The equity premium, which is the average return to stocks over Treasury bills, has appeared to be about 6 percent in the United States over the past century. This number is too big for theory according to the standard utility functions, and there are many papers produced each year trying to solve this puzzle. The excessive risk premium is in contrast to the lack of any equity premium one finds within equities or anywhere else, in that here we see too high a risk premium, where almost everywhere else we see none, if not a negative premium. Thus, it is a somewhat comforting puzzle for financial researchers: Here is a price of risk that makes some intuitive sense, even if too high, and it applies to the signature risk asset in the economy, the stock market.

I argue that the equity risk premium is like the Beardstown Ladies’ putative investment success. The women had claimed that their investment club had earned an average annual return of 23.4 percent from 1984 to 1994, and published five folksy books that mingled recipes like five-hour stew with investment tips. In 1998, an article in Chicago magazine asserted that the group’s stated returns had included the new investments made by its members, and that when computed in conventional fashion, their annual rate of return was actually 9.1 percent, well below the 17.2 percent return of the aggregate market over the same period. Such are the vagaries of investing, as all sorts of biases inflate returns, and the source of returns usually has little incentive in meticulously adding up all those expenses, because for many the psychic benefits of thinking they are outperforming the indexes is worth a couple percent a year in actual returns.

To recap the equity premium puzzle, in 1985 Mehra and Prescott documented that for any value of the preference parameters that generate an expected real return to Treasury bills of less than 4 percent (very likely), the risk premium is less than 0.35 percent annually.\textsuperscript{1} Given standard estimates of consumption volatility and growth, 0.35 percent is, in practice, empirically indistinguishable from zero percent, so my assertion that the equity
risk premium is zero is really not so radical as a mere numerical estimate, in that the common observation that the equity premium is 6.0 percent is about as many standard deviations from my null hypothesis, as the standard null hypothesis is within Mehra and Prescott and their considerable legacy. But there is a major difference, in that those working within the standard approach seek a solution, a revised theoretical estimate, within the system that rises to something intuitive like 3 to 6 percent, whereas my approach argues no hope for raising the real expected risk premium.

This equity premium was my main block, why I could not explain the simultaneous absence of a risk premium within equities and an equity risk premium. A free lunch seemed to exist, whereby one could get beta returns simply by going long a 0.5 beta stock, shorting a 1.5 beta stock, generating a beta of negative 1, which since 1962 has generated a zero return. Thus if we add this position to one long the market, which has a beta of 1, you have a market return at zero beta! If the equity premium is positive, you make positive expected return at zero risk. Why wouldn’t everyone do this? Well, maybe they should, but there are many slips between cup and lip.

Mehra and Prescott’s seminal paper on the equity premium puzzle estimated a U.S. risk premium of 6.2 percent using 1889–1978 U.S. data. The 1996 edition of the popular Brealey, Myers, and Allen finance textbook presented an 8.4 percent risk premium, but by 2001 Ivo Welch surveyed academic financial economists and found the average equity premium was 7.0 percent in 2000, and 5.5 percent in 2001. In 2002, the American Institute for Management and Research sponsored a forum on the equity risk premium with several well-known researchers of this issue, and those offering a forward-looking premium generally estimated a mean of 3.0 percent. This is in line with the real-model generated estimates of Fama-French (2002) and Blanchard (1993), of around 3.5 percent. As the top-line return on the S&P500 was basically zero from August 1998 through January 2009, the equity return premium is sure to be revised downward by this group yet again. Thus, in the past 20 years the equity premium has been cut in half, and so my proposal that it is actually zero is in line with previous adjustments in this number.

The specific drivers that would lead us to zero are several, and to my knowledge no empirical researcher has addressed all of them simultaneously, making them highly probable in theory. But my interest in this adjustment is highly influenced by personal experience. In 1987, the Friday before Black Monday, in my first securities purchase ever, I bought a put on the most out-of-the-money put option I could find on the S&P100 index. I had noted that interest rates were climbing, and the Fed was staying tough, trying to defend the dollar, and after listening to Hyman Minsky keep telling me that
we are always on the brink of a market collapse, especially when the Fed is tightening, I figured it was a good investment. After the biggest 1-day drop in history, my insanely fortunate market timing had turned my $3,000 nest egg into $44,000. I was rich! I then imagined using my investing savvy to become independently wealthy right away.

