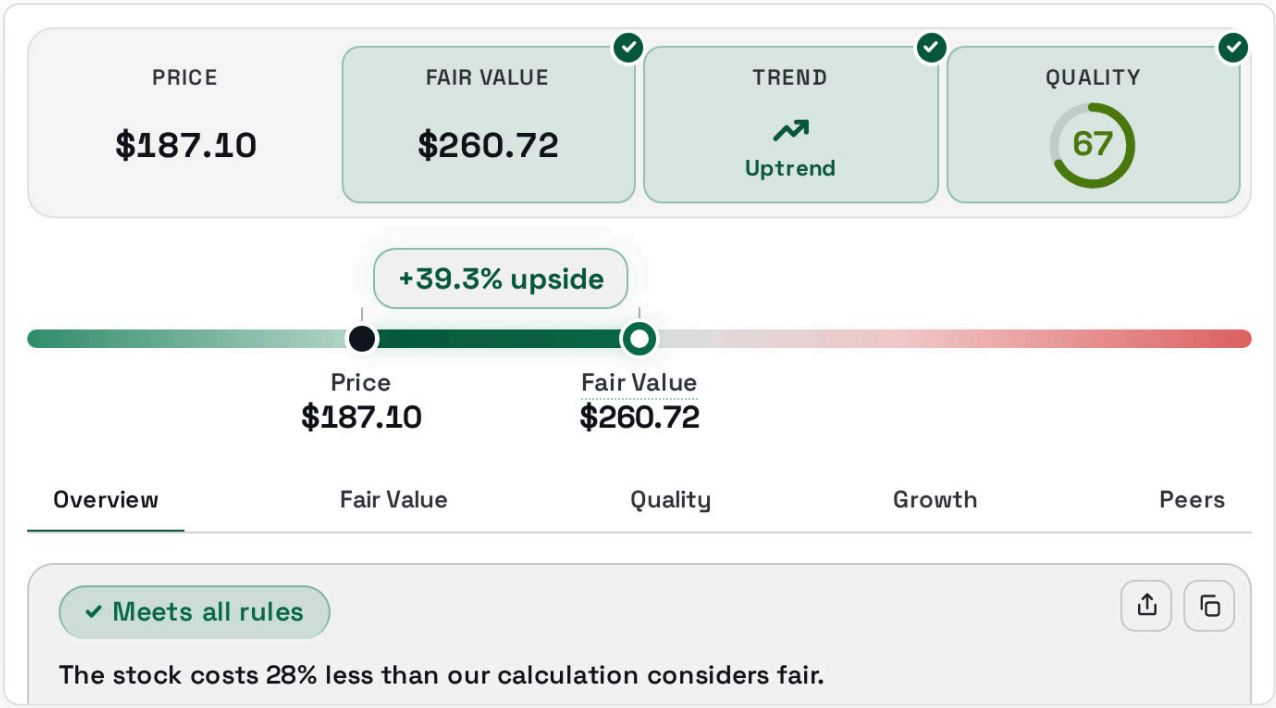
The Fair Value Playbook

An evidence-based handbook for calmer investing: what a stock is really worth, why the gap is your opportunity, how the tool shows it, and the science that says it works.





Dr. Peter Klein, BA
Founder, fairvalue-calculator.com

A practical, scientific guide to value, quality, profitability and mean reversion, built on the live Fair Value Calculator method.

Edition of 12 November 2026. Figures and screenshots as of this date.

Not financial advice. Historical data and backtests are not guarantees of future results.

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PREFACE

How to read this book

Five parts, five layers, and what you may skip

You can read this book from front to back. You do not have to. It has five parts, and each one answers a different question.

- **Part I, Foundations:** Why is a price not yet a value, and why does a private investor stand a chance at all?
- **Part II, The Method:** What do the rules look like, and how does the tool show them to you, view by view?
- **Part III, The Science:** How do we know that this holds up? Here you find the research behind fair value and quality, our own tests, and also what we tested and discarded.
- **Part IV, Research and Legends:** What have others found out about markets, valuation and investors, what is really documented about the famous investors, and do our results fit in?
- **Part V, The Origin:** Who built this, since when, and what did the critics change about it?

Alongside the running text there are five layers. You recognise each one by its label.

- **Motto:** a short quotation under the chapter heading, in its original wording or expressly marked as a paraphrase, always with its source. Many famous stock market sayings are misattributed; here you find only what can be looked up.
- **Box:** a scene from stock market history or a research finding that brings the point of the chapter to life.

- **From the engine room:** true episodes from our own work: what a check found, what caused it and what has guarded against it since. They show you how things are checked here.
- **Try it:** a task in the tool that takes two minutes. In the printed book a QR code takes you there. Where a function needs an account or Pro, it says so.
- **In short:** the three to five sentences that should stay with you from the chapter.

What you may skip: if you already know the tool, the tutorials in Part II. If statistics tire you, the method boxes and tables in Part III and Part IV; read "In short" and the engine-room stories there, and you will know what was tested and what came out. The glossary and the references in the appendix are there for looking things up.

Three routes through the book, depending on your mood. If you have an hour, read Part I, Chapter 9 with the rules of the strategy, and "In short" everywhere. If you want to get started right away, take Part II and keep your phone at hand. If you are suspicious, which I understand well, start at the back: with the critics in Part V and the evidence in Part III. And if it has to be really quick: "The method on one page" is at the end of Part II.

Every number in this book has a source, and whatever is an estimate is called one. The numbers are taken from the same sources the website uses, on the date printed on the cover. Screenshots show the tool on that day; the live numbers on the site move every day. Not financial advice.

CHAPTER 1

Why this handbook exists

The idea in one sentence, and who it is for

> *"To invest successfully over a lifetime does not require a stratospheric IQ, unusual business insights, or inside information."*
>
> Warren Buffett, preface to Benjamin Graham's "The Intelligent Investor", fourth edition 1973 [31]

I did not originally write this for the market. I wrote it for my children, Rosalie and Ferdinand, and for the younger version of myself who sensed that something important was happening in investing but could not find a simple, honest, practical explanation.

For a long time the stock market looked like a strange game. Some people treated stocks like gambling; others spoke as if professionals had a secret language ordinary people could never learn. I had no mentor, so I learned the slow way: books, mistakes, spreadsheets, painful lessons, and eventually a system.

One sentence organised the whole subject for me: price is what you pay, value is what you get; that is how Warren Buffett, by his own account, learned it from Benjamin Graham [33]. On a screen you see prices every second. What you do not see directly is value. If you never estimate value, your decisions quietly become emotional: fear, greed, hope, panic, or the feeling that you are missing out.

Core principle

You do not need a finance degree. You need clarity, rules, patience, and a way to separate emotion from decision.

That is why I built the Fair Value Calculator. It is not magic and not a promise. It is a **compass**. It asks one clean question: is this stock probably cheap, fair, or expensive compared with a reasonable estimate of its intrinsic value? This handbook turns that question into a repeatable process, shows you step by step how the tool answers it, and shows you the science that says the process has an edge.

IN SHORT

- On the screen you see prices; value you have to estimate, otherwise emotion decides.
- The Fair Value Calculator is a compass, not magic and not a promise: is the stock cheap, fair or expensive?
- You do not need a finance degree; you need clarity, rules and patience.

CHAPTER 2

Why monkeys often beat fund managers

Costs, incentives and the private-investor edge

> *"... a blindfolded chimpanzee throwing darts at the Wall Street Journal could select a portfolio that would do as well as the experts."*
>
> Burton Malkiel on the first edition of his book from 1973, in "A Random Walk Down Wall Street", 2003 edition, Chapter 11 [32]

When you ask a bank to invest your money, you are often sold a feeling before you are sold a strategy. The key question is not how elegant the fund name sounds. It is what costs you pay, and who gets paid regardless of performance.

TRY IT

What 1.5% really costs

In the Compound Growth Calculator, run the same starting amount over 30 years twice, for example once at 7% and once at 5.5% a year. The difference between the two final amounts is the price of a fee that sounds harmless. The rates are a worked example, not an expectation. The calculator is free and needs no account.

fairvalue-calculator.com/en/simple-stock-compound-calculator/

Active funds face two structural problems. First, incentives are not always aligned: institutions may prefer their own products or whatever is easiest to sell. Second, size is a cage: a fund moving billions cannot turn as nimbly as an individual managing a personal portfolio.

The maths is unforgiving. William Sharpe's "arithmetic of active management" [19] shows that, before costs, the average actively managed dollar must earn exactly the market return, so after fees the average active dollar must underperform the market. Decades of SPIVA scorecards, S&P's half-yearly comparisons of active funds with their index, confirm it: across most regions and horizons, the majority of active funds trail their benchmark [27]. Carhart showed that what little persistence exists is largely explained by costs and momentum, that is, the price swing of recent months, not stock-picking genius [20].

A ten-year bet

On 19 December 2007 Warren Buffett made a bet: a plain index fund on the S&P 500 would do better over ten years than a selection of hedge funds. His counterpart, the advisory firm Protégé Partners, picked five funds of funds that spread their money across more than 200 hedge funds. In 2008 all five were ahead of the index fund, which lost 37%. After that they trailed as a group for nine years in a row. At the end the index fund stood at +125.8%, the best fund of funds at +87.7%, the weakest at +2.8%. Buffett did not put this down to stupid managers but to the arithmetic of this chapter: fixed fees of around 2.5% a year, spread over two layers. His line on it: "Performance comes, performance goes. Fees never falter." [33]

This does not make professionals useless. A low-cost index ETF is a perfectly sensible core. But if you choose individual stocks, you need something a brochure cannot give you: a process that stops you confusing **price movement with business value**. That is exactly where this method begins, and where a disciplined private investor actually holds an edge over a giant, fee-laden fund.

Practical takeaway

Before buying any fund or stock, ask: what are the costs, what is the underlying value, and can I explain the decision without relying on somebody else sounding confident?

IN SHORT

- Before costs, the average actively managed dollar earns exactly the market return, so after fees it earns less.
- Across most regions and horizons, the majority of active funds trail their benchmark.
- A low-cost index ETF is a sensible core.
- If you choose individual stocks, you need a process that separates price movement from business value.
- Before every purchase, ask: what does it cost, and what value is behind it?

CHAPTER 3

Price is not value

Mr. Market, the margin of safety, and your real edge

> *"Confronted with a like challenge to distill the secret of sound investment into three words, we venture the motto, MARGIN OF SAFETY."*
>
> Benjamin Graham, "The Intelligent Investor", Chapter 20 [18]

A stock price is only the last transaction between two participants. It is not an objective truth about the company. In real life you would never buy a house just because yesterday's quote jumped, yet in stocks people do exactly that, because the market flashes prices in their faces all day.

The value was in the files

In 1925 the young Benjamin Graham was working his way through reports that oil pipeline companies had to file with the US regulator and that hardly anyone read. At Northern Pipe Line Co. he found something odd: the stock cost $65, but the company held high-grade bonds worth at least $80 per share. The price was below what lay in the vault in securities alone. Graham bought, kept pressing the management until it paid out more to the owners, and three years later had $110 per share in hand. The market had shown the price every day. The value had to be looked up. That is how Jason Zweig tells it in his edition of Graham's book [18].

Benjamin Graham gave us the antidote: imagine the market as a moody business partner, **Mr. Market**, who shows up every day quoting a price to buy your share or sell you his. Some days he is euphoric, some days terrified. You are free to ignore him or to exploit him, but never obliged to trade [18]. Fair value is your anchor against his moods. It is not a prophecy; it is a rational estimate, or range, that sorts a stock into three zones: **undervalued, fairly valued, overvalued**.

TRY IT

Three zones in two minutes

Search for a company whose product you used today. Read only two numbers: price and fair value. Then say out loud which of the three zones the stock is in before you look at the colour of the field. Browsing costs nothing and needs no account.

fairvalue-calculator.com/?lang=en



Figure 1 The core idea, on a real chart: the price line and the fair value line of one stock over time. The gap between today's price and a defensible estimate of fair value is the potential upside, your **margin of safety**.

This changes how you feel about volatility. A falling price can be a warning or an offer. It depends entirely on value. But the anchor only works if it is honest: the more stable the earnings, the cleaner the growth, and the stronger the balance sheet, the more useful a fair-value estimate becomes. The shakier the business, the wider the range and the larger the margin of safety must be.

Evidence note

This is not folklore. The ”value effect” is among the most replicated facts in finance. Basu showed high earnings-yield stocks earned higher risk-adjusted returns, that is, more return relative to their volatility [1]. Fama and French showed book-to-market captures much of the cross-section of returns [2]. Lakonishok, Shleifer and Vishny tied the effect to investor overreaction [3]. De Bondt and Thaler documented the long-term reversal that follows [4]. The studies are covered in detail in Chapter 24.

IN SHORT

- The price is the last transaction between two participants, not a truth about the company.
- Mr. Market makes you an offer every day; you never have to trade with him.
- Fair value is an estimate or a range and sorts a stock into three zones.
- The gap between price and fair value is the margin of safety; the shakier the business, the larger it must be.
- The value effect is among the most replicated facts in finance.

CHAPTER 4

The simple Fair Value calculator

Earnings per share, growth, smoothing and guardrails

> *"... the combination of precise formulas with highly imprecise assumptions can be used to establish, or rather to justify, practically any value one wishes ..."*
>
> Benjamin Graham, speech "The New Speculation in Common Stocks", May 1958, reprinted in the appendix of "The Intelligent Investor" [18]

The simple calculator has one job: teach the logic of fair value without intimidating you. You enter earnings per share and a growth rate, and the output forces a conversation between today's price and a reasonable estimate of worth. It is still on the site, next to many other calculators for single questions (dividends, DCF, compound interest and more).

"What were you thinking?"

