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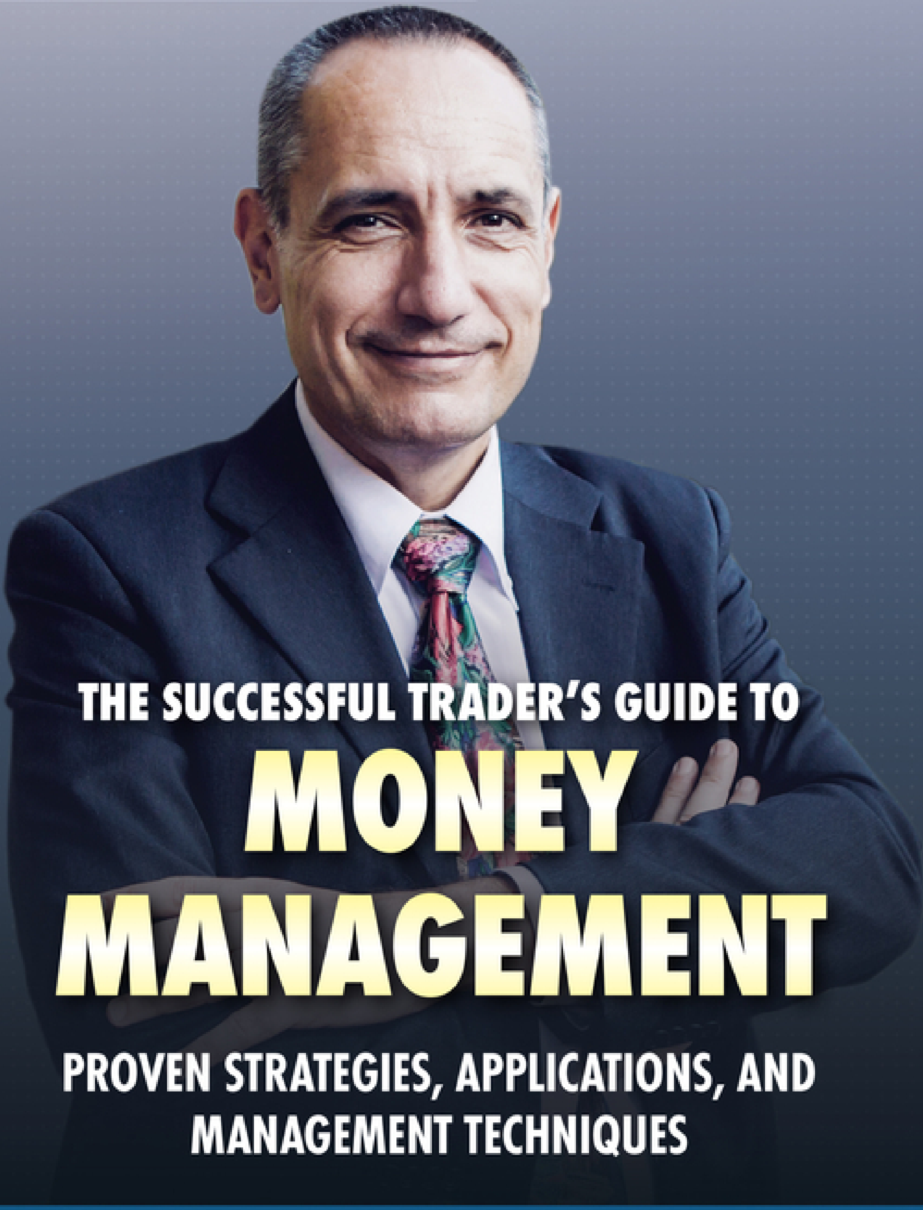

# THE SUCCESSFUL TRADER'S GUIDE TO MONEY MANAGEMENT

## PROVEN STRATEGIES, APPLICATIONS, AND MANAGEMENT TECHNIQUES

ANDREA UNGER
FOUR-TIME WORLD CUP TRADING CHAMPION

WILEY

# The Successful Trader's Guide to Money Management

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Proven Strategies, Applications, and Management Techniques

**Andrea Unger**

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For the members of my family, who have always stood beside me and offered their support every day, also when taking the most difficult decisions.

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# FOREWORD

The second millennium began with the explosion of online trading in Europe, as the increase in the amount of available information and advertising of various kinds goes to show, encouraging many to try their luck at trading on the financial markets.