I figured, big picture calls were good, but I could make them even better by looking at individual stocks, where presumably there is even more inefficiency. So I bought Value-Line's listing of stocks, which ranked them from one to five. I then figured, since the Fed had eased, following Minsky logic, no Depression, in fact, the market should rebound. I then put all my money into out-of-the-money calls. The problem was, I was taxed about 40 percent on my windfall, so I had only $25,000 left the next year. I proceeded to buy calls on individual stocks, and even as the general market rose 27 percent in 1988, I lost most of the money left, primarily crossing the bid-ask spread in these illiquid equity option transactions. The market makers in the equity option pits skinned me alive, as I would buy a call for $3/4 and sell it for $1/4 (they quoted in fourths then), a round trip that over time guaranteed failure. The net effect of taxes and transaction costs through a naïve understanding of trade execution, gave me close to a cumulative zero percent return, even though my big picture forecast was spot on during the most extreme event in stock market history, and my arithmetic return was still well over 500 percent.

I had a large amount of good fortune in that span, but still generated a modest return. Yet, such costs are rarely mentioned, let alone prioritized. Ignoring these issues seemed like, well, looking at your pre-tax top line revenue as if it were money in the bank.

GEOMETRIC VERSUS ARITHMETIC AVERAGING

Remember, the size effect, initially, was found to be on the order of 20 percent between the smallest and largest stocks using daily data. Yet, it was quickly discovered that if you merely used monthly data, that then cumulated the returns as they bounced up 100 percent and down 50 percent every day, cutting this effect by more than half. De Bondt and Thaler prominently discovered that stocks tended to mean-revert, using the past three years' return as the explanatory variable. Yet, the past three years' losers invariably had such low prices, the difference between the arithmetic and geometric average explained this result. Finally, it should be noted that the infamous hedge fund Long-Term Capital Management had an arithmetic annual return of slightly above zero in their four-year existence, but they are
widely noted as a failure, more consistent with their \(-93\) percent cumulative return, or a \(-47\) percent geometric annual average. All numbers are correct, but the geometric is clearly more meaningful.

It has already been mentioned that the geometric average return is the buy-and-hold return, where the arithmetic average assumes one rebalances a portfolio at the frequency of the return data. Thus, the common use of monthly returns is an overstatement to the extent monthly returns are used to present data. Since stock index returns have an annual standard deviation of about 20 percent internationally, the predicted difference is variance divided by two, which in this case would be \(0.22/2 = 0.02\), or 2 percent.

This closely matches the difference in the geometric versus arithmetic return internationally over the past 100 years as documented by Dimson et al. (2006), a 2 percent reduction for geometric averaging. This is a lower bound, because as most investors are highly undiversified—they do not invest, their volatility is at least 50 percent higher, implying a 4.5 percent adjustment.

**SURVIVORSHIP BIAS**

There is a bias of using one of the most diversified and successful equity markets in the world, the United States, where most of the leading financial academics work. Brown, Goetzmann, and Ross (1995) claim that survival of the series imparts a bias to ex post returns. For example, in countries such as Czechoslovakia, Hungary, Poland, Russia, and China equity investors at some point lost 100 percent of their equity investment, a data point that significantly affects geometric averages. They show that an ex ante equity premium of zero can generate a high ex post positive premium by simply conditioning upon the market surviving an absorbing lower bound over the course of a century.

Jorion and Goetzmann (1999) address this issue by expanding the sample by collecting additional cross-sectional data. Using real return data for 39 countries over much of the twentieth century, they include not only markets that survived, but also those that experienced both temporary and permanent interruptions. This approach generates a reduction in the risk premium of 350 basis points compared to using the U.S. time series alone.

A different look at similar data gives a very different answer, however. Dimson, Staunton, and Marsh (2006) estimate the survivorship bias by looking at the entire world portfolio and value-weight the returns by country. This approach generates an estimate around 20 basis points because the size
of the better-performing countries was generally larger, and the average of annual returns across the world is less volatile, and thus has a higher geometric mean than the averages of more highly variable time-series returns for individual countries. Thus, survivorship bias can be interpreted as trivial or large, depending on whether one thinks we should consider each country as a data point with equal weight (3 percent), or look at the globe as a giant market portfolio (0.2 percent); whether we equal weight, or value weight the world portfolios. Reasonable people can disagree as to which adjustment is most appropriate, generating a meaningfully different estimate looking at the same data.