In 2000 the stock of the computer maker Sun Microsystems cost $64, ten times its annual revenue. Two years and one crash later, chief executive Scott McNealy worked out in an interview what that price would have demanded: to pay back the purchase price in ten years, he would have to pay out the entire revenue as dividends for ten years. For that, Sun could have no cost of goods sold, could not pay its 39,000 employees, could pay no taxes and could put nothing more into research, and revenue would still have to stay the same. "Do you realize how ridiculous those basic assumptions are?" he asked, and then: "What were you thinking?" It is the calculation of this chapter, only backwards: which assumptions would have to be true for this price to be fair? [34]

Earnings per share is profit per share, preferably diluted, which accounts for options and other instruments. Growth should come from observed or carefully estimated revenue or earnings growth, not from hope. If revenue rises from 100 to 110, that is 10%, nothing mystical.

TRY IT

Turn the growth dial

Enter a company's figures in the simple Fair Value calculator and note the result. Then double only the growth and leave everything else as it is. How far does the value jump? That is how sensitive every valuation is to the one assumption that is hardest to know. The calculator is free.

fairvalue-calculator.com/en/stock-fair-value-calculator-excel/

The biggest beginner mistake is treating a single abnormal year as normal. A one-off gain, a write-down, a cyclical spike or a crisis year can make a valuation look mathematically clean but economically wrong. That is why smoothing matters: median, mean, geometric and weighted averages reduce the influence of one-off distortions and move you towards a sustainable base level of profit and growth. The full engine on the site works the same way and goes further: it removes documented one-off gains and losses before it values a company.

FROM THE ENGINE ROOM

The margin that was too good

In November 2026 a finished image card for our channels was waiting for approval. It celebrated the profit margin of one of the largest corporations in the world: this many cents of every dollar of revenue are left as profit. The number was correct. It was in the accounts exactly like that.

On the second read we noticed that the net margin was above the operating margin. That is like a baker who earns more than his bakery yields: possible, but then the money does not come from the bread. A large part of the pre-tax profit came not from the company's own business but from its stakes in other companies. We counted, and found the same pattern in many more companies that our users follow.

We scrapped the card before it was published. What stayed is a test question that has been part of our sign-off ever since and that you can ask yourself: if the net margin is above the operating margin, check where the difference comes from before you take the number for the earning power of the business. Nobody can count on a book gain from stakes in other companies for next year.

Rule

If the input is unrealistic, the output is not analysis, it is speculation dressed as mathematics. Companies with no profits, extreme growth assumptions or a chaotic history should not be forced into a simple formula. Sometimes the best output is a warning, not a number.

IN SHORT

- The simple calculator needs earnings per share and a growth rate; its job is to teach the logic of fair value.
- A single abnormal year is not a normal year; smoothing leads to a sustainable base level.
- Unrealistic inputs produce speculation dressed as mathematics.
- Sometimes the best output is a warning, not a number.

CHAPTER 5

Finding ideas

From stories to verifiable candidates

> *"Investing without research is like playing stud poker and never looking at the cards."*
>
> Peter Lynch, "One Up on Wall Street" (1989), Chapter 7 [35]

Good ideas come from screeners, magazines, conversations, everyday products, even your children or partner noticing a brand everywhere. The art is not finding stories. The art is testing them.

Question for every idea

Is this just a great story, or is there a measurable gap between price and value? Let curiosity fill the funnel, but let data decide what stays.

The feed and the screener turn a spontaneous idea into a structured candidate: filter for stocks whose calculated fair value sits above the current price, then narrow by region, size, profitability, debt, growth and trend. Ready-made strategies do this in one tap; the strategy "Backtested Best" shows exactly the stocks that meet the three buy rules of Chapter 9. This stops you confusing media attention with investment quality.

FROM THE ENGINE ROOM

Far more than double

In the summer of 2026 we wanted to take a closer look at a company whose profit swings strongly from year to year. The tool showed a fair value that was far more than twice the price. That does happen, but rarely with a company that has been listed for decades and that anyone can check for themselves.

A look at the profits of recent years explained it. In a weak year almost nothing was left, in the best year many times that. Our calculation had treated the best year as if it were an ordinary one, and the fair value danced up and down with the cycle.

Since then a guard, an automatic check that runs before display, tests whether a cyclical peak is distorting the valuation, and a badge on the card tells you when that is the case. How we tested this caution and what it means for the strategy is described in Chapter 20.

For the search for ideas this means: a huge gap to fair value is no reason to cheer. It is a prompt to look at the earnings history first.

TRY IT

Three cards, three risks

Open the strategy "Backtested Best". Take the first three cards and read only the line "Main risk" on each. After that line, which of the three would you check more closely first? This works without an account.

fairvalue-calculator.com/?lang=en&screen=backtested

Everyday life still matters. The early iPhone was a product signal millions saw as consumers before they understood it as investors. A great product can reveal customer love, pricing power and room to grow. But you must take one more step: check whether the numbers support the story. A company can be beloved and overvalued; a boring one can be ignored and deeply cheap.

IN SHORT

- Ideas come from everyday life, from screeners and from conversations; the art is testing them.
- The feed and the screener turn a spontaneous idea into a structured candidate.
- A beloved company can be overvalued, a boring one ignored and deeply cheap.
- Curiosity fills the funnel, data decides what stays.

CHAPTER 6

The tools, explained

Search, feed, stock window, stock page, watchlist, market, screener, evidence

The tool is a shortcut through work you could do by hand across dozens of websites and spreadsheets. Its real value is that the process becomes **repeatable**: the same questions, the same rules, the same numbers on every surface. Fair Value Calculator values 40,000+ stocks worldwide with 26 valuation models and scores each company on up to 37 quality factors. The feed shows 27,000+ of them that pass its visibility checks. 26,000+ have their own stock page. Values are recalculated every day.

Search

The search at the top finds a company by name, brand, ticker, ISIN or German WKN (the identification numbers of a security), also without umlauts and on a phone keyboard. When two different companies fit equally well, it shows both instead of guessing.

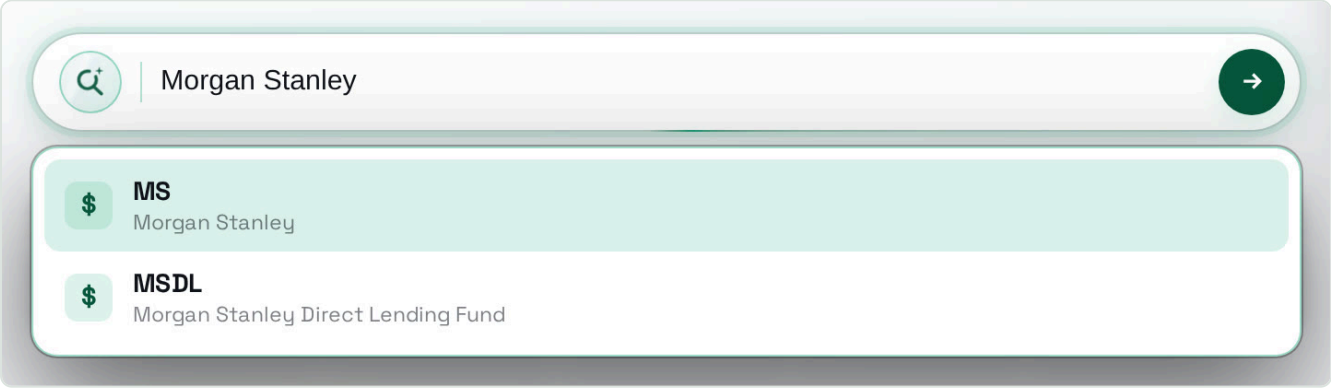


Figure 2 The search finds a company by name, ticker or ISIN. Tapping a suggestion opens the analysis of exactly that listing.

The feed and the stock card

Every stock in the feed is a card. The row of numbers reads from left to right: **price, fair value, trend, quality.** The fair value field turns green when the fair value is at least 30% above the price, orange between zero and that mark, red below the price. The trend field shows an arrow: up (the price a month ago was higher than twelve months ago), sideways (down to −10%) or down. The quality field turns green from 50, orange from 40, red below. A green field carries a small tick: that rule of the strategy is met. The bar below shows the gap between price and fair value.

Under the numbers sits the verdict: one sentence about fair value, quality and trend, with a tick when all three rules are met. An example: "Fair value well above the price, solid quality and an uptrend." When a rule is missing, the sentence says so: "Strong quality and an uptrend, but price close to fair value." Below it one line "Plus" names the strongest point and one line "Main risk" the biggest danger. Small badges at the top say in a few words what the company does, its size class (micro to mega) and its data coverage (broad, some or thin data: how much data backs the fair value).

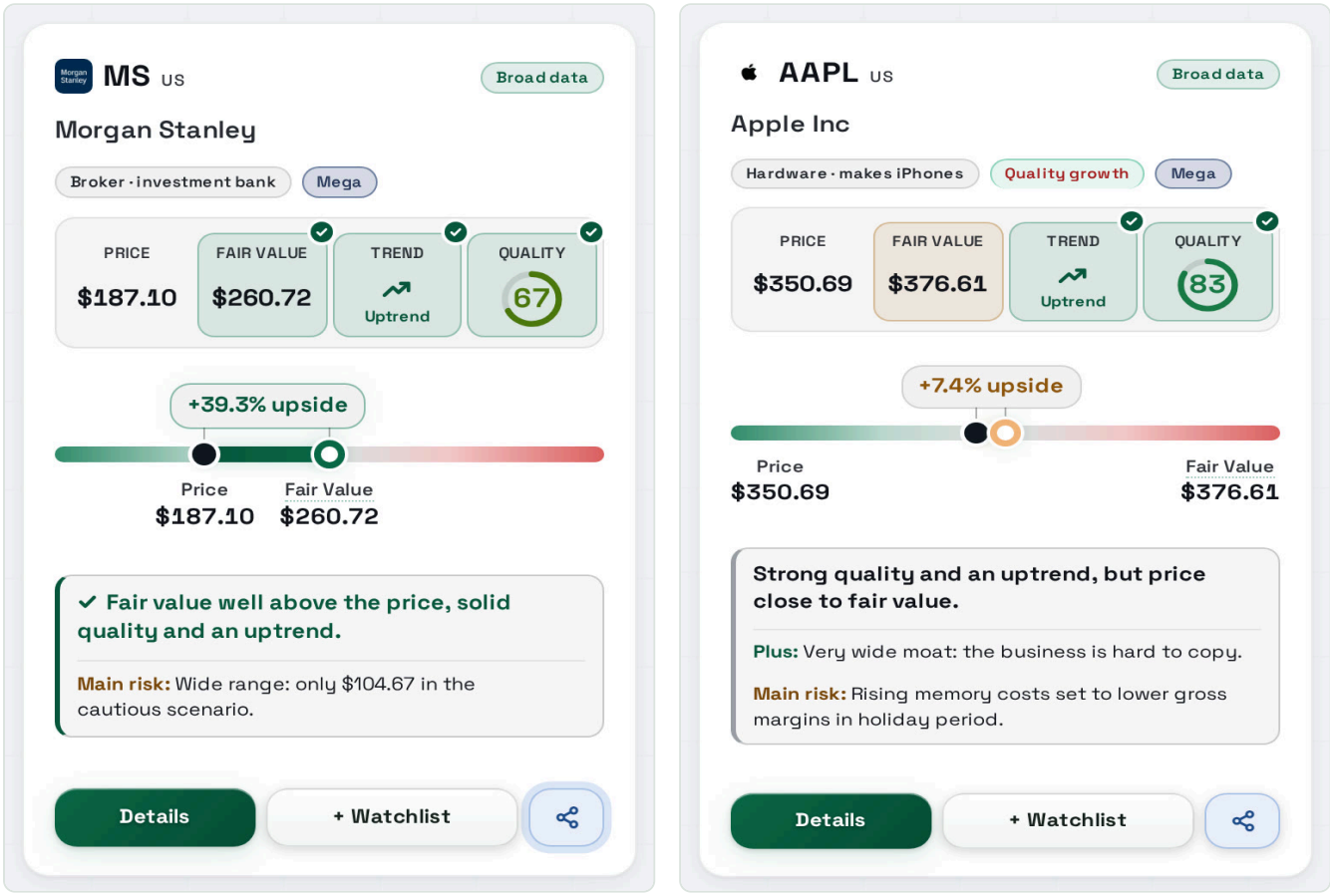


Figure 3 Two feed cards. Left: price, fair value, trend and quality in one row, all three fields green with a tick; the verdict sentence sums them up, followed by the main risk. Right, for contrast: the fair value field is orange (less than 30% above the price), and the sentence names what is met and what is missing.

The stock window

Tap a card and the stock window opens. It starts with the same row of numbers and the bar between price and fair value. The overview then shows the verdict as a short badge (for example "Meets all rules"), one sentence on price and value ("The stock costs 28% less than our calculation considers fair.") and a short list of what matters. It covers fair value, quality, margins, dividend, competitive advantage, growth, the comparison with peers, insider trades, the width of the range and the last

change of the fair value. Risks found by the AI analysis appear as a separate group, and a button asks the AI chat why the stock is valued this way. The button "+ Watchlist" at the top saves the stock; comments and votes of other users sit behind the speech bubble.

