becomes inefficient, bureaucratic, and even harmful to productivity. Government expenditures necessarily compete with private agents and interfere in market prices by overstimulating demand and potentially diverting resources through a crowding-out effect. In extreme cases, governments

can coerce goods and capital out of markets altogether, driving up interest rates and inflation. Distortions in markets occur whenever the purpose of the government’s expenditure is to acquire resources for the government’s own purposes (government consumption) or for transfer payments.

It is understood that some level of government expenditures represents true public goods, implying an ideal level greater than zero. However, identifying that ideal level seems too arbitrary, static, and difficult to apply universally. For these reasons, the methodology treats zero government spending as the benchmark. Moreover, governments that have no public goods will be penalized by lower scores in the other factors (such as property rights and financial freedom).

The scale for scoring government size is non-linear, which means that government spending that is close to zero is lightly penalized, while levels of government exceeding 30 percent of GDP receive much worse scores in a quadratic fashion (e.g., doubling spending yields four times less freedom), so that only really large governments receive very low scores.

The government’s appetite for private resources affects both economic freedom and economic growth. Even if a state-managed economy achieves fast growth through heavy expenditure, it diminishes freedom in the process and can create long-term damage to a country’s growth potential.

Methodology. Scoring of the government size factor is based on government expenditures as a percentage of GDP. The following non-linear quadratic cost function is used to calculate the expenditures score:

$$GE_i = 100 - \alpha (\text{Expenditures}_i)^2$$

where GE_i represents the government expenditure score in country I ; Expenditures_i represents the total amount of government spending at all levels as a portion of GDP (between 0 and 100); and α is a coefficient to control for variation among scores (set at 0.03). The minimum component score is zero.

In most cases, general government expenditure data include all levels of government:

federal, state, and local. In cases where general government spending data are not available, data on central government expenditure are used instead.

Sources. Unless otherwise noted, the authors used the following sources for information on government intervention in the economy, in order of priority: World Bank, *World Development Indicators*, 2006 and 2007, and *Country at a Glance* tables; official government publications of each country; Economist Intelligence Unit, *Country Report* and *Country Profile*, 2004–2007; Organisation for Economic Co-operation and Development data (for member countries); African Development Bank, *Selected Statistics on African Countries 2007*; International Monetary Fund, Staff Country Report, *Selected Issues and Statistical Appendix*, 2002–2007; Asian Development Bank, *Key Indicators 2006*; and U.S. Department of Commerce, *Country Commercial Guide*, 2005–2007.

Freedom #5: Monetary Freedom

Monetary freedom is to market economics what free speech is to democracy. Free people need a steady and reliable currency as a medium of exchange and store of value. Without monetary freedom, it is difficult to create long-term value.

A country's currency is controlled largely by its government's monetary policy. With a monetary policy that endeavors to maintain stability, people can rely on market prices for the foreseeable future. Investment, savings, and other longer-term plans are easier to make, and individuals enjoy greater economic freedom. Inflation not only confiscates wealth like an invisible tax, but also distorts pricing, misallocates resources, raises the cost of doing business, and undermines a free society.

There is no singularly accepted theory of the right monetary institutions for a free society. At one time, the gold standard enjoyed widespread support, but this is no longer the case. What characterizes almost all monetary theorists today, however, is support for low inflation and an independent central bank. There is a powerful consensus among economists that price controls corrupt market efficiency and

that measured inflation in the face of widespread price controls is essentially impossible since the price signal can no longer equate supply and demand.

Methodology. The score for the monetary freedom factor is based on two components:

- The weighted average inflation rate for the most recent three years and
- Price controls.