**PESO PROBLEMS**

The Peso problem is related to survivorship bias, but different because it tries to address the estimate of the probability of a large collapse by merely calibrating the probability of such a collapse that would explain the equity premium of, say, 3 percent. It turns out that this probability need only be very small, so small it is quite probable that it would not be observed in sample. Rietz (1998) calls this a “Peso problem” in that it represents a small probability of a large catastrophe, like when the Mexican peso fell 75 percent in 1982, and caught most investors completely off guard.\(^{11}\) If a market has a 2 percent chance annually of falling 75 percent, you might not see this in a century, but it affects your geometric expected return by 3.13 percent. If you looked at the historical price variability of the peso, this was a statistical improbability so small as to be inconceivable, but such are the real-life vagaries of financial time-series, the fat tails. Major disruptions have afflicted nearly all the markets in their sample, with the conspicuous exception of the United States, which is often used to represent the market.

This approach relies on small probability events that make it difficult to quantify, however, and an assumption about whether catastrophe generally involves debt and equity going to zero (as in Russia), or just equity generating severe declines as in the Great Depression (see Mehra and Prescott [1988]).\(^{12}\) Robert Barro (2006) argues a correct probability of a significant catastrophe explains much of the equity premium, about 300 basis points.\(^{13}\) When you are arguing about events that are expected to happen once every 100 years, given our limited data, you can expect they are somewhat irrefutable, and thus also somewhat unconvincing, because one can’t prove that an actual 1-in-100 year event should be considered a 1-in-200 year event, or a 1-in-50 year event, though the difference is material.
ONE-TIME EFFECT OF AN ANOMALOUS POST-DEPRESSION PERIOD

A significant portion of the previous century was due to an increase in valuation ratios that cannot be expected to repeat. For example, if a 10-year bond moves from a 10 percent yield to a 5 percent yield in one year, it will generate a significant price appreciation and thus a greater-than-10 percent return. Prospectively, however, the yield is diminished to 5 percent, and its historical one-year return is clearly a bias of its future expected return. The post–World War II U.S. period dominates the data. In the 1930-to-1955 period with the Great Depression, World War II, and the fear of another great depression, the survival of the capitalistic system was in doubt, and by 2000 these fears were largely gone. The dividend yield (dividend divided by the price) was 7.18 percent in 1951, and only 1.2 percent in 2000.14

Using fundamentals to estimate expected stock returns can get around this bias. That is, one can assume the return on stocks is from the dividend yield, and growth in the dividend. This gets around issues of expected capital gains from reductions in the equity premium that could be biased in our post–World War II sample. This approach generates forward-looking returns around 3.5 percent lower than what is in the historical twentieth-century data for an equity premium.15

ASYMMETRIC TAX EFFECTS

In the United States, the average long-term capital gain tax rate has been around 25 percent, while short-term tax rates are then just like one’s marginal tax rates, and the top marginal tax rates in the United States since 1926 has been around 60 percent.

Investors care about their after-tax return, not pretax, and this is relevant because the tax rate will compress an equity premium. That is, consider a risk-free rate of 5 percent, and an equity return of 11 percent. At a tax rate of 40 percent, the risk-free rate becomes 3 percent and the equity return 6.6 percent, reducing the equity premium from 6 percent to 3.6 percent.

Different countries have different policies, and they generally change a lot over time, so that it is difficult to generalize as to what tax regime the average investor faced in the twentieth century. Furthermore, the demographics of the marginal investor, be he the middle-income investor to whom the tax-loss carry-forward is significant, or the large investor for whom the tax-loss carry-forward is irrelevant, is unclear. Lastly, the volatility of one’s investment strategy is relevant, because if you invest in a risk-free asset,
you can ignore the asymmetries between gains and losses, whereas if the volatility is sufficiently large, proportionately more of the upside goes to the government (you do not get a rebate check for your investment losses).

Given the multidimensional matrix of inputs changing over time, we can only estimate the average effect of taxes on the after-tax return. Jeremy Siegel differentiates between long-term and short-term gains, and the differing tax rate on dividends. He assumes a very modest 5 percent average annual turnover, which I find extremely conservative, given that the average mutual fund has a 100 percent turnover. He calculates that from 1926 through 1997, taxes reduced the equity premium above U.S. Treasury bonds from 5.2 percent to 4.0 percent for the top bracket, and 4.7 percent for the lowest tax bracket, which is a reduction of 0.5 percent to 1.2 percent from the pretax equity premium.