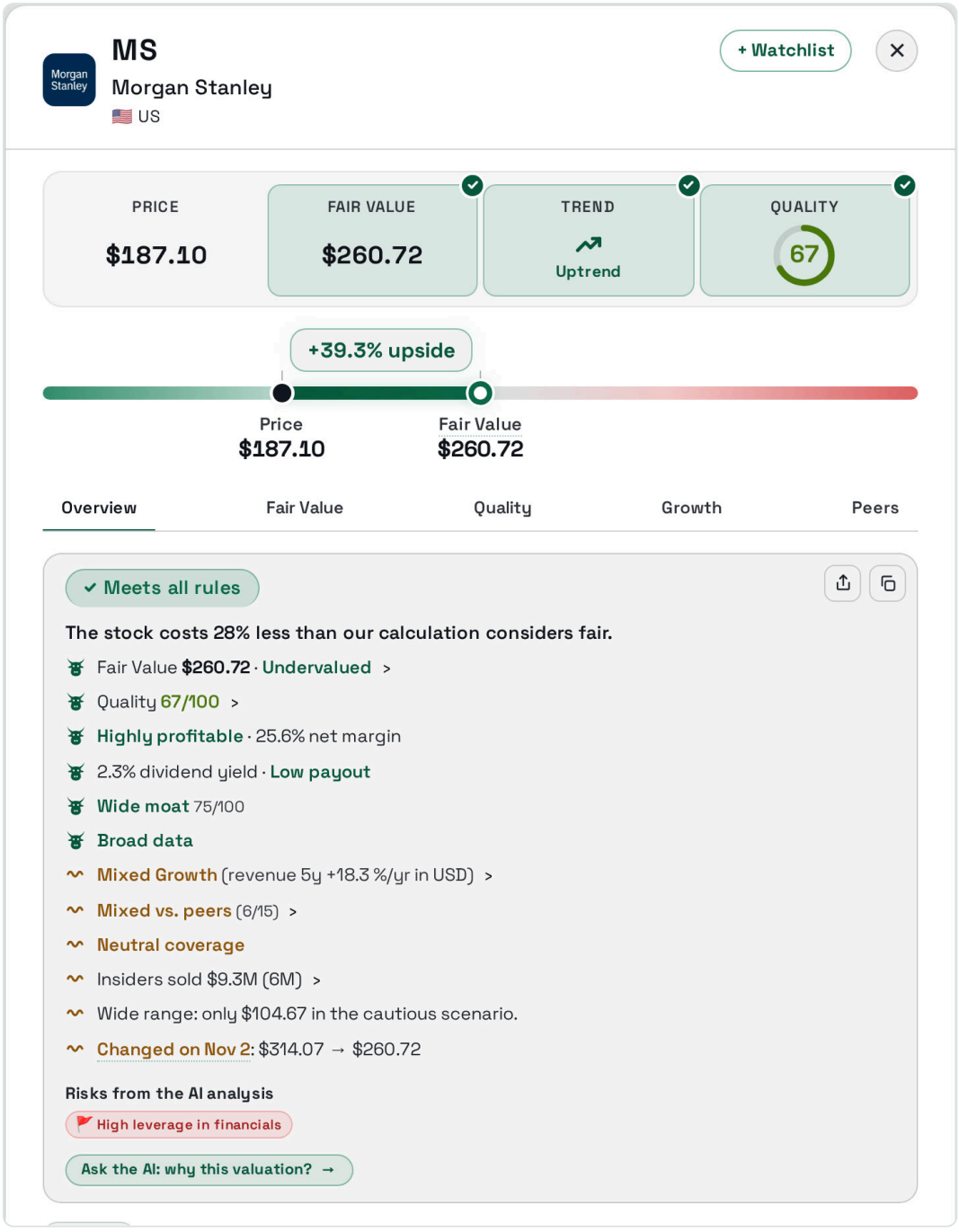


Figure 4 The overview of the stock window: number row, the badge "Meets all rules", the sentence on price and value, the list of what matters and the risks from the AI analysis.

The tabs go deeper:

- **Fair Value** shows the range from cautious (bear) through base to optimistic (bull) and the table of every valuation model that fits this company, each with its three scenarios.
- **Quality** shows the Quality Score from 0 to 100, its factor families with bars and an explanation for every factor, plus the Piotroski F-Score and insider trades from filings with the SEC, the US securities regulator (shown for information, never part of the score).

- **Growth** shows the history of revenue and earnings and how much growth today's price already assumes.
- **Peers** places the company inside its industry.

FROM THE ENGINE ROOM

Two sentences that contradicted each other

In November 2026 one stock carried the badge "Meets all rules" at the top of the stock window and, a few lines further down, "Strongly Overvalued". Both came from us, each was justified on its own, but together they did not fit.

What had happened? One of our own caution rules had lowered the displayed fair value markedly overnight. Anyone who already had the stock on their watchlist saw a different number from the day before and no reason for it.

What we changed is how we handle this. When one of our own rules moves a displayed value markedly, a short line now says so and, where we can document it, gives the reason. And before we switch on such a rule, we count how many watchlists it affects and inform the Pro customers concerned.

A number that moves owes you an explanation. That is why the overview tells you, when the fair value has changed markedly in recent weeks, when that was and, where we know it, why.

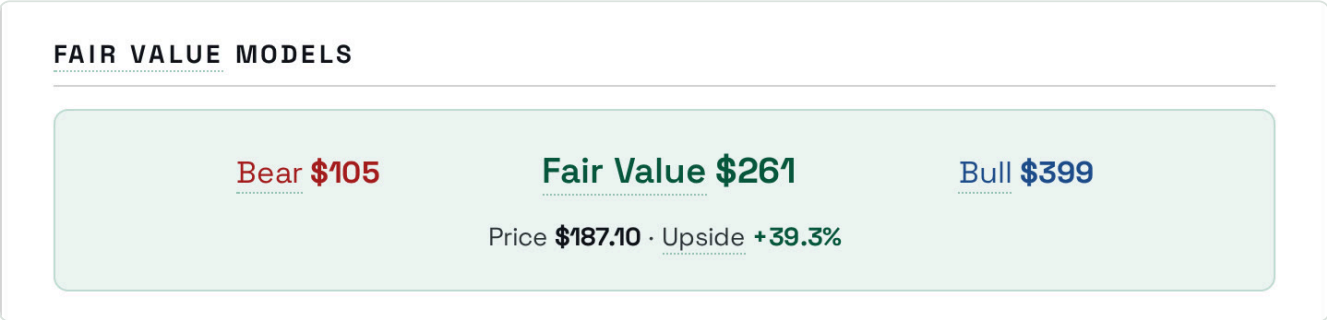


Figure 5 Tab Fair Value: the range from bear to bull and the models behind it.

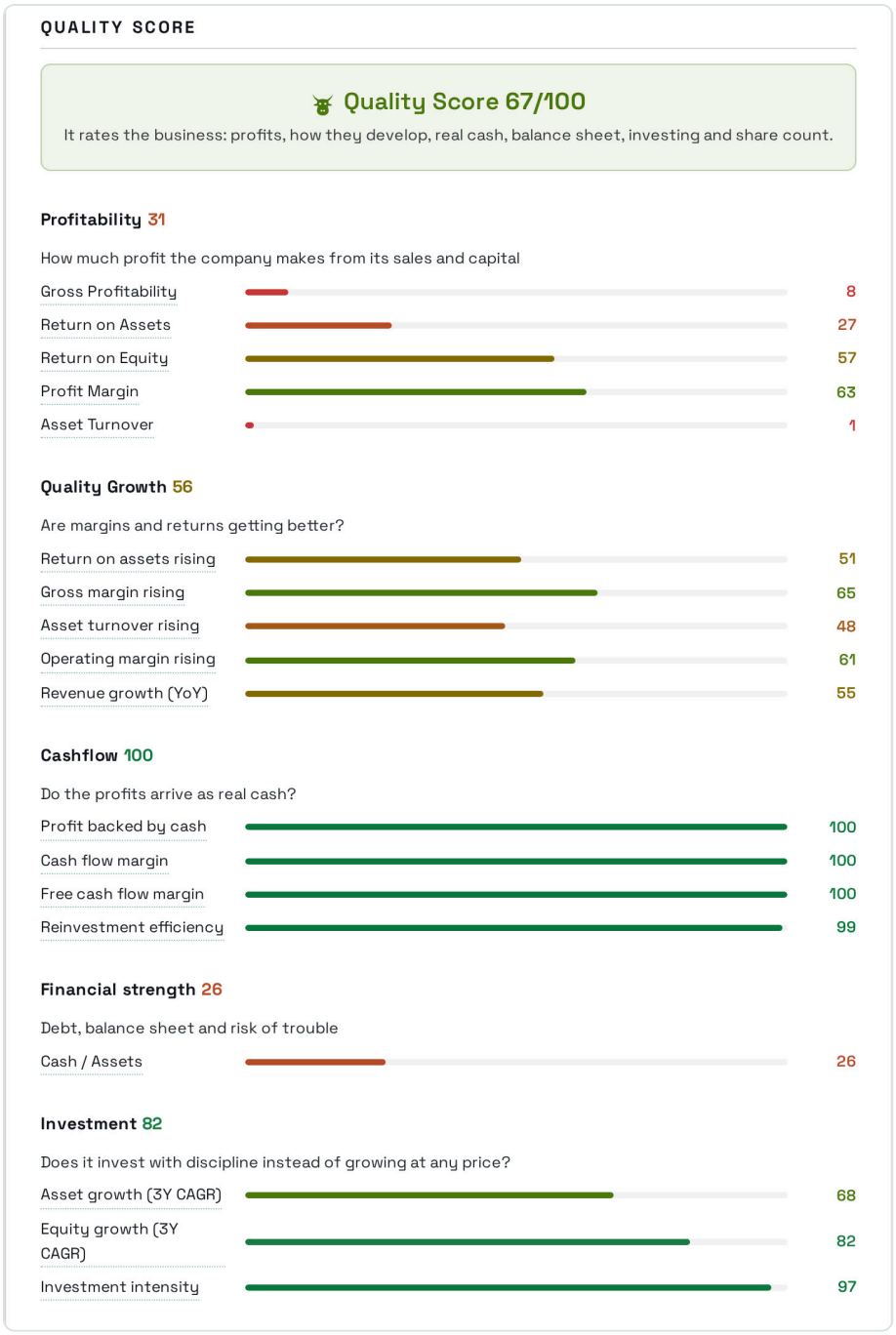


Figure 6 Tab Quality: the score, the factor families and the bars behind them.

Quality adjustment

Strong, stable companies deserve more trust in the valuation; weak or chaotic ones need a larger margin. A stock that looks "200% below fair value" but has unstable numbers can be less attractive than one with a smaller gap and much cleaner fundamentals. The goal is never to worship the score; it is to see where the opportunity and the risks actually are.

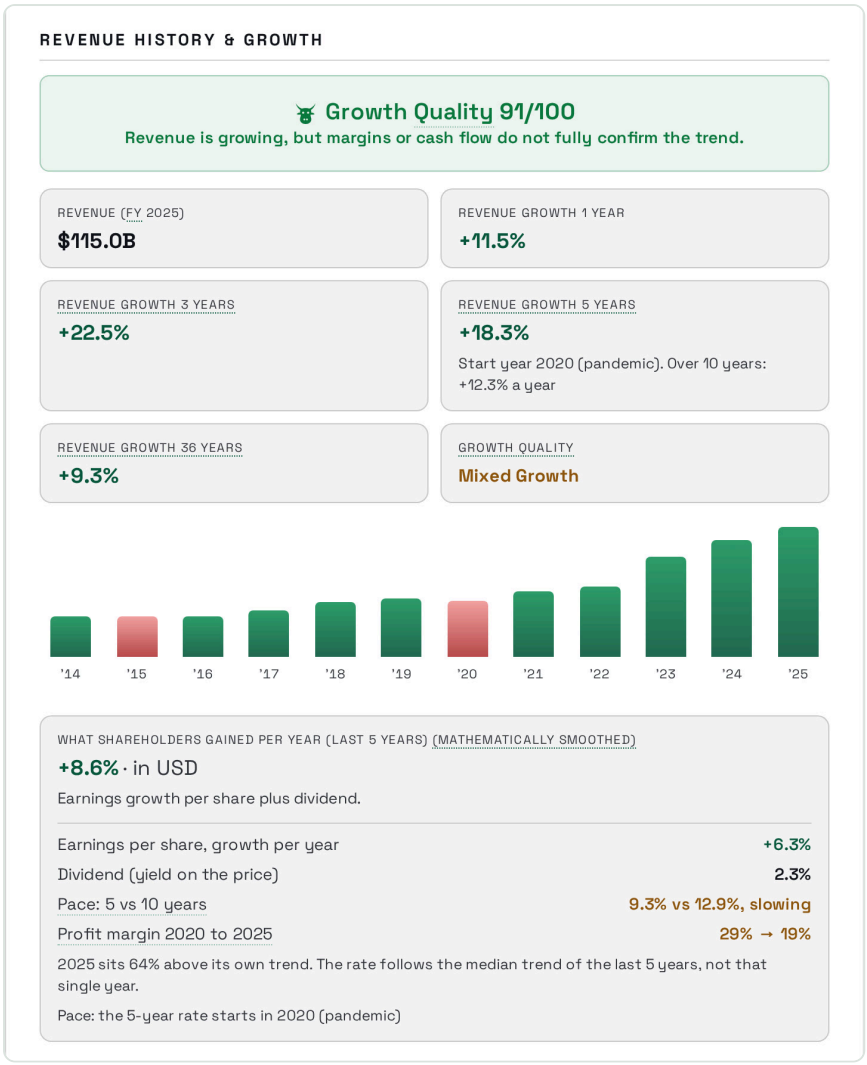


Figure 7 Tab Growth: what the business delivered and what the price already assumes.

TRY IT

How much growth is already in the price?

Open the tab Growth for Microsoft and find the figure for how much growth today's price assumes. Compare it with what the company has delivered in recent years. If the expectation is higher than the history, you are paying for the future. The stock window is free.

fairvalue-calculator.com/?lang=en&q=MSFT.US#growth

The chart: price, fair value, trend and the five-year forecast

The chart "Price vs Fair Value" shows the price line and the fair value line, with the cautious and the optimistic value as thin lines, over three months up to the full history. A shaded area marks the trend of the buy rule: it runs from twelve months ago to one month ago, green for an uptrend, orange for sideways, red for a downtrend, and names the change in per cent. The last month stays unshaded because the rule does not use it. On the right the chart looks ahead, five years in the 5Y and Max views: the expected return per year over the period shown, as the most likely path for the price, and where the fair value is likely to head. The methodology page explains how the forecast is made; it is a hypothetical estimate, single stocks can deviate widely.