The weighted average inflation rate for the most recent three years serves as the primary input into an equation that generates the base score for monetary freedom. The extent of price controls is then assessed as a penalty of up to 20 percentage points subtracted from the base score. The two equations used to convert inflation into the policy score for a given year are:

$$WAI_i = \Theta_1 Inflation_{it} + \Theta_2 Inflation_{it-1} + \Theta_3 Inflation_{it-2}$$

$$MF_i = 100 - \alpha \sqrt{WAI_i} - PC_i$$

where θ_1 through θ_3 (thetas 1–3) represent three numbers that sum to 1 and are exponentially smaller in sequence (in this case, values of 0.665, 0.245, and 0.090, respectively); $Inflation_{it}$ is the absolute value of the annual inflation rate in country i during year t as measured by the consumer price index; α represents a coefficient that stabilizes the variance of scores; and the PC penalty is an assigned value of 0–20 percentage points based on the extent of price controls. The convex (square root) functional form was chosen to create separation among countries with low inflation rates; 128 of 161 countries had weighted average inflation under 10 percent in absolute value. A concave functional form would essentially treat all hyperinflations as equally bad, whether they were annual price increases of 100 percent or 100,000 percent, whereas the square root provides much more gradation. The α coefficient is set to equal 6.333, which converts a 10 percent inflation rate into a freedom score of 80.0 and a 2 percent inflation rate into a score of 91.0.

Sources. Unless otherwise noted, the authors used the following sources for data on monetary policy, in order of priority: International Monetary Fund, *International Financial Statistics On-line*; International Monetary Fund, *2007 World Economic Outlook*; and Economist Intelligence Unit, *Country Report*, 1999–2007, and *Country Profile*, 2004–2007.

Freedom #6: Investment Freedom

Restrictions on foreign investment limit the inflow of capital and thus limit economic freedom. By contrast, the presence of few or no restrictions on foreign investment enhances economic freedom because foreign investment provides funds for economic expansion. By its nature, capital will flow to its best use where it is most needed and the returns are greatest. State action to redirect the flow of capital is an imposition on both the freedom of the investor and the people seeking capital. For this factor, the more restrictions a country imposes on foreign and domestic investment, the lower its level of economic freedom.

Methodology. This factor scrutinizes each country's policies toward foreign investment, as well as its policies toward capital flows internally, in order to determine its overall investment climate. The authors assess all countries using the same rubric.

Questions examined include whether there is a foreign investment code that defines the country's investment laws and procedures; whether the government encourages foreign investment through fair and equitable treatment of investors; whether there are restrictions on access to foreign exchange; whether foreign firms are treated the same as domestic firms under the law; whether the government imposes restrictions on payments, transfers, and capital transactions; and whether specific industries are closed to foreign investment.

The following criteria are used:

- **100%**—Foreign investment (FI) is encouraged and treated the same as domestic investment, with a simple and transparent FI code and a professional, efficient bureaucracy. There are no restrictions in sectors related to national security or real estate. No expropriation is allowed. Both residents and non-residents have access to foreign exchange and may conduct international payments. Transfers or capital transactions face no restrictions.
- **90%**—Same as above with the following exceptions: There are very few restrictions on FI in sectors related to national security. There are legal guarantees against expropriation of property. Transfers or capital transactions are subject to virtually no restrictions.
- **80%**—Same as above with the following exceptions: A transparent FI code is subject to minimal bureaucratic or other informal impediments. There are very few restrictions on foreign exchange. Transfers or capital transactions are subject to very few restrictions.
- **70%**—Same as above with the following exceptions: There are some restrictions on FI through general rules or in a few sectors such as utilities, natural resources, or national security. There are a few restrictions on access to foreign exchange or the ability to conduct international payments.
- **60%**—Same as above with the following exceptions: FI is generally encouraged but may not receive equal treatment in a few sectors. The FI code is somewhat non-transparent, and/or FI faces bureaucratic impediments. Expropriation of property is highly unlikely, and the government guarantees compensation. Transfers or capital transactions are subject to some restrictions.
- **50%**—Same as above with the following exceptions: Foreign investors face restrictions on their ability to purchase real estate. All investors face bureaucratic impediments and corruption. Residents and/or non-residents face some restrictions on access to foreign exchange or their ability to conduct international payments. Transfers or capital transactions are subject to obvious restrictions.
- **40%**—Same as above with the following exceptions: FI is somewhat restricted, the FI code is somewhat discriminatory, and FI is restricted outright in some sectors. Expropriation of property is rare. Transfers and capital transactions are subject to significant restrictions.