Niall Gannon and Michael Blum modeled the after-tax returns more meticulously. They modeled a portfolio that began in 1961 and saw identical returns to the S&P 500 Index, and assumed a 20 percent annual turnover, on which it paid long-term capital gains tax at the highest rate. The model portfolio also received annual dividends, based on the dividend yield of the index, on which it paid taxes at the highest rate. This generated a 6.72 percent annual return, a 5.28 percent reduction compared to the CRSP NYSE-AMEX market-weighted index as calculated by Kenneth French. During the same time period studied, the Long-Term Municipal Bond Buyer Index had a straight-line average return of 6.14 percent, with about one-third the volatility. That is, the equity premium was reduced to 58 basis points by taxes.

The interesting point here is that this assumed a 20 percent annual turnover. The average stock with a market cap over $100 million trades at about a 200 percent turnover. Now, some of this is by programs, and so a short-timer with a 1,000 percent turnover, averaged with a long-term investor with a 10 percent turnover, averages out to a 55 percent average annual turnover over investors, because the short-term investor will max out his capital gains. Odean and Barber (2000) find that the average individual retail investor turns over his portfolio 60 percent each year. Furthermore, as most equity investors are undiversified, their volatility will be higher than the market, leading to greater losses. Thus, I think Siegel is a lower bound for the marginal retail investor.

**MARKET TIMING**

In analyzing the returns of stock investors from 1950 to 2002, researchers typically refer to an average buy-and-hold return for some widely used stock
index like the Standard and Poor's 500. But consider a different measure of returns, one that weights time periods by how much money was at work. That is, suppose you have a stock that goes from a price of 100, to 200, to 100. The geometric average return is 0 \(|[(1 + 100\%)(1 - 50\%)]^2 - 1 = 0\)|, which makes sense because we started at 100 and ended at 100. But think of an investor buying one share each period. He makes 100 percent on his $100 investment in Period One, but then loses 50 percent on $200 new investment in Period Two, and loses 50 percent on the 100 percent he invested initially. This strategy basically buys too much when the market is high, and too little when the market is low. To the extent market inflows tend to crowd around market peaks, the average return experienced by investors will be less than if we equal weight the periods.

The Internal Rate of Return is defined as the number that when applied to a bunch of cash flows, makes the sum equal zero. In general:

\[
NPV = \sum_{t=0}^{N} \frac{C_t}{(1 + r)^t} = 0
\]

So in this example, we have

\[-100 - 200(1 + r)^{-1} + 200(1 + r)^{-2} = 0\]

Solving for \(r\), you get \(-27\) percent. Thus, if people tend to invest more after a cycle has run its course, and less after a cycle has run through a significant drawback, this suggests this adjustment will lower the estimated return to investors (as opposed to the return to stocks). To the extent one tends to invest at peaks, dollar cost averaging is a useful discipline to avoid this problem, because by putting in a fixed dollar amount each period, you avoid bunching up your investments around periods that have, historically, been investment peaks. If you invest a fixed amount of dollars per year, you avoid the bias. Unfortunately, people do not invest that way in practice.

We know that equity capital tends to flow into the market after superior past returns and preceding poor future returns (Tim Loughran and Jay R. Ritter, 1995; Malcolm Baker and Jeffrey Wurgler, 2000) and the reverse holds for equity outflows (David Ikenberry et al., 1995). Thus it should be no surprise to learn that when you adjust for the inflows and outflows, the return estimated for investors is significantly less than for stock indexes.

Ilia Dichev performed empirical tests concentrated on aggregate national-market specifications to provide a comprehensive investigation of dollar-weighting effects in the United States and around the world over the full available history of stock returns. The results revealed that dollar-weighted returns are systematically lower than buy-and-hold returns. The
return differential is 1.3 percent for the NYSE/AMEX market over the 1926-to-2002 period, 5.3 percent for Nasdaq over the 1973-to-2002 period, and an average of 1.5 percent for 19 major international stock markets over the 1973-to-2004 period, all highly statistically significant.

**TRANSACTION COSTS**

Transaction costs include commissions, bid-ask spread, and trade impact. There is a tradeoff whereby small traders with low trade impact generally have higher commissions, and always cross the bid-ask spread to transact, buying at the ask, and selling at the bid. Large institutions, meanwhile, get volume discounts on their commissions, and have the incentive to invest in systems and personnel that trade in a more patient manner. Algorithmic trading optimizes the size, frequency, and limit order specifications, currently done through a computer-based execution of equity orders by way of direct market-access channels, and these strategies can be optimized through extensive trial-and-error. However, as the institutions generally trade large size, their trade impact—actually moving prices by their volume—is much greater than for individuals. Thus, for both small and large investors, there are unavoidable costs in trading stock.

