

CHAPTER 5

Security-Market Indexes

After you read this chapter, you should be able to answer the following questions:

- What are some major uses of security-market indexes?
- What major characteristics cause alternative indexes to differ?
- What are the major stock-market indexes in the United States and globally, and what are their characteristics?
- Why are bond indexes more difficult to create and maintain than stock indexes?
- What are the major bond-market indexes for the United States and the world?
- What are some of the composite stock-bond market indexes?
- Where can you get historical and current data for all these indexes?
- What is the relationship among many of these indexes during short run periods (monthly)?

A fair statement regarding **security-market indexes**—especially those outside the United States—is that everybody talks about them but few people understand them. Even those investors familiar with widely publicized stock-market series, such as the Dow Jones Industrial Average (DJIA), usually know little about indexes for the U.S. bond market or for non-U.S. stock markets such as Tokyo or London.

Although portfolios are obviously composed of many different individual stocks, investors typically ask, “What happened to the market today?” The reason for this question is that if an investor owns more than a few stocks or bonds, it is cumbersome to follow each stock or bond individually to determine the composite performance of the portfolio. Also, there is an intuitive notion that most individual stocks or bonds move with the aggregate market. Therefore, if the overall market rose, an individual’s portfolio probably also increased in value. To supply investors with a composite report on market performance, some financial publications or investment firms have created and maintain stock-market and bond-market indexes.

In the initial section of this chapter, we discuss several ways that investors use security-market indexes. An awareness of these significant functions should provide an incentive for becoming familiar with these indexes and indicates why we present a full chapter on this topic. In the second section, we consider what characteristics cause various indexes to differ. Investors need to understand these differences and why one index is preferable for a given task because of its characteristics. In the third section, we present the most well-known U.S. and global stock-market indexes, separated into groups based on the weighting scheme used. In section four, we consider bond-market indexes that are becoming a more important topic because the bond

market continues to grow in size and importance for individuals and institutions.¹ Again, we consider international bond indexes following the domestic indexes. In the fifth section, we consider composite stock market-bond market series. In our final section, we examine how alternative indexes relate to each other over monthly intervals. This comparison demonstrates the important factors that cause high or low correlation among series. With this background, you should be able to make an intelligent choice of the market index that is best for you based on how you want to use it.

5.1 USES OF SECURITY-MARKET INDEXES

Security-market indexes have at least five significant uses. A primary application is to use the index values to compute total returns and risk measures for an aggregate market or some component of a market over a specified time period. In turn, many investors use the computed return-risk results as a *benchmark* to judge the performance of individual portfolios. A basic assumption when evaluating portfolio performance is that any investor should be able to experience a risk-adjusted rate of return comparable to the market by randomly selecting a large number of stocks or bonds from the total market; hence, a superior portfolio manager should consistently do better than the market. Therefore, *an aggregate stock or bond-market index can be used as a benchmark to judge the performance of professional money managers.*

An obvious use of indexes is to develop an index portfolio. As we have discussed, it is difficult for most money managers to consistently outperform specified market indexes on a risk-adjusted basis over time.² If this is true, an obvious alternative is to invest in a portfolio that will emulate this market portfolio. This notion led to the creation of *index funds* and *exchange-traded funds* (ETFs), whose purpose is to track the performance of the specified market series (index) over time. The original index funds were common-stock funds as discussed in Malkiel (2007), Chapter 14, and Mossavar-Rahmani (2005). The development of comprehensive, well-specified bond-market indexes and the inability of most bond-portfolio managers to outperform these indexes have led to a similar phenomenon in the fixed-income area (bond-index funds), as noted by Hawthorne (1986) and Dyalynas (2001).

Securities analysts, portfolio managers, and academicians doing research use security-market indexes to examine the factors that influence aggregate security price movements (that is, the indexes are used to measure aggregate market movements) and to compare the risk-adjusted performance of alternative asset classes (e.g., stocks versus bonds versus real estate). An extension of this is to examine the relative performance *within* asset classes such as large-cap stocks versus small-cap stocks.