- **30%**—Same as above with the following exceptions: FI is significantly restricted, the FI code is discriminatory, and foreign investors may purchase real estate only in limited circumstances. All investors face significant bureaucratic impediments and corruption. Residents and non-residents face strict restrictions on access to foreign exchange, and the government imposes many controls on international payments.
- **20%**—Same as above with the following exceptions: FI is discouraged and prohibited in many sectors, the FI code is discriminatory, and the approval process is opaque and subject to widespread corruption. Few sectors are open to FI. Expropriation of property is common. The government imposes extensive controls on international payments, transfers, and capital transactions.
- **10%**—Same as above with the following exceptions: Foreign investors may not purchase real estate. The government controls or prohibits most international payments, transfers, and capital transactions.
- **0%**—Same as above with the following exceptions: FI is prohibited, foreigners may not own real estate, and the government prohibits international payments, transfers, and capital transactions.

Sources. Unless otherwise noted, the authors used the following sources for data on capital flows and foreign investment, in order of priority: International Monetary Fund, *Annual Report on Exchange Arrangements and Exchange Restrictions*, 2006 and 2007; official government publications of each country; Economist Intelligence Unit, *Country Commerce, Country Profile, and Country Report*, 2005–2007; Office of the U.S. Trade Representative, *2007 National Trade Estimate Report on Foreign Trade Barriers*; and U.S. Department of Commerce, *Country Commercial Guide*, 2005–2007.

Freedom #7: Financial Freedom

In most countries, banks provide the essential financial services that facilitate economic growth. They lend money to start businesses, purchase homes, and secure credit for the pur-

chase of durable consumer goods, and they furnish a safe place in which individuals can store their savings. Greater direct control of banks by government is a threat to these functions because government interference can introduce inefficiencies and outright corruption. Heavy bank regulation reduces opportunities and restricts economic freedom; therefore, the more a government restricts its banking sector, the lower its economic freedom score will be.

It should be noted that virtually all countries provide some type of prudential supervision of banks and other financial services. This supervision serves two major purposes: ensuring the safety and soundness of the financial system and ensuring that financial services firms meet basic fiduciary responsibilities. Ultimately, this task falls under a government's duty to enforce contracts and protect its citizens against fraud by requiring financial institutions to publish their financial statements and relevant data, verified by independent audit, so that borrowers, depositors, and other financial actors can make informed choices.

In a free banking environment, the marketplace should be the primary source of protection through such institutions as independent auditors and information services. Such oversight is distinguished from burdensome or intrusive government regulation or government ownership of banks, both of which interfere with market provision of financial services to consumers. It is such government intervention in the market, not the market itself, that limits economic freedom and causes a country's grade for this factor to be worse than it might otherwise be.

Increasingly, the central role played by banks is being complemented by other financial services that offer alternative means for raising capital or diversifying risk. As a result, the authors take related non-banking financial services, such as insurance and securities, into consideration when grading this factor. As with the banking system, aside from basic provisions to enforce contractual obligations and prevent fraud, increased government intervention in these areas undermines economic freedom and inhibits the ability of non-bank-

ing financial services to contribute to economic growth. If the government intervenes in the stock market, it contravenes the choices of millions of individuals by interfering with the pricing of capital—the most critical function of a market economy. Equity markets measure, on a continual basis, the expected profits and losses in publicly held companies. This measurement is essential in allocating capital resources to their highest-valued uses and thereby satisfying consumers’ most urgent requirements. Similarly, government ownership or intervention in the insurance sector undermines the ability of providers to make available those services at prices based on risk and market conditions.

Methodology. The financial freedom factor measures the relative openness of each country’s banking and financial system. The authors score this factor by determining the extent of government regulation of financial services; the extent of state intervention in banks and other financial services; the difficulty of opening and operating financial services firms (for both domestic and foreign individuals); and government influence on the allocation of credit. The authors use this analysis to develop a description of the country’s financial climate and assign it an overall score between 0 percent and 100 percent.

