



Step 9 ~ History

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STEP 9 History



"The only new thing in the world is the history you don't know."

- Harry S. Truman



"Those who are ignorant of investment history are bound to repeat it. Historical investment returns and risks of various asset classes should be studied. Investment results for an asset over a long enough period (greater than 20 years) are a good guide to the future returns and risks of that asset. Further, it should be possible to approximate the future long-term return and risk of a portfolio consisting of such assets."

- William Bernstein, *The Intelligent Asset Allocator*



"While much has changed over the years, some things remain the same. There is still a strong relation between risk and expected return, and price-scaled fundamental variables (such as book-to-market) still have explanatory power for stock returns. Some things have stood the test of time."

- James L. Davis, *Digging the Panama Canal*



"Data! Data! Data!" he cried impatiently. "I can't make bricks out of clay!"

- Sherlock Holmes, *The Adventures of the Copper Beeches*



"It takes between 20 and 800 years of monitoring performance to statistically prove that a money manager is skillful rather than lucky — which is a lot more than most people have in mind when they say 'long-term' [track record]."

- Ted Aronson, "Confessions of a Fund Pro," *Money*



"I know of no way of judging the future but by the past."

- Patrick Henry, March 23, 1775, Virginia Convention Speech

"... statisticians will tell you that you need 20 years worth of data — that's right, two full decades — to draw statistically meaningful conclusions. Anything less, they say, and you have little to hang your hat on."

- Susan Dziubinski, Morningstar, Inc.

"The four most dangerous words in investing are, It's different this time."

- Sir John Templeton, legendary investor. *Money Magazine*

"Those who forget the past are condemned to repeat it."

- George Santanya, Philosopher

"History teaches everything including the future."

- Lamartine

"Whoever wishes to foresee the future must consult the past; for human events ever resemble those of preceding times. This arises from the fact that they are produced by men who ever have been, and ever shall be, animated by the same passions, and thus they necessarily have the same results."

- Machiavelli

"History, in brief, is an analysis of the past in order that we may understand the present and guide our conduct into the future."

- Sidney E. Mead

"If a man dwells on the past, then he robs the present; but if a man ignores the past, he may rob the future. The seeds of our destiny are nurtured by the roots of our past."

- Master Po, Kung Fu Television Series

9.1 INTRODUCTION

Step 9: Understand the historical risks and returns of indexes.

The decision of how and where to invest is important. This decision cannot be made wisely without having a good sense of the historical long-term risk and returns of different indexes. Gaining this understanding involves identifying the universe of indexes that are available for investment. Ideally, investors invest in index portfolios that provide the highest rate of return at a level of risk that matches their risk capacity.

Only a good understanding of the long-term historical risk and return of various indexes will enable investors to know how to allocate indexes in accordance with their personal risk capacity. This step provides data on the risk and return characteristics of both size and value subsets of markets around the world. For many indexes, data dates as far back as 1926.

Before proceeding, it's important to understand that a big difference exists between track records of active mutual funds and the historical returns of indexes. The most obvious distinction is the difference in time periods or in statistical terms, the sample size. Statisticians are quick to remind you that the smaller the sample size, the more error there is in information obtained from the sample.

As previously mentioned, manager picking occurs when an investor identifies an investment, such as a mutual fund with an outstanding track record, and invests in it because of the fund manager's past performance. This involves picking out specific funds with the best track records from among thousands. A manager picker assumes that a mutual fund with a great

track record will continue its excellent performance into the future.

However, the track record of any given active mutual fund or its manager rarely exceeds 10 years and is notoriously unreliable in predicting future returns. That's because the typical active fund manager doesn't hold investments that comprise a single discrete index. To complicate matters, the manager randomly moves in and out of different types of stocks and holds them in inexplicably different proportions for unpredictably different times because of attempts to outperform the market. Many active mutual funds eventually go out of business and simply disappear from the mutual fund databases. Some funds merge into other active funds or the manager gets fired, retires or moves on to run other funds. Thus, not only are

Examining the historical risk and return data of indexes is a completely different exercise than examining the track records of specific active mutual funds. In sharp contrast to the unclear investment methods of active funds and their

The best index fund managers have identified the risk factors that generate higher stock returns and structure the construction rules of their indexes for maximum exposure to those factors. This is really nothing more than taking advantage of a fundamental principle of investing—the relationship between risk and return. This isn't to say that the actual returns earned by any given index in the future are known today. But, an indexer can be quite sure that an index fund will efficiently capture the performance of the index. It's simply more reliable.

DEFINITIONS

9.2.1 Historical Databases and Studies

Several different historical databases are used to study the market. One of the first was the Cowles Commission's Common-Stock Indexes, spearheaded by Alfred Cowles. The Common-Stock Indexes were created in order to portray the average experience of investors who invested in those securities from 1871 to 1938. The compilation of the data was no easy task. Remember, it was assembled without the help of modern computer technology. The data, which was published in August 1938, was the product of years of research and data collection. According to Cowles, more than 1.5 million worksheet entries were made (and we're not talking about Excel worksheets!).

The premier source of historical data used by the academic and corporate community comes from the Center for Research in Security Prices (CRSP). CRSP, which is housed at the University of Chicago Graduate School of Business, was established in 1960 with the goal of building and maintaining historical databases for stock (NASDAQ, AMEX, NYSE), indexes, bond, and mutual fund securities. Part of the goal of the center was to unite the common interests between the academic and financial communities by providing a better understanding of the operations of the market. Since computer technology was in its infancy, no machine-readable, historical stock data files were in existence at the time CRSP was launched. Initially, CRSP was formed to accurately measure the returns from investing in common stocks listed on the New York Stock Exchange for the period 1926 to 1960. It took the researchers at CRSP four years to complete this initial study. Since its inception CRSP has developed a host of new data resources. The data

housed at CRSP is used extensively for financial, economic, and accounting research. Currently, Eugene Fama, a well respected professor of finance at the Graduate School of Business at the University of Chicago and director of research at DFA, is the chairman of CRSP. DFA bases several of its investment products on Fama's findings from that database.

The prestigious University of Chicago publication, *The Journal of Business*, caused the academic equivalent of an earthquake in an article published in January 1964 titled "Rates of Return on Investments in Common Stocks." In the article, James Lorie and Lawrence Fisher, two business professors at the school, made the first comprehensive measurement of the performance of all common stocks listed on the New York Stock Exchange from 1926 through 1960. They obtained and compiled their data from CRSP.

The study presented a mind-boggling accumulation of statistical calculations. Both academic researchers and investment professionals were astonished at Fisher and Lorie's discoveries. For instance, the study showed that an investor who invested \$1,000 in the stock market in 1926, reinvested all dividends, paid no taxes, and remained fully invested until the end of 1960 would have accumulated nearly \$30,000 or a gain of about 9% a year. In light of the fact that many investors in 1964 still had vivid memories of the Great Depression and its stock market crash, 9% a year was a great deal of money. In addition, this return was far greater than the amount an investor would have earned from bonds or savings bank deposits during that time period. For the first time, investors had comprehensive historical investment data that gave them a sense of how



Rex Sinquefeld



Roger Ibbotson

University of Chicago, released a study that was published in *The Journal of Business* titled “Stocks, Bonds, Bills and Inflation.” The two researchers were the first to compile and present in an organized way historical investment data that covered not only stocks, but bonds as well. They even reported data on inflation. As was the case with Lorie and Fisher’s study, their data went back to 1926, and was obtained from CRSP. The Ibbotson-Sinquefeld data, now updated annually in what has come to be known as the “Stocks, Bonds, Bills and Inflation (SBBI) Yearbook,” is widely used in the investment world.

In 1990, G. William Schwert of the University of Rochester published an article in *The Journal of Business* titled “Indexes of U.S. Stock Prices from 1802 to 1987.” Schwert pointed out that the data compiled by CRSP launched an explosion of research in finance in the 1960s to 1970s. However, notes Schwert, a major drawback of the CRSP database is that it starts in 1926, a time right before the Great Depression. Consequently, the behavior of the stock market and stock returns was unusual in the 1929 to 1939 decade. Therefore, an empirical study based on the data could be “suspect.” So, Schwert set his sights on pre-CRSP stock return data. His article compares and contrasts all of the major indexes of stock prices or returns that were available monthly from 1802 to 1925 or daily from 1885 to 1962. The outcome of the comparison is a series of monthly stock portfolio returns from 1802 to 1925, and daily returns from 1885 to 1962. This important study included many refinements of the concept of “stitching” together several different index data series to obtain a longer term prospective.

9.2.2 Time Series Construction

A time series construction is the stitching together of indexes through history so that researchers and investors can better characterize the risk and return of their investments. See Figure 9-1 for an example of the time series construction of indexes. As seen in the graph, indexes are stitched together to increase the sample size of the data. All indexes have been taken back to 1927 through this process. A substitution process is used to extend current indexes back in time. This process is far from perfect, but provides the best information available for extending current indexes and mixes of those indexes back in time. Table 9-1 is the annual returns of these stitched together indexes with corresponding color buttons, and a total market index for comparisons. This is an interesting assembly of the per-year annual returns for each index going all the way back to 1927! These indexes are described in further detail in Appendix B.