Another group interested in an aggregate market index is composed of “technicians,” who believe past price changes can be used to predict future price movements. For example, to project future stock price movements, technicians would plot and analyze price and volume changes for a stock-market series like the Dow Jones Industrial Average or the S&P 500 index.

Finally, work in portfolio and capital market theory has implied that the relevant risk for an individual risky asset is its *systematic risk*, which is the relationship between the rates of return for a risky asset and the rates of return for a market portfolio of risky assets.³ Therefore, an aggregate market index is used as a proxy for the market portfolio of risky assets.

¹This significant growth is well documented in Chapter 17.

²Throughout this chapter and the book, we will use *indicator series* and *indexes* interchangeably, although *indicator series* is the more correct specification because it refers to a broad class of series; one popular type of series is an index, but there can be other types and many different indexes.

³This concept and its justification are discussed in Chapter 7 and Chapter 8. Subsequently, in Chapter 25, we consider the difficulty of finding an index that is an appropriate proxy for the theoretical market portfolio of risky assets.

5.2 DIFFERENTIATING FACTORS IN CONSTRUCTING MARKET INDEXES

Because the indexes are intended to reflect the overall movements of a group of securities, we need to consider three factors that are important when constructing an index intended to represent a total population.

5.2.1 The Sample

The first factor is the sample used to construct an index. The size, the breadth, and the source of the sample are all important.

A small percentage of the total population will provide valid indications of the behavior of the total population *if* the sample is properly selected. In some cases, because of the economics of computers, virtually all the stocks on an exchange or market are included, with a few deletions of unusual securities. Assuming you are not including the total population, the sample should be *representative* of the total population; otherwise, its size will be meaningless. A large biased sample is no better than a small biased sample. The sample can be generated by completely random selection or by a nonrandom selection technique designed to incorporate the important characteristics of the desired population. Finally, the *source* of the sample is important if there are any differences between segments of the population, in which case samples from each segment are required.

5.2.2 Weighting Sample Members

The second factor is the weight given to each member in the sample. Four principal weighting schemes are used for security-market indexes: (1) a price-weighted index, (2) a market-value-weighted index, (3) an unweighted index, or what would be described as an equal-weighted index, and (4) a fundamental weighted index based on some operating variable like sales, earnings, or return on equity. We will discuss each of these in detail and consider examples of them.

5.2.3 Computational Procedure

The final consideration is the computational procedure used. One alternative is to take a simple arithmetic mean of the various members in the index. Another is to compute an index and have all changes, whether in price or value, reported in terms of the basic index. Finally, some prefer using a geometric mean of the components rather than an arithmetic mean.

5.3 STOCK-MARKET INDEXES

As mentioned previously, we hear a lot about what happens to the Dow Jones Industrial Average (DJIA) each day. You might also hear about other stock indexes, such as the S&P 500 index, the NASDAQ composite, or even the Nikkei Average of Japanese stocks. If you listen carefully, you will realize that these indexes experience different percentage changes (which is the way that the changes should be reported). Reasons for some differences are obvious, such as the DJIA versus the Nikkei Average, but others are not. In this section, we briefly review how the major series differ in terms of the characteristics discussed in the prior section, which will help you understand why the percent changes over time for alternative stock indexes *should* differ.

We have organized the discussion of the indexes by the weighting of the sample of stocks. We begin with the price-weighted index because some of the most popular indexes are in this category. The next group is the value-weighted index, which is the technique currently used for most indexes. This is followed by the unweighted indexes, and finally the fundamental indexes.

5.3.1 Price-Weighted Index

A **price-weighted index** is an arithmetic mean of current stock prices, which means that index movements are influenced by the differential prices of the components.