A considerable number of brokers set up shop and offered their services both for trading online and speculation on the markets, and new books are published almost every day, written by expert traders giving a great deal of advice on how to win on the markets. There are dozens of books on scalping, more on speculation in general, and even more on trading systems, not to mention those on technical analysis and even a few on trading psychology. An expert trader following the continuous evolution of these publications can't help but notice that (in Europe) one thing that's missing is a book that explains a subject that's by far the most important for he or she who wants to make trading their profession, in other words: *money management* (hereinafter referred to simply as M.m.).

In this book the author explains all the important points of how to manage your own capital in detail in consideration of the risk and the far-from-remote possibility that you might lose everything before you've even learnt how to place consistently winning trades on the market.

The author has explained the subject in a clear and frank way, making the book suitable for beginners and expert traders alike, and with the obstinacy of someone who's learned their lessons firsthand in the field he repeatedly emphasizes the importance of applying the right money management techniques. It would be a shame not to make the most of all the secrets this book has to offer.

The author's desire to help the reader understand that money management isn't the same as using a stop-loss can be found in every chapter. Also, the various methods discussed throughout the book, which are intrinsic to the strategies that can be applied to manage assets, let the trader prepare a plan of action for their M.m. that's as close as possible to perfect.

Anyone who reads this book will realise that technical analysis, trading systems, and various methods – no matter how valid they may be – are all but worthless without the effective management of your assets, and it would be a real shame if the reader failed to make the effort to apply some of the numerous suggestions they could make on their own after reading the book. The author, however, advises against using a poor strategy with the meticulous application of M.m. even if that can produce acceptable results, and this should perhaps make us reflect on the fact that the correct application of M.m., as well as protecting yourself from the risk of going bankrupt, can also help you obtain spectacular results that would be impossible without correct money management.



I love reading books on trading (I don't think many people have a collection as vast as mine on the subject), and I can truly say this book on money management is a must, and is the first complete and clear book to come out of Italy on how to apply M.m. to financial markets. I was lucky enough to be given the chance to read it first, and made good use of numerous suggestions to manage some futures' trading strategies, so I must compliment the author on the excellent work he's done in creating a book that's a real one of a kind – a book readers would do well to read and read again, always keeping it on hand to use as a point of reference to dispel any doubts on the correct way to manage the method they're adopting.

Domenico Foti

# PREFACE



The trading world has changed considerably over the last two decades, and online trading has gradually transformed the sector from specialised to 'DIY', expanding to become so widespread it's now within reach of the investor from the comfort of his or her own home. The 1999 dot.com bubble made investing on the stock exchange more enticing than ever, with people dreaming of getting rich quick in a world that once mostly consisted of Treasury bills and bonds. When the bubble burst in spring 2000, it was, to say the least, painful for most of those who'd ventured into speculating on the stock exchange, and produced a variety of effects, leaving its mark also on those who weren't literally swept away by the crash.

A small number of speculators managed to adapt to the new market, people who'd been trading before the bubble, who'd already survived various ups and downs; and those who managed to turn what had once been a reckless gambler into a professional trader. These survivors, in turn, had an effect on other survivors, leading some to take the same route, revising their trading methods, and encouraging others to try and learn more about the specific sector in order to trade safely and emulate those who'd made their name in trading.

Gradually, more channels were created through which you could obtain trading information, courses were organised, conferences held, and books written promoting a variety of trading techniques.

The motto 'Cut your losses and let your profits run' is on everyone's lips, as is 'First, don't lose too much'. Scalping is the technique favoured by the masses, as all you need is a fast and reliable trading platform, and a marked propensity for interpreting short-term market movements. But many traders, born scalpers, gradually move away from this type of trading to try a less frenetic but perhaps also less enticing approach, and this is where trading systems came in, selling trading signals and courses to construct the same systems.

Those who follow me know I trade almost exclusively with automatic systems, as this is the approach that's best suited to planning your trading in detail.

The year 2008 was bad for the masses, and in time there were other sporadic events – such as the flash crash, the Fukushima meltdown, and the crisis of August 2015, which created more than a few obstacles to those who make a living or are just trying to survive on the stock exchange.

The trading industry opened its doors to the masses, trying to convince people all they needed was just a little time and money to obtain truly unbelievable results. At first the Forex market was promoted, emphasising the notable leverage that could be used, then there was a short-lived attempt to promote trading with options, which paved the way for CFDs, once again emphasising the concept that with little, you could make a lot. Then came binary options, which didn't actually have a lot to do with trading but still promised a road paved with gold, and last but not least cryptocurrencies, which in a way marked the end for binary options, but we're already waiting for the next fad, all riding the wave of greed.



