Chapter 16

The Danger of Shortcuts

Blinded by Myopia

Myopia can mean either nearsightedness or a failure of imagination: both definitions apply here. We are blinded by self-enforced closeness to noise and narrative, and an inability to see past it, or outside the prevailing narrative. We look at what is right in front of us and extrapolate. Furthermore, there are many people in the investment industry who encourage us to react to the noise and narrative because that's how they get paid.

Volatility Is in the Eye of the Beholder

I was recently one of seven speakers at a volatility conference. As I prepared, I worried there wouldn't be much to say and figured the other speakers were likely struggling as well. I was wrong. One by one, chief strategists, heads of structuring and risk takers from the sell and buy sides expressed concern over the "structural shift higher in volatility" and provided compelling reasons for the move. The impact of algorithms (algos), poor liquidity, and great uncertainty surrounding central bank policy, not to mention the insatiable and seemingly irrational appetite for risk from

AlphaBrain: How a Group of Iconoclasts Are Using Cognitive Science to Advance the Business of Alpha Generation, First Edition. Stephen Duneier.

the investment community, were chief among them. The charts used to illustrate long-term structural shifts rarely included data prior to two years earlier, and the evidence of the damaging effects of algos showed 20 tick moves in pairs like US Dollar versus Norwegian Kronor in the seconds leading up to the release of non-farm payrolls.

The moderator then asked me about my apparently contentious argument that we are experiencing a moment of extreme risk aversion, especially in light of the points every other panelist had made. I described what it must feel like to be in the Twilight Zone, that perhaps it is a function of my being located in Santa Barbara, where I am not engulfed by the minute-by-minute deluge of news flow, scrolling headlines, and endless array of central bank prognostications that has provided me with a very different take on the current environment.

I did my best to show that besides an impressive multiyear run for equities and evidence of spread compression which has accompanied the collapse in risk-free rates, there was little to support the belief that market participants were exhibiting great risk tolerance. In fact, I argued just about every decision maker of consequence is exhibiting risk-averse behavior. Politicians' willingness to vote against party lines had hit record lows. Rather than investing profits in R&D, infrastructure, and their employees, CEOs were sitting in short-term risk-free assets and returning capital to investors. Although some may have seen the rise in corporate borrowing as evidence of risk tolerance, the fact that the proceeds weren't being invested in the underlying business told me it was still more risk aversion. Hedge fund allocations were up, and some saw that as a sign of risk seeking behavior, but the fact that 93% of those dollars were being invested in funds with AUM over $1 billion, in spite of their relatively poor return profiles, reeked of career-risk aversion among allocators. Finally, the historically low VaR levels among many of those large hedge funds confirmed my view as well.

One of the other panelists respectfully disagreed with my assessment and proceeded to enlighten me. Perhaps I am at a disadvantage being located so far from the action, away from the hustle and bustle of the big trading floor where flow provides significant insight. He noted the increased foreign exchange activity his bank was seeing among

multinational corporate clients as evidence that market participants were more risk tolerant. I thanked him for reminding me. You see, when more corporates are hedging foreign exchange exposure, it is proof that risk averse behavior is expanding, not receding. After all, hedging is what you do when you are attempting to reduce risk exposure.

I wrapped up by making the case that much of the perceived volatility of the previous four years had been a function of relatively minor differences between expectations for a particular data point and the actual result, which was then extrapolated out well into the future and typically accompanied by a beautifully woven narrative to explain the discrepancy. So, a disappointing Network Financial Printing (NFP) print became evidence of a failing recovery and incompetent Fed, while a slightly better number proved just how behind the curve the Fed was and the inevitability of wage pressure. Similar disconnects were being witnessed in politics, where relatively minor events were being portrayed as outliers of historic proportions and with global ramifications for generations to come. Take your pick from among the coverage of the Ebola panic to the "socialist" president who had presided over the biggest jump in wealth disparity since the 1920s. What gets lost in a world that has an insatiable appetite for rapid fire content creation and the technology that makes it possible for just about anyone to satisfy that craving, is just how difficult it can be to distinguish between fact and fiction as rapidly as it is delivered to us.

Macro Myopia

In meetings with clients and subscribers when I returned I typically opened with what I had witnessed at the conference and how there seemed to be such a wide divide between the world we were experiencing and the one we were perceiving. I suggested it was likely due to an attempt to use very short-term indicators, many of which I would categorize as noise, in order to create a macro narrative that resonates for us. When the narrative turns out to be fallacious, we carefully select alternative indicators to quickly generate another version, repeating the cycle and thereby creating the sensation of higher volatility and heightened uncertainty.

