After Thorp beat the blackjack dealers in Las Vegas, he took his gambling savvy to an even bigger casino—Wall Street.

Arbitrage in its pure form involves exploiting differences in the price of the same good in separate markets. If an ounce of gold sells for $1,210 in London and $1,200 in New York, an arbitrageur can short gold in London while buying it in New York, earning the $10 discrepancy in price (minus expenses). The stock market offers similar opportunities. If an exchange-traded fund representing the S&P 500 trades at $2,200 while the prices of the individual 500 stocks convert to a value of $2,150, a profitable arbitrage trade is possible. Building his own option pricing model, Mr. Thorp would pounce on any discrepancy revealed by his mathematical formulas. The arbitrages he used included exploiting the value of options traded in Chicago on individual stocks and the prices of the underlying stock in New York.

Princeton Newport was very successful until some of its traders got caught up in the prosecution of Michael Milken in the 1980s. The five top people in New York and Princeton, N.J. (who refused to help convict Milken) were indicted by New York's U.S. Attorney Rudy Giuliani on various charges, including stock manipulation and tax fraud. Though most of the charges were later dropped, the prosecution spelled the end of Princeton Newport.

The rest of "A Man for All Markets" covers a variety of topics, all associated with investing and life. There is a chapter on swindles and hazards, including the Madoff Ponzi scheme and how it worked. We learn lessons from financial crises: e.g., the need to price mortgages more reliably by including catastrophic "black swan" events in their predicted default rates. In a section on asset allocation Mr. Thorp notes that "investors who chase returns, buying asset classes on the way up and selling on the way down, have had poor historical results." Throughout, he emphasizes the importance of containing risk and avoiding excessive leverage. Perhaps his best advice is a maxim that has nothing to do with material wealth: "Whatever you do, enjoy your life and the people who share it with you, and leave something good of yourself for the generations to follow."

Mr. Thorp goes out of his way to criticize the academic view that our securities markets are reasonably efficient. He cites the story of the finance professor admonishing his students not to pick up a $100 bill on the ground because if it was really a $100 bill it wouldn't be there. Of course markets aren't perfectly efficient, any more than a well-built mechanical engine is perfectly efficient. Arbitrage opportunities do appear from time to time and can be exploited.

But one implicit lesson of Mr. Thorp's memoir is that, as arbitrage opportunities are exploited, they tend to disappear and pricing becomes more efficient. Casinos changed their rules when the card counters invaded. When option traders entered the market with hand-held computers, the option trades that Mr. Thorp made became less profitable. Over time, hedge funds lose their edge as opportunities for arbitrage are exploited with more money and returns diminish. Perhaps the finance professor's story should be restated: "Pick up the $100 bill right away because if it is really a $100 bill it will not be there for long."

Mr. Malkiel, chief investment officer of Wealthfront, is the author of "A Random Walk Down Wall Street."