When one mentions money management, though, these words can be interpreted ambiguously and cause confusion. Most people see money management as the rigorous application of a stop-loss, and a set of rules that produce risk/reward rations close to one-third. One classic example of this is a system that aims to make a profit three times the system stop, which is often considered a system with a good approach to money management. Nothing could be further from the truth!

Everything that concerns position management should be considered part of risk management, while money management is used to study what would be the best choice in terms of the percentage of the capital to use for a trade. Explained in such simple terms, it seems quite a banal thing a trader might not consider that important. My hope is to convince you, in the following pages, that this is not the case.

When I got my hands on my first futures' trading system report, it was clear that the monthly profit (or annual profit, depending on how you want to consider it) produced by the single contract analyses wasn't enough to live on or justify abandoning everything else to dedicate my time exclusively to that system. The first thing I thought was: What sort of profits could I make if I used more contracts instead of just one, and in relation to the results, with the same number of contracts, what would change during the negative period of the system in terms of drawdown? If a system made a profit of €10,000/year with one contract, it would certainly be interesting to consider using five contracts to make (or it might be better to say, try to make) €50,000; but the same system could have a maximum drawdown of €2,500, which with five contracts would become a loss of €12,500 at a certain time of the year, and it's therefore important to ask yourself if you could withstand such a loss and continue to follow the signals of the system without qualms.

So, calculating the number of contracts to use becomes much more important than one might think, and is even more so when you see the effect a correct approach to making this choice can have on the results.

Personally, I interpret money management only in terms of the science that tells me 'how much' to use and not how to do so. Some prefer to call this simply 'position sizing' and include risk management also as part of money management, but in my opinion this is a somewhat strained interpretation that does no damage, apart from causing a few misunderstandings.

Everything you'll find in this book can be used to get the best out of the trading system or technique you've decided is best suited to your needs, in order to maximize profits. It won't turn a losing trading system into a winning one, because the basic concept on which the trades are made must be laid on solid foundations.

# Martingale and Anti-Martingale

## 1.1 The Right Stake



As mentioned in the introduction, money management (M.m) aims to establish the best stake to place when opening a trade or, in general, how much of your capital to use in the gamble you are about to embark on.

I think we all tend to adopt quite a simple statistical approach that encourages us to hope in a positive result after one or more negative results, and to fear repeating a success after placing a successful stake. In general, this is why you don't want to continue after a certain number of consecutive winning trades, while after a series of losing trades you'll be sure the next one will be a winner.

This tendency induces us to adopt a sort of risk management that, in general, leads us to increase the stakes after a negative period (betting on the fact that after various losses one should statistically expect a success) and reduce them after a positive period (for exactly the opposite reason).

In this chapter, we'll deal with this question by moving away from the trading environment, to enter a world we're all in any case familiar with: that of the coin toss.

Flipping a coin to see whether it lands heads or tails is a classic statistical example of 50% probability, and analyzing how we manage the stakes, on the basis of one event or another, can produce some surprising results.

This *isn't* trading, and the intention isn't to compare a trading system to betting. The purpose of this first part is simply to demonstrate what might be the best way to manage your available capital, when 'staking' part of it on an event.

If we take 100 people with €100 each, I don't think many would come out winning if they had to bet on a series of 100 or 1,000 coin tosses. In my opinion, most would lose all their capital due to inadequate risk management.

Of the resources to download, at the link https://autc.pro/guide you'll find the Excel file 'HeadOrTail.xls' you can use to run coin-toss simulations. This is the one I used for the various examples we'll be taking a look at.

As I said, let's suppose we have a capital of €100 and we'll use it for a series of 100 and 1,000 coin tosses, 'heads' wins, 'tails' loses. The win/loss ratio will be different for each analysis. In other words, let's imagine we lose €1 on every stake; the amount won, on the other hand, changes as we analyze various examples.

Stake calculation systems are mostly based on two styles that can be grouped together as *Martingale* systems and *anti-Martingale* systems. The first aim to increase exposure in the case of a loss; while the second only increase exposure after a win and decrease it in the case of a loss.