Brokers make money off all three components of trading costs, and it should not be surprising that they maximize their income given various institutional constraints. Furthermore, brokers mingle opportunities, such as access to IPOs, with commissions, so that an investor has to look at a very broad spectrum when considering his total costs and benefits in any broker relationship. As some brokers advertise $0 commissions, you can be sure they are making money off their customers somehow. The AMEX Broker/Dealer equity index rose at over twice the annualized rate of the S&P500 from 1993 (XBD Index) through 2004, and the price of a NYSE seat has also risen at a faster rate than the S&P500 since 1993. Brokers and floor specialists have figured out a way to squeeze money out of their trading flow even as both average commissions and bid-ask spreads have fallen by about half over this period, a period that included the reappearance of odd-eights quotes for Nasdaq in 1994, and introduction of decimalization in 2002. Clearly a model that supposes explicit commissions and bid-ask spreads are proportional to total costs to traders, and revenue to brokers, is incorrect as a first approximation.

The effect of trade-impact by brokers gaming the system is evident in the mutual fund timing scandal of 2004. It was documented that a minority of savvy traders would take advantage of an institutional quirk whereby one could buy a fund at its closing price after the close that day. For
in institutional funds especially, this means one could buy a Japanese fund when the U.S. market was up a lot, at yesterday’s closing price, even though the odds the Nikkei would open up were much greater than 50 percent. Many people played this game with their 401(k) retirement accounts, but hedge funds jumped in too, giving a fund complex, say $100 million, with the understanding that they could engage in this practice, a clear quid pro quo at the expense of those ignorant of this dilution. Even some of the mutual fund managers were doing this on their own portfolios with their personal money, a blatant breach of fiduciary duty, under the hope that you can spread a scam like this around and no one is the wiser. Zitzewitz (2006) concluded that dilution can cost investors in international stock funds 1 to 2 percent of their assets a year. This arbitrage was from the timers—who knew exactly what they were doing—at the expense of existing fund owners, in the form of dilution. The costs were not explicit for mutual fund owners, because most were probably ignorant of them, but the costs were no less real. Such is the nature of the trade impact and bid-ask transaction costs, as they show up only if you do some work estimating them. Most investors are blissfully unaware of these costs, often merely focusing on the commissions. Indeed, as an institutional investor I have dealt with major investment banks offering algorithms that benchmark against the value-weighted average price (VWAP). When I asked about the price impact, they had no idea what I was talking about. But an algorithm must address both costs, and some beat VWAP by pushing the price so much the total efficiency is worse than with naïve trading. As these investment banks served a large number of institutional clients, I can only conclude most institutional investors do not monitor trade impact.

Kenneth French discussed trading costs in his 2008 American Finance Association Presidential Address, and estimated them to be 0.67 percent of market value, based on average mutual fund expense ratios and adding up revenues of all securities companies registered by the SEC. This method of evaluation excludes many of the issues I address, such as taxes, adverse timing, and peso problems, but the trading costs he estimates, 0.11 percent in 2006, are simply implausible. At Deephaven I was involved with some high-frequency equity strategies (investment horizons less than one month). We had to estimate the trading costs, because on a long/short portfolio, trading every week generates 208 trades a year, meaning a 0.2 percent trading cost annualizes to a 41.6 percent drag on a strategy. Using thousands of transactions, and comparing my fill amount with the price at open when I traded against by fill price, I was able to estimate both a VWAP miss and a price impact, and these varied by the amount we were trading, whether it was a long or a short, whether we were initiating or closing a position, and so on. But our 0.2 percent cost was for someone whose full-time job
involves minimizing this cost, using sophisticated algorithms refined via a large database that is impossible for your average retail investor to create, and direct market access software that retail investors do not have, so hearing that your average trader experienced a fraction of that cost is preposterous. Most traders, especially retail traders, are not measuring, and so cannot minimize this cost, and it is probably an order of magnitude higher for retail traders as brokers play bait and switch with commissions, trade impact, the bid-ask spread, funding costs, and other fees.

The effect of trade impact for large investors is paramount, much greater than commissions or bid-ask spreads. In trade impact, consider a broker who front runs his clients. That is, if I am a broker for a large fund, and note they started to sell out of a stock on Tuesday, given the size of their fund, if they want that position to go to zero they have a lot of selling to do. This is valuable information, and whether I trade in front of it myself (risking detection) or send subtle signals to a friend in an unspoken quid pro quo, it is rare that such valuable information is not exploited to its maximum, at the expense of the institutional trader. Such schemes are virtually impossible to detect.

