

Fischer Black  
on  
MARKETS

Vol. 1, No. 5  
April 12, 1976

WHY AND HOW DOES AN INVESTOR DIVERSIFY?

You diversify to reduce risk; to reduce your exposure to large losses. With many stocks, you hope that when some go down, others will go up, or will go down less, so your overall loss will not be too great. With only a small fraction of your portfolio in any one stock, you know that if a company goes out of business, your loss will be limited. All of that is clear.

What's not so clear is that you also diversify to increase the amount you expect to gain from your portfolio; to increase the portfolio's expected return, including dividends, interest, and capital gains. At first, this may seem odd, because diversification limits the possible upward moves in a portfolio to about the same extent that it limits the possible downward moves. It works, though, because you can hold more of a well diversified portfolio than you can hold of a badly diversified portfolio. If the bad things that can happen to a portfolio are limited, you can hold more of it.

The total amount of money that you have to invest is, of course, limited. When I say you can hold more of a portfolio, I mean that you can hold less in bonds and more in stocks, or that you can borrow to buy more stocks, or perhaps that you can hold riskier stocks in a well diversified portfolio than you can hold in a badly diversified portfolio. And investors can generally expect more from risky stocks than from safe stocks.

Since every stock has to be held by someone, every stock must be priced so that it fits into at least some portfolios. This means that a portfolio containing all the stocks there are will be quite attractive, if the costs of putting together such a portfolio are low. Since all the outstanding shares of every stock have to be held by someone, such a portfolio would contain more of a large company's stock than it would contain

of a small company's stock. It would be a "market portfolio."

You don't really have to hold a piece of every stock to be holding something like the market portfolio, though. Because almost all stocks tend to go up and down together, smaller portfolios can be built that will behave very much like the whole market. We can imagine everyone holding a different portfolio, but the different portfolios acting so much alike that each has behavior very similar to that of all portfolios taken together.

While it is possible to build portfolios that will behave very much like the market, it is also easy to build portfolios that will have returns that differ greatly from the market's return from time to time, even though the portfolios contain lots of stocks. Just concentrate the portfolio in stocks with a history of growing earnings; or in high technology stocks; or in stocks that seem less sensitive to the cost of energy than other stocks. Almost any systematic rule for picking stocks will give a portfolio that will act rather unlike the market at times.

It's also hard to know when you have a portfolio that acts like the market. The market contains not only listed stocks, but also unlisted stocks, stocks that trade very infrequently, corporate bonds, assets of businesses that aren't incorporated, and personal assets such as real estate. It even includes, to some extent, human capital, government bonds, and foreign assets. It's very hard to guess what many of these assets are worth at any one time, and it's even harder to know how much they have gone up or down.

There is reason to believe, though, that a diversified portfolio of listed stocks (like the Standard & Poor's 500) will act very much like the market portfolio we can't see. The very largest companies in the U.S. make up a very significant part of the whole U.S. economy; and the factors that influence their values also influence the values of small companies and personal assets. Similarly, the U.S. economy makes up a very significant part of the world's economy, and the factors that influence it also influence the rest of the world.

It is the individual who is interested in diversification more than anyone else. A corporation's assets need not be diversified if its shareholders have diversified portfolios. Even a mutual fund need not be diversified if it makes up only a small part of any individual investor's risks. It is the individual, in the end, who wants to balance one risk against another.

There are some risks, though, that an individual has little control over. Once he has trained for an occupation, and spent years developing the skills and experience that make him good at it, he can shift to another occupation only at great cost. While he can make many small shifts within his occupation, he must normally take the risk of his occupation as given. He may also take as given the risks of changes in the value of the home he owns, and certain general risks such as the risk that the earth will be destroyed by a comet.

Some of these risks are rather significant for an individual. If he takes them as given, he may be relatively unconcerned about the precise extent to which his portfolio of common stocks is diversified. A substantial reduction in the risk of his common stock portfolio may mean only a small reduction in the risk of his overall portfolio.

An individual will care about specific risks as well as about some measure of the overall risk of his portfolio. He may be especially concerned about inflation, or about the cost of food, or about the cost of housing. If so, he may want to have positions that will pay off when things go badly along one of these dimensions. He may want an asset that goes up in value when the cost of the kind of housing he likes goes up, for example. If any asset like that is available.

An individual may even care about doing well when his neighbors or friends or coworkers do well, and he may not mind so much doing badly when they do badly. If so, he may want to have the same kinds of risks they have. If they have investments in rural land, he may want investments in rural land, even though that may mean a poorly diversified portfolio by the usual measures of diversification.