9.3 PROBLEM

A lack of quality long-term data of stock market returns presents a hurdle for many investors. Furthermore, many are largely unaware that long-term data is more valuable than short-term data. When looking at 80 years of data, many investors think it is irrelevant because they do not have 80 years to live. This point of view negates the importance of sample size and the issue of sample error. When characterizing the risk and return of capitalism, the more quality data you have, the more accurate your conclusions. Any subset of the data, such as five years’ worth, is bound to contain significant errors in its attempt to describe the risk and return of an index. For example, for the five-year period from 2000 to 2004, the S&P 500 had a total loss of 12%. Based on that negative total

Figure 9-1

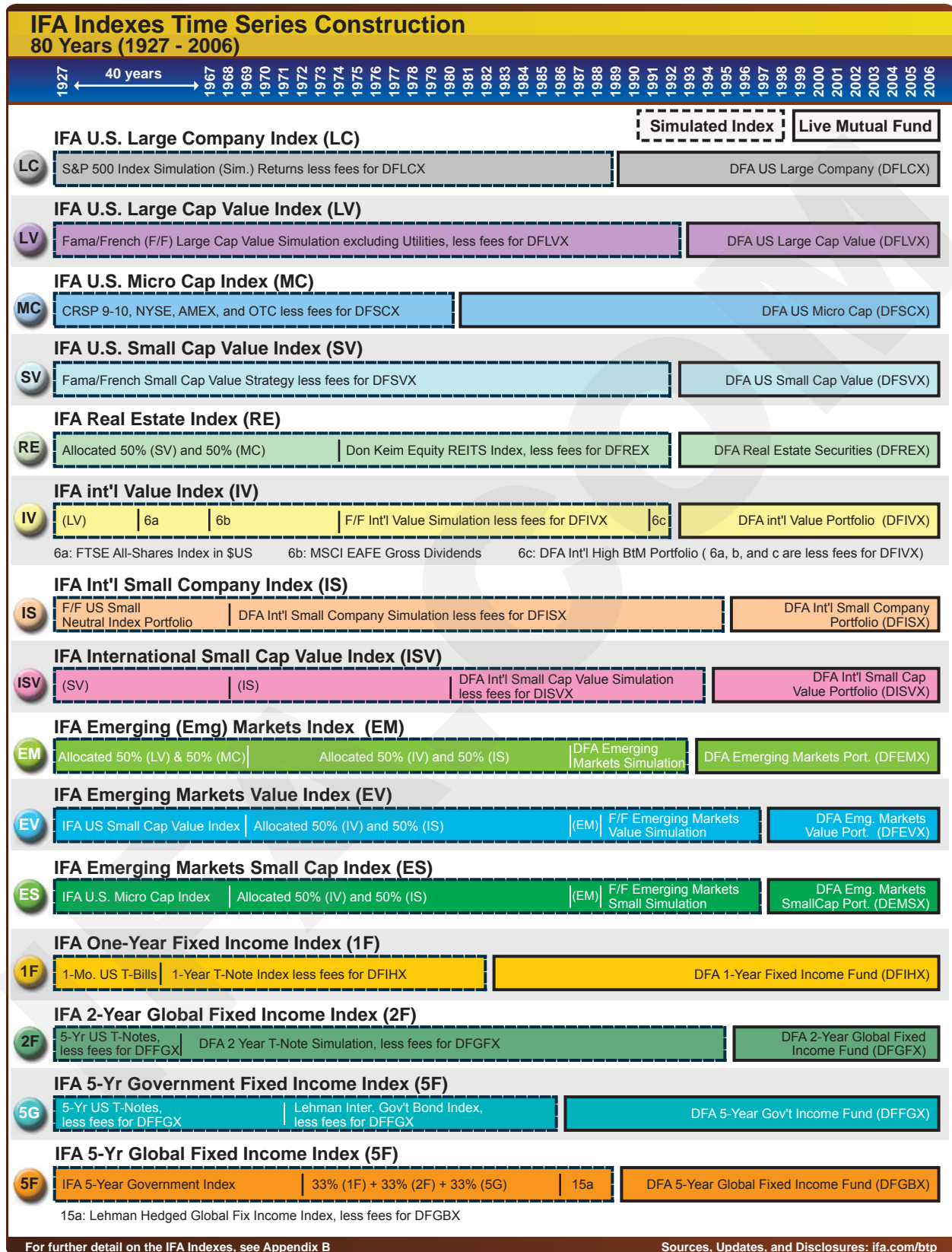


Table 9-1

Annual Returns of 15 Indexes 80 years (1927 - 2006)															
	LC	LV	MC	SV	RE	IV	IS	ISV	EM	EV	ES	1F	2F	5G	5F
Year															
1927	37.3	31.3	30.8	33.2	32.1	31.3	26.1	33.2	31.2	33.2	30.8	2.9	4.3	4.3	4.3
1928	43.4	25.2	44.2	39.0	41.8	25.2	40.0	39.0	34.9	39.0	44.2	3.0	0.7	0.7	0.7
1929	-8.5	-6.7	-51.4	-41.8	-46.7	-6.7	-30.9	-41.8	-32.1	-41.8	-51.4	4.5	5.8	5.8	5.8
1930	-25.0	-45.2	-46.1	-47.7	-46.8	-45.2	-32.3	-47.7	-45.2	-47.7	-46.1	2.2	6.5	6.5	6.5
1931	-43.4	-60.8	-50.3	-53.8	-52.0	-60.8	-48.5	-53.8	-55.4	-53.8	-50.3	0.8	-2.6	-2.6	-2.6
1932	-8.3	-6.4	8.9	-2.0	3.7	-6.4	-8.7	-2.0	3.2	-2.0	8.9	0.7	8.6	8.6	8.6
1933	53.8	90.8	185.3	141.2	162.9	90.8	120.4	141.2	137.8	141.2	185.3	0.1	1.6	1.6	1.6
1934	-1.6	-21.8	23.4	7.4	15.3	-21.8	19.5	7.4	-1.0	7.4	23.4	-0.1	8.7	8.7	8.7
1935	47.5	42.6	69.6	49.2	59.2	42.6	75.3	49.2	56.6	49.2	69.6	-0.1	6.7	6.7	6.7
1936	33.8	50.8	83.7	76.7	80.4	50.8	48.0	76.7	67.8	76.7	83.7	-0.1	2.8	2.8	2.8
1937	-35.1	-38.2	-53.1	-53.0	-53.0	-38.2	-49.0	-53.0	-45.9	-53.0	-53.1	0.1	1.3	1.3	1.3
1938	31.0	29.7	23.8	33.5	28.6	29.7	42.9	33.5	27.4	33.5	23.8	-0.3	6.0	6.0	6.0
1939	-0.5	-15.0	-0.2	-7.7	-3.8	-15.0	0.6	-7.7	-7.3	-7.7	-0.2	-0.2	4.3	4.3	4.3
1940	-9.9	-7.4	-12.5	-11.2	-11.8	-7.4	-2.4	-11.2	-9.7	-11.2	-12.5	-0.3	2.7	2.7	2.7
1941	-11.7	-0.5	-14.0	-4.0	-9.1	-0.5	-11.5	-4.0	-7.2	-4.0	-14.0	-0.2	0.3	0.3	0.3
1942	20.2	36.0	50.2	37.5	43.8	36.0	27.0	37.5	43.3	37.5	50.2	0.0	1.7	1.7	1.7
1943	25.8	39.0	97.8	98.9	98.5	39.0	54.0	98.9	66.8	98.9	97.8	0.1	2.6	2.6	2.6
1944	19.6	41.7	59.4	52.6	56.0	41.7	39.5	52.6	50.5	52.6	59.4	0.1	1.6	1.6	1.6
1945	36.3	43.8	80.9	72.0	76.4	43.8	59.2	72.0	61.5	72.0	80.9	0.1	2.0	2.0	2.0
1946	-8.2	-8.2	-13.5	-12.2	-12.8	-8.2	-10.1	-12.2	-10.7	-12.2	-13.5	0.1	0.8	0.8	0.8
1947	5.6	7.7	-3.5	7.3	1.8	7.7	-2.7	7.3	2.1	7.3	-3.5	0.3	0.7	0.7	0.7
1948	5.4	3.8	-7.0	-6.6	-6.8	3.8	-7.6	-6.6	-1.7	-6.6	-7.0	0.6	1.6	1.6	1.6
1949	18.7	13.9	20.6	19.5	20.1	13.9	22.1	19.5	17.3	19.5	20.6	0.9	2.1	2.1	2.1
1950	31.6	58.7	44.9	55.0	49.9	58.7	31.6	55.0	51.8	55.0	44.9	1.0	0.5	0.5	0.5
1951	23.9	13.3	8.6	10.4	9.5	13.3	14.3	10.4	11.0	10.4	8.6	1.3	0.1	0.1	0.1
1952	18.2	18.3	5.7	6.6	6.2	18.3	9.5	6.6	11.9	6.6	5.7	1.4	1.9	1.4	1.4
1953	-1.1	-7.1	-6.4	-9.1	-7.8	-7.1	-1.8	-9.1	-6.7	-9.1	-6.4	1.6	2.1	3.0	3.0
1954	52.5	77.1	64.1	64.2	64.2	77.1	60.4	64.2	70.7	64.2	64.1	0.6	2.3	2.5	2.5
1955	31.4	20.3	21.4	25.0	23.2	9.8	19.8	25.0	20.9	25.0	21.4	1.3	-0.1	-0.9	-0.9
1956	6.4	1.7	2.9	5.3	4.1	-6.5	7.1	5.3	2.4	5.3	2.9	2.2	1.9	-0.7	-0.7
1957	-10.9	-23.0	-15.7	-18.2	-16.9	-1.4	-15.7	-18.2	-19.4	-18.2	-15.7	2.9	3.9	7.6	7.6
1958	43.2	71.6	69.4	73.8	71.7	44.0	56.6	73.8	70.6	73.8	69.4	1.3	0.8	-1.5	-1.5
1959	11.8	14.7	17.6	14.1	15.9	56.7	19.1	14.1	16.2	14.1	17.6	2.7	3.6	-0.6	-0.6
1960	0.3	-9.1	-5.6	-7.4	-6.5	-6.3	-1.5	-7.4	-7.3	-7.4	-5.6	2.4	6.8	11.5	11.5
1961	26.7	27.2	30.0	31.1	30.6	4.7	30.2	31.1	28.7	31.1	30.0	1.9	2.8	1.6	1.6
1962	-8.8	-1.7	-16.6	-9.5	-13.1	-1.3	-15.8	-9.5	-9.3	-9.5	-16.6	2.5	3.0	5.3	5.3
1963	22.6	29.5	11.3	28.8	19.8	17.3	15.8	28.8	20.2	28.8	11.3	3.1	3.2	1.4	1.4
1964	16.4	21.6	17.7	24.3	21.0	-4.9	17.2	24.3	19.7	24.3	17.7	3.8	3.9	3.8	3.8
1965	12.3	22.5	37.2	43.2	40.2	11.5	32.5	43.2	29.8	43.2	37.2	3.7	3.5	0.8	0.8
1966	-10.2	-12.5	-8.8	-8.4	-8.6	-5.0	-6.4	-8.4	-10.4	-8.4	-8.8	6.2	4.9	4.4	4.4
1967	23.8	32.3	102.1	72.0	86.6	16.2	70.8	72.0	64.0	72.0	102.1	4.7	3.7	0.8	0.8
1968	11.0	21.4	49.4	50.1	49.9	46.2	39.4	50.1	35.2	50.1	49.4	5.5	5.8	4.3	4.3
1969	-8.6	-17.6	-32.8	-30.0	-31.4	2.3	-23.7	-30.0	-25.4	-30.0	-32.8	6.9	7.1	-1.0	-1.0
1970	3.9	9.7	-17.2	-1.5	-9.6	-10.9	0.3	0.3	-5.4	-5.4	-17.2	10.2	11.0	16.6	16.6
1971	14.2	19.0	17.4	15.2	16.4	30.6	67.3	67.3	48.1	48.1	17.4	5.4	5.9	8.5	8.5
1972	18.8	18.9	-1.6	4.4	1.4	37.0	63.3	63.3	49.7	49.7	18.9	3.9	3.9	4.9	4.9
1973	-14.8	-4.4	-41.1	-32.4	-36.8	-14.6	-14.2	-14.2	-14.3	-14.3	-41.1	6.7	6.1	3.1	5.3
1974	-26.6	-17.4	-29.7	-20.7	-25.3	-22.5	-29.1	-29.1	-25.8	-25.8	-26.6	8.5	9.1	6.8	8.1