Surprisingly, almost all portfolio managers very quickly recognized this in themselves. One said, point blank, "I think of myself as a macro trader with a six-month to one-year investment horizon, but if I'm honest, I know I have become something more like a day trader." Half the battle in getting better is admitting you have a problem that you want to solve. Unfortunately, without the other half of the strategy for improvement, knowing what you are doing wrong while continuing to repeat the error only serves to weigh more heavily on you psychologically, making the problem that much worse.

For those of you who can relate, here are my suggestions for getting back on track.

1. Get away from markets, news, screens, the office, and coworkers. Take a step back and think about the world with fresh eyes. Work hard to rid yourself of the bias that has been building for months, and possibly years.
2. See if you can identify the biggest trends since 2011 and what would make it possible for *all* of them to exist at the same time. See if you can figure out why they came to be and what could derail them. Begin by asking questions rather than seeking questions to match your answers. For example, if you can't explain why commodities broke multigenerational ranges early this millennium, you probably should not be participating in those markets today. By default, that should also exclude you from trading emerging markets.
3. Formalize your trading process with investment plans for every trade in your portfolio, something akin to a business plan, but for a trade. Identify the stumbling blocks, the supporting evidence, action items, as well as strengths and weaknesses. Then share that plan with someone you admire. I know of no greater way to avoid impulsive trading than to force this discipline upon yourself.
4. Take the time to analyze the value of every source of information you allow to infect your assessment of the world. Every newsletter, economist, and analyst, even the choice of newspapers, TV stations, and number of screens on your desk should be reviewed. Once they influence your thought process the odds of you overcoming the bias they inject goes down dramatically.

Twitter TV

During an interview I was asked five questions on very different topics, each of which was worthy of a 30-minute discussion (or even an entire book). Unfortunately, I had less than one minute to answer each. As I sat in the green room, I wondered, what value could I deliver in such a short amount of time? Better yet, why would anyone take even five minutes to watch something that provided so little substance? When I asked the host this he told me that traders are very busy, they don't have time to watch in-depth pieces. They will look up from their screens for a couple of minutes if the topic catches their attention, but then quickly return to their screens. "If they find what you have to say interesting, they'll seek you out independently."

In other words, financial market-related television is something akin to a commercial for me, and a teaser for the audience. In order for it to be effective, for me to truly capitalize on this opportunity, I really needed to say something dramatic, perhaps invoke hyperbole, or, better yet, pepper my answers with hashtag worthy terms like *Grexit, systemic,* or *collapse*. That's not really my style, and in fact, because I tend to focus on topics that are not the popular fodder of the moment, and I am often working hard to bring perspective back from the edge of lunacy, I worried that it was a mistake to participate at all.

In reality, much of what we think of as industry-related content is little more than an infomercial dressed up in formal attire. As an example, an investment conference organizer once contacted me about a speaking engagement. Included in the email, he told me how much they charge speakers to be included in the schedule. Did you catch that? Although the organizer pitches the conference as bringing together the best and brightest minds in the business, no thought whatsoever was put into the value of the content or who was delivering it. It is quite simply a pay-to-play scheme, an infomercial. For the record, I would never pay to speak at a conference, whether outright or surreptitiously by becoming an event sponsor. I equate it to purchasing followers on social media.

Postscript

If I'm correct in my assessment that the media, analysts and our own colleagues are driving the wedge between reality and our perception of

it, we need to do more to build a defense, even if it's just a minimal hurdle. Perhaps it would be a good exercise to speculate what tomorrow's irrational concern might be today. If it will truly be worthy of our attention tomorrow, we should be able to at least identify it as a possible candidate today. If we can't, that will serve as a first indication that it should probably be treated more like noise than signal.

Odometer Readings and Negative Interest Rates

Back in 2011, researchers gathered data relating to 22 million wholesale used-car auction transactions.[1] Their goal was to see what affect mental heuristics (shortcuts) have on price. In particular, they were curious about whether there is evidence of a particular type of inattention known as "left-digit" bias. In other words, they wanted to know if a car's odometer ticking over to the next big round number had an inordinate impact on the selling price. For example, is there a disproportionate drop in sale prices at 10,000-mile thresholds? Does it matter significantly whether a car has 59,500 miles versus 60,000?