The following criteria are used in determining a country’s score for this factor:

- **100%—Negligible government influence.** Independent central bank supervision and regulation of financial institutions are limited to enforcing contractual obligations and preventing fraud. Credit is allocated on market terms. The government does not own financial institutions. Financial institutions may engage in all types of financial services. Banks are free to issue competitive notes, extend credit and accept deposits, and conduct operations in foreign currencies. Foreign financial institutions operate freely and are treated the same as domestic institutions.
- **90%—Minimal government influence.** Same as above with the following exceptions: Independent central bank supervision and regulation of financial institutions are minimal but may extend beyond enforcing contractual obligations and preventing fraud.
- **80%—Nominal government influence.** Same as above with the following exceptions: Independent central bank supervision and regulation are straightforward and transparent but extend beyond enforcing contractual obligations and preventing fraud. Government ownership of financial institutions is a small share of overall sector assets. Financial institutions face almost no restrictions on their ability to offer financial services.
- **70%—Limited government influence.** Same as above with the following exceptions: Credit allocation is slightly influenced by the government, and private allocation of credit faces almost no restrictions. Foreign financial institutions are subject to few restrictions.
- **60%—Significant government influence.** Same as above with the following exceptions: The central bank is not fully independent, its supervision and regulation of financial institutions are somewhat burdensome, and its ability to enforce contracts and prevent fraud is insufficient. The government exercises active ownership and control of financial institutions with a significant share of overall sector assets. The ability of financial institutions to offer financial services is subject to some restrictions.
- **50%—Considerable government influence.** Same as above with the following exceptions: Credit allocation is significantly influenced by the government, and private allocation of credit faces significant barriers. The ability of financial institutions to offer financial services is subject to significant restrictions. Foreign financial institutions are subject to some restrictions.
- **40%—Strong government influence.** Same as above with the following exceptions: The central bank is subject to government influence, its supervision and regulation of financial institutions are heavy, and its ability to enforce contracts and prevent fraud is weak. The government exercises active ownership and control of financial institutions with a large minority share of overall sector assets.
- **30%—Extensive government influence.** Same as above with the following exceptions:

Credit allocation is extensively influenced by the government. The government owns or controls a majority of financial institutions or is in a dominant position. Financial institutions are heavily restricted, and bank formation faces significant barriers. Foreign financial institutions are subject to significant restrictions.

- **20%—Heavy government influence.** Same as above with the following exceptions: The central bank is not independent, and its supervision and regulation of financial institutions are repressive. Foreign financial institutions are discouraged or highly constrained.
- **10%—Near repressive.** Same as above with the following exceptions: Credit allocation is controlled by the government. Bank formation is restricted. Foreign financial institutions are prohibited.
- **0%—Repressive.** Same as above with the following exceptions: Supervision and regulation are designed to prevent private financial institutions. Private financial institutions are prohibited.

Sources. Unless otherwise noted, the authors used the following sources for data on banking and finance, in order of priority: Economist Intelligence Unit, *Country Commerce, Country Profile*, and *Country Report, 2005–2007*; official government publications of each country; U.S. Department of Commerce, *Country Commercial Guide, 2005–2007*; Office of the U.S. Trade Representative, *2007 National Trade Estimate Report on Foreign Trade Barriers*; and World Bank, *World Development Indicators 2007*.

Freedom #8: Property Rights

The ability to accumulate private property is the main motivating force in a market economy, and the rule of law is vital to a fully functioning free-market economy. Secure property rights give citizens the confidence to undertake commercial activities, save their income, and make long-term plans because they know that their income and savings are safe from expropriation. This factor examines the extent to which the government protects private property by enforcing the laws, as well as the extent

to which private property is safe from expropriation. The less protection private property receives, the lower a country's level of economic freedom and the lower its score.

Methodology. This factor scores the degree to which a country's laws protect private property rights and the degree to which its government enforces those laws. It also assesses the likelihood that private property will be expropriated and analyzes the independence of the judiciary, the existence of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. The less certain the legal protection of property, the lower a country's score; similarly, the greater the chances of government expropriation of property, the lower a country's score.