## 1.2 Martingale

The Martingale system comes from the roulette wheel, and in practice is based on the impossibility of an infinite series of consecutive losses. Therefore, the concept is that the more consecutive losses there are, the greater the probability of a win next time. On this basis, the system involves doubling the stake after every loss. If you bet 1 on the first spin of the wheel, you'll bet 2 on the second if the first bet lost, and if you lose again you'll bet 4, then 8, and so on, and when you get a winning spin of the wheel you'll finally have made a profit. Note that, if you get a win on the second spin, you'd win 2, and after losing 1 on the first spin you'd be 1 up. If you lost also on the second spin, you'd have lost $1 + 2 = 3$, so winning 4 on the third spin would again give you a profit of 1. If you lost on the third spin, you'd have lost $1 + 2 + 4 = 7$, and winning on the fourth spin would make 8, giving you a profit of $8 - 7 = 1$. As this simulation continues, we can see that, when we finally win, we make a profit of 1, just like we would have if we'd won on the first bet.

The above is true if you double the stake, and it's closely related to roulette-betting systems where one bets on red and black or odd and even numbers. In much more general terms, all approaches that simply increase the stake after a loss, and not just ones that double it, are called Martingale approaches; vice versa, these approaches decrease the stake after a win.

I'd like to emphasize that most people probably have a natural inclination to prefer a Martingale-type approach.

Now let's take a look at the simulations. The first is based on the supposition that, a win produces a profit of €1.25 for each €1 bet, while a loss loses the €1 bet. As mentioned above, the probability a coin toss comes down heads is 50%, so out of 1,000 tosses it should, in theory, land 500 times heads and 500 times tails, producing the final result:

$$500 * 1.25 + 500 * (-1) = 625 - 500 = 125$$

€125 at the end for every €1 bet. Obviously, this is pure theory and the situation must be studied more carefully, as must the strategy to adopt.

As we've said, each gambler has €100, so let's analyze the results of 14 gamblers using the Martingale approach, which increases the stake by a factor $x$ after every loss. Each gambler starts with a different risk percentage and, in particular, for the first it's 1%, the second 2%, the third 3%, the fourth 4%, the fifth 5%, the sixth 10%, then 15%, 20%, 25%, 30%, 35%, 40%, 45%, and 50%.

The first gambler with a factor $x = 2$ on the first spin risking 1% bets €1 euro (1% of the €100 capital is €1). If he wins, he'll again bet 1% of the new capital €101.25 (he won €1.25), which is €1.0125. If he lost, however, he'll have €99, and using a factor $x = 2$, he'll double the initial risk to risk 2%, so

$$99 * 2/100 = €1.98$$

If the gambler wins, he'll go back to staking 1%; he would have won in the previous stake

$$1.98 * 1.25 = €2.475$$

and would therefore have a capital of €101.475, of which he'll stake

$$101.475 * 1/100 = €1.01475$$

If he lost, however, he'd have

$$99 - 1.98 = €97.02$$

At this point, he'd stake 4% (double the previous 2%) and bet

$$97.02 * 4/100 = €3.8808$$

and so on.

The second gambler will immediately stake 2% equal to €2 (2% of €100) and then proceed using the same logic; the third would start with €3 (3% of €100) and the last, daring or reckless, would start by betting €50 (50% of €100).

Figure 1.1 shows the results after 100 and 1,000 coin tosses. The simulation produced 53 heads and 47 tails in the first 100 tosses and a total of 467 heads and 533 tails after 1,000 tosses. Note that after 100 tosses, only the gamblers who bet less than 10% still have available funds, while those who started with a greater risk have used up all their capital. The gambler who started with 5% has increased his capital tenfold to €1,051.98. Note that the gamblers' luck was in; in fact, the wins amounted to 53% of the total. Continuing the game, however, after 1,000 tosses, all the gamblers have lost every last penny, perhaps also due to an unfavourable turn of events that brought the percentage of wins in the first 100 tosses down to 46.7%.



multiple = 2

Martingale (increase bet after loss)

| after 100 tosses | | | after 1000 tosses | | |
|---|---|---|---|---|---|
| heads | 53 | 53% | heads | 467 | 46.7% |
| tails | 47 | | tails | 533 | |
| % risk | ending capital | gain % | % risk | ending capital | gain % |
| 1% | 221.99 | 122% | 1% | – | –100% |
| 2% | 410.97 | 311% | 2% | – | –100% |
| 3% | 649.53 | 550% | 3% | – | –100% |
| 4% | 887.26 | 787% | 4% | – | –100% |
| 5% | 1,051.98 | 952% | 5% | – | –100% |
| 10% | 70.55 | –29% | 10% | – | –100% |
| 15% | – | –100% | 15% | – | –100% |
| 20% | – | –100% | 20% | – | –100% |
| 25% | – | –100% | 25% | – | –100% |
| 30% | – | –100% | 30% | – | –100% |
| 35% | – | –100% | 35% | – | –100% |
| 40% | – | –100% | 40% | – | –100% |
| 45% | – | –100% | 45% | – | –100% |
| 50% | – | –100% | 50% | – | –100% |