One look at Figure 16.1 and you have your answer. As irrational as it may be to value that one mile between 59,999 and 60,000 so radically different from the one that lies between 60,000 and 60,001, the evidence clearly shows that we do. The reason is that our brains' ability to process information is limited. There is only so much information we can retain in short-term memory for the comparison of data, a mental process that requires both ability and motivation to carry out.

So, in that moment when this information becomes available and we are forced to make a quick decision based upon it, we tend to employ heuristics. Often, the result is a suboptimal decision. In the case of these auto auctions, rational participants, the kind that seem to exist only in the imagination of economists, would purposely avoid purchasing the overpriced cars with odometers that read just below the major thresholds. In turn, that would erase the disproportional drops at those levels and

[1] Nicola Lacetera, Devin G. Pope, and Justin R. Sydnor, "Heuristic Thinking and Limited Attention in the Car Market," NBER Working Paper No. 17030, May 2011.

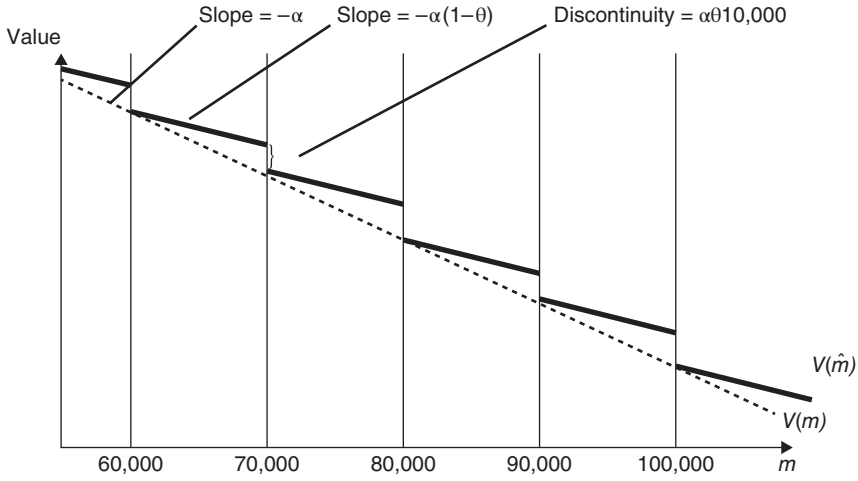

Figure 16.1 Auto odometer and value

you'd have a more efficient market. Alas, we don't, and that creates opportunity for those who can avoid the bias.

When this data is mapped as a value function (Figure 16.2), you can see that although these discontinuities occur, in general, across the full range of odometer readings, mileage has a somewhat linear relationship to value. So, a pattern consistent with rational expectations does emerge.

A similar phenomenon occurred in financial markets on January 29th, 2016. When the Bank of Japan moved policy rates below zero, our brains perceived it to be new territory, similar to the way it treats the turn of an odometer. However, along the continuum of interest paid by a borrower to a lender, the move from +10 basis points (bps) to 0 should be treated no differently than the one from 0 to −10 bps.

After all, the incentive to hold Yen denominated assets is not solely a function of the interest rate earned in Japan, but also of the relative return that can be earned on alternatives as well. A decision to hold one currency is, by default, a simultaneous decision to not own all others. When the Bank of Japan moves its policy rate into negative territory, nothing miraculous occurs as it crosses over that threshold. The interest