Even if an individual decides he wants a very well diversified overall portfolio, he still has a big decision to make. He has to decide how much of that portfolio to hold: how much risk he wants to take. And he must make this decision both now and in the future. He must decide over and over again how much risk he wants to take, in the light of what has happened and what might happen in the future.

In other words, he needs a strategy for changing his position over time. One of the elements of this strategy is likely to be that he will want diversification across time as well as diversification across assets. "Time diversification" is often just as important as diversification across stocks. It helps because what happens to the market in one period is largely independent of what happens to the market in some other period. In fact, adding a stock to a portfolio may not help to diversify the portfolio much, if there are other stocks like it already in the portfolio. But adding investment in a different time period always helps, because with the market, every time period is different from every other.

To illustrate, suppose you have a choice of the following strategies:

- A. Invest \$1000 in the market at the start of year 1. Whatever happens in year 1, bring your investment to \$1000 again at the start of year 2. Evaluate your position at the end of year 2.
  
- B. Keep all your money in short term bills during year 1. Invest \$1400 in the market at the start of year 2. Evaluate your position at the end of year 2.

It turns out that the uncertainty in what you will have at the end of year 2 is about the same for these strategies. With strategy A, you have \$1000 at risk for each of two years, but large losses are unlikely because a loss

in one year may be offset by a gain in the other. With strategy B, you have \$1400 at risk for only one year. If year 2 is a bad year, you're out of luck.

So the two strategies have about the same risk. But strategy A has a higher expected return. If the market is expected to return 6 percentage points more than short term bills, the expected gain from strategy A is \$120 more than the gain on short term bills. But the expected gain from strategy B is only \$84 more than the gain on short term bills.

Assuming a basic \$1000 investment, the loss from using strategy B is \$36 over two years, or \$18 a year. This is equivalent to a loss of 1.8 percentage points on your basic investment every year. We can think of this as the cost of poor time diversification. A consistent cost of 1.8% per year is a serious matter. My example is extreme, but it illustrates the potential importance of diversification through time.

This doesn't mean, though, that an individual will want to keep a constant number of dollars at risk all the time. In fact, he will want to change his exposure for all sorts of reasons, ranging from unexpected medical expenses to a gain due to a phenomenal rise in the market in a short time.

If the individual puts money into the market, and never adds anything, but spends say 5% of the value of his holdings each year, then he will have an amount of money at risk that depends on what the market does. If the market suddenly drops 50%, the value of his holdings will drop 50%, so he will have 50% fewer dollars at risk. If the market suddenly doubles, he will have twice as many dollars at risk. This is a perfectly sensible strategy for some people.

Suppose, though, that you want to limit your losses. If you have all your money in the market all the time, then you can lose all your money. If you sell off some of your holdings as the market goes down, and buy them back as the market goes up, shifting the money you get into and out of short term bills, then you will limit your losses. But this method takes

lots of trades, and means that you have to keep a close watch on the market.

Another way to limit your losses is to buy call options. Instead of putting all your money in the market, you can put some in options and some in bills. That can give the same effect when the market goes down as if you had all your money in the market and sold gradually as the market declines.

Options have a habit of expiring from time to time, so a strategy involving options also takes some attention and involves some trading costs. For some investors, though, a strategy with options may cost less than any strategy involving stocks alone. Especially if there's a bonus in the form of tax gains from options trading.

For every buyer of options there must be a seller. The seller does not limit his losses as much as he would with other strategies. So he must have some other reason for selling. He may have tax reasons; he may be taking a naked short position as a substitute for shorting the stock; or he may think the option is overpriced. But it may simply fit the way he likes to adjust his position over time.

When things go badly, some people react by doubling their bets. They increase their exposure to risk in hopes of recouping their losses. On the other hand, when things go well they may reduce their exposure to risk so they can't lose what they have won. It's a very common gambling strategy and it's a very common philosophy of life.

The person who writes covered options may be doing just that. He starts out with a fairly conservative position. Some of what he loses on his stock position he will make on his options position, and vice versa. But if his stocks go down, the protection he gets from his options is cut back. And if his stocks go up, his position may become almost perfectly safe, because his gains and losses on his stocks may be offset almost one-for-one by his losses and gains on his options. Or his stocks may be called away.

Again, he can use a similar strategy with stocks alone. He can buy more stock

as the market declines, and sell off stock as the market goes up. Whether options fit into the best strategy will depend on factors like convenience, trading costs, the pricing of options, and taxes. Strategies involving options, though, illustrate the variety of strategies that can be consistent with good diversification over time.

If you have any questions or comments, please call me at 617-253-6691, or write me at 50 Memorial Drive, Cambridge, MA 02139.