**FIGURE 1.1** Loss 1, win 1.25 – double bet after loss. Note how in the first 100 tosses the scenario changes drastically, passing from 5% to 10% as initial risk.

multiple = 1.5

| Martingale (increase bet after loss) | | | | | |
|---|---|---|---|---|---|
| after 100 tosses | | | after 1000 tosses | | |
| heads | 53 | 53% | heads | 467 | 46.7% |
| tails | 47 | | tails | 533 | |
| % risk | ending capital | gain % | % risk | ending capital | gain % |
| 1% | 145.99 | 46% | 1% | 23.67 | –76% |
| 2% | 204.40 | 104% | 2% | – | –100% |
| 3% | 274.90 | 175% | 3% | – | –100% |
| 4% | 355.54 | 256% | 4% | – | –100% |
| 5% | 442.63 | 343% | 5% | – | –100% |
| 10% | 759.48 | 659% | 10% | – | –100% |
| 15% | 507.48 | 407% | 15% | – | –100% |
| 20% | 109.39 | 9% | 20% | – | –100% |
| 25% | 2.83 | –97% | 25% | – | –100% |
| 30% | – | –100% | 30% | – | –100% |
| 35% | – | –100% | 35% | – | –100% |
| 40% | – | –100% | 40% | – | –100% |
| 45% | – | –100% | 45% | – | –100% |
| 50% | – | –100% | 50% | – | –100% |

**FIGURE 1.2** Loss 1, win 1.25 – multiply bet by 1.5 after loss. The final result is less 'harsh' than the previous case, but still isn't encouraging.



In Figure 1.2 the same scenario is analyzed in the case in which the gamblers, instead of doubling the percentage after every loss, multiply it by 1.5, a more 'conservative' approach that produces less drastic results.

The entire reasoning behind this is based on the percentages rather than on the resulting figures in euros. One could work on the basis of a hypothesis of starting with €1 and betting €2 in the case of a loss and then €4 after another loss, etc. In practice, this sort of approach would produce results similar to those shown, but with slightly more marked multiplication factors. Note, in fact, the gambler would have bet €2 instead of the €1.98 in the percentage example and €4 instead of €3.8808; note also that a higher multiplication factor causes more damage for the gamblers (the results of Figure 1.2 aren't as bad as those of Figure 1.1), so it's easy to see that the approach based on absolute stakes rather than percentages would have been even worse.

Figure 1.3 shows the Martingale approach, doubling the percentage on a new series of tosses in which, out of the first 100 as many of 57 tosses were wins and, of the 1,000 tosses, the number of wins was just over average at 502 wins, with 498 losses.

multiple = 2

| Martingale (increase bet after loss) | | | | | |
|---|---|---|---|---|---|
| after 100 tosses | | | after 1000 tosses | | |
| heads | 57 | 57% | heads | 502 | 50.2% |
| tails | 43 | | tails | 498 | |
| % risk | ending capital | gain % | % risk | ending capital | gain % |
| 1% | 193.33 | 93% | 1% | – | –100% |
| 2% | 180.02 | 80% | 2% | – | –100% |
| 3% | 24.67 | –75% | 3% | – | –100% |
| 4% | – | –100% | 4% | – | –100% |
| 5% | – | –100% | 5% | – | –100% |
| 10% | – | –100% | 10% | – | –100% |
| 15% | – | –100% | 15% | – | –100% |
| 20% | – | –100% | 20% | – | –100% |
| 25% | – | –100% | 25% | – | –100% |
| 30% | – | –100% | 30% | – | –100% |
| 35% | – | –100% | 35% | – | –100% |
| 40% | – | –100% | 40% | – | –100% |
| 45% | – | –100% | 45% | – | –100% |
| 50% | – | –100% | 50% | – | –100% |

**FIGURE 1.3** Loss 1, win 1.25 – double stake after loss, a particular favourable situation in the first 100 tosses is in any case advantageous only for those who started betting low. After 1,000 tosses, the results are balanced without any advantages even for the more conservative approaches.