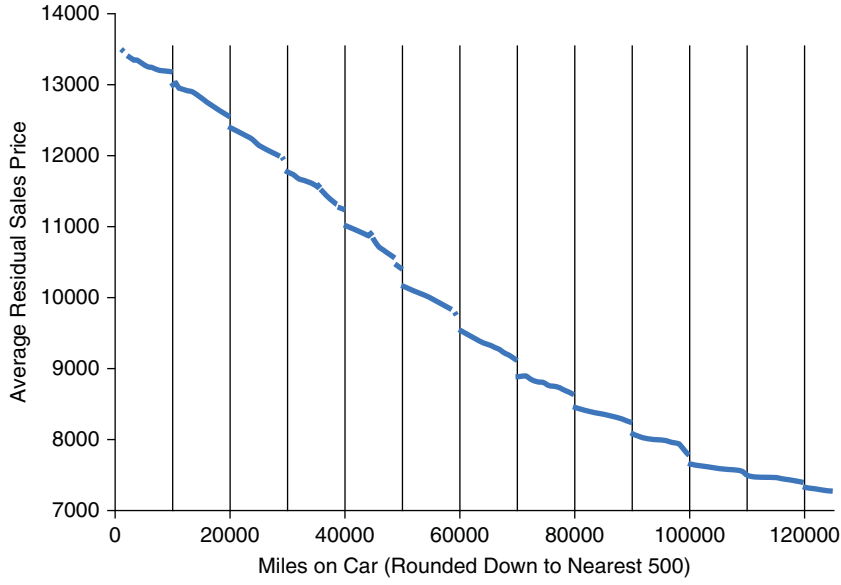

Figure 16.2 Data mapped as a function of value

earned is now 10 bps less than it was on January 28. It's really that simple. If expectations for the future trajectory of interest rates in the United States are simultaneously lowered as well, the net change in incentive to sell JPY and buy USD may be unchanged, or even possibly made less compelling.

Given the evidence produced by studies in behavioral psychology, like the one related to odometer readings, we shouldn't be surprised by the irrational reaction to the announcement of negative rates. The spike higher in USD/JPY was to be expected, and it is further evidence of cognitive bias. Bias, by definition is a systematic error in judgment, meaning it is predictable.

When I entered a trade in US Dollar versus Japanese Yen on January 15, 2016, one of the Reassessment Triggers stated that if USD/JPY were to trade up to 120.00, I would double the capital at risk on the trade through the addition of another one-year 10 delta USD put JPY call. In order for that to occur, JPY would need to weaken by 2.5% from where it was when I first wrote that plan. At the time, I had no idea what would drive it higher, but whatever it might be, I had to

know it was unlikely to be supportive of the trade. In other words, at the time that I stated my plan to double up if USDJPY went higher, I was assuming that move would be accompanied by news that would have me questioning my view.

We are all susceptible to irrational behavior, particularly when we must make decisions under emotional duress and/or time constraints. Knowing this, in those moments of lucidity, when we are particularly objective, we should do what we can to help our future selves make better choices when we are most likely to be vulnerable.

Anchored to Missed Opportunities

As I've said repeatedly, we humans are prone to decision-making mistakes and it's those mistakes that make it possible for skill to exist in our industry. Remove all decisional mistakes made by market participants and your investment performance will be determined purely by chance. Ipso facto, the only way to generate true alpha is to capitalize on the mistakes of others.

To review, decision theory is the field of study that focuses on decision-making, and it is broken into two main categories, normative and descriptive. Normative decision theory is the study of how we *should* make decisions. It is objective, systematic, and unemotional. It relies heavily on statistical analysis and requires an understanding of probabilities. Descriptive decision theory, on the hand, is the study of how we *actually* make decisions.

There are times when a decision will fall under the domain of both, typically occurring when we are dealing with what is known as a "decision under certainty." For instance, when faced with the decision about whether we should touch a stove that is red hot, assuming we do not want to burn our hands, very often we will *actually* make the decision as we *should*. In our business, it is extremely rare to face a decision under certainty. Instead, we must make "decisions under risk," which means we have historical data from which to generate probabilities of future outcomes. This is the type of decision we face when forecasting weather, predicting demand for electricity, producing mpg estimates for new cars, and making investment decisions.

What separates a decision made descriptively from one made normatively can only be described as a mistake. Cognitive scientists prefer the term, *cognitive bias*, but whichever term you choose, they both reflect systematic errors in judgment, and they tend to occur when we are employing heuristics. Once again, heuristics are mental shortcuts, such as intuition, gut feel, and rules of thumb. One of the more commonly employed heuristics is known as *anchoring*.

Anchoring is a popular phenomenon among retailers and negotiators. For the retailer, it provides a simple, inexpensive way to manipulate customers into spending more. As an example, they will create an anchor by first showing something like an MSRP (manufacturer's suggested retail price), and then emphasize how far below that price they are willing to sell it to you. In reality, the MSRP is completely arbitrary, created merely to set an anchor by which all transactions will be compared. It is how some people can actually think of shopping in terms of money saved as opposed to money spent. Good negotiators will often present the first offer, knowing that all discussions from that point forward will be anchored to it, and *we rarely adjust very much away from it*.