1975	37.1	47.1	68.9	66.0	34.2	38.3	49.0	49.0	43.7	43.7	68.9	7.2	7.9	8.1	7.8
1976	23.7	50.3	53.6	56.6	38.7	2.8	10.8	10.8	6.8	6.8	50.3	6.1	8.9	11.5	8.8
1977	-7.3	-6.1	21.4	20.9	17.6	29.4	73.1	73.1	50.1	50.1	21.4	4.7	3.7	2.8	3.7
1978	6.5	3.1	21.1	21.5	9.0	42.0	64.6	64.6	53.1	53.1	21.1	6.1	5.5	2.0	4.5
1979	18.3	22.9	43.4	33.1	32.8	5.5	-1.4	-1.4	2.1	2.1	2.1	9.1	10.4	6.3	8.6
1980	32.3	16.0	33.9	21.9	29.2	18.2	34.7	34.7	26.3	26.3	16.0	9.7	14.1	6.4	10.1
1981	-5.0	16.1	7.1	16.0	5.8	8.5	-0.5	1.8	4.1	4.1	7.1	14.3	18.9	10.5	14.5
1982	21.3	20.2	28.8	37.0	27.8	-2.7	-0.6	-3.1	-1.6	-1.6	20.2	17.0	19.5	25.1	20.5
1983	22.4	34.5	39.7	48.4	29.1	28.8	35.3	35.3	32.1	32.1	34.5	9.5	8.6	8.0	8.4
1984	6.1	9.0	-6.7	3.1	21.4	8.5	11.0	10.9	9.8	9.8	9.0	11.2	12.8	14.0	12.7
1985	32.0	30.6	24.7	27.2	11.5	54.4	66.6	66.6	60.4	60.4	30.6	10.5	13.2	17.7	13.8
1986	18.3	19.8	6.9	4.5	24.4	64.6	58.6	58.6	62.2	62.2	19.8	8.9	11.9	12.8	11.2
1987	5.1	3.5	-9.3	-5.4	-6.4	34.4	39.8	39.8	37.2	37.2	3.5	6.4	6.0	3.5	6.6
1988	16.7	23.6	22.9	30.0	14.1	38.0	25.2	33.6	37.4	37.4	23.6	7.4	5.9	6.3	8.7
1989	31.3	27.0	10.2	10.9	6.3	17.6	30.0	30.0	37.2	37.2	10.2	9.6	8.7	9.5	6.8
1990	-3.2	-22.8	-21.6	-26.6	-16.3	-22.0	-18.5	-17.7	-8.4	-1.1	1.5	9.1	8.9	10.8	3.5
1991	30.1	34.3	44.6	42.1	39.8	9.2	5.2	4.5	69.0	39.8	44.6	9.8	10.7	14.6	12.7
1992	7.3	15.6	23.4	34.2	27.9	-10.3	-21.1	-21.9	2.9	-5.4	9.3	5.2	5.7	7.3	6.5
1993	9.6	17.0	21.0	26.3	15.5	44.7	33.6	44.6	89.2	105.8	89.5	4.4	5.1	8.3	11.6
1994	1.3	-4.5	3.1	1.2	-8.4	8.8	15.2	21.1	-10.6	13.8	2.5	2.5	0.5	-3.2	-4.3
1995	37.1	38.4	34.5	29.3	12.1	11.5	2.1	1.2	2.2	-8.3	-10.1	8.0	8.1	9.6	16.1
1996	22.6	20.2	17.6	22.3	33.8	7.8	3.4	0.9	11.4	11.5	4.8	5.8	7.2	6.6	10.8
1997	33.1	28.1	22.8	30.8	19.4	-3.1	-23.7	-22.7	-18.9	-15.7	-22.6	6.0	5.9	6.4	8.3
1998	28.7	12.0	-7.3	-7.3	-15.4	14.9	8.2	5.3	-9.4	-5.7	-7.3	5.7	6.5	5.4	8.4
1999	20.8	4.8	29.8	13.0	-2.0	16.3	21.9	19.0	71.7	84.3	85.3	4.6	4.6	3.8	3.7
2000	-9.3	10.2	-3.6	9.0	28.4	-0.2	-5.4	-3.1	-29.2	-34.2	-31.8	6.7	6.5	6.8	6.7
2001	-12.1	3.9	22.8	22.6	13.2	-15.3	-10.5	-4.6	-6.8	-1.0	-2.6	5.8	6.1	7.1	5.9
2002	-22.2	-14.9	-13.3	-9.3	4.2	-8.5	1.9	5.8	-9.4	-1.7	-0.2	3.9	5.3	11.8	10.4
2003	28.5	34.4	60.7	59.4	35.6	49.9	58.8	66.5	60.2	76.2	72.8	1.6	1.9	2.7	3.0
2004	10.7	18.3	18.4	25.4	32.1	28.8	30.9	34.8	29.9	39.5	28.9	0.9	0.7	2.8	2.9
2005	4.9	10.2	5.7	7.8	13.2	15.3	22.0	23.2	29.9	30.8	25.7	2.3	1.9	0.8	1.7
2006	15.7	20.2	16.2	21.5	35.3	34.1	29.9	28.4	29.2	37.9	37.3	4.8	4.5	4.5	3.9
Annualized Return (%)	10.27	11.53	12.83	13.92	12.44	11.35	13.97	15.05	15.22	15.99	15.90	4.06	5.10	4.95	5.10
Standard Deviation (%)	19.23	25.74	32.98	29.63	30.02	25.86	24.35	28.96	28.73	29.80	32.08	1.55	2.13	3.66	3.25
Growth of \$1	\$2,483	\$6,182	\$15,621	\$33,621	\$11,816	\$5,419	\$35,007	\$74,335	\$83,846	\$142,461	\$133,843	\$24.22	\$53.38	\$48.73	\$53.40

* See Appendix B for Index Portfolio Button Definitions

Sources, Updates, and Disclosures: ifa.com/btp

return, many investors would conclude that the S&P 500 was not a good investment. But when considering 80 years from 1927 to 2006, we see that the annualized return over that period is about 10% per year, and it would be within normal limits for it to fluctuate that much over five year periods. Therefore, it is still an important component of diversified index portfolios. That is a very different conclusion and is far more accurate than the conclusion many investors make based on the last five years.

9.4 SOLUTIONS

9.4.1 Long-term History Characterizes Risk and Return

The history of several U.S. stock markets are captured in Figure 9-2. In essence this chart captures the effectiveness of capitalism over the last 80 years. The numbered events in Figure 9-2 are taken from the historical events in Table 9-2 below it, titled “Market Turmoil and the Dow Jones Industrial Average.” Despite several set backs, capitalism continues to work. Also note that the value of a dollar scale is a log scale, so each unit increases by a factor of 10. These are indexes and therefore the growth of a dollar does not reflect any fees or transaction costs. This long-term history of quality data allows investors to create the best set of probabilistic estimates of future performances of these indexes.

The global history of the size and value effect on stocks is made even more clear by reviewing Figure 9-3. Next, Table 9-4 provides a thorough analysis of many indexes over the 1927 to 2006 period. Both the chart and table indicate that over the 80-year period, small-value has outperformed the S&P 500 and large-cap growth. Also, it is clear that value has higher returns in international and emerging markets,

even though available data only dates back to 1975 for international and 1988 for emerging markets.

To expand the range of asset classes to include art, farmland and gold, let’s take a look at Table 9-3.