Despite this, the scenario is devastating and the results speak for themselves.

Figure 1.4 shows the same results with the stake multiplied by 1.5 instead of 2. The scenario is certainly less drastic but can hardly be considered encouraging. As the statistics were better than in the first case, how can we explain such a disappointing result?

A brief study of the logic behind the dynamics of increasing the stake sheds some light on this.

Let's suppose we start with 1%. We're in the following risk percentage situation doubling our bets, as in Table 1.1.

Note that after seven consecutive losing tosses, you would have to stake 128% of your remaining capital. This is obviously impossible to do, and you can only stake all you have (100%). After another losing toss, you'll have lost all your capital.

multiple = 1.5

**Martingale (increase bet after loss)**

| after 100 tosses | | | after 1000 tosses | | |
|---|---|---|---|---|---|
| heads | 57 | 57% | heads | 502 | 50.2% |
| tails | 43 | | tails | 498 | |

| % risk | ending capital | gain % | % risk | ending capital | gain % |
|---|---|---|---|---|---|
| 1% | 152.15 | 52% | 1% | 319.03 | 219% |
| 2% | 219.30 | 119% | 2% | – | –100% |
| 3% | 300.11 | 200% | 3% | – | –100% |
| 4% | 390.28 | 290% | 4% | – | –100% |
| 5% | 482.03 | 382% | 5% | – | –100% |
| 10% | 501.13 | 401% | 10% | – | –100% |
| 15% | – | –100% | 15% | – | –100% |
| 20% | – | –100% | 20% | – | –100% |
| 25% | – | –100% | 25% | – | –100% |
| 30% | – | –100% | 30% | – | –100% |
| 35% | – | –100% | 35% | – | –100% |
| 40% | – | –100% | 40% | – | –100% |
| 45% | – | –100% | 45% | – | –100% |
| 50% | – | –100% | 50% | – | –100% |

**FIGURE 1.4** Loss 1, win 1.25 – multiply bet by 1.5 after loss, even increasing the stakes in a more conservative way still doesn't produce results that are anything to write home about.



**TABLE 1.1**

| consecutive losing coin tosses | Percentage risked on next coin toss |
|---|---|
| 0 | 1% |
| 1 | 2% |
| 2 | 4% |
| 3 | 8% |
| 4 | 16% |
| 5 | 32% |
| 6 | 64% |
| 7 | 128% ??? |
| 8 | Capital = zero |

Starting with a higher percentage speeds up this process considerably, as Table 1.2, starting at 3%, shows.

Or even starting at 5%, as shown in Table 1.3.

**TABLE 1.2**

| consecutive losing coin tosses | Percentage risked on next coin toss |
|---|---|
| 0 | 3% |
| 1 | 6% |
| 2 | 12% |
| 3 | 24% |
| 4 | 48% |
| 5 | 96% |
| 6 | 192% -> 100% |
| 7 | Capital = zero |

**TABLE 1.3**

| consecutive losing coin tosses | Percentage risked on next coin toss |
|---|---|
| 0 | 5% |
| 1 | 10% |
| 2 | 20% |
| 3 | 40% |
| 4 | 60% |
| 5 | 120% -> 100% |
| 6 | Capital = zero |

The above tables show that, starting with a 1% risk and doubling the percentage risked after every loss, a series of 8 consecutive losses would reduce the capital to zero. Starting on the other hand with 3% all the capital would be lost on the seventh consecutive loss, or the sixth if we start at 5%.

Fans of statistics can calculate the probability that a series of 100 coin tosses comes up 6, 7, or 8 consecutive times tails; they'll see this probability isn't as low as you might think. If they then continue with the analysis to include a series of 1,000 coin tosses the probability increases again. Here, we won't perform an analysis of this kind as it's quite a lengthy process, and in my opinion the results of the simulations provide a sufficiently clear example of the risk taken.

Note that the real problem with this approach is running out of capital, which, when you have to stake 100% you obviously run the risk of losing everything in the case of another loss. The same goes for playing roulette and placing your bet on red or black. Even leaving aside the fact that the ball might land on zero, which makes the odds worse than 50–50, a gambler could bet by doubling their stake each time they lose, but this approach could only be used if you had an infinite capital, with no stake limit. I must ask myself, who, having an infinite capital, would waste their time losing on the stock exchange or at roulette?