Anchoring can be powerful in far more subtle ways too. Tversky and Kahneman first exposed the effect in a study 42 years ago, when they asked people to estimate "how many African nations are part of the United Nations?" To test the anchoring effect, they first had participants spin a wheel with 100 numbers painted on it. Unbeknownst to participants, the wheel was rigged to land on either 10 or 65. Although you would think that the random number generated by spinning a wheel would have no effect whatsoever on someone's estimate regarding how many African nations are part of the United Nations, you'd be wrong.

There is a simple formula to quantify the anchoring effect called the *anchoring index*. To calculate it, you take the difference in the mean response from each group and divide it by the difference between the high and low anchors. In the case of Tversky and Kahneman's experiment, the average answer from those who had the low anchor of 10 was 25, whereas the average for those who were anchored to 65 was 45 – an anchoring index of 36%.

The anchoring effect is evidence of a *systematic* error in judgment. Given that mistakes are required in order for skill to present itself in investing, we should be using the information gleaned from 60-plus years of research that effectively presents a roadmap of psychological vulnerability to predictably irrational decisions. What makes it difficult to create a competitive edge in this area is that we are all inherently vulnerable. No matter how intelligent, experienced, or even educated we may be specifically in this area, we are all susceptible to both making the mistakes, and even more importantly, being oblivious to the error as it's occurring. The only real defense against it is a willingness to accept just how powerful the effect can be and an openness to allow the evidence to override even the most deeply seated belief.

The reason I mention this right now is because I believe there is a bias being exhibited by even the smartest, most highly educated, experienced, and respected people in the investment and policymaking communities today (This section was written when the Fed maintained its policy of zero interest rates and quantitative easing). It is a mistake caused by the anchoring effect, and true to form, no one seems to be acknowledging its existence or even contemplating the possibility that something could be amiss. The mistake occurs in the belief that *zero* means something as it relates to interest rates, that it is, in effect, a *floor*, below which it should never go, and if it does, it should go for only a very short time and by a very tiny amount.

This belief is equivalent to an MSRP of markets, unsupported by economic fundamentals or market principles. Yet, so much of what is happening in monetary policy and investment management is being affected by it. If you believe the risk/reward of holding US Treasuries is unattractive here, there's a good chance you're experiencing the anchoring effect. If you believe interest rates are too low, you might be experiencing the anchoring effect. If you believe *low* interest rates didn't work so we might as well raise them, you are probably experiencing the anchoring effect. If you believe there isn't plenty of powder left in monetary policy, you might be exhibiting the anchoring effect. If it makes you feel any better, nearly every central banker and economist is making the same mistake.

What gets lost in conversations about Fed policy is the fact that the Federal Reserve, for all intents and purposes, is in the business of behavior modification. Every tool, from open market operations to the discount rate and even quantitative easing, is meant to alter the behavior patterns of its target audience. Although their mandate is tied to inflation and growth, how they achieve it depends on their ability to alter behaviors. Effectively, they stand as the floodgate between financial assets and the real economy. If too much capital is being invested in the real economy, threatening to push inflation higher than their goal, they will raise the interest rate offered on risk-free investments, effectively saying, "why take risk when you can earn attractive returns without it?" On the other hand, when not enough capital is finding its way into the real economy, threatening growth and/or inflation below the lower end of the targeted range, they will lower the incentive offered to sit in risk-free assets. In essence, saying, "you will have to take some risk if you are going to achieve the returns you seek."

If they aren't getting the responses they want, they just go lower, and lower, and lower. Why should zero be the floor? Why can't the risk-free rate go as deep into negative territory as it does into positive?

When it is deep in positive territory, it serves to shift capital from the public sector to the private. If owners of capital are deep in risk-seeking mode, it will require very high rates to draw them away from the riskier alternatives. On the other hand, if investors are exhibiting extremely risk-averse behavior, as we are currently witnessing, then it will require very low rates to push them to take risk. If it requires rates so low that they enter very negative territory to force that action, it will also begin shifting capital from the private to the public sector, thereby rebalancing the imbalance created by the massive bailouts. That too would serve to move policymakers closer to where they want to be, wouldn't it?