The authors grade each country according to the following criteria:

- **100%—Private property is guaranteed by the government.** The court system enforces contracts efficiently and quickly. The justice system punishes those who unlawfully confiscate private property. There is no corruption or expropriation.
- **90%—Private property is guaranteed by the government.** The court system enforces contracts efficiently. The justice system punishes those who unlawfully confiscate private property. Corruption is nearly nonexistent, and expropriation is highly unlikely.
- **80%—Private property is guaranteed by the government.** The court system enforces contracts efficiently but with some delays. Corruption is minimal, and expropriation is highly unlikely.
- **70%—Private property is guaranteed by the government.** The court system is subject to delays and is lax in enforcing contracts. Corruption is possible but rare, and expropriation is unlikely.
- **60%—Enforcement of property rights is lax and subject to delays.** Corruption is possible but rare, and the judiciary may be influenced by other branches of government. Expropriation is unlikely.
- **50%—The court system is inefficient and subject to delays.** Corruption may be present,

and the judiciary may be influenced by other branches of government. Expropriation is possible but rare.

- **40%**—The court system is highly inefficient, and delays are so long that they deter the use of the court system. Corruption is present, and the judiciary is influenced by other branches of government. Expropriation is possible.
- **30%**—Property ownership is weakly protected. The court system is highly inefficient. Corruption is extensive, and the judiciary is strongly influenced by other branches of government. Expropriation is possible.
- **20%**—Private property is weakly protected. The court system is so inefficient and corrupt that outside settlement and arbitration is the norm. Property rights are difficult to enforce. Judicial corruption is extensive. Expropriation is common.
- **10%**—Private property is rarely protected, and almost all property belongs to the state. The country is in such chaos (for example, because of ongoing war) that protection of property is almost impossible to enforce. The judiciary so corrupt that property is not protected effectively. Expropriation is common.
- **0%**—Private property is outlawed, and all property belongs to the state. People do not have the right to sue others and do not have access to the courts. Corruption is endemic.

Sources. Unless otherwise noted, the authors used the following sources for information on property rights, in order of priority: Economist Intelligence Unit, *Country Commerce*, 2005–2007; U.S. Department of Commerce, *Country Commercial Guide*, 2005–2007; U.S. Department of State, *Country Reports on Human Rights Practices*, 2005–2007; and U.S. Department of State, *Investment Climate Statements 2007*.

Freedom #9: Freedom from Corruption

Corruption is defined as dishonesty or decay. In the context of governance, it can be defined as the failure of integrity in the system, a distortion by which individuals are able to gain personally at the expense of the whole. Political corruption is a sad part of human history and manifests itself in many forms such as

bribery, extortion, nepotism, cronyism, patronage, embezzlement, and (most commonly) graft, whereby public officials steal or profit illegitimately from public funds.

Corruption infects all parts of an economy unless the market is allowed to develop transparency and effective policing. As a general rule, a higher level of corruption equates to a greater corrosion of economic freedom, although this may not hold in extreme cases. “In some circumstances,” notes Harvard economist Robert Barro, “corruption may be preferable to honest enforcement of bad rules. For example, outcomes may be worse if a regulation that prohibits some useful economic activity is thoroughly enforced rather than circumvented through bribes.”⁷

Many societies, of course, outlaw such activities as trafficking in illicit drugs, but others frequently limit individual liberty by outlawing such activities as private transportation and construction services. A government regulation or restriction in one area may create an informal market in another. For example, a country with high barriers to trade may have laws that protect its domestic market and prevent the import of foreign goods, but these barriers create incentives for smuggling and an informal market for the barred products.

Methodology. This factor relies on Transparency International’s Corruption Perceptions Index (CPI), which measures the level of corruption in 152 countries, to determine the freedom from corruption scores of countries that are also listed in the *Index of Economic Freedom*.

The CPI is based on a 10-point scale in which a score of 10 indicates very little corruption and a score of 1 indicates a very corrupt government. In scoring freedom from corruption, the authors convert each of these raw CPI data to a 0 to 100 scale by multiplying the CPI score by 10. For example, if a country’s raw CPI data score is 5.5, its overall freedom from corruption score is 55.

⁷ Robert J. Barro, “Rule of Law, Democracy, and Economic Performance,” Chapter 2 in Gerald P. O’Driscoll, Jr., Kim R. Holmes, and Melanie Kirkpatrick, *2000 Index of Economic Freedom* (Washington, D.C.: The Heritage Foundation and Dow Jones & Company, Inc., 2000), p. 36.