Table 9-3

Various Asset Class Returns		
Annualized Returns over 48 years - (1945 to 1992)		
Asset Class	Return %	Risk Index
Emerging Markets Equities	16.0	29.6
Venture Capital	15.9	35.4
Japanese Stocks	15.9	29.2
U. S. Small-Cap Stocks	13.5	25.7
S&P 500	11.7	16.5
U.S. Farmland	9.9	7.4
Art	8.5	15.0
U.S. Real Estate (commercial)	7.6	5.7
U.S. Real Estate (residential)	7.3	4.0
Corporate Bonds	5.4	6.2
Long-term Government Bonds	4.9	9.7
Gold	4.9	26.0
U. S. Treasury Bills	4.8	3.2
Silver	4.2	56.2
Inflation	4.5	1.7

Source: Morgan Stanley Capital International

It is interesting that over the 48-year period emerging market public equities outperformed venture capital, and at a lower risk level. In addition, the S&P 500 outperformed real estate by more than 50%, although the S&P 500 had about three times the risk. Figure 9-4 graphs the data from Table 9-3 on the Markowitz risk/return plot and adds in index portfolios 5, 50 and 100 for comparison. Note where venture capital and emerging markets sit on the plot. Gold and silver are also interesting, reinforcing the idea that they have lots of risk and returns pretty close to T-bills and bonds.

Venture Economics, an information provider for equity professionals, compiled a 20-year data series of various types of private equity strategies for the period ending September 30, 2001. According to the survey, venture and private

Table 9-2

Market Turmoil and the Dow Jones Industrial Average									
	Date	Event	First Trading Session Response to Event				Subsequent Market Behavior		
			DJIA Close Previous Day	DJIA Close	DJIA Change	DJIA % Change	One Month Change	Six Months Change	One Year Change
1	3/19/03	Operation Iraqi Freedom	8194.23	8265.45	71.22	0.87%	0.77%	16.69%	23.24%
2	9/11/01	World Trade Center Towers Destroyed	9605.51	8920.70	-684.81	-7.13%	3.50%	18.58%	-7.99%
3	4/19/95	Oklahoma Bombing	4179.13	4207.49	28.36	0.68%	3.18%	14.14%	31.56%
4	1/16/91	US Launches Bombing Attack on Iraq	2490.59	2508.91	18.32	0.74%	16.87%	18.93%	28.53%
5	8/2/90	Iraq Invades Kuwait	2899.26	2864.60	-34.66	-1.20%	-8.74%	-3.22%	4.95%
6	10/25/83	Crisis in Grenada	1248.98	1252.44	3.46	0.28%	2.00%	-7.10%	-3.31%
7	3/30/81	President Reagan Shot	994.78	992.16	-2.62	-0.26%	0.56%	-14.33%	-16.90%
8	11/4/79	Iran Hostage Crisis	818.94	812.63	-6.31	-0.77%	1.51%	0.45%	17.29%
9	8/9/74	President Nixon Resigns	784.89	777.30	-7.59	-0.97%	-14.71%	-8.87%	5.98%
10	2/26/65	Vietnam Conflict	899.90	903.48	3.58	0.40%	-1.31%	-0.81%	5.37%
11	11/22/63	President Kennedy Assassinated	732.65	711.49	-21.16	-2.89%	6.58%	15.37%	25.19%
12	10/22/62	Cuban Missile Crisis	573.29	568.60	-4.69	-0.82%	13.41%	25.05%	31.41%
13	9/24/55	President Eisenhower Heart Attack	487.45	455.56	-31.89	-6.54%	1.15%	12.62%	7.06%
14	6/25/50	North Korea Invades South Korea	224.35	213.91	-10.44	-4.65%	-4.71%	9.49%	14.67%
15	12/7/41	Japan Attacks Pearl Harbor, Hawaii	115.90	112.52	-3.38	-2.92%	-0.86%	-6.19%	2.88%