You see, the fundamental issue is that capital continues to flow out of the hands of spenders and into those of the savers. Thanks to income and wealth disparity, every transaction that occurs in the real economy lowers the probability of a future transaction (see the trajectory of the velocity of money, Figure 16.3), while simultaneously increasing the demand for financial assets. Those who control the overwhelming majority of the world's wealth are exhibiting extreme levels of risk aversion – yes, even at

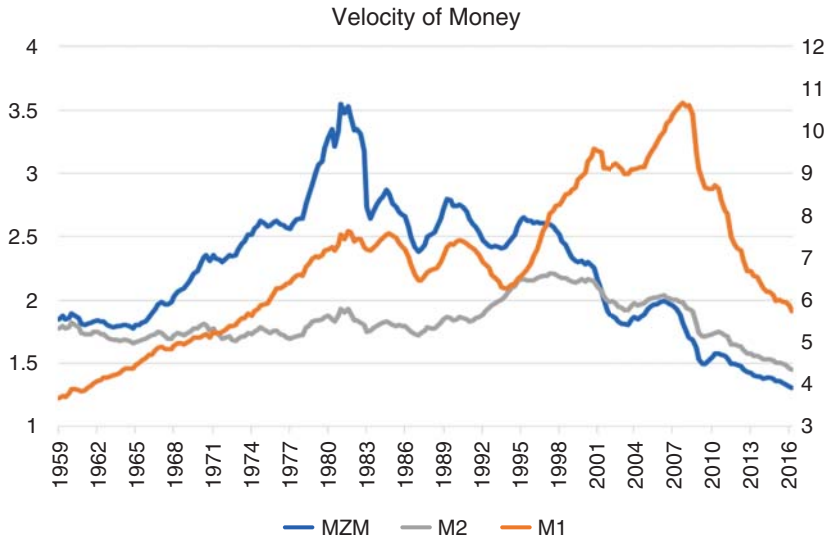

Figure 16.3 Velocity of money

zero or negative rates. If they won't start spending more of their income, and it's highly unlikely they will (or even can), then policymakers need to push them in that direction. They have two tools to do so. Either they can raise taxes and redistribute that capital through fiscal spending, or they move interest rates deep into negative territory. In so doing, savers will transfer capital to the government, and then the government can redistribute it through fiscal spending into the hands of spenders.

The old argument that negative interest rates are "unsustainable" is true. Eventually, if the owners of capital don't shift out of financial assets and into the real economy, either by spending or investing in R&D, equipment, and/or people, they will run out of capital. But let's be logical about that. At –50 bps, assuming 100% of the private sector's funds were invested, it would take 200 years for that to occur. At –5%, it would take 20 years. Of course, by that time, we wouldn't be talking about onerous government debt overhang anymore.

Getting back to the specific issue of zero as an anchor, rather than a valid discrete moment, consider the marginal impact on an investment portfolio. If interest rates shift down 100 bps, from +250 bps to +150 bps, the annual return on a $100 million portfolio will be $1,000,000 less.

If interest rates shift down 100 bps, from +50 bps to –50 bps, the annual return on a $100 million portfolio will be $1,000,000 less. Yes, the marginal change is exactly the same.

On a related note, someone once mentioned that one of the major stock market indices had been on a multiyear run that has never occurred before. As a result, he was considering going short the index. This is a cognitive mistake that should be easily refuted with a simple statistical analysis. However, the argument rarely changes anyone's mind. Nonetheless, I felt compelled to make the case.

At the time of the analysis, since October 1959, the DAX index had experienced 671 rolling 12-month periods, of which 62% had been positive. The DAX index had been positive for the previous four calendar years. Throughout its history we've only seen the DAX up five years straight 8% of the time. One might leap to the conclusion that based on historical results there was a 92% chance that the DAX index would be negative that year. However, they'd be wrong.

You see, the hard part of a five-year run had already occurred. The DAX had only had four straight up years 13% of the time. In this case though, the odds of the DAX being up four years straight was 100%. I can say that because it had actually happened. Now you might think that it makes the odds of it continuing to extend another year a long shot, but statistically speaking that is incorrect. You see, historically speaking, the odds of the DAX index ending a 12-month period higher than it began was 62%, even after four straight positive years. The consistency of the return profile is quite remarkable. See Table 16.1 for a comparison between the actual percentage of times the index had experienced different winning streaks versus what the expectations would be if every single year was a constant 62%.

What I'm saying is, based on historical data, the odds of the DAX index being up that year, given that it had been up the past four straight calendar years, remained 62%. That's what a machine would tell you. The question is, would you listen?

Table 16.1 Actual versus predicted percentages of DAX winning streak

	1 Year	2 Years	3 Years	4 Years	5 Years
Actual	62%	39%	22%	13%	8%
Predicted	62%	39%	24%	15%	9%