Dow Jones Industrial Average The best-known price-weighted index is also the oldest and certainly the most popular stock-market index, the Dow Jones Industrial Average (DJIA). The DJIA is a price-weighted average of 30 large, well-known industrial stocks that are generally the leaders in their industry (blue chips). The DJIA is computed by totaling the current prices of the 30 stocks and dividing the sum by a divisor that has been adjusted to take account of stock splits and changes in the sample over time.⁴ The divisor is adjusted so the index value will be the same before and after the split. An adjustment of the divisor is demonstrated in Exhibit 5.1. The equation for the index is

$$DJIA_t = \sum_{i=1}^{30} \frac{P_{it}}{D_{adj}}$$

where:

- DJIA_t = the value of the DJIA on day *t*
- P_{it} = the closing price of stock *i* on day *t*
- D_{adj} = the adjusted divisor on day *t*

In Exhibit 5.1, we employ three stocks to demonstrate the procedure used to derive a new divisor for the DJIA when a stock splits. When stocks split, the divisor becomes smaller, as shown. The cumulative effect of splits can be derived from the fact that the divisor was originally 30.0, but as of April 8, 2011 it was 0.132129493.

The adjusted divisor ensures that the new value for the index is the same as it would have been without the split. In this case, the presplit index value was 20. Therefore, after the split, given the new sum of prices, the divisor is adjusted downward to maintain this value of 20. The divisor is also changed when there is a change in the sample makeup of the index.

Because the index is price weighted, a high-priced stock carries more weight than a low-priced stock. As shown in Exhibit 5.2, a 10 percent change in a \$100 stock (\$10) will cause a larger change in the index than a 10 percent change in a \$30 stock (\$3). For Case A, when the \$100 stock increases by 10 percent, the average rises by 5.5 percent; for Case B, when the \$30 stock increases by 10 percent, the average rises by only 1.7 percent.

The DJIA has been criticized on several counts. First, the sample used for the index is limited to 30 nonrandomly selected large, mature blue-chip stocks that cannot be

Exhibit 5.1 Example of Change in DJIA Divisor When a Sample Stock Splits			
Stock	Before Split	After Three-for-One Split by Stock A	
	Prices	Prices	
A	30	10	
B	20	20	
C	10	10	
	60 ÷ 3 = 20	40 ÷ X = 20	X = 2 (New Divisor)

⁴A complete list of all events that have caused a change in the divisor since the DJIA went to 30 stocks on October 1, 1928, is contained in Phyllis S. Pierce, ed., *The Business One Irwin Investor's Handbook* (Burr Ridge, IL: Dow Jones Books, annual).

Exhibit 5.2 Demonstration of the Impact of Differently Priced Shares on a Price-Weighted Index

Stock	Period <i>T</i>	PERIOD <i>T</i> + 1	
		Case A	Case B
A	100	110	100
B	50	50	50
C	30	30	33
Sum	180	190	183
Divisor	3	3	3
Average	60	63.3	61
Percentage change		5.5	1.7

representative of the thousands of U.S. stocks. As a result, the DJIA has not been as volatile as other market indexes, and its long-run returns are not comparable to other NYSE stock indexes.

In addition, because the DJIA is price weighted, when companies have a stock split, their prices decline and therefore their weight in the DJIA is reduced—even though they may be large and growing. Therefore, the weighting scheme causes a downward bias in the DJIA because high-growth stocks will have higher prices and because such stocks tend to split, these stocks of growing companies will consistently lose weight within the index. For a discussion of specific differences between indexes, see Ip (1998b). Detailed reports of the averages are contained daily in *The Wall Street Journal* and weekly in *Barron's*.

Nikkei-Dow Jones Average Also referred to as the Nikkei Stock Average Index, it is an arithmetic mean of prices for 225 stocks on the First Section of the Tokyo Stock Exchange (TSE) and shows stock price trends since the reopening of the TSE. Similar to the DJIA, it is a price-weighted index and is likewise criticized because the 225 stocks only comprise about 15 percent of all stocks on the First Section. It is reported daily in *The Wall Street Journal* and the *Financial Times* and weekly in *Barron's*.