Sources: djindexes.com and Yahoo! Finance

Figure 9-2

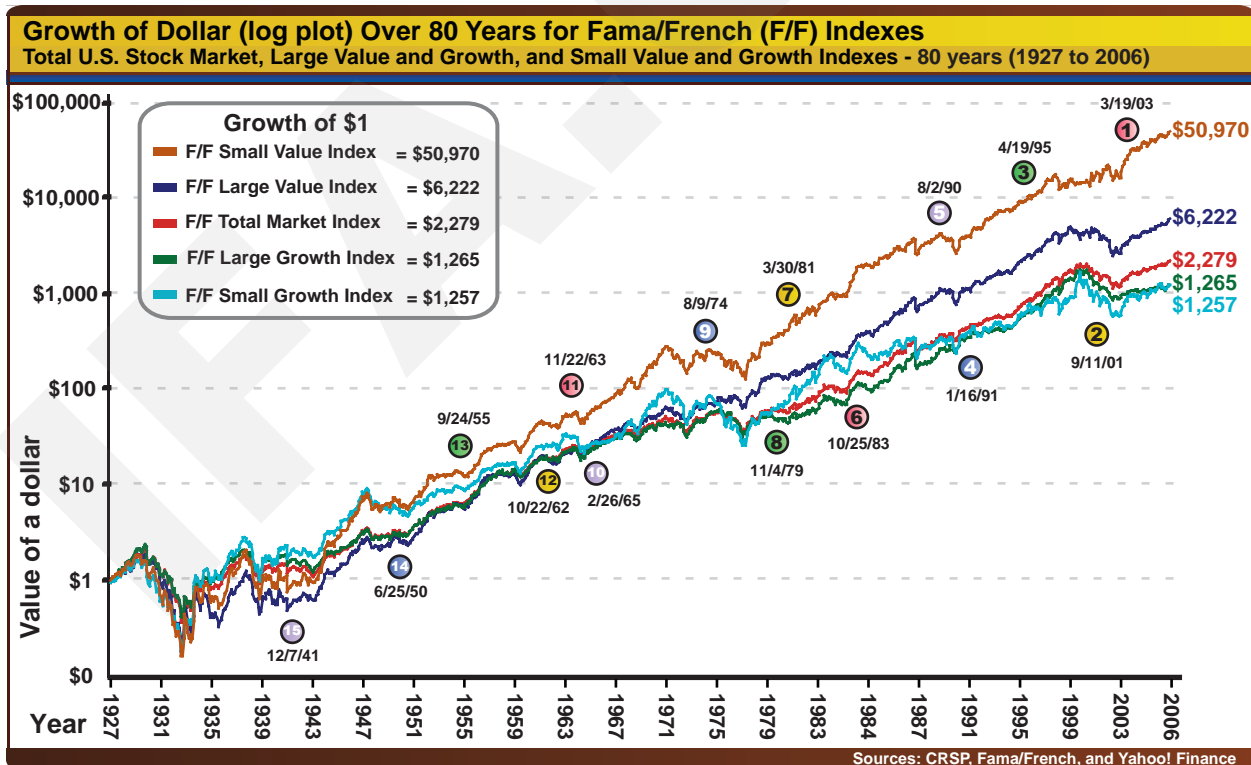


Figure 9-3

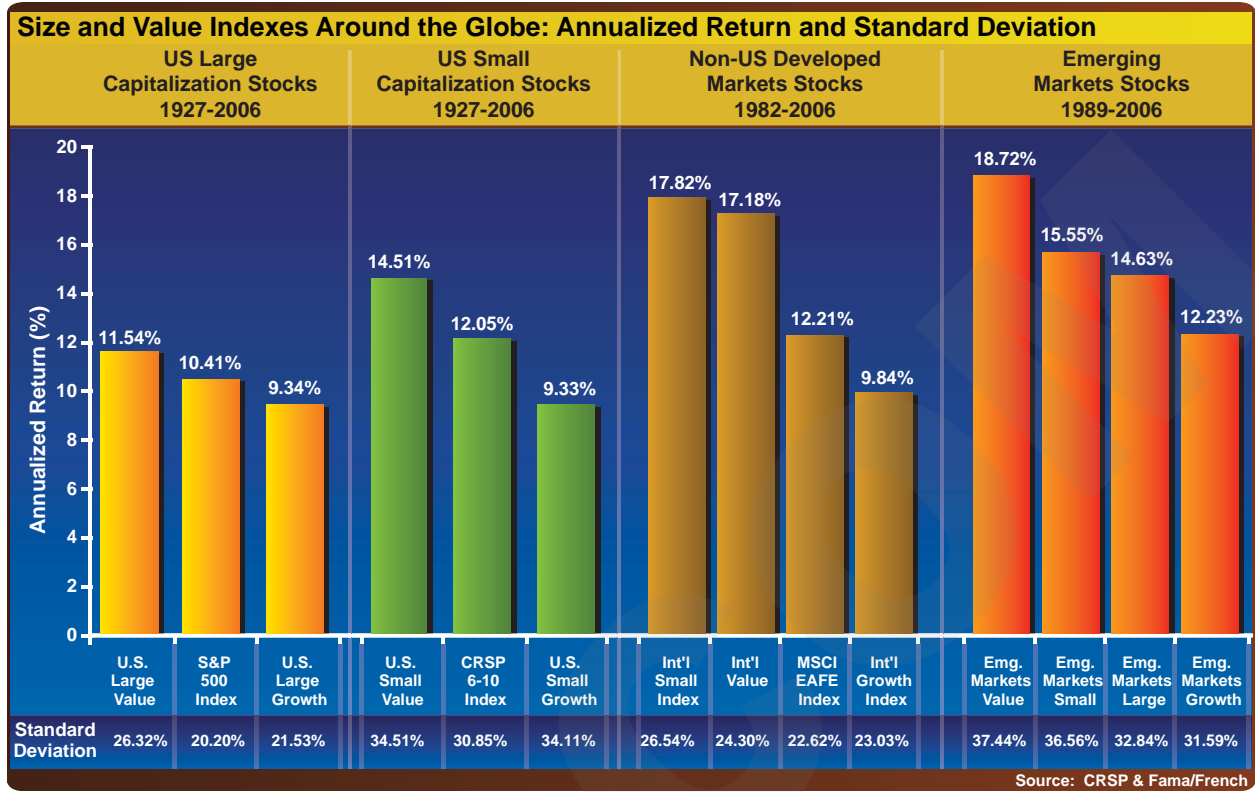


Figure 9-4

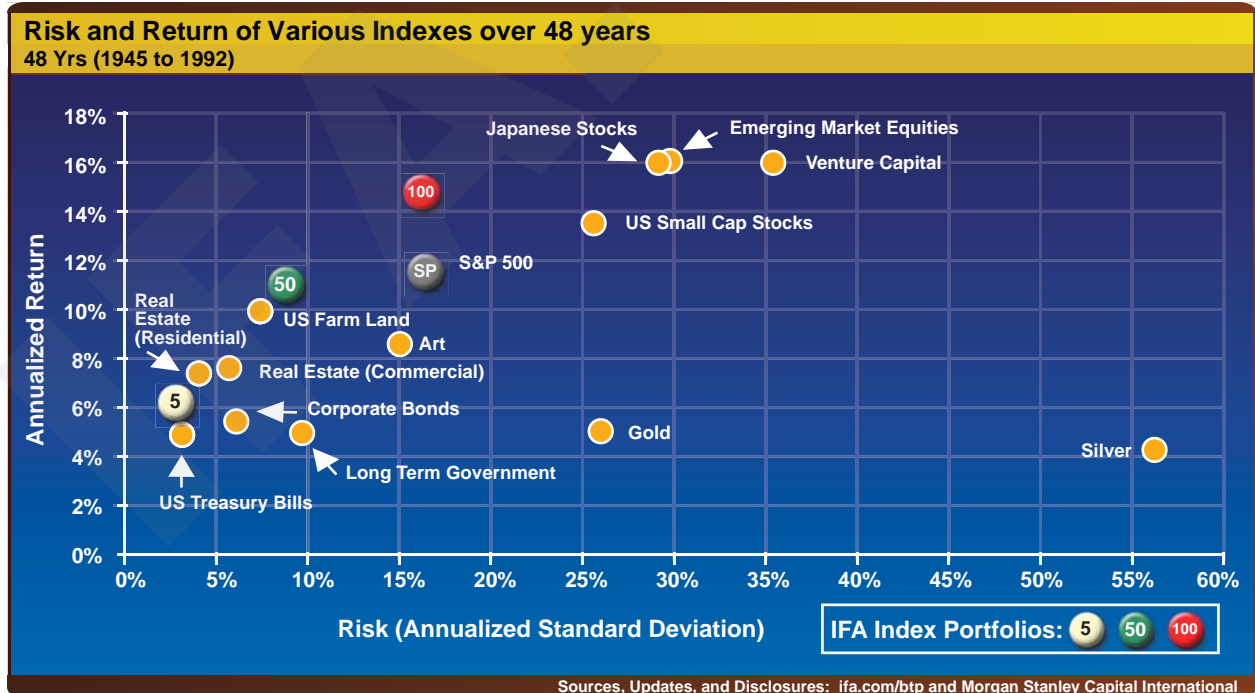


Table 9-4

Fama/French, IFA, and Other Indexes - Annualized Rates of Returns (%) 80 years (1927 to 2006)										
Indexes	1 Yr 2006	1 Yr 2005	1 Yr 2004	1 Yr 2003	5 Yr 2002- 2006	10 Yr 1997- 2006	25 Yr 1982- 2006	35 Yr 1972- 2006	50 Yr 1957- 2006	80 Yr 1927- 2006
LC IFA U.S. Large Company Index	15.71	4.85	10.72	28.49	6.07	8.28	13.19	11.19	10.47	10.27
TM Fama/French Total US Market Index	15.28	6.13	11.88	31.76	7.29	8.63	13.05	11.32	10.70	10.15
MC IFA U.S. Micro Cap Index	16.17	5.69	18.39	60.70	15.16	13.48	14.07	13.57	13.13	12.83
LV IFA U.S. Large Cap Value Index	20.18	10.24	18.25	34.43	12.38	11.93	14.69	14.14	13.30	11.53
LG Fama/French US Large Growth	6.54	3.39	5.27	17.77	1.29	5.38	11.79	9.56	9.42	9.35
SV IFA U.S. Small Cap Value Index	21.55	7.79	25.38	59.39	18.89	15.84	16.63	16.14	15.66	13.92
SG Fama/French US Small Growth	9.32	6.01	11.16	54.72	5.44	5.68	7.91	8.36	8.93	9.33
RE IFA U.S. Real Estate REIT Index	35.25	13.16	32.06	35.58	23.34	15.17	14.68	12.60	12.83	12.44
IV IFA International Value Index	34.15	15.29	28.79	49.94	22.26	11.58	14.95	14.20	13.40	11.35
IS IFA International Small Cap Index	24.89	21.96	30.91	58.77	26.40	10.63	14.11	15.76	15.69	13.97
ISV IFA International Small Cap Value Index	28.39	23.24	34.80	66.46	30.31	12.90	16.39	17.48	17.51	15.05
EM IFA Emerging Markets Index	29.17	29.85	29.90	60.18	25.89	10.16	21.19	19.76	17.85	15.22
EV IFA Emerging Markets Value Index	37.93	30.80	39.54	76.18	34.23	15.32	21.96	20.30	19.05	15.99
ES IFA Emerging Markets Small Cap Index	37.31	25.74	28.88	72.81	30.82	13.37	20.82	19.50	18.10	15.90
N IFA NSDQ/FF Small Growth Index	9.51	1.38	5.43	53.29	4.37	6.47	10.57	9.11	9.58	9.74
1F IFA One-Year Fixed Income Index	4.77	2.30	0.88	1.63	2.69	4.20	6.60	6.88	6.07	4.06
2F IFA Two-Year Global Fixed Income Index	4.47	1.89	0.73	1.92	2.84	4.35	6.98	7.48	6.62	5.10
5F IFA Five-Year Global Fixed Income Index	3.90	1.73	2.90	2.97	4.33	5.45	7.89	7.80	6.68	5.10
5G IFA Five-Year Government Index	4.51	0.78	2.77	2.68	4.43	5.15	7.97	7.46	6.44	4.95
Long Term Government Bonds Index	1.42	7.81	9.34	1.44	7.40	7.94	11.20	8.73	6.82	5.42
Long Term Corporate Bonds Index	3.45	5.87	8.72	5.27	7.84	7.74	11.15	8.76	7.10	5.85
One Month Treasury Bills Index	4.82	3.42	1.19	1.02	2.32	3.60	5.33	6.02	5.36	3.72
Inflation (Consumer Price Index)	3.06	2.98	3.25	1.88	2.80	2.49	3.14	4.68	4.08	3.10
5 IFA Index Portfolio 05	6.40	2.35	4.03	7.95	4.97	5.23	7.84	7.79	6.94	5.55
10 IFA Index Portfolio 10	7.38	2.88	5.07	10.14	5.72	5.68	8.30	8.23	7.40	6.07
15 IFA Index Portfolio 15	8.35	3.41	6.11	12.32	6.46	6.11	8.76	8.65	7.85	6.58
20 IFA Index Portfolio 20	9.32	3.93	7.15	14.51	7.20	6.55	9.22	9.07	8.29	7.07
25 IFA Index Portfolio 25	10.30	4.46	8.19	16.70	7.92	6.97	9.67	9.48	8.72	7.54
30 IFA Index Portfolio 30	11.27	4.99	9.22	18.89	8.64	7.39	10.11	9.89	9.14	7.99
35 IFA Index Portfolio 35	12.25	5.52	10.26	21.07	9.35	7.81	10.56	10.28	9.55	8.43
40 IFA Index Portfolio 40	13.22	6.04	11.30	23.26	10.05	8.21	10.99	10.68	9.95	8.85
45 IFA Index Portfolio 45	14.19	6.57	12.34	25.45	10.74	8.62	11.42	11.06	10.35	9.26
50 IFA Index Portfolio 50	15.17	7.10	13.38	27.64	11.42	9.01	11.85	11.44	10.73	9.65
55 IFA Index Portfolio 55	16.14	7.63	14.42	29.82	12.10	9.41	12.27	11.81	11.11	10.02
60 IFA Index Portfolio 60	17.12	8.16	15.46	32.01	12.77	9.79	12.69	12.18	11.48	10.38
65 IFA Index Portfolio 65	18.09	8.68	16.50	34.20	13.42	10.17	13.11	12.54	11.84	10.71
70 IFA Index Portfolio 70	19.06	9.21	17.54	36.39	14.07	10.55	13.51	12.89	12.19	11.04
75 IFA Index Portfolio 75	20.04	9.74	18.58	38.58	14.72	10.92	13.92	13.24	12.54	11.34
80 IFA Index Portfolio 80	21.01	10.27	19.62	40.76	15.35	11.28	14.32	13.58	12.87	11.63
85 IFA Index Portfolio 85	21.99	10.79	20.66	42.95	15.98	11.64	14.71	13.91	13.20	11.89
90 IFA Index Portfolio 90	22.96	11.32	21.70	45.14	16.59	11.99	15.10	14.23	13.51	12.14
95 IFA Index Portfolio 95	22.63	11.42	22.17	48.38	17.26	12.36	15.37	14.61	13.88	12.45
100 IFA Index Portfolio 100	22.30	11.51	22.64	51.63	17.92	12.71	15.62	14.97	14.22	12.74

IFA Index Portfolios shown net of IFA fees.