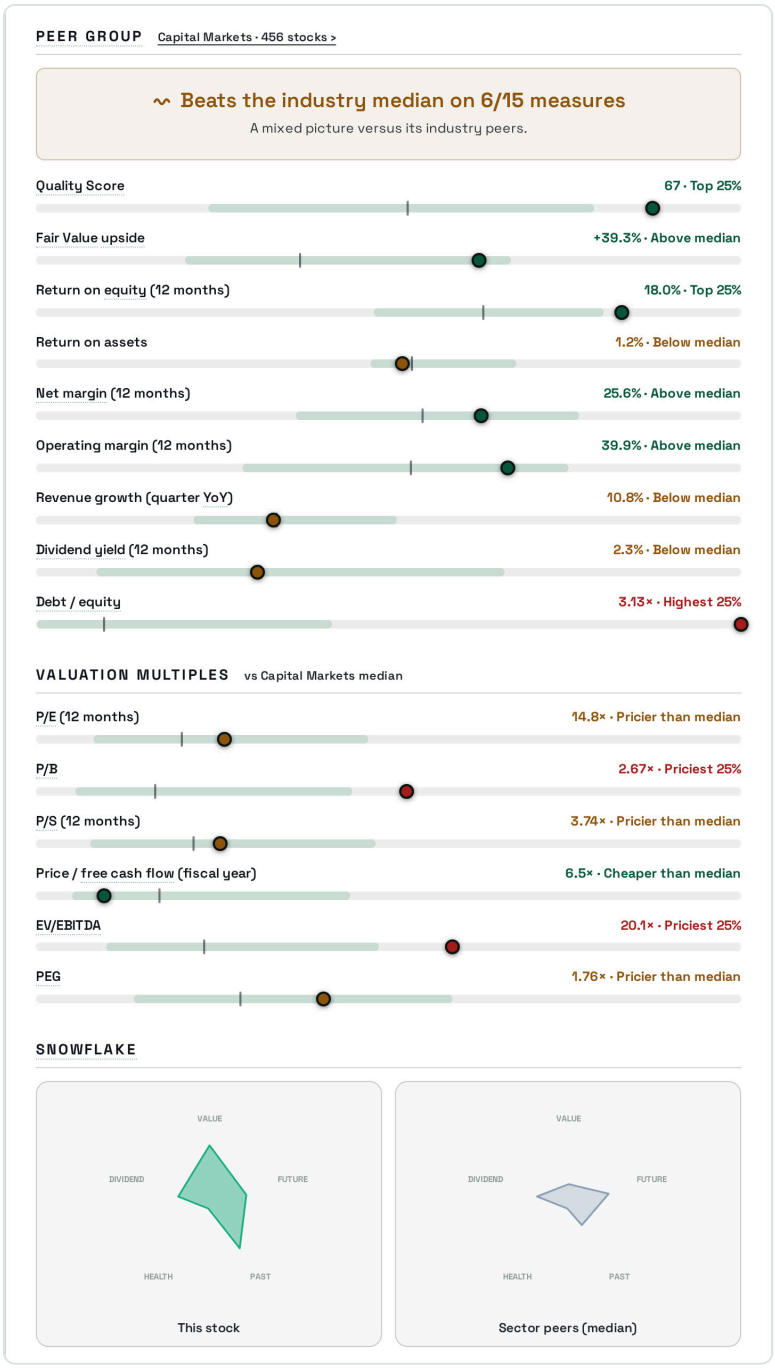


Figure 8 Tab Peers: how the company compares with its industry, measure by measure.

The trend area is shown in the chart figure in Chapter 3: it lies between the two points of the trend rule, twelve months and one month ago, shaded in the colour of the trend field.

The stock page

Most stocks also have their own page (for example /stock/MS for Morgan Stanley), built for search engines and for sharing: the same row of numbers, the same verdict and the same figures as the stock window, plus questions and answers about the company.



Figure 9 The forecast on the right of the chart in the five-year view: expected return per year and the likely path of price and fair value.

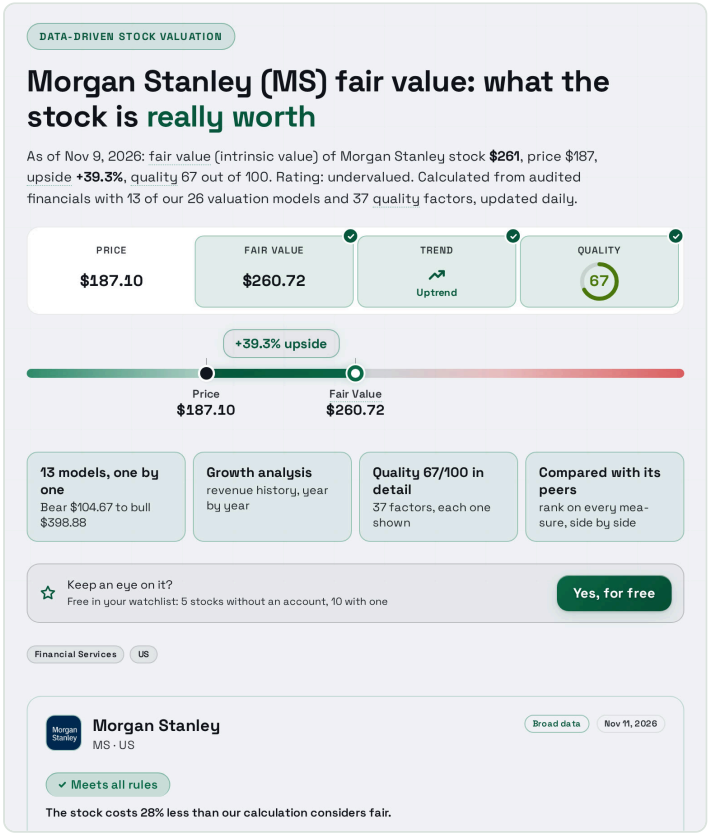


Figure 10 The stock page: same numbers and verdict as the stock window, on its own address.

Compare two stocks

The comparison puts two companies side by side with the same values: fair value, quality, trend, multiples, growth and dividend. It answers the everyday question "this one or that one?" without switching tabs.

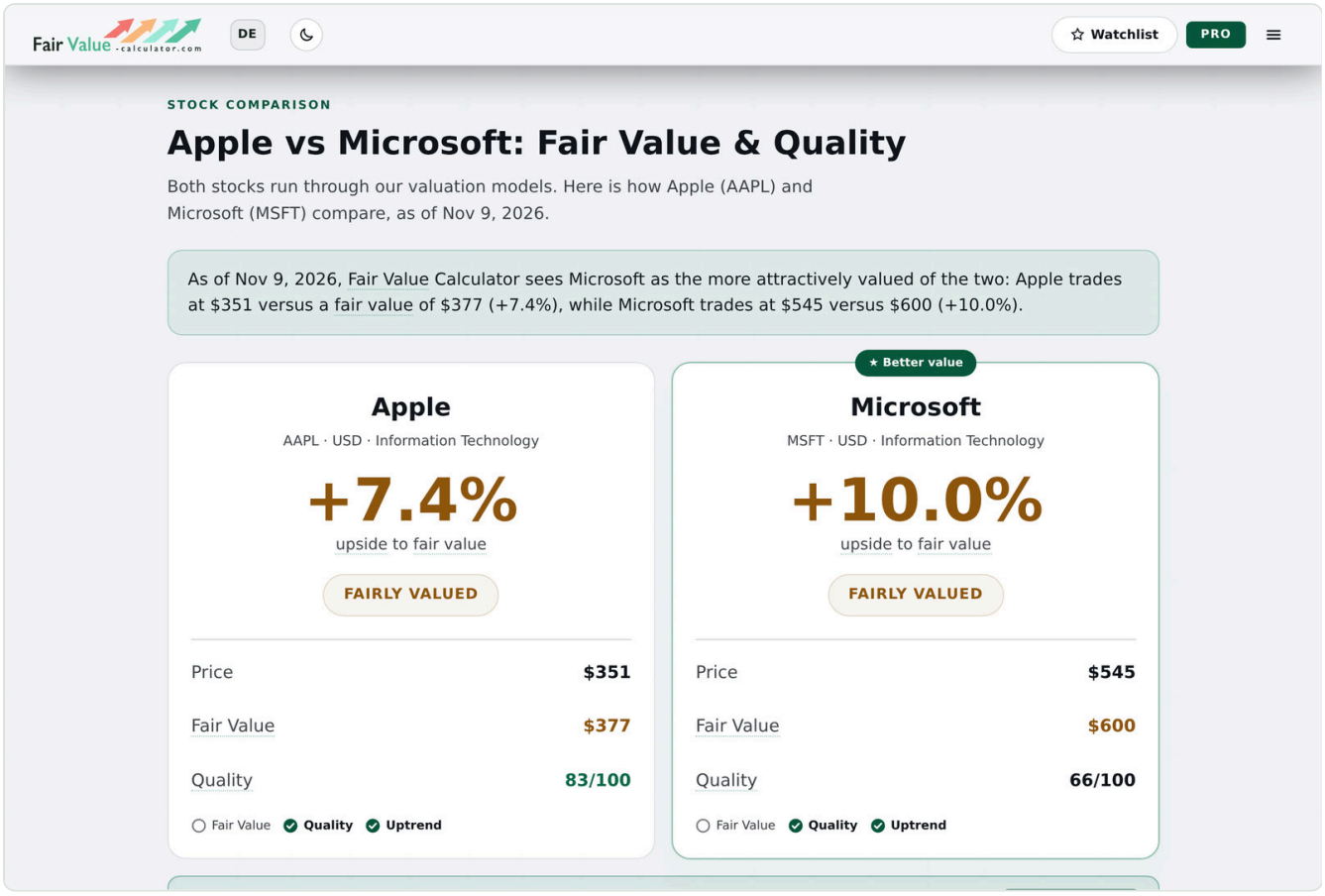


Figure 11 Two stocks side by side on the comparison page.

TRY IT

This one or that one?

On the comparison page, type in two companies you have wavered between yourself. Read three lines: fair value, quality, trend. Only then decide which one you would look at more closely, and check whether your answer is the same as before the comparison. The comparison is free.

fairvalue-calculator.com/compare/

The watchlist: where discipline lives

The watchlist keeps your stocks and judges each one by the sell rules of the strategy: **On track** or **Review** (Chapter 10). The buy rules do not appear there any more: once a stock is on your list, what counts is whether the case still holds. Without an account the watchlist keeps 5 stocks in your browser, a free account keeps 10 on every device, Pro keeps more.

At the top, the card "Your portfolio at a glance" sums up the whole list in four bars: how many stocks, how they are valued (the median gap to fair value), the average quality, and how well they are spread. Diversification is a number from 0 to 100; with Pro it opens into sectors, regions, size and measured

correlation, with suggestions for stocks that fit what you already hold. Each bar has a button ”Improve” with a concrete next step.

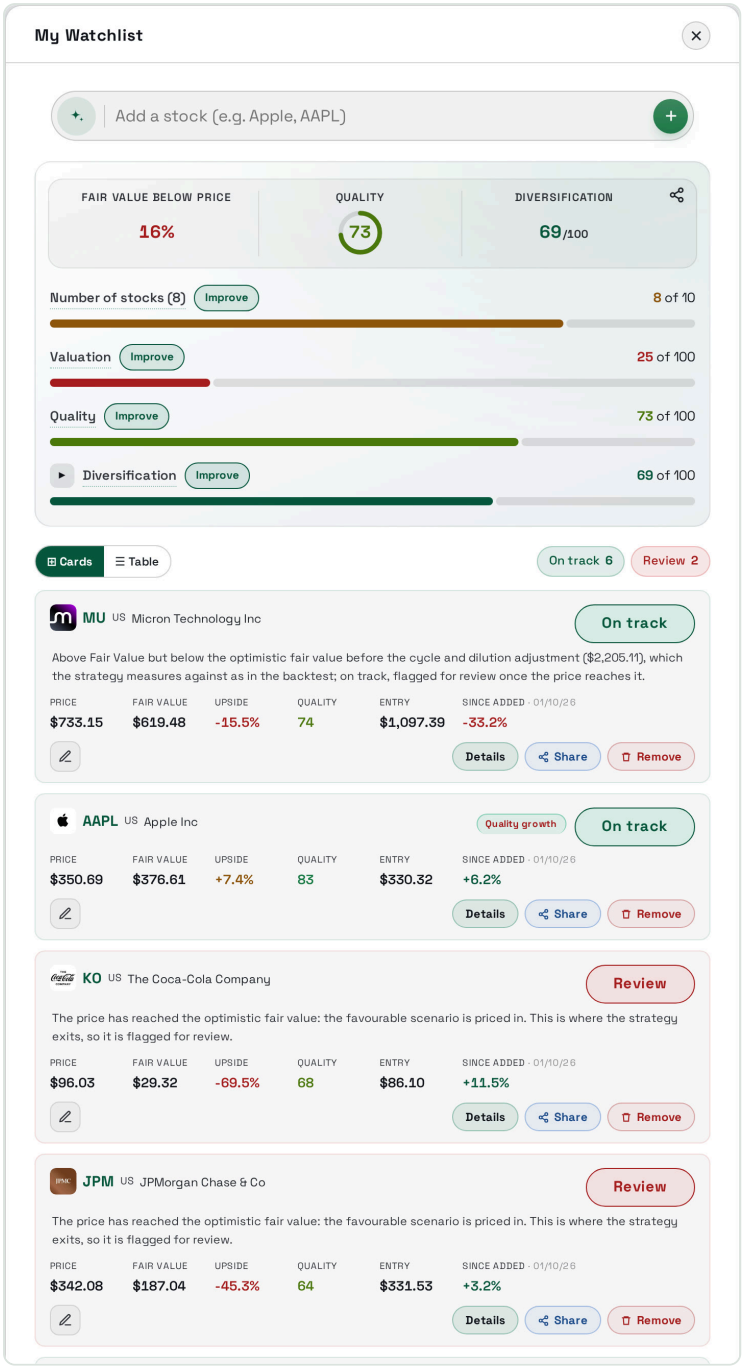


Figure 12 The watchlist with its overview card: number of stocks, valuation, quality and spread, then each stock with its status.

Market valuation and the world map

Zoom out: is the whole market cheap, fair or expensive right now? The market valuation answers with the average of all models for the world market, a world map coloured by country and the history of the model view. It is context for patience, not a timing signal.