Odean (1999) and Barber and Odean (2000) used brokerage data to estimate annual turnover at 112 percent and 75 percent, respectively. These same sources estimate commission costs between 1.5 percent and 2.5 percent. This implies a direct cost of between 1.5 percent and 2.5 percent in commissions. Trade impact costs for larger traders probably offset any potential volume discount available to the larger institutions, and many individuals are probably subjected to large phantom costs for their larger trades by savvy brokers, and Carhart (1997) estimates 0.95 percent costs for a buy-sell decision in a mutual fund, which is in the same ballpark.

Barber and Odean (2000) compared investment club actual returns to returns calibrated on closing prices, and estimated that the net effect of these costs was 2.3 to 2.9 percent annually over the period from 1991 to 1997. As large-cap equity funds underperform passive indexes by about 2.0 percent per year (Malkiel, 2003), this is consistent with the idea that collectively, a group without any edge churns through 2.0 percent in costs through all of their trading costs and management fees. If management fees are around 0.7 percent, then trading costs were around 1.3 percent for these institutions, but the 0.7 percent in management fees could be thought of as the cost of accessing the sophisticated trading algorithms of an experienced trader. Total trade impact costs of between 2 and 3 percent seem reasonable for the average investor.

While currently, the lowest-cost passive mutual funds actually have negative costs because they are able to reap the benefits of lending out their long positions in stock loan transactions, these are the exception, the
bleeding edge of low-cost stock access. Historically, and for the average investor, the costs have been considerably greater.

**SUMMARY**

When Dimson et al. published a new estimate of equity returns in 2005, revising the equity premium to a mere 3.5 percent, I e-mailed him and asked about some of these other adjustments that would lower it further. He was quick to respond that some funds actually generate a slight (for example, 20 basis points per year) premium because they are large, and have an ability to make money lending out shares with some market power. That is, a handful of cutting-edge passive funds imply that many of these risks are irrelevant. While true, my point was not that a sufficiently sophisticated investor could not capture most of the observed equity premium by avoiding active investing tactics of all sorts, but rather, that on average an equity investor has encountered these costs, and so in the process has not fared anywhere near as well as the indexes that are supposed to reflect equity investor performance. The equity risk premium is perhaps the most important parameter in finance, because it is our one estimate of the price of risk that can then be extrapolated and interpolated by risk factors. It is the base on which the cost of capital estimates are made, and its seemingly high value suggests to many economists that, while risk measurement within asset classes, or across diverse asset classes, is seemingly impossible, the large equity premium is proof positive that risk begets return, on average.

The return on the stock market is a little like the payout on slot machines in Las Vegas. If you play optimally, your losses are only 0.4 percent in blackjack, if you count cards, slightly negative! But the average person loses 3 percent per hand because they get distracted and do not bet optimally, and tend to gamble longer and more capriciously after they have won. Similarly, if we take a return of 6 percent on U.S. equities as the naive estimate, we have the total list of adjustments listed in Table 6.1.

These are all reasonable estimates, and they add up to an adjustment to the effective equity risk premium well below zero, using reasonable estimates for each of these issues. Most papers address one of these issues and then note that such issues (peso problem, taxes, and so forth) can explain much of the equity premium. An unrecognized implication is that considering all of them simultaneously can explain the equity premium a couple of times over, turning the puzzle that it is too large into a puzzle that it is too negative. Like the evidence against O.J. Simpson in his murder case, you can throw out half, any half, of the evidence, and still get the same result: The
TABLE 6.1 Adjustment to Top-Line Equity Risk Premium

<table>
<thead>
<tr>
<th>Factor</th>
<th>Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geometric versus Arithmetic Averaging</td>
<td>3.0%</td>
</tr>
<tr>
<td>Survivorship Bias–Peso Problems</td>
<td>3.0%</td>
</tr>
<tr>
<td>Post–WWII Reduction in Eq. Premium</td>
<td>3.0%</td>
</tr>
<tr>
<td>Taxes</td>
<td>2.0%</td>
</tr>
<tr>
<td>Adverse Market Timing</td>
<td>2.0%</td>
</tr>
<tr>
<td>Transaction Costs</td>
<td>2.0%</td>
</tr>
<tr>
<td>Sum</td>
<td>15.0%</td>
</tr>
</tbody>
</table>

practical equity risk premium is zero for the typical retail investor. It seems likely that while the efficient investor may be able to play the Vanguard 500 mutual fund and capture much of the equity premium, such an investor is the exception. The median investor loses money in the stock market, after paying for advice, transaction help, sneaky brokers, the government, and his own poor timing.