Sources, Updates, and Disclosures: ifa.com/btp, CRSP, and Fama/French

equity strategies generally performed well over the period. But, the premium relative to public securities appears rather small considering the higher risk, investment concentration, absence of liquidity, transparency and daily pricing. The results are shown in Table 9-5.

9.4.2 Cross Correlation among Indexes

In addition to the long-term risk and return of indexes, a third input used to create optimal portfolios is cross correlation. Cross correlation refers to the extent to which performances of different asset classes move in relation to each other. The lower the correlation among different indexes in a portfolio, the greater the diversification, which means lower volatility of returns.

If indexes are highly correlated, then their prices are responding to market news in the same direction at the same time. Market news that affects prices in all markets, include the overall strength of the U.S. economy, consumer confidence, the level of interest rates and expectations for inflation rates. A low correlation means that market prices of different indexes react in different directions to the same news. These indexes have market price movements that are not connected, showing a low similarity in movement to each other.

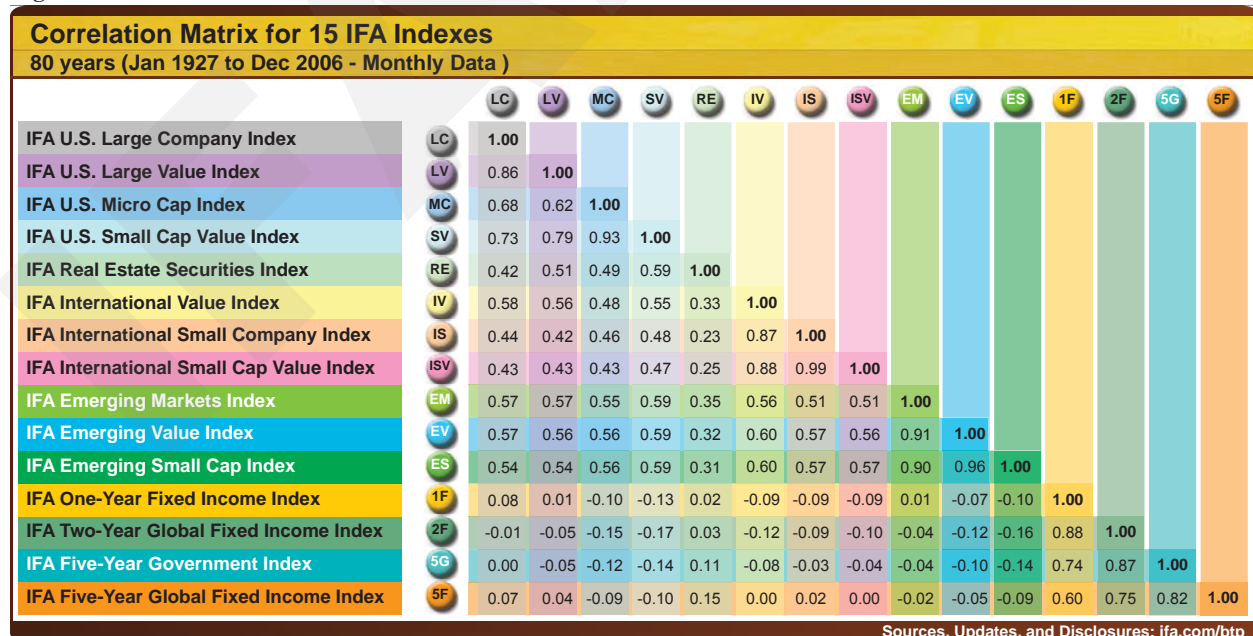
For example, large company stocks and small company stocks historically have a low

Table 9-5

Private Equity Strategies 20 Years - Jan. 1986 - Dec. 2005	
Asset Class	Return %
IFA Emerging Markets Value Index	21.0%
IFA Emerging Markets Index	20.5%
Early/Seed Venture Capital	20.4%
All Venture Capital	16.5%
IFA U.S. Small Value Index	14.3%
All Private Equity	14.2%
IFA Index Portfolio 100	13.9%
Later Stage Venture Capital	13.5%
Buyouts	13.3%
IFA U.S. Micro Cap Index	12.8%
IFA U.S. Large Value Index	12.8%
IFA U.S. Large Company Index	11.7%
Mezzanine Financing	8.9%

Source: Thomson Financial/National Venture Capital Association
Sources, Updates, and Disclosures: ifa.com/btp

Figure 9-5



correlation. As seen in Figure 9-5, large company stocks and one-year fixed income stocks have a very low correlation of 0.01, which means that there's almost no correlation between the market price movements of these two asset classes.

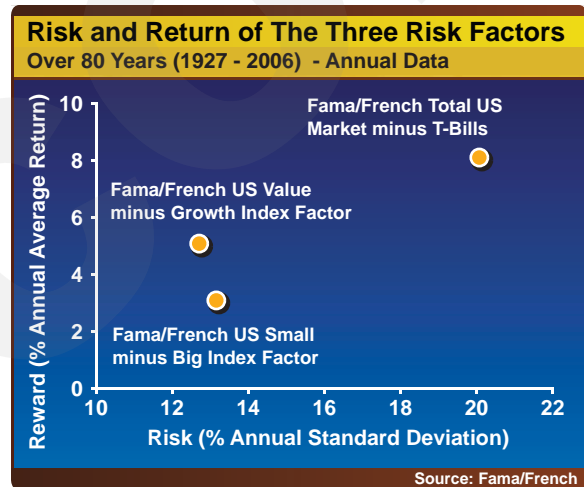
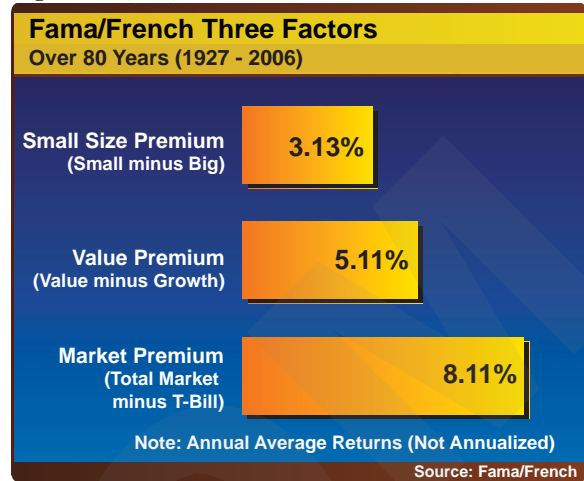
The next best diversifier of risk is low positive correlation among asset classes in a portfolio. By designing the proper mix of low correlation index funds, it is possible to lower a portfolio's risk and increase its risk-adjusted return at the same time. More historical data on the correlation among indexes found in the global financial markets appears in Figure 9-5.

The data in Figures 9-6, 9-7 and 9-8 is attributable to the three risk factors documented by Eugene Fama, Kenneth French, and Jim Davis. These factors are used in a multiple regression analysis to risk adjust returns of other investments and to establish the cost of capital of firms that sell their equity. Remember that a firm's cost of capital is equal to the investor's expected return. The Fama/French data indicates that these three factors explain 95% of stock returns in diversified portfolios. In those calculations, average instead of annualized returns are used. The average annual returns of these risk factors are known as the risk premiums.

A Comparative History of Several Indexes using Rolling Periods

At times investors doubt whether the fundamentals of capitalism and the relationship between risk and return will hold up in the future. For example, the August 13, 1979 issue of *BusinessWeek* featured this question on the cover: "Are Equities Dead?" After 10 years of lousy performance, it really must have appeared that way. For the 11-year period of 1969 to 1979, the S&P 500 average annual compound return

Figures 9-6, 9-7, 9-8



Fama/French U.S. Index Returns 80 Years (1927 - 2006)			
U.S. Indexes	Growth of \$1	Annualized Return	Annualized Standard Deviation
Fama/French US Small Cap Value Index	\$50,970	14.51%	29.94%
Fama/French US Micro Cap Index	\$18,148	13.04%	33.22%
Fama/French US Large Cap Value Index	\$6,222	11.54%	25.99%
Fama/French US Large Company Index	\$2,761	10.41%	19.24%
Fama/French Small Cap Growth Stock Index	\$1,257	9.33%	28.68%
Fama/French Large Cap Growth Stock Index	\$1,265	9.34%	18.90%
One-Month Treasury Bills	\$18.61	3.72%	0.88%
Inflation (US Consumer Price Index)	\$0.09	3.10%	1.85%

Sources, Updates, and Disclosures: Fama/French and CRSP

was only 4.5%. And, it was even worse, 3.2%, for the more than seven-year period of 1973 to 1979, just before the article. These kinds of returns made it seem as if stocks were no longer a viable investment. Thus, many investors decided to invest only in Treasury bills, which outperformed stocks for both periods, and avoid the risk of stocks. Of course, the concern that the fundamental relationship between risk and return wouldn't hold up was as ridiculous then as it is now.

An analysis of multiple year rolling periods offers an interesting way to sort out these kinds of concerns. For example, if you look at Figure 9-11 you will see that we have 841 ten-year periods shifting one month at a time, over the 80 years from 1927 to 2006. Of those 841 periods the S&P 500 Index outperformed T-bills 85.7% of the time. In the 721 twenty-year periods it outperformed T-bills 100% of the time. And in the 949 one-year periods, it outperformed only 68.2% of the time. This brings to mind Benjamin Graham's famous observation that, "In the short run, the market is a voting machine, but in the long run it is a weighing machine."

Figures 9-9 through 9-16 offer numerous comparisons of this kind of data and they are very helpful in understanding the comparisons of various indexes. Figure 9-16 shows that large value does not always outperform large growth stocks. In fact, the size and value risk factors come and go unpredictably. This is consistent with the Random Walk Theory of changes in stock prices. In addition, the cycle of good or bad returns for small company stocks compared to large company stocks can last for many years.