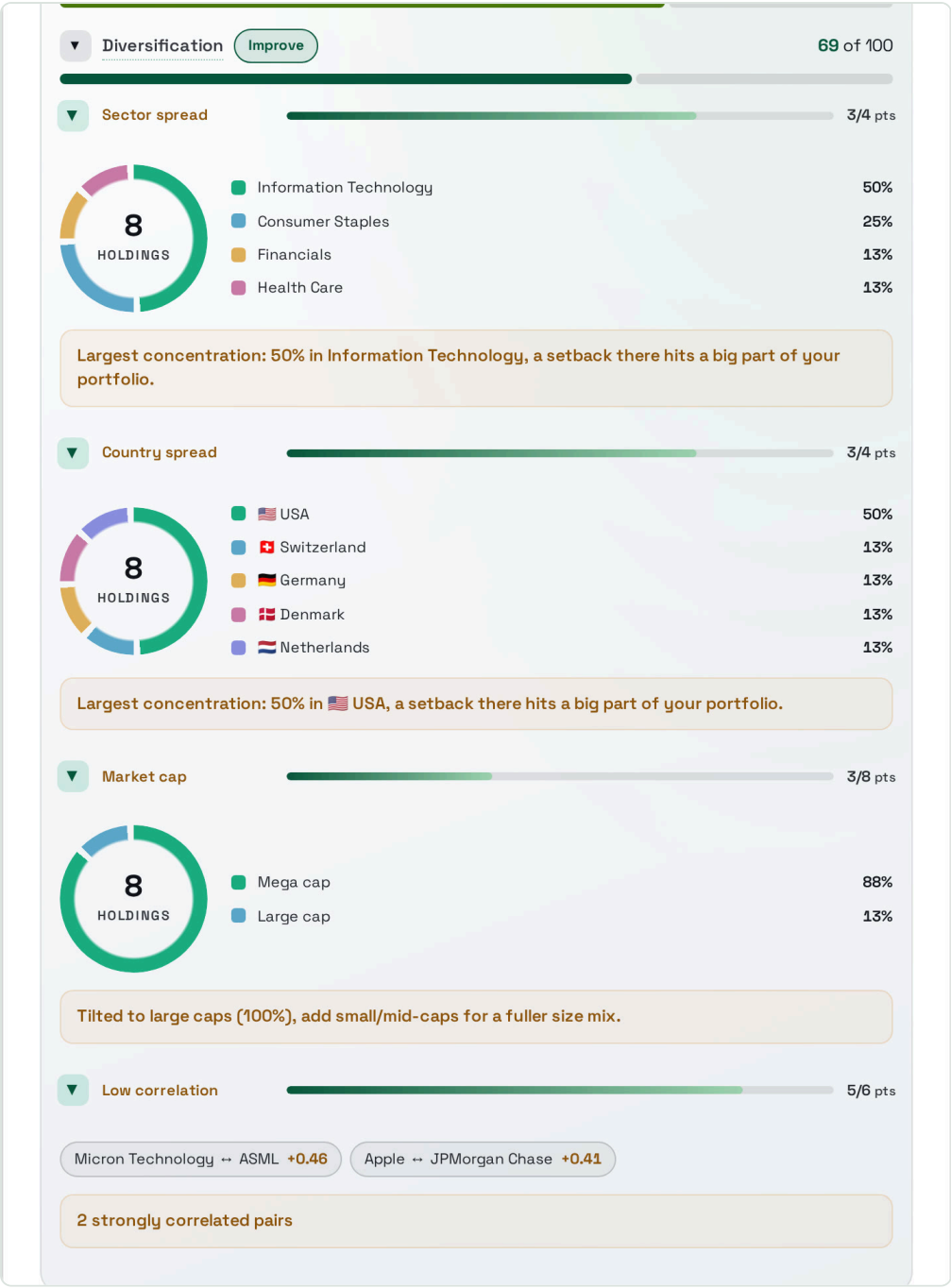


Figure 13 Diversification opened: the score from 0 to 100 and suggestions that fit the portfolio.

Strategies and the Pro screener

The feed offers ready-made strategies (Backtested Best, Big names, Dividend, Buffett style, Graham style and more), filters for region, size and sector, and one sort order "Best picks" that puts stocks with all three buy rules first. The Pro screener turns every metric into a slider, from the forecast return per year to margins, debt and the trend.

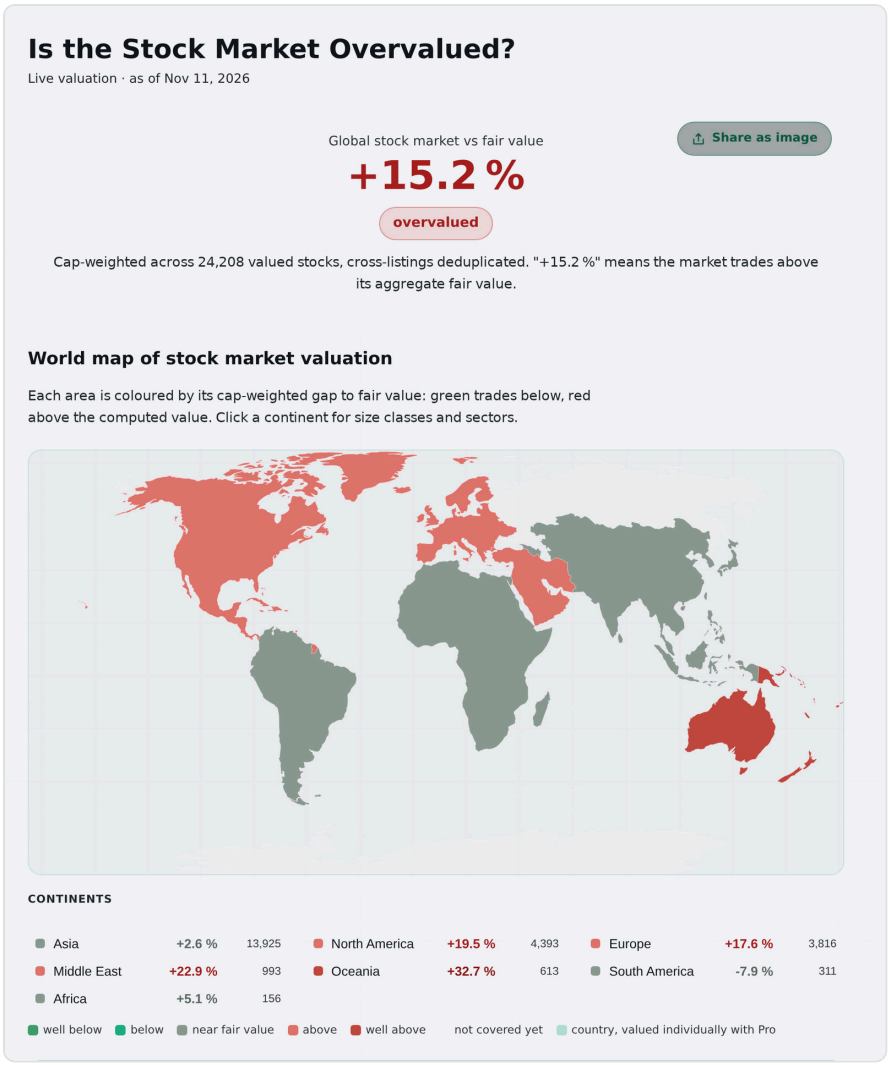


Figure 14 Market valuation: the verdict for the world market and the map by country.

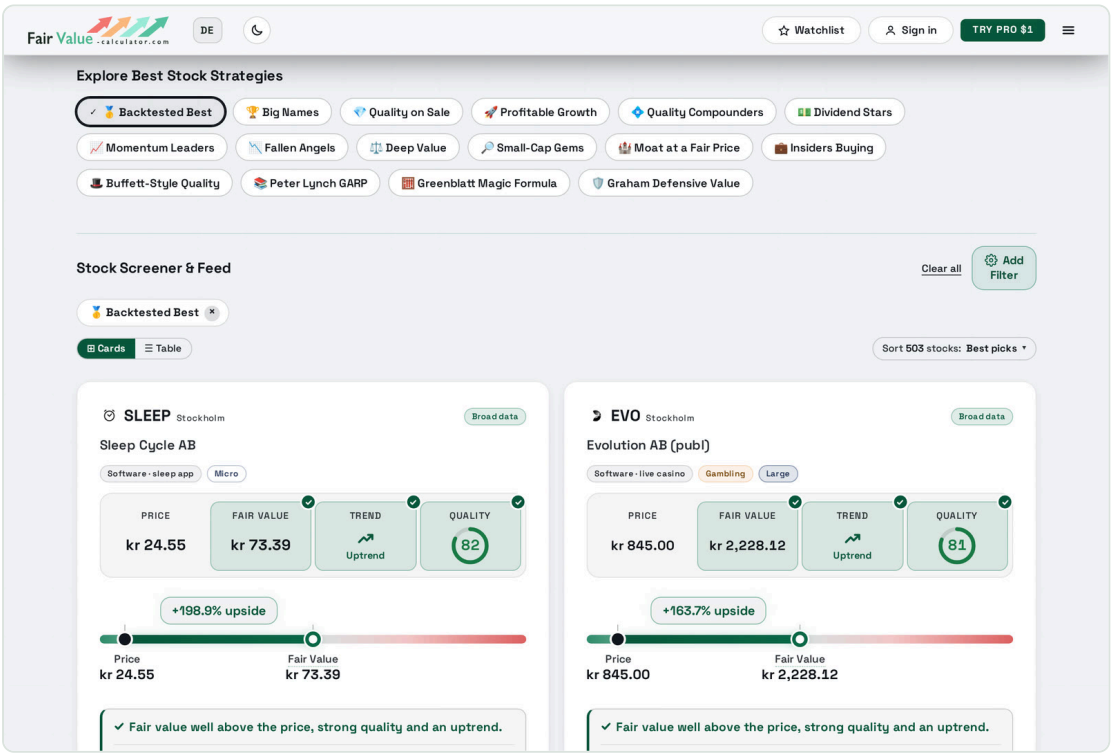


Figure 15 The feed with strategies and filters.

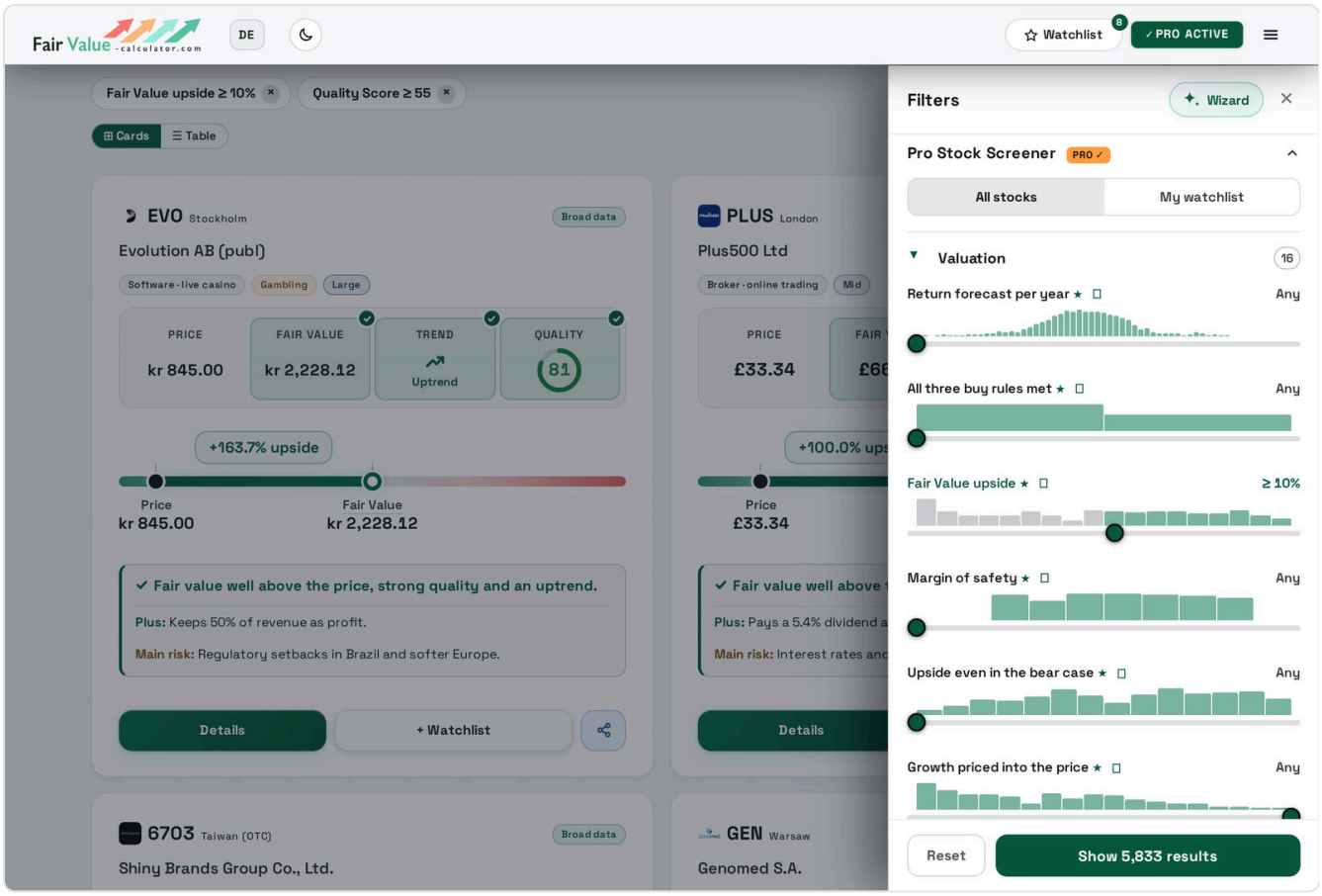


Figure 16 The Pro screener: every metric as a slider.

The evidence window

The evidence window shows the backtest over 34 years, the periods compared with the market, the rules of the strategy, the risk and the running live test. Chapter 15 walks through it.