For countries that are not covered in the CPI, the freedom from corruption score is determined by using the qualitative information from internationally recognized and reliable sources. This procedure considers the extent to which corruption prevails in a country. The higher the level of corruption, the lower the level of overall economic freedom and the higher a country's score.

Sources. Unless otherwise noted, the authors used the following sources for information on corruption, in order of priority: Transparency International, *Corruption Perceptions Index*, 2002, 2004, 2005, and 2006; U.S. Department of Commerce, *Country Commercial Guide*, 2004–2007; Economist Intelligence Unit, *Country Commerce, Country Profile*, and *Country Report*, 2004–2007; Office of the U.S. Trade Representative, *2007 National Trade Estimate Report on Foreign Trade Barriers*; and official government publications of each country.

Freedom #10: Labor Freedom

Labor policy has been a key variable in the *Index of Economic Freedom* since its inception in 1995 as part of the wages and prices factor as well as the regulation factor. However, coverage of labor market flexibility in the previous methodology was limited by the lack of data on labor regulation that were available across countries in a consistent manner.

In light of the growing importance of labor market flexibility in today's economy and the increased availability of consistent labor policy data across countries, the 2007 *Index* adopted an independent labor freedom factor that is designed to measure countries' labor market regulations more adequately.

Methodology. The labor freedom factor is a quantitative factor based on objective data from the World Bank's *Doing Business* study. It provides reliable cross-country data on regulations concerning minimum wages, laws inhibiting layoffs, severance requirements, and measurable regulatory burdens on hiring, hours, and so on.

Specifically, four quantitative components are equally weighted as 25 percent of the labor freedom factor:

- Minimum wage,
- Rigidity of hours,
- Difficulty of firing redundant employees, and
- Cost of firing redundant employees.

The minimum wage component is basically a single quantitative measure: each country's mandatory minimum wage as a percentage of the average value added per worker. A higher minimum wage makes hiring unskilled workers more difficult.

Rigidity of hours is an index measure, calculated by *Doing Business*, that includes five components:

- (i) whether night work is unrestricted; (ii) whether weekend work is unrestricted; (iii) whether the workweek can consist of 5.5 days; (iv) whether the workweek can extend to 50 hours or more (including overtime) for 2 months a year; and (v) whether paid annual vacation is 21 working days or fewer.⁸

Difficulty of firing is also an index measure calculated by *Doing Business*. It represents a simple issue: whether employers have the legal authority to lay off workers efficiently, or whether that act has to be justified to the government or third parties. It has eight components:

- (i) whether redundancy is disallowed as a basis for terminating workers; (ii) whether the employer needs to notify a third party (such as a government agency) to terminate 1 redundant worker; (iii) whether the employer needs to notify a third party to terminate a group of more than 20 redundant workers; (iv) whether the employer needs approval from a third party to terminate 1 redundant worker; (v) whether the employer needs approval from a third party to terminate a group of more than 20

⁸ World Bank, *Doing Business 2007: How to Reform*, p. 81.

redundant workers; (vi) whether the law requires the employer to consider reassignment or retraining options before redundancy termination; (vii) whether priority rules apply for redundancies; and (viii) whether priority rules apply for reemployment.⁹

The cost of firing is a composite of three quantitative subcomponents related to dismissals: the legally mandated notice period, mandatory severance pay, and a penalty the employer must pay when dismissing a worker.

In constructing the labor freedom score, each of the four components is converted to a 0 to 100 scale, based on the following equation:

$$\text{Component Score}_i = 50 \frac{\text{component}_{\text{average}}}{\text{component}_i}$$

where country *i* data are calculated relative to the world average and then multiplied by 50. The average country will receive a component score of 50 percent, whereas a country's maximum component score is limited to 100 percent. The four component scores are then averaged for each country, yielding a labor freedom score.

As an example, the imaginary country Indexia has an average minimum wage as a ratio of the average wage of 0.62, which is almost double the average of 0.32 globally, yielding a component score of roughly 25 percent. Yet Indexia's overall score is 44 percent, because the other three components scored much better.

The simple average of the converted values for these four variables is computed for the country's labor freedom score. For example, even if a country has the worst rigidity of hours in the world, with a zero score for the component, it could still get a score as high as 75 based on the other three components.