A Comparative History of Market Cap Deciles

Figure 9-17 clearly lays out the history of the size effect. The several charts break out a number of time periods in history to illustrate the diversifying power of small-cap stocks. This chart is created using CRSP market capitalization data broken down into one-tenth size buckets, referred to as deciles. All 10 deciles are then measured and charted in different time periods. It illustrates that especially in shorter periods, small company stocks don't always outperform large company stocks, but as seen in the top left chart, over the whole time period of 1927 to 2006, there is a clear advantage to have some exposure to small companies. But, in shorter periods anything can happen. For example, during the five-year period of 2002 to 2006, small company stocks widely outperformed large company stocks, while during the seven-year period of 1984 to 1990, and six years from 1994 to 1999, large-cap stocks were the king of the hill.

The Returns Matrix

The use of a returns matrix is yet another interesting way to look at long-term data. Figures 9-18 and 9-19 bring together annual and annualized returns covering every combination from 1927 to 2006 for an Index Portfolio 90 (see Appendix A). Because the matrix is so large, it is spread out over two pages. This big triangle identifies the years along all three borders. The intersection of any two years shows the annualized return over that period. The diagonal lines show one year returns on the first diagonal and rolling period returns can be found on each diagonal line below the first one. For example, the second gray diagonal shows five year rolling periods from 1927 to 2006. The very bottom left hand corner shows the annualized return over the entire 80-year period, which is 12.1% for Index Portfolio 90.