5.3.2 Value-Weighted Index

A **value-weighted index** is generated by deriving the initial total market value of all stocks used in the index (Market Value = Number of Shares Outstanding (or freely floating shares) × Current Market Price). Prior to 2004, the tradition was to consider all outstanding shares. In mid-2004, Standard & Poor's began only considering “freely floating shares” that exclude shares held by insiders. This initial figure is typically established as the base and assigned an index value (typically the beginning index value is 100, but it can vary—say, 10, 50). Subsequently, a new market value is computed for all securities in the index, and the current market value is compared to the initial “base” market value to determine the percentage change, which in turn is applied to the beginning index value.

$$\text{Index}_t = \frac{\sum P_t Q_t}{\sum P_b Q_b} \times \text{Beginning Index Value}$$

where:

Index_t = index value on day t

P_t = ending prices for stocks on day t

Q_t = number of outstanding or freely floating shares on day t

P_b = ending price for stocks on base day

Q_b = number of outstanding or freely floating shares on base day

Exhibit 5.3 Example of a Computation of a Value-Weighted Index

Stock	Share Price	Number of Shares	Market Value
December 31, 2011			
A	\$10.00	1,000,000	\$ 10,000,000
B	15.00	6,000,000	90,000,000
C	20.00	5,000,000	100,000,000
Total			<u>\$200,000,000</u>
Base Value Equal to an Index of 100			
December 31, 2012			
A	\$12.00	1,000,000	\$ 12,000,000
B	10.00	12,000,000 ^a	120,000,000
C	20.00	5,500,000 ^b	110,000,000
Total			<u>\$242,000,000</u>
$\begin{aligned} \text{New Index Value} &= \frac{\text{Current Market Value}}{\text{Base Value}} \times \text{Beginning Index Value} \\ &= \frac{\$242,000,000}{\$200,000,000} \times 100 \\ &= 1.21 \times 100 \\ &= 121 \end{aligned}$			

^aStock split two-for-one during the year.

^bCompany paid a 10 percent stock dividend during the year.

A simple example for a three-stock index in Exhibit 5.3 indicates that there is an *automatic adjustment* for stock splits and other capital changes with a value-weighted index because the decrease in the stock price is offset by an increase in the number of shares outstanding. In a value-weighted index, the importance of individual stocks in the sample depends on the market value of the stocks. Therefore, a specified percentage change in the value of a large company has a greater impact than a comparable percentage change for a small company. As shown in Exhibit 5.4, if we assume that the only change is a 20 percent increase in the value of stock A, which has a beginning value of \$10 million, the ending index value would be \$202 million, or an index value of 101. In contrast, if only stock C increases by 20 percent from \$100 million, the ending value will be \$220 million or an index value of 110. The point is, price changes for large market value stocks in a value-weighted index will dominate changes in the index value over time. Therefore, it is important to be aware of the large-value stocks in the index.

Exhibit 5.4 Demonstration of the Impact of Different Values on a Market-Value-Weighted Stock Index

Stock	DECEMBER 31, 2011			DECEMBER 31, 2012			
	Number of Shares	Price	Value	Case A		Case B	
				Price	Value	Price	Value
A	1,000,000	\$10.00	\$ 10,000,000	\$12.00	\$ 12,000,000	\$10.00	\$ 10,000,000
B	6,000,000	15.00	90,000,000	15.00	90,000,000	15.00	90,000,000
C	5,000,000	20.00	100,000,000	20.00	100,000,000	24.00	120,000,000
			<u>\$200,000,000</u>		<u>\$202,000,000</u>		<u>\$220,000,000</u>
Index Value			100.00		101.00		110.00

Exhibit 5.5 Computation of Index Value Assuming Equal Weights for Sample Stocks

Stock	DECEMBER 31, 2011			DECEMBER 31, 2012		
	Number of Shares	Price	Value	Price	Value	Percent Change
X	2,000,000	\$20	\$40,000,000	\$30	\$60,000,000	50.0
Y	8,000,000	15	120,000,000	20	160,000,000	33.3
Z	10,000,000	30	300,000,000	33	330,000,000	10.0
			<u>\$460,000,000</u>		<u>\$550,000,000</u>	<u>93.3/3 = 31.1</u>
Equal Wtd. Index: $100 \times 1.311 = 131.100$						
Market Value Wtd Index: $100 \times \frac{550,000,000}{460,000,000} = 119.565$						