For the 11 countries that are not covered by the World Bank's *Doing Business* study, the labor freedom factor is scored by looking into labor market flexibility based on qualitative

information from other reliable and internationally recognized sources.¹⁰

Sources. Unless otherwise noted, the authors relied on the following sources for data on labor freedom, in order of priority: World Bank, *Doing Business 2008*; Economist Intelligence Unit, *Country Report and Country Profile*, 2004–2007; and U.S. Department of Commerce, *Country Commercial Guide*, 2004–2007.

CONTINUITY AND CHANGE

With over a decade's experience measuring freedom in over 100 nations annually, two issues regularly challenge our methodology.

The first challenge has to do with outdated data. Country data in the most up-to-date sources are often behind by years. Also, countries often make policy changes during the year of grading. Sometimes the policy changes are not reflected in official data, and sometimes the changes are proposed but not made law, or are made law but not enforced. Additionally, a country can experience a violent conflict or catastrophe that interrupts all efforts to measure the economy.

The second challenge is the balance between quality and consistency of the *Index* itself. The authors aim for methodological consistency from one year to the next, balanced against opportunities to incorporate new data and methods that improve the quality of the current year's scores.

Most Current Information. Analyzing economic freedom annually permits the authors of the *Index* to include the most recent information as it becomes available country by country. A cutoff date is utilized so that all countries are treated fairly. As described above, the period of study for the current year's *Index* considers all information as of the last day of June of the previous year (June 30, 2007). Any changes in law effective after that date have no positive or negative impact; nor do new constitutions, election results, or democratic initiatives.

Occasionally, because the *Index* is published several months after the cutoff date for evaluation, recent economic events cannot be factored

9 *Ibid.*

10 See note 5.

into the scores. In the past, such occurrences have been uncommon and isolated to one region of the world. The Asian financial crisis, for example, erupted at the end of 1997 just as the 1998 *Index of Economic Freedom* was going to print. The policy changes in response to that crisis therefore were not considered in that year's scoring, but they were included in the next year's scores.

Changes in government policy are occurring at a rapid rate in many less-developed countries. The *Index of Economic Freedom*, because it is published each year, enables readers around the world to see how recent changes in government policy affect economic freedom in specific countries. Each country page includes a time-series graph of the country's overall score for each year from the present back to 1995.

Continuity. Ideally, the methodology used for the *Index of Economic Freedom* should not change over time. Instead, the scores for various countries would improve as the institutions of freedom improved as measured against a constant standard of measurable liberty. However, the increased quality of data available allows researchers to create more detailed measures of institutions as well as economic performance. The happy consequence of progress is an enhanced ability to measure progress.

Over time, therefore, the *Index of Economic Freedom* has been continually revised and improved; but we also aim for continuity, so each time a methodology change is implemented, we also attempt to make the scores continuous back to 1995. In this way, country performance from one year to the next is comparable.

Nevertheless, there are still some cases for which new data are not available going back

to the first year, at least not in the same level of detail. There is a natural tension between the quality of the *Index* and the continuity of the *Index*. It would be easy to maintain perfect continuity if no changes were ever made, or vice versa, but we are committed to incorporating innovations into the methodology to optimize both the quality and continuity of the *Index* rather than simply maximizing one at the expense of the other.

It is important to remember that the *Index* has been an effort to quantify subjective factors, not the measure of a singular, natural data-generating process (such as temperature). It is a policy tool with uses for current-year analysis and time-series analysis.

This year, changes in the *Index* methodology include:

- **Rescaling** the business freedom scores from 1995–2005 in order to make them comparable as a time series with the new methodology in place for 2006–2008;
- **Revising** last year's business freedom and labor freedom scores to reflect revisions to the World Bank *Doing Business* data;
- **Enhancing** the detail and process used to measure non-tariff barriers (NTBs) and extending that approach back to 1995;
- **Updating** the coefficients used in the equations for two factors—government size and fiscal freedom—to align them with each other and with the other eight freedoms; and
- **Adding** new data from Transparency International for earlier years back to 1997.

All of these changes are minor and aim simply to improve the internal and time consistency of the *Index*.