Figure 9-9

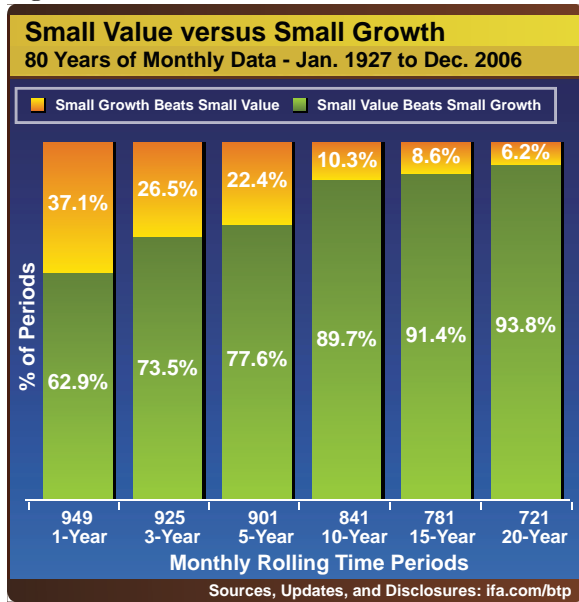


Figure 9-10

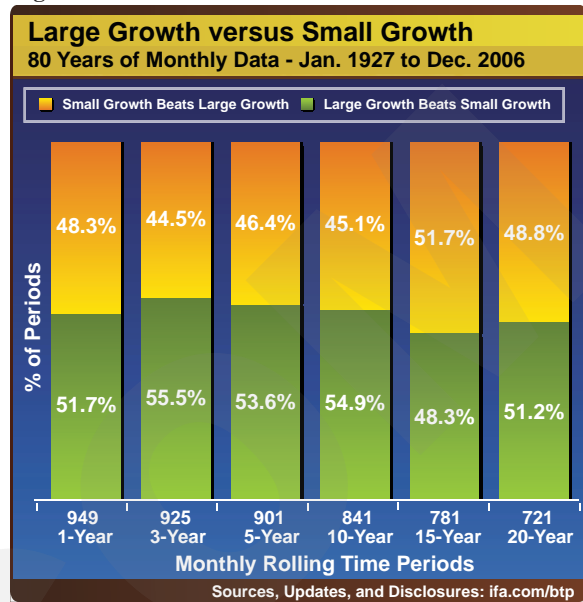


Figure 9-11

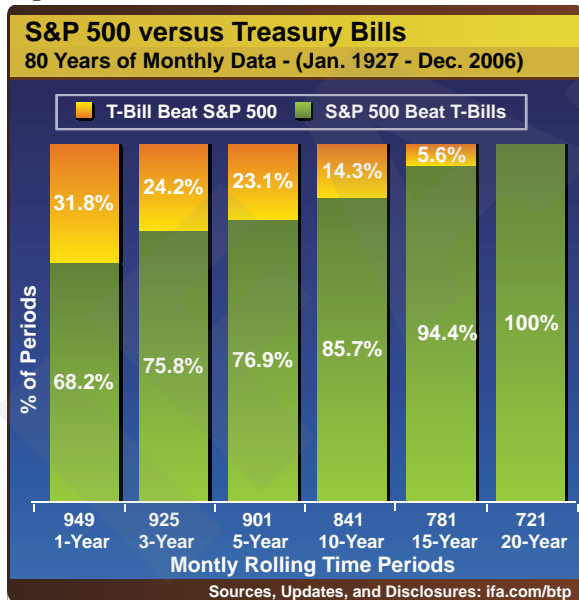


Figure 9-12

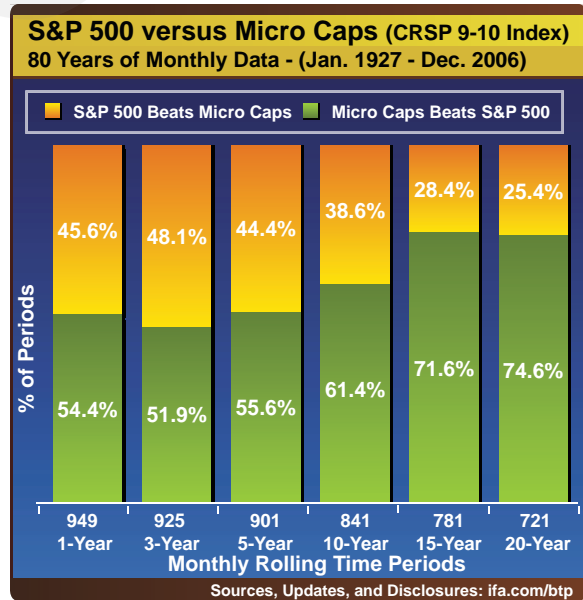


Figure 9-13

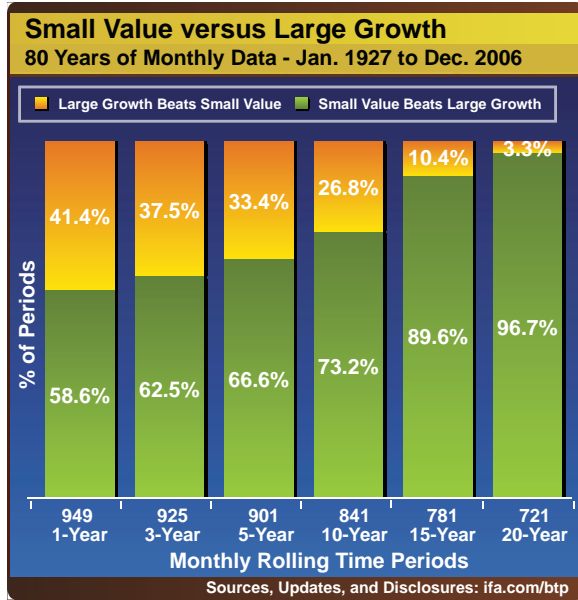


Figure 9-14

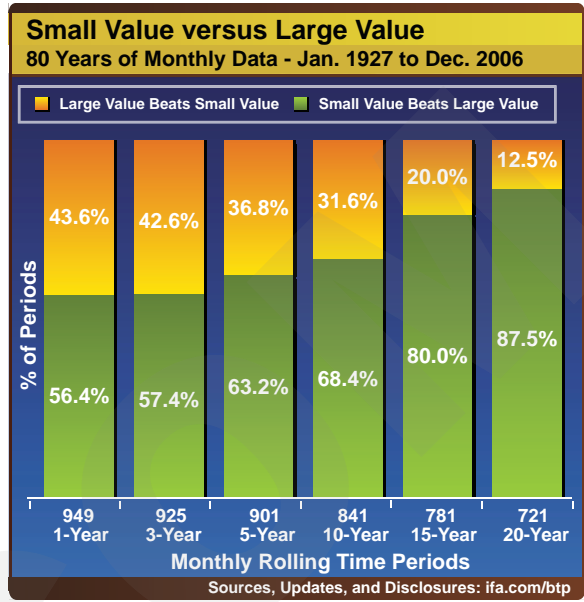


Figure 9-15

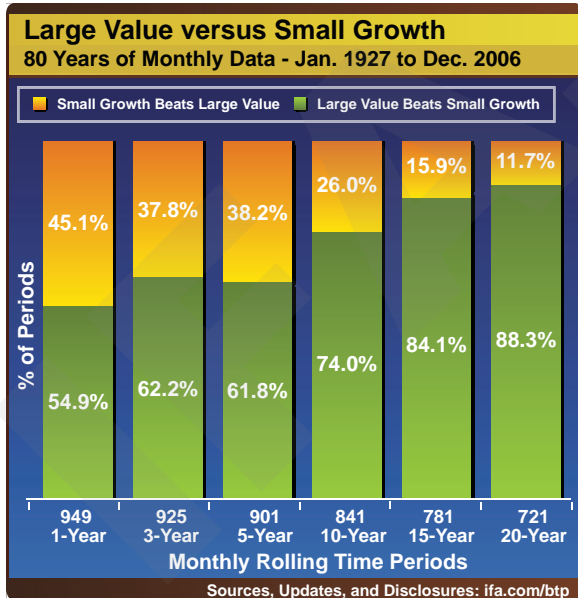


Figure 9-16

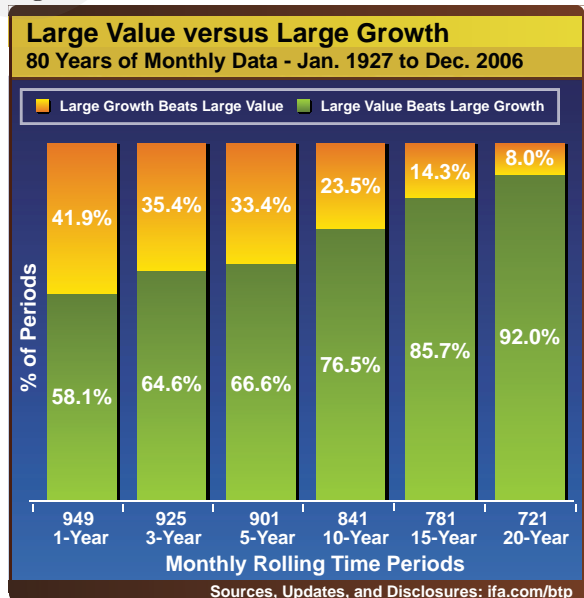


Figure 9-17

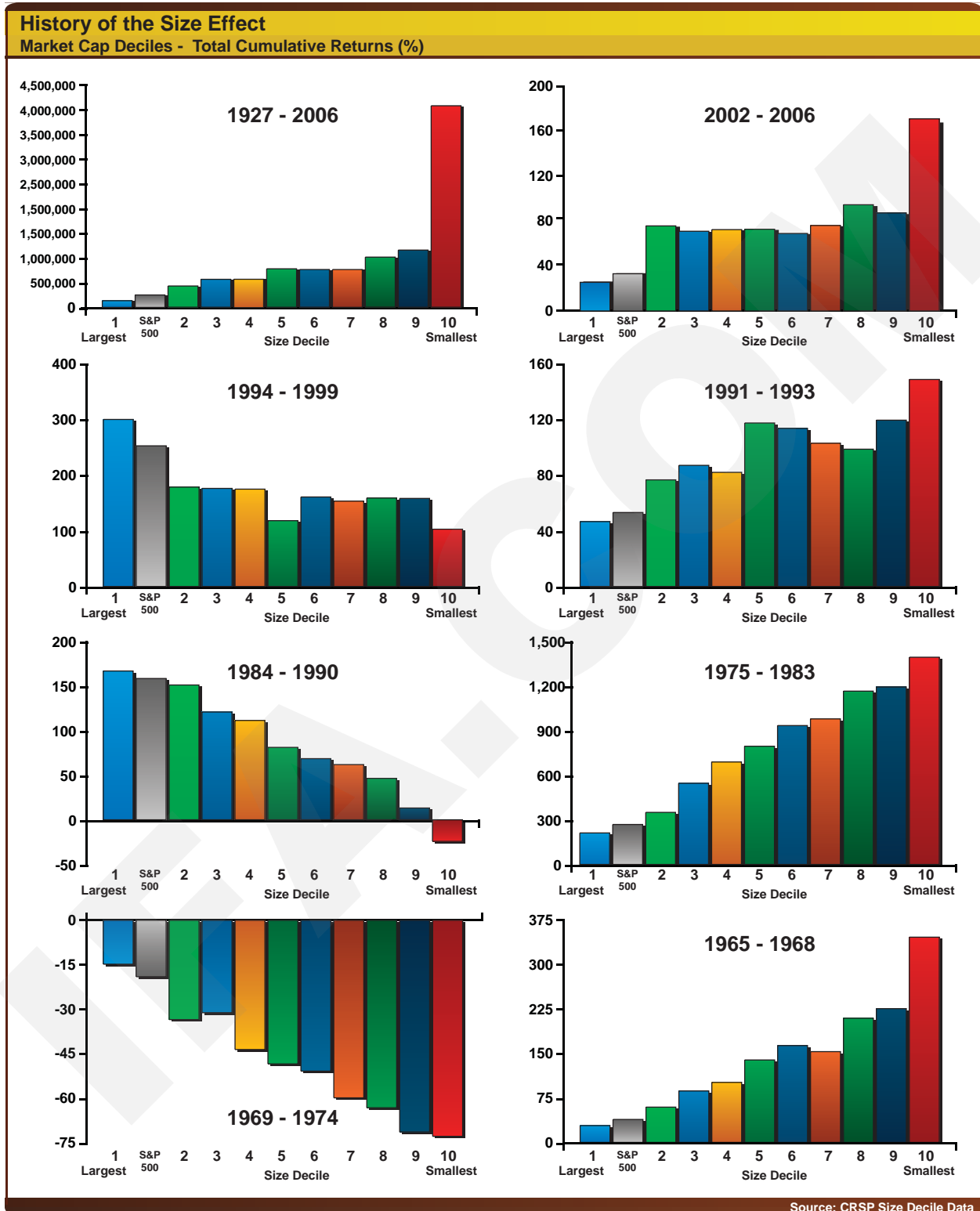


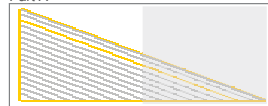
Figure 9-18

Index Portfolio 90 Gold

Annualized Returns Matrix (%)

80 Years of IFA Index Portfolio 90 (1927 - 2006)
Returns Net of IFA and DFA fees

Part A



1927	31.4	1928	31.4	1929	35.5	1930	35.5	1931	35.5	1932	35.5	1933	35.5	1934	35.5	1935	35.5	1936	35.5	1937	35.5	1938	35.5	1939	35.5	1940	35.5	1941	35.5	1942	35.5	1943	35.5	1944	35.5	1945	35.5	1946	35.5	1947	35.5	1948	35.5	1949	35.5	1950	35.5	1951	35.5	1952	35.5	1953	35.5	1954	35.5	1955	35.5	1956	35.5	1957	35.5	1958	35.5	1959	35.5	1960	35.5	1961	35.5	1962	35.5	1963	35.5	1964	35.5	1965	35.5	1966	35.5	1967	35.5	1968	35.5	1969	35.5	1970	35.5	1971	35.5	1972	35.5	1973	35.5	1974	35.5	1975	35.5	1976	35.5	1977	35.5	1978	35.5	1979	35.5	1980	35.5	1981	35.5	1982	35.5	1983	35.5	1984	35.5	1985	35.5	1986	35.5	1987	35.5	1988	35.5	1989	35.5	1990	35.5	1991	35.5	1992	35.5	1993	35.5	1994	35.5	1995	35.5	1996	35.5	1997	35.5	1998	35.5	1999	35.5	2000	35.5	2001	35.5	2002	35.5	2003	35.5	2004	35.5	2005	35.5	2006	35.5
------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------

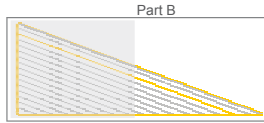
Sources, Updates, and Disclosures: ifa.com/bip

Figure 9-19

Index Portfolio **90** Gold

Annualized Returns Matrix (%)

80 Years of IFA Index Portfolio 90 (1927 - 2006)
Returns Net of IFA and DFA fees



1-Yr	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
5-Yr	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006												
10-Yr	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006																				
15-Yr	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006																									
20-Yr	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006																													
25-Yr	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006																																		
30-Yr	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006																																						
35-Yr	2000	2001	2002	2003	2004	2005	2006																																											
40-Yr	2004	2005	2006																																															

How to read the Annualized Returns Matrix: You can locate the annualized compounded rate of return for this simulated Index Portfolio for a designated time period by following these easy instructions: Locate the column for the beginning year of the period. Years are labeled at the top and the bottom of each column. Then, locate the ending year of the period on the left-most vertical column. The annualized return can be found where the first year's column intersects with the ending year's row. IFA advisory fees of 0.9% per year and DFA mutual fund expense ratios have been deducted from these results. The 10-Yr diagonal (highlighted, starting from far left column) represents the estimated average holding period for investors who score 90 on the Risk Capacity Survey at ifa.com. Sources, Updates, and Disclosures: ifa.com/bmp.

Sources, Updates, and Disclosures: ifa.com/bmp

9.5 SUMMARY

A good understanding of the long-term historical risk and return of various indexes enables an investor to know how to construct an efficient asset allocation according to risk capacity. Risk and return will work themselves out or revert to the mean over the long run. In the meantime, the best bet is to diversify among index funds that are structured for optimal exposure to risk factors that history has shown to be most rewarding.

9.6 REVIEW QUESTIONS

1. Stock markets are best characterized when looking at:
 - a. one-year periods
 - b. five-year periods
 - c. eighty-year periods
 - d. three-year periods
2. The long-term characteristics of indexes are important because:
 - a. they better reflect the differences between capital and capitalism
 - b. margin rules are the same throughout history
 - c. favored industries change with time
 - d. the law of large numbers is not applicable to market returns
3. Many high net worth investors try to get allotments of venture capital partnerships. According to Morgan Stanley, over a 48-year period venture capital had a 16% return and a 35.4 risk index. Emerging market equities over the same period had the following:
 - a. 4.9% return, 26 risk
 - b. 16% return, 29.6 risk
 - c. 5.4% return, 6.2 risk
 - d. 12.7% return, 8.2 risk
4. Many people look at 80-year risk and return data and say that it is not relevant to them because they don't have 80 years to invest. This is faulty logic because:
 - a. the basic concept of sampling error means short-term data is worse than long-term data.
 - b. three years of data contains a large sampling error.
 - c. one year of data has no predictive value on the following year's data.
 - d. five years of data have little predictive value on the following year's data.
 - e. all of the above
5. The index with the highest return since 1927 is:
 - a. large growth index
 - b. large value index
 - c. small growth index
 - d. small value index
 - e. total market index