The Academy and the AI connection

The free FVC Academy has 22 short video lessons plus an overview, from "what is a stock" to the screener, in English and German, at /academy. And Chapter 8 shows how to ask Claude, ChatGPT and other AI assistants for the same valuations.

Free and Pro

Browsing, the stock window, the stock pages, the comparison and a watchlist of 10 stocks with a free account cost nothing. Pro adds the larger watchlist with the full diversification view, the email alert, the Pro screener and higher limits in the AI connection. The first month costs $1, after that $9.90 or $99, cancel any time.

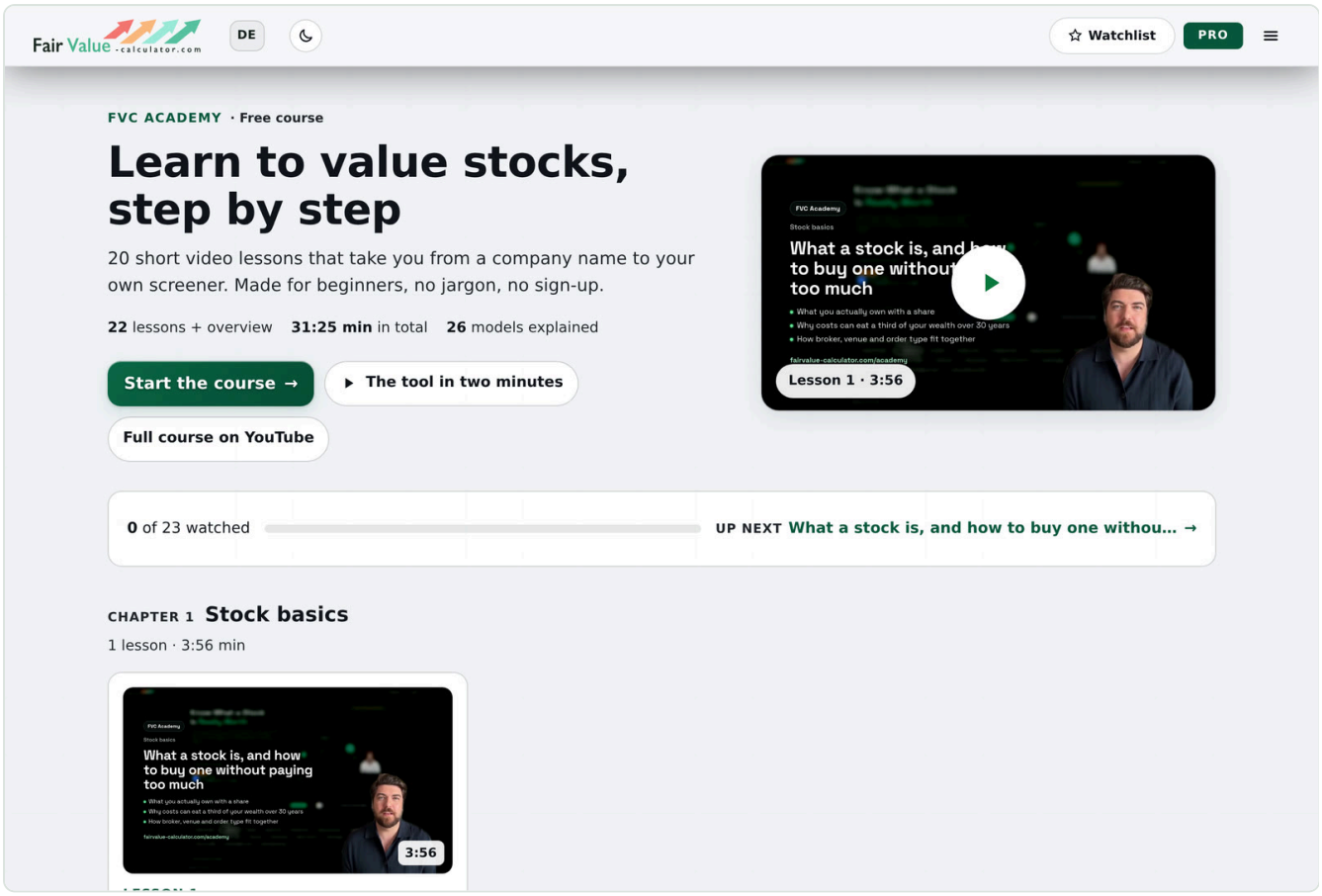


Figure 17 The FVC Academy: short video lessons from the first stock to the screener.

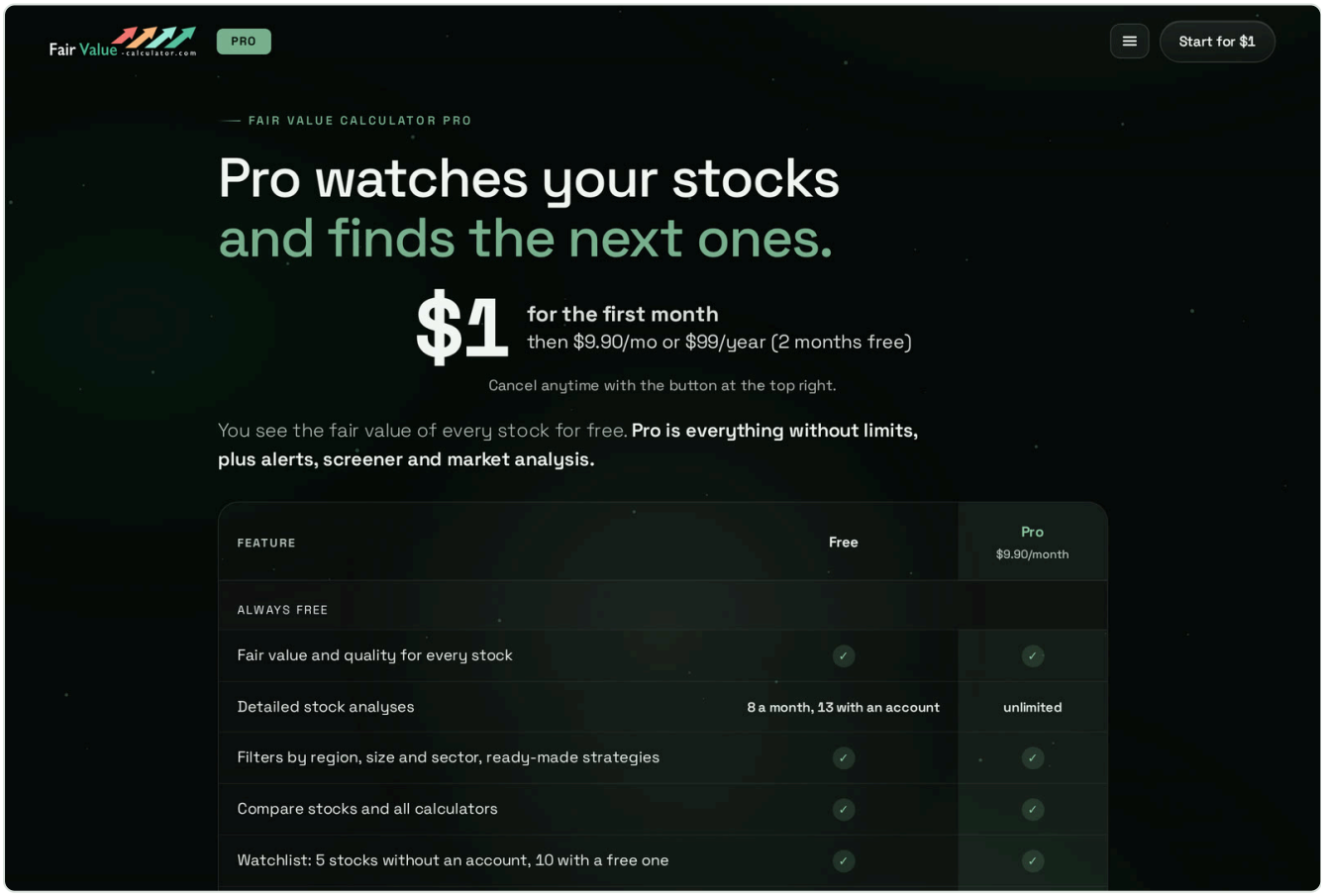


Figure 18 The Pro page: what Pro adds.

IN SHORT

- Every card reads from left to right: price, fair value, trend, quality; a green field with a tick meets a rule of the strategy.
- The stock window goes deeper in tabs: fair value as a range, quality, growth and the comparison with the industry.
- The watchlist judges each stock by the sell rules: ”On track” or ”Review”.
- Market valuation, strategies, screener and evidence window round out the view of the single stock.
- Browsing, the stock window, the stock pages, the comparison and a watchlist of 10 stocks cost nothing with a free account.

CHAPTER 7

Seven tutorials

Step by step, with a picture for every step

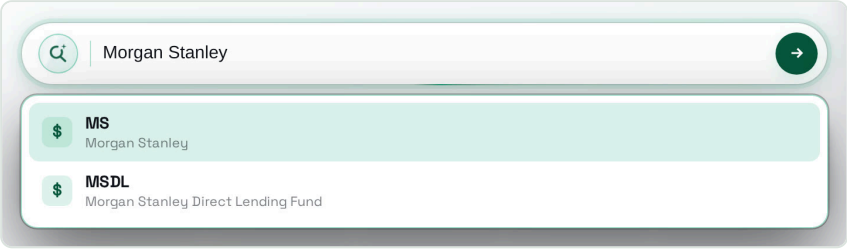
If you have never opened the tool, follow along. Nothing here assumes prior knowledge, and every term is explained in the glossary at the back. The order follows the FVC Academy: first one stock, then the analysis, then the work with your own list.

Tutorial 1: Search for a stock and read the card

STEP 1

Search

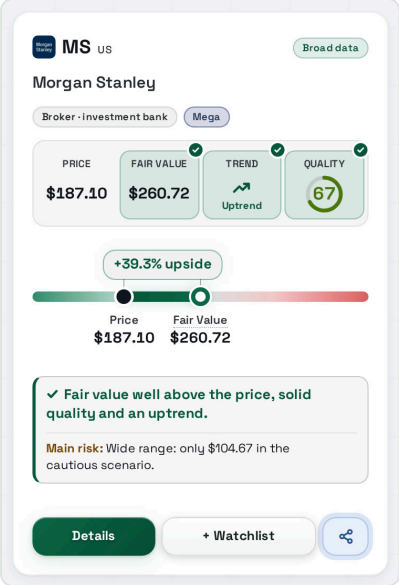
Type a company name or ticker into the search, for example "Morgan Stanley" or "MS", and pick the suggestion.



STEP 2

Read the card as a sentence

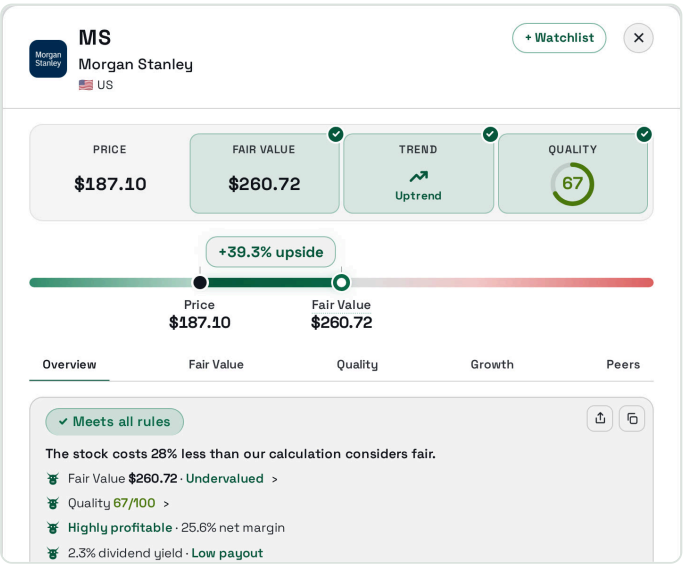
"This company trades at X, its fair value is Y, the trend is up, the quality is Q out of 100": green fields with a tick meet the rule, the sentence below sums it up.



STEP 3

Open the analysis

Tap the card. The overview repeats the numbers and adds the sentence on price and value and the list of what matters.

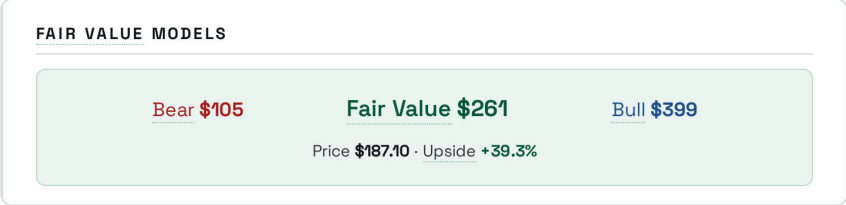


Tutorial 2: Fair value and the models

STEP 1

Open the tab Fair Value

You see three values, not one: cautious (bear), base and optimistic (bull). A wide spread means the business is hard to pin down.



STEP 2

Look at the models

Every model that fits this company is listed with its scenarios. Banks and insurers get only the models that suit them.



Model	Bear	Base	Bull	Coverage
GROWTH DCF				
Growth DCF	$317	$638	$1159	74
Rev-Margin DCF	$71.42	$171	$286	69
ECONOMIC PROFIT				
Residual Income	$70.84	$91.53	$137	75
DCF MODELS				
Owner Earnings	$291	$617	$1158	72
5Y P/E Exit	$68.28	$160	$257	68
10Y P/E Exit	$151	$261	$399	62
EARNINGS-BASED				
Graham-Dodd	$73.00	$314	$429	64
Lynch FV	$80.48	$115	$149	61
DIVIDEND DISCOUNT				
Gordon GGM	$37.87	$77.37	$120	66

STEP 3

Check the history

The chart shows how price and fair value moved; the gap between the lines is the margin of safety.



TRY IT

How wide is the range?