In the simulation we're studying, each gambler has an initial limit of €100, and after losing that, he'll be out of the game for good.

We've seen that our gamblers didn't have a lot of luck, and the result should discourage anyone who's considering using this approach in the hope of making money with it. So do you always lose everything, or almost? Not necessarily. Up to now, we've considered gamblers who, using a Martingale approach, increased their exposure in negative periods and decreased it in positive periods. In effect, no matter how logical it might seem from a certain point of view, this approach is totally illogical when we consider that, in practice, he who has less risks more, and he who has more risks less, which puts the approach in an entirely different light.

## 1.3 Anti-Martingale



So, what can you do? We've mentioned the anti-Martingale system – in other words an approach that decreases exposure after a loss and increases it after a win. In practice, with this approach there's the tendency to increase your exposure as you make profits from winnings, and close defensively in losing periods.

In order to analyze what could have happened with this approach, we'll run the simulation simply using the same investment percentages for each stake. Some might say that in this way we aren't decreasing the stake after a loss and increasing it after a win, but in reality that's exactly what we'll do. In fact, we are not lowering (reducing) the percentage, but the capital to which it is applied will be smaller after a loss, so we will be betting more or less. The gambler who bets 1% of €100, in the case of a loss will have €99 and, placing 1% again on the next bet, will stake €0.99, which is less than the initial €1. Vice versa, in the case of a win of €1.25 on the basis of the above rules, we will have €101.25 and staking 1% we'll place the next bet of €1.0125, which is more than the initial €1 stake. Therefore, using a fixed bet percentage you 'follow' the trend of your capital, with more or less exposure as it increases or decreases.

Now let's go back to the first simulation, the one that after 100 coin tosses produced 53 heads (wining tosses) and 47 tails (losing tosses). This time we'll take 15 gamblers instead of 14, adding one who places 51% of his capital each time. Using the Martingale system this wouldn't make sense, because if the gambler lost and doubled the bet percentage, he'd be immediately in difficulty as he couldn't stake 102%.

As mentioned above, all the gamblers stake the same initial percentage each time. Figure 1.5 shows the results of this approach.

After 100 coin tosses it's immediately clear that the overall situation looks much better than with the Martingale approach. No one has increased their capital tenfold, but a lot more gamblers are making a profit on their initial capital, even those who risked 30% on each bet (with the Martingale approach, gamblers who started with 10% were losing after 100 tosses). Certainly, the profits of the more prudent gamblers are lower than in the previous case, and we can see this by making a direct comparison between Figures 1.5 and 1.1; but this doesn't weigh in favour of the Martingale approach which, as shown above, was devastating as the coin tossing continued. The first 100 tosses in fact were particularly favourable, while





**Anti-Martingale**

| after 100 tosses | | | after 1000 tosses | | |
|---|---|---|---|---|---|
| heads | 53 | 53% | heads | 467 | 46.7% |
| tails | 47 | | tails | 533 | |
| % risk | ending capital | gain % | % risk | ending capital | gain % |
| 1% | 120.45 | 20% | 1% | 155.97 | 56% |
| 2% | 143.22 | 43% | 2% | 214.56 | 115% |
| 3% | 168.13 | 68% | 3% | 260.48 | 160% |
| 4% | 194.89 | 95% | 4% | 279.24 | 179% |
| 5% | 223.07 | 123% | 5% | 264.42 | 164% |
| 10% | 363.48 | 263% | 10% | 31.59 | –68% |
| 15% | 434.78 | 335% | 15% | 0.17 | –100% |
| 20% | 381.47 | 281% | 20% | 0.00 | –100% |
| 25% | 243.86 | 144% | 25% | 0.00 | –100% |
| 30% | 112.11 | 12% | 30% | 0.00 | –100% |
| 35% | 36.32 | –64% | 35% | 0.00 | –100% |
| 40% | 8.05 | –92% | 40% | 0.00 | –100% |
| 45% | 1.17 | –99% | 45% | 0.00 | –100% |
| 50% | 0.11 | –100% | 50% | 0.00 | –100% |
| 51% | 0.06 | –100% | 51% | 0.00 | –100% |

**FIGURE 1.5** Loss 1, win 1.25 – anti-Martingale system.

the following 900 were distinctly unfavourable and Figure 1.1 shows how all the gamblers lost their capital. The same goes if we make a comparison with Figure 1.2, showing less aggressive Martingale gamblers.