5.3.3 Unweighted Index

In an **unweighted index**, all stocks carry equal weight regardless of their price or market value. A \$20 stock is as important as a \$40 stock, and the total market value of the company is unimportant. Such an index can be used by individuals who randomly select stock for their portfolio or invest the same dollar amount in each stock. One way to visualize an unweighted index is to assume that equal dollar amounts are invested in each stock in the portfolio (for example, an equal \$1,000 investment in each stock would work out to 50 shares of a \$20 stock, 100 shares of a \$10 stock, and 10 shares of a \$100 stock). In fact, the actual movements in the index are typically based on *the arithmetic mean of the percent changes in price or value for the stocks in the index*. The use of percentage price changes means that the price level or the market value of the stock does not make a difference—each percentage change has equal weight.

Exhibit 5.5 demonstrates the computation of an equal weighted index using the average of the percent changes for each of the three stocks. There is also a comparison to the index value if market value weights are used. As shown, the equal weighting result gives a higher value because of the large percent increase in value for the stock with the smallest market value (the small-cap stock). In contrast, the market value weighted index did not do as well because the large-cap stock (that has a large weight) experienced the poorest performance.

In contrast to computing an arithmetic mean of percentage changes, both *Value Line* and the *Financial Times* Ordinary Share Index compute a *geometric* mean of the holding period returns and derive the holding period yield from this calculation. Exhibit 5.6, which

Exhibit 5.6 Example of an Arithmetic and Geometric Mean of Percentage Changes

SHARE PRICE				
Stock	<i>T</i>	<i>T</i> + 1	<i>HPR</i>	<i>HPY</i>
X	10	12	1.20	0.20
Y	22	20	0.91	−0.09
Z	44	47	1.07	0.07
Π = 1.20 × 0.91 × 1.07		Σ(0.20) + (−0.09) + (0.07) = 0.18		
= 1.168		0.18/3 = 0.06		
1.168 ^{1/3} = 1.0531		= 6%		
Index Value (<i>T</i>) × 1.0531 = Index Value (<i>T</i> + 1)				
Index Value (<i>T</i>) × 1.06 = Index Value (<i>T</i> + 1)				

contains an example of an arithmetic and a geometric mean, demonstrates the downward bias of the geometric calculation. Specifically, the geometric mean of holding period yields (HPY) shows an average change of only 5.3 percent versus the actual change in wealth of 6 percent.

5.3.4 Fundamental Weighted Index

As noted, one of the rationales for using market-value weighting is that the market value of a firm is an obvious measure of its economic importance. In contrast, some observers contend that this weighting scheme results in overweighting overvalued stocks over time and underweighting undervalued stocks. A prime example is what transpired during the technology boom in the 1998–2000 period when technology stocks exploded in price and, in retrospect, were clearly overvalued—selling for 60–70–100 times earnings. As a result, the high valuations caused the weight of the technology sector in the indexes to almost double, the result was an overweight in overvalued stocks. You can envision an opposite example for undervalued stocks.

In response to this implicit problem with market-value weighting, some observers have suggested other measures of a *company's economic footprint*. The leading advocates of an approach that weights firms based on company fundamentals are individuals involved with Research Associates, Inc. (Arnott, Hsu, and West, 2008). Their approach to creating a Fundamental Index is an example of employing some widely used fundamental factors.⁵ Specifically, they proposed four broad fundamental measures of size: (1) sales, (2) profits (cash flow), (3) net assets (book value), and (4) distributions to shareholders (dividends). Given these variables for a large sample of firms, they created an index of 1,000 of the largest firms and computed the percent of each firm's sales, cash flow, book value, and dividends to the total for the sample and determined a company's relative size (weight) by averaging the weights of the four size metrics across the trailing five years (to avoid the impact of cyclicity). The authors contend that this index (entitled Research Associates Fundamental Index [RAFI]) is representative, but also ensures high liquidity, high capacity, and low turnover.