Open the tab Fair Value for Apple and read bear, base and bull. How far apart are the cautious and the optimistic value? Do the same for a company you consider hard to judge. Which range is wider, and does that match your gut feeling?

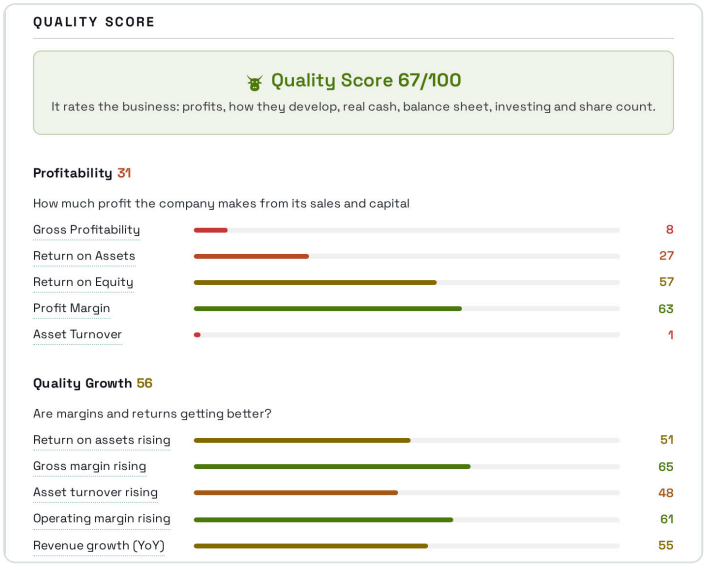
fairvalue-calculator.com/?lang=en&q=AAPL.US#fair-value

Tutorial 3: Read the quality

STEP 1

Open the tab Quality

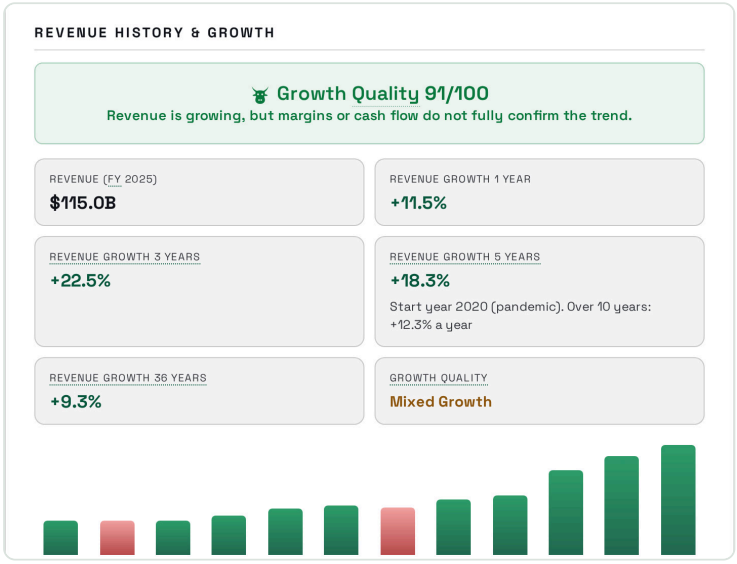
The Quality Score from 0 to 100 describes the business, not the price. From 50 it counts as solid, from 75 as strong.



STEP 2

Check growth

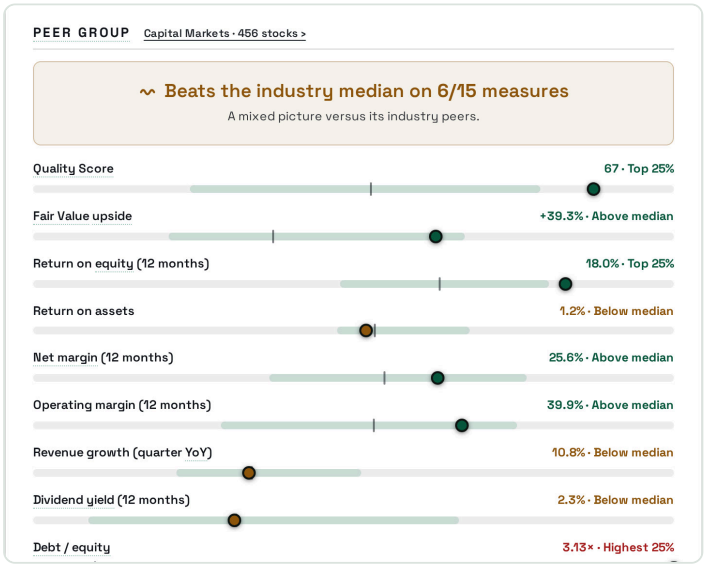
The tab Growth shows what the company delivered and how much growth the price already assumes.



STEP 3

Compare with the industry

The tab Peers shows whether the company is cheap or strong for its industry.

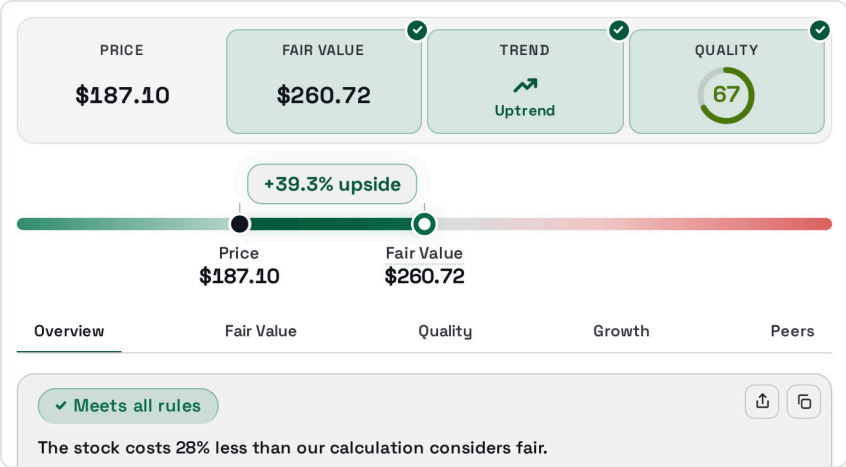


Tutorial 4: The three buy rules and the trend

STEP 1

Read the three fields

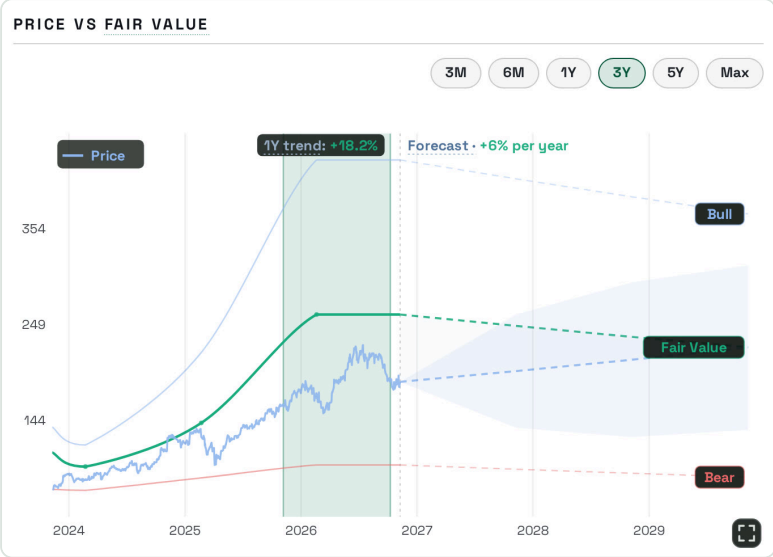
Fair value at least 30% above the price, quality 50 or more, uptrend. A tick marks each rule that is met.



STEP 2

See the trend in the chart

The shaded area spans the two points of the rule: the price twelve months ago against one month ago.



STEP 3

Look ahead

The five-year forecast on the right shows the expected return per year as the most likely path, not a promise.

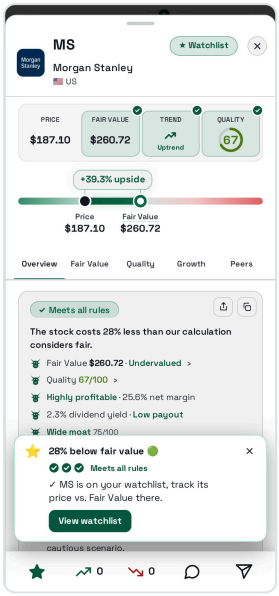


Tutorial 5: Build a watchlist and switch on the alert

STEP 1

Add the stock

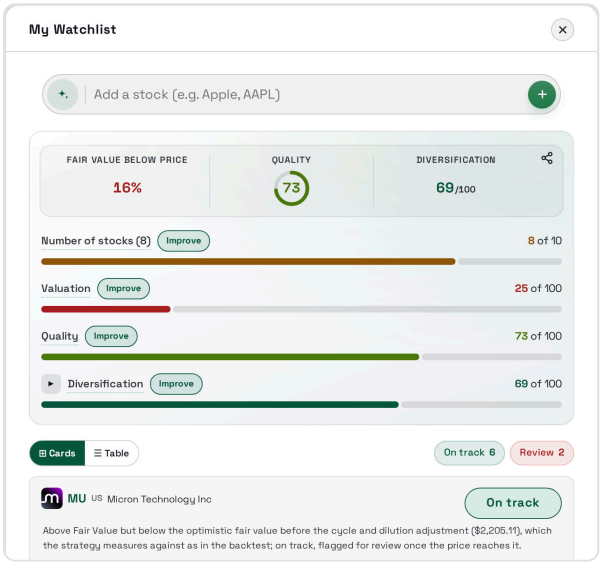
Tap the watchlist button in the stock window. The stock is saved with its price on that day.



STEP 2

Read your list

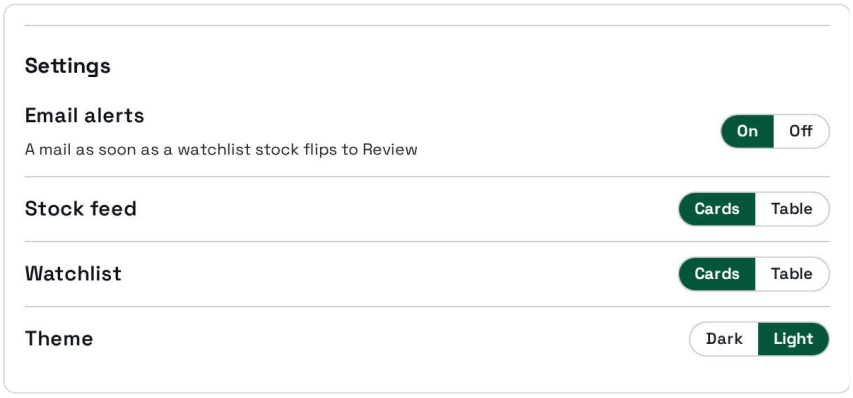
The card at the top sums up count, valuation, quality and spread; each stock shows On track or Review.



STEP 3

Switch on the alert

In your account settings, the email alert (Pro) tells you when a stock changes from On track to Review.



TRY IT

Every slot needs a reason

Set up a watchlist: without an account it holds up to 5 stocks, with a free account up to 10. For each stock, write down one sentence on why it is there. The list shows the status "On track" or "Review" without Pro as well; the email alert is part of Pro.

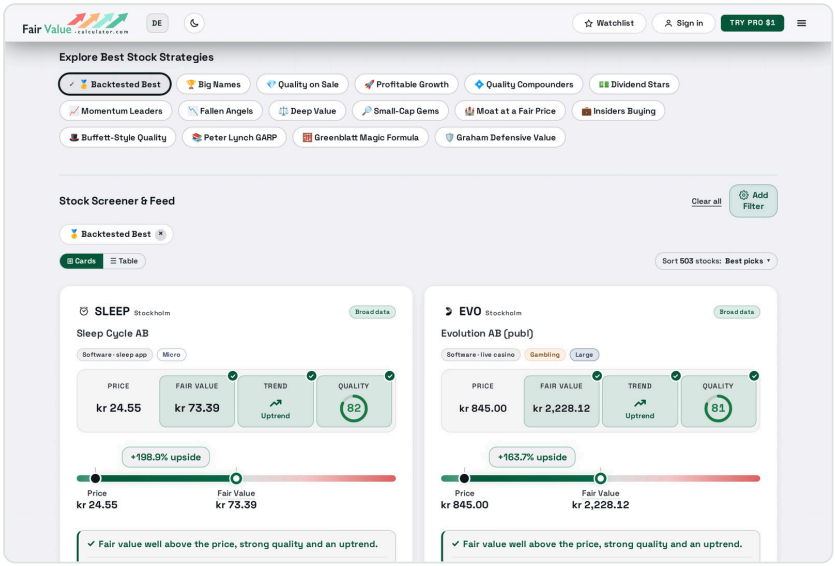
fairvalue-calculator.com/?lang=en&open=watchlist

Tutorial 6: Find undervalued stocks with the screener

STEP 1

Pick a strategy

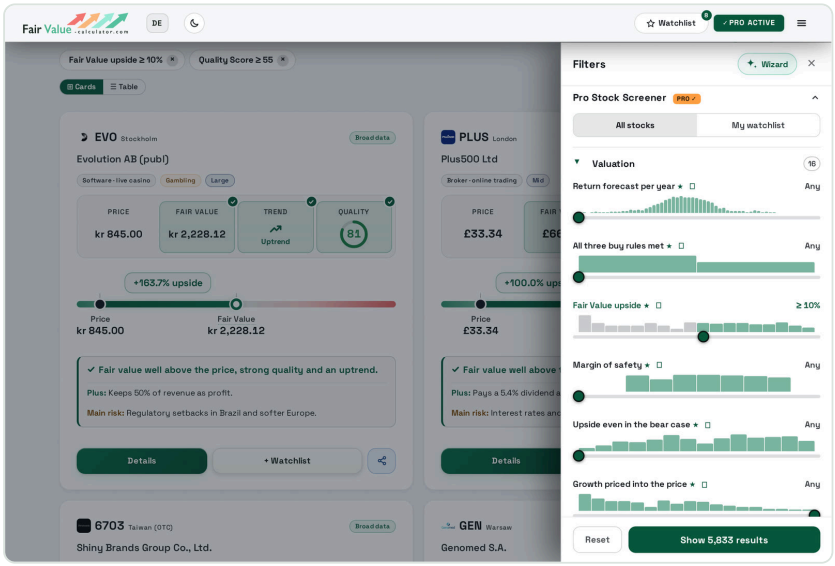
"Backtested Best" shows the stocks from the USA and Europe that meet all three buy rules.