Taking a look at Figure 1.5, what does this show us about the results after 1,000 coin tosses? One can immediately see that, not only various gamblers still have their capital, but they also made a profit. Gamblers who bet 3% to 5% have practically 2.5 times their initial capital. Their Martingale colleagues on the other hand, have lost everything.

This is an unlucky case, but still possible. 1,000 coin tosses are, it must be said, not many for the law of large numbers, and final percentages of heads and tails like those in question are anything but impossible (this data, in fact, was obtained from a real probabilistic simulation done in Excel).

Now let's take a look at the second simulation. In the first 100 coin tosses the success rate was as high as 57% and then, after 1,000 coin tosses there was a much more balanced distribution with 502 wining tosses and 498 losing ones.

Figure 1.3 shows the harsh results of the Martingale approach for this series, proving that with this approach it isn't so much the final result that makes it good or bad (in fact, after 100 coin tosses the situation was theoretically better than that shown in Figures 1.1 and 1.2) but rather the distribution of the coin tosses. (As shown above, it's the number of losing consecutive coin tosses that dictates matters in this case.)

We used the same distribution of coin tosses with the anti-Martingale approach, and Figure 1.6 shows the results. Effectively, these are the figures, after 1,000 coin tosses, the gambler by always placing a 10% stake, instead of the €100 of initial capital, would have €77,863.87 in his pocket! Pure science fiction? No, the potential of mathematics.

The anti-Martingale system doesn't always work, as the various examples in which all capital was lost (*) in Figure 1.6, go to prove. In practice, it's immediately obvious that more conservative approaches make more profit than more aggressive approaches, within certain limits. Gamblers placing large bets won't last long, whatever approach they're using.

*(*) N.B.: In reality the capital isn't mathematically lost as it is using the Martingale approach, but we can consider it to be lost when all that remains is less than €0.01. One could actually continue indefinitely staking smaller and smaller amounts if there wasn't a material limit set on said minimum stakes. (You can't stake less than 1 euro cent as this is the smallest denomination of our currency.)*

**Anti-Martingale**

| after 100 tosses | | | after 1000 tosses | | |
|---|---|---|---|---|---|
| heads | 57 | 57% | heads | 502 | 50.2% |
| tails | 43 | | tails | 498 | |
| % risk | ending capital | gain % | % risk | ending capital | gain % |
| 1% | 131.77 | 32% | 1% | 342.48 | 242% |
| 2% | 171.39 | 71% | 2% | 1,032.68 | 933% |
| 3% | 220.04 | 120% | 3% | 2,743.80 | 2644% |
| 4% | 278.90 | 179% | 4% | 6,428.39 | 6328% |
| 5% | 319.03 | 249% | 5% | 13,288.71 | 13189% |
| 10% | 887.40 | 787% | 10% | 77,863.87 | 77764% |
| 15% | 1,656.27 | 1556% | 15% | 20,734.87 | 20635% |
| 20% | 2,273.74 | 2174% | 20% | 244.14 | 144% |
| 25% | 2,287.15 | 2187% | 25% | 0.12 | –100% |
| 30% | 1,669.05 | 1569% | 30% | 0.00 | –100% |
| 35% | 868.80 | 769% | 35% | 0.00 | –100% |
| 40% | 314.56 | 215% | 40% | 0.00 | –100% |
| 45% | 76.44 | –24% | 45% | 0.00 | –100% |
| 50% | 11.87 | –88% | 50% | 0.00 | –100% |
| 51% | 7.70 | –92% | 51% | 0.00 | –100% |

**FIGURE 1.6** Loss 1, win 1.25 – anti-Martingale system, results may appear excessively optimistic but they do reflect reality after 100 coin tosses with particularly favourable results and after 1,000 coin tosses with balanced results.





Figure 1.7 shows the results in the case of a luckier series of coin tosses in which, after 1,000 tosses, the coin came up 512 heads. In this case the final result is even more astounding. The gambler staking 10% would have closed with €725,163.77 compared to the initial €100.

Figure 1.8 shows the results of the Martingale approach for the same simulation.

Figures 1.9 and 1.10 show another comparison in which the result of the final distribution is less ‘balanced,’ and the coin has come up heads just 486 times.

It’s immediately obvious that, while with the Martingale approach the final result is closely tied to the sequence of consecutive coin tosses, with the anti-Martingale approach on the other hand it’s the final percentages that have the greatest influence. A simulation with 51.2% of winning tosses, in fact, produces much better results than a simulation with 48.6% wins.