As noted earlier, this is an example of such an index—other firms and authors can and have created indexes with single variables or a different set of fundamental variables to determine the weights. For an informative discussion, see (Geer, 2011).

5.3.5 Style Indexes

Financial service firms such as Dow Jones, Moody's, Standard & Poor's, Russell, and Wilshire Associates are generally very fast in responding to changes in investment practices. One example is the growth in popularity of small-cap stocks following academic research in the 1980s that suggested that over long-term periods, small-cap stocks outperformed large-cap stocks on a risk-adjusted basis. In response to this, Ibbotson Associates created the first small-cap stock index, and this was followed by small-cap indexes by Frank Russell Associates (the Russell 2000 Index), the Standard & Poor's 600, the Wilshire 1750, and the Dow Jones Small-Cap Index. For a comparative analysis of these indexes, see Reilly and Wright (2002). This led to sets of size indexes, including large-cap, mid-cap, small-cap, and micro-cap. These new size indexes were used to evaluate the performance of money managers who concentrated in those size sectors.

The next innovation was for money managers to concentrate in *types* of stocks—that is, *growth* stocks or *value* stocks. We included a designation of these stocks in Chapter 2 in terms of what they are and how they are identified. As this money management innovation evolved, the financial services firms again responded by creating indexes of growth stocks and value

⁵For further discussion of the justification and details on the variables and construction, see Arnott, Hsu, and West, (2008).

Exhibit 5.7 U.S. Stock Market Indexes**Major U.S. Stock Market Indexes**

	LATEST WEEK					52-WEEK RANGE			% CHG	
	High	Low	Close	Net chg	% chg	High	Low	% chg	YTD	3-yr. ann.
Dow Jones										
Industrial Average	12303.16	12219.79	12288.17	61.53	0.50	12288.17	9686.48	19.2	6.1	-0.2
Transportation Avg	5306.54	5231.99	5285.52	54.48	1.04	5285.52	3906.23	31.9	3.5	4.0
Utility Average	411.33	406.82	409.19	-1.52	-0.37	415.59	353.02	10.5	1.0	-6.5
Total Stock Market	14135.13	14028.04	14122.65	94.61	0.67	14122.65	10654.14	23.9	6.3	1.1
Barron's 400	344.47	341.21	344.06	2.85	0.84	344.06	253.33	31.1	6.6	6.0
Nasdaq Stock Market										
Nasdaq Composite	2828.19	2811.52	2825.56	21.21	0.76	2825.56	2091.79	26.9	6.5	6.8
Nasdaq 100	2403.52	2387.66	2397.94	16.02	0.67	2397.94	1728.34	32.4	8.1	10.4
Standard & Poor's										
500 Index	1337.61	1329.51	1336.32	8.31	0.63	1336.32	1022.58	21.5	6.3	-0.3
MidCap 400	978.93	969.56	976.85	7.12	0.73	976.85	700.16	33.4	7.7	7.1
SmallCap 600	437.64	434.68	437.53	4.80	1.11	437.53	318.17	32.2	5.2	5.8
Other Indexes										
Russell 2000	828.59	823.31	828.27	8.34	1.02	828.37	590.03	32.6	5.7	5.7
NYSE Composite	8457.85	8383.76	8453.76	70.09	0.84	8453.76	6434.81	20.2	6.1	-2.0
Value Line	393.26	389.41	393.04	3.58	0.92	393.04	290.04	27.0	5.6	-1.1
NYSE Arca Biotech	1300.41	1293.00	1299.16	4.67	0.36	1333.16	995.18	26.8	0.1	21.3
NYSE Arca Pharma	306.77	304.89	306.62	1.08	0.35	318.27	266.44	0.6	0.2	-0.4
KBW Bank	55.70	55.27	55.54	0.09	0.16	57.95	42.98	20.8	6.4	-14.1
PHLX [§] Gold/Silver	211.40	208.26	211.40	1.61	0.77	228.76	155.42	29.7	-6.7	6.0
PHLX [§] Oil Service	283.30	276.02	281.54	6.17	2.24	281.54	159.12	40.5	14.9	1.3
PHLX [§] Semiconductor	467.85	463.05	466.56	5.18	1.12	466.56	307.49	36.6	13.3	10.3
CBOE Volatility	16.74	15.84	16.72	0.35	2.14	45.79	15.45	-23.0	-5.8	-12.6

[§]Philadelphia Stock Exchange

Sources: Thomson Reuters; WSJ Market Data Group

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stocks based on relative *P/E*, price-book value, price-cash flow ratios, and other metrics such as return on equity (*ROE*) and revenue growth rates.

Eventually, these two factors (size and type) were combined into six major *style* categories:

Small-cap growth	Small-cap value
Mid-cap growth	Mid-cap value
Large-cap growth	Large-cap value

Currently, most money managers identify their investment style as one of these, and consultants generally use these style categories to identify money managers.

The most recent style indexes are those created to track ethical funds referred to as *socially responsible investment* (SRI) funds. These SRI indexes are further broken down by country and include a global ethical stock index.

The best source for style stock indexes (both size and type of stock) is *Barron's*.

Exhibit 5.7 shows the stock market indexes from *The Wall Street Journal*, which contains values for many of the U.S. stock indexes we have discussed. Exhibit 5.8 shows a table for numerous international stock indexes contained in *The Wall Street Journal*.

5.3.6 Global Equity Indexes

As shown in Exhibits 5.8 and 5A.2 (the latter is in this chapter's appendix), there are stock-market indexes available for most individual foreign markets. While these local indexes are closely followed within each country, a problem arises in comparing the results implied

Exhibit 5.8 International Stock Market Indexes

International Stock Indexes					
Region/Country	Index	Close	LATEST		YTD
			Net chg	% chg	% chg
World	The Global Dow	2222.45	16.40	 0.74	6.5
	DJ Global Index	264.75	1.46	 0.55	4.3
	DJ Global ex U.S.	227.46	1.08	 0.48	2.7
	MSCI EAFE*	1740.02	7.66	 0.44	4.9
Americas	DJ Americas	360.44	2.65	 0.74	5.7
Brazil	Sao Paulo Bovespa	67570.76	1229.37	 1.85	-2.5
Canada	S&P/TSX Comp	14059.18	129.83	 0.93	4.6
Mexico	IPC All-Share	37074.93	123.68	 0.33	-3.8
Chile	Santiago IPSA	4536.75	-35.59	 -0.78	-7.9
Europe	Stoxx Europe 600	290.72	1.28	 0.44	5.4
Euro zone	Euro Stoxx	296.63	2.46	 0.84	8.1
Belgium	Bel-20	2755.61	24.83	 0.91	6.9
France	CAC 40	4151.26	40.92	 1.00	9.1
Germany	DAX	7414.30	14.26	 0.19	7.2
Israel	Tel Aviv	1334.55	19.32	 1.47	0.6
Italy	FTSE MIB	23167.58	343.76	 1.51	14.8
Netherlands	AEX	371.49	0.98	 0.26	4.8
Spain	IBEX 35	11047.80	221.60	 2.05	12.1
Sweden	SX All Share	358.68	0.90	 0.25	-2.7
Switzerland	Swiss Market	6711.65	20.75	 0.31	4.3
U.K.	FTSE 100	6085.27	48.19	 0.80	3.1
Asia-Pacific	DJ Asia-Pacific	142.61	0.32	 0.22	0.1
Australia	S&P/ASX 200	4930.20	-0.83	 -0.02	3.9
China	Shanghai Composite	2923.90	24.66	 0.85	4.1
Hong Kong	Hang Seng	23156.97	257.19	 1.12	0.5
India	Bombay Sensex	18300.90	27.10	 0.15	-10.8
Japan	Nikkei Stock Avg	10808.29	61.62	 0.57	5.7
Singapore	Straits Times	3094.72	14.06	 0.46	-3.0
South Korea	Kospi	1989.11	-21.41	 -1.06	-3.0
Taiwan	Weighted	8712.96	-8.97	 -0.10	-2.9

*Europe, Australia, Far East, U.S.-dollar terms

Source: Thomson Reuters; WSJ Market Data Group

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by these indexes for different countries because of a lack of consistency among them in sample selection, weighting, or computational procedure. To solve these comparability problems, several investment data firms have computed a set of consistent country stock indexes. As a result, these indexes can be directly compared and combined to create various regional indexes (for example, Pacific Basin). We will describe the three major sets of global equity indexes.

FT/S&P-Actuaries World Indexes The FT/S&P-Actuaries World Indexes are jointly compiled by the Financial Times Limited, Goldman Sachs & Company, and Standard & Poor's (the "compilers") in conjunction with the Institute of Actuaries and the Faculty of Actuaries. Approximately 2,500 equity securities in 30 countries are measured, covering at least 70 percent of the total value of all listed companies in each country. All securities included must allow direct holdings of shares by foreign nationals.

The indexes are market value weighted and have a base date of December 31, 1986 = 100. The index results are typically reported in U.S. dollars, but, on occasion, have been reported

in U.K. pound sterling, Japanese yen, euros, and the local currency of the country. In addition to the individual countries and the world index, there are several geographic subgroups, subgroups by market value, and by industry sectors. These indexes are available daily in the *Financial Times*.

Morgan Stanley Capital International (MSCI) Indexes The Morgan Stanley Capital International Indexes consist of three international, 22 national, and 38 international industry indexes. The indexes consider some 1,673 companies listed on stock exchanges in 22 countries, with a combined market capitalization that represents approximately 60 percent of the aggregate market value of the stock exchanges of these countries. All the indexes are market value weighted.

The following relative valuation information is available: (1) price-to-book value (P/BV) ratio, (2) price-to-cash earnings (earnings plus depreciation) (P/CE) ratio, (3) price-to-earnings (P/E) ratio, and (4) dividend yield (YLD). These ratios help in analyzing different valuation levels among countries and over time for specific countries.

Notably, the Morgan Stanley group index for Europe, Australia, and the Far East (EAFE) is the basis for futures and options contracts on the Chicago Mercantile Exchange and the Chicago Board Options Exchange.

Dow Jones Wilshire Global Indexes The Dow Jones Wilshire Global Indexes is composed of more than 2,200 companies worldwide and organized into 120 industry groups. The index includes 35 countries representing more than 80 percent of the combined capitalization of these countries. In addition to the 35 individual countries shown in Exhibit 5.9, the countries are grouped into three major regions: Americas, Europe, and Pacific Region and some subregions. Finally, each country's index is calculated in its own currency as well as in U.S. dollars. The index for the individual countries is reported daily in *The Wall Street Journal* and the full presentations as shown in Exhibit 5.9 is published weekly in *Barron's*.

Comparison of World Stock Indexes As shown in Exhibit 5.10, the correlations between the three series since December 31, 1991, when the DJ series became available, indicate that the results with the various world stock indexes are quite comparable.

A summary of the characteristics of the major price-weighted, market-value-weighted, and equal-weighted stock price indexes for the United States and major foreign countries is contained in Exhibit 5A.1 in the chapter appendix. As shown, the major differences are the number of stocks in alternative indexes, but more important is the *source* of the sample (e.g., stocks from the NYSE, NASDAQ, all U.S. stocks, or stocks from a foreign country such as the United Kingdom or Japan).

5.4 BOND-MARKET INDEXES⁶

Investors know little about the growing number of bond-market indexes currently available because these indexes are relatively new and not widely published. Still, knowledge regarding these indexes is important because of the growth of fixed-income money managers and mutual funds and the consequent need to have a reliable set of benchmarks to use in evaluating their performance. Also, because the performance of many fixed-income money managers has been unable to match that of the aggregate bond market, interest has been growing in bond-index funds, which requires appropriate indexes to emulate as discussed by Dialynas (2001) and Volpert (2005).

⁶The discussion in this section draws heavily from Reilly and Wright (2012).