STEP 2

Refine with sliders

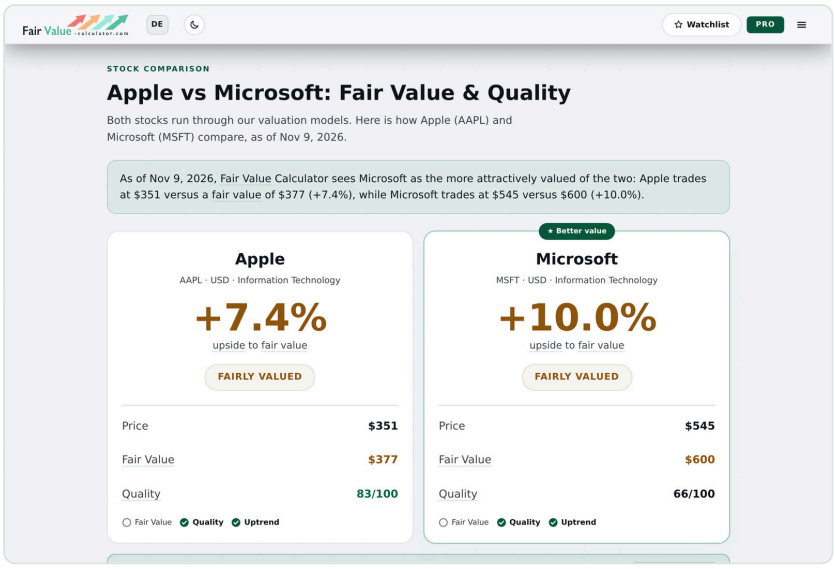
In the Pro screener every metric is a slider: gap to fair value, quality, trend, margins, debt.



STEP 3

Narrow it down

Compare the last two candidates side by side before one goes on your watchlist.



Tutorial 7: Read the evidence

STEP 1

The headline

Strategy per year against the MSCI ACWI Equal Weighted, from 2001, with failed companies in the test.

Does it actually beat the market?

We tested the Fair Value Calculator strategy over **34 years**, including companies that later failed and with dividends reinvested, against the MSCI ACWI Equal Weighted from 2001. Every one of the 12 possible review months was computed.

11.7%	8.6%	+3.1 pp	2,361
Strategy per year from 2001, median of the 12 review months	**MSCI ACWI Equal Weighted per year** after 0.25% ETF costs a year	**Gap per year** ahead in 12 of 12 review months	**failed companies** in the test, USA and Europe

STEP 2

The periods and the rules

Three start years side by side, and the exact buy and sell rules the test used.

Periods

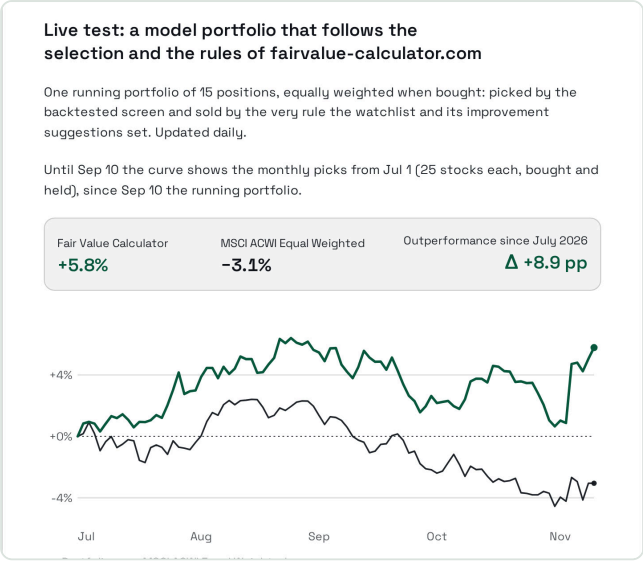
from	Strategy	MSCI ACWI Equal Weighted	Gap	Months ahead
2001	**11.7%**	8.6%	+3.1 pp	12 of 12
2009	**12.3%**	8.3%	+4.0 pp	12 of 12
2016	**11.4%**	8.1%	+3.3 pp	12 of 12
1992	**12.9%**	no comparison: the index starts in 1997, and failed US companies before 1999 are largely missing		

Per year, in US dollars, dividends reinvested, up to 2026. MSCI ACWI Equal Weighted after 0.25% ETF costs a year. Each row is the median over the 12 review months (100 portfolios each); "months ahead" counts in how many of the 12 review months the strategy was ahead of the MSCI ACWI Equal Weighted.

STEP 3

The live test

The running portfolio against the same market, updated every day.



Beginner quick-start

(1) Search for a company you know. (2) Read the card as a sentence. (3) Open it and look at the range from bear to bull and the tab Quality. (4) If value, quality and trend line up, add it to your watchlist. (5) Diversify, then hold long enough for the case to work. That is the whole method in five taps.

IN SHORT

- Seven tutorials lead from the search through fair value, quality and the buy rules to the watchlist, the screener and the evidence.
- Read the card as a sentence: price, fair value, trend, quality.
- You see three values, not one; a wide spread means the business is hard to pin down.
- The quick-start in five steps: search, read the card, look at the range and the quality, add the stock to your watchlist, diversify and hold.

CHAPTER 8

Connect your AI

The fair value inside Claude, ChatGPT and other assistants

Ask an AI what a stock is worth and it estimates from memory: the price is old, the fair value is a guess, and each time you ask you get a different number. With the Fair Value Calculator connection the AI fetches the answer from us instead: the same fair value, Quality Score, trend and verdict as on the site, calculated daily for 40,000+ stocks, and it names the source.

Technically this is an MCP server (Model Context Protocol), the open standard AI assistants use to call outside services. The address is https://www.fairvalue-calculator.com/mcp. You do not need to know the protocol: you connect once, sign in with your Fair Value Calculator account (a free one is enough, no card), and then ask in your own words.

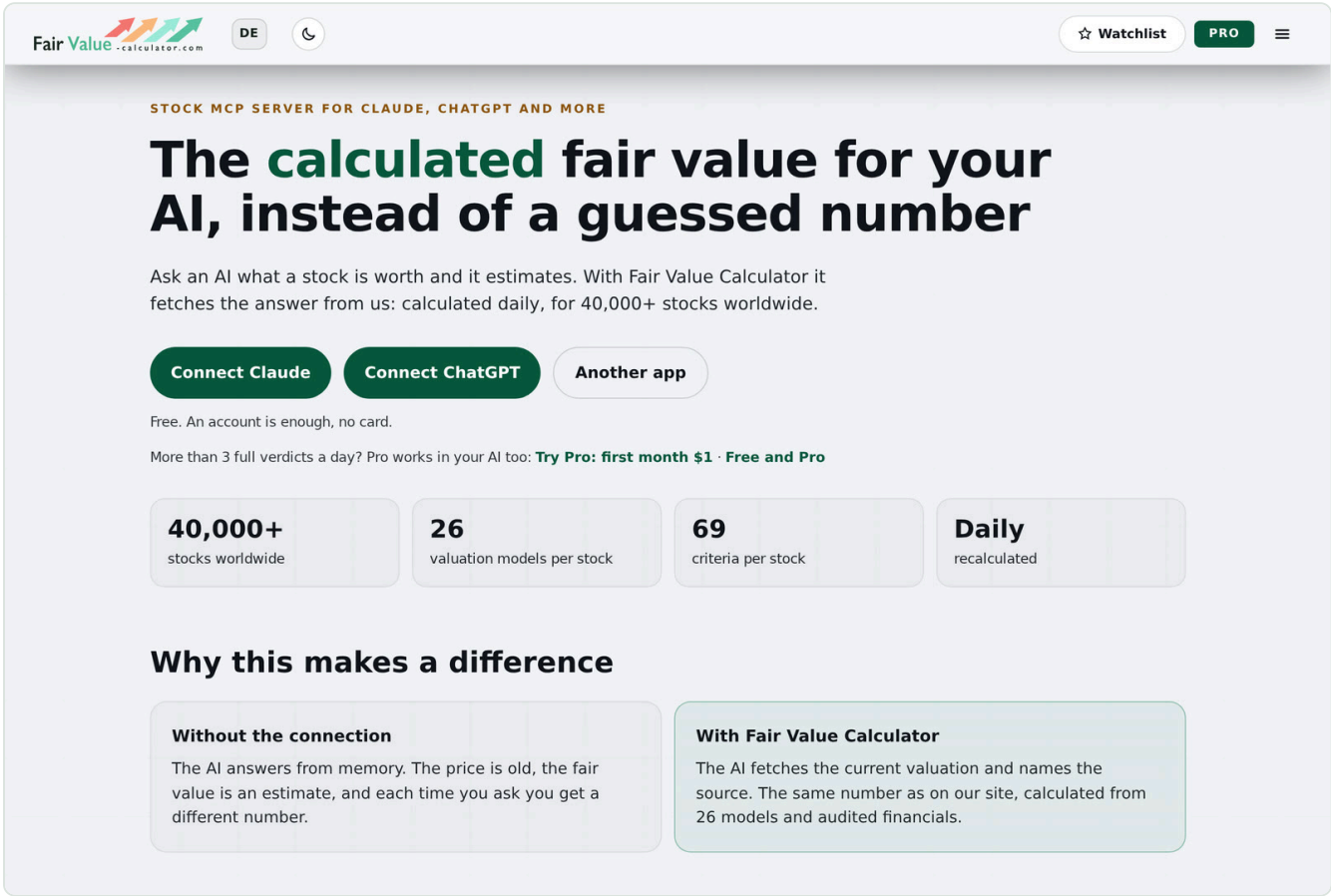


Figure 19 The page /mcp: what the connection does and why it makes a difference.

FROM THE ENGINE ROOM

What an AI really reads

In the autumn of 2026 we wanted to know where AI assistants get what they say about us. Three findings.

First: there is a dedicated text file for AI services in which a website describes itself. We had reworked ours again and again. Then we counted in the access log of one week and, among all the requests from AI services, found exactly one that was for this file. What gets read are the ordinary pages. Since then we make our corrections where the reading happens.

Second: an assistant stated things about us that were out of date, among them an old figure for the number of our stocks. None of it was on any visible page. It was in a place that people do not see and machines read. We removed it there.

Third: in the middle of an answer, our own AI chat wrote out a command in English to a user that was clearly not meant for him. It was an internal instruction that sat in the wrong place; the model passed it on word for word. We removed it from there.

All three findings say the same thing: an AI repeats what it finds, whether it was meant for it or not. For the connection this means: it delivers only the results for the question asked, and the last sentence of this chapter applies: the wording comes from the AI, the numbers come from us.

Which programs work

Today 9 programs can connect: Claude, ChatGPT, Perplexity, Mistral Vibe (Le Chat), Google Gemini, Claude Code, Cursor, VS Code and Codex. Each has its own short guide at /integrations. Claude connects with one click through our listing in the Claude directory, on every Claude plan, and the connection then also works in Claude on your phone. ChatGPT, Perplexity, Mistral Vibe and Gemini are set up once as a custom connector in a browser on a computer; which plans offer custom connectors is decided by each provider (for Gemini currently in the USA). Developer tools such as Claude Code, Cursor, VS Code and Codex connect with one command or one click.

Program	Kind	Guide
Claude	AI assistant	fairvalue-calculator.com/integrations/claude
ChatGPT	AI assistant	fairvalue-calculator.com/integrations/chatgpt
Perplexity	AI assistant	fairvalue-calculator.com/integrations/perplexity
Mistral Vibe (Le Chat)	AI assistant	fairvalue-calculator.com/integrations/mistral
Google Gemini	AI assistant	fairvalue-calculator.com/integrations/gemini
Claude Code	Developer tool	fairvalue-calculator.com/integrations/claudecode
Cursor	Developer tool	fairvalue-calculator.com/integrations/cursor
VS Code	Developer tool	fairvalue-calculator.com/integrations/vscode
Codex	Developer tool	fairvalue-calculator.com/integrations/codex

Connect in three steps

1. Pick your AI assistant and open its guide.
2. Sign in once with your Fair Value Calculator account and confirm. Fields for "OAuth Client ID" and "Client Secret" stay empty: our server registers the connection itself.
3. Just ask. The AI recognises by itself when it needs Fair Value Calculator and names it as the source.

TRY IT

Ask your AI twice

Before you connect it, ask your AI assistant "What is Siemens worth?" and note the number. Then connect it (a free account is enough, no card) and ask again. Watch whether the answer now names a source. 3 full verdicts a day are included for free.

fairvalue-calculator.com/mcp?lang=en

The 10 functions

You do not need to know them: you ask in your own words and the AI picks the right function. The first group asks for valuations, the second works on your watchlist and alert. Changes to your watchlist happen only on your explicit request, and the AI tells you afterwards what it did.

Function	What it does	You ask	
Find a stock	A name, ticker or ISIN becomes the right listing, in the same order as the search on the site. Up to five matches.	"Find Siemens."	Free
Fair value verdict	The fair value per share with its currency and its range (cautious to optimistic), the verdict (under-, fairly or overvalued), the distance to fair value in 10-point bands, the quality score, the data level, the uptrend and the three buy rules of the strategy (fair value, quality, uptrend). Plus the reasoning: strengths and weak points, the AI conclusion and the main risk, with the link to the full analysis.	"What is Apple worth?"	Free
Quick snapshot	Verdict, distance in 10-point bands and quality of one stock, without the fair value as a number. For a quick look at many stocks.	"Is Nestlé roughly expensive or cheap?"	Free
Screen for undervalued stocks	Stocks that match your criteria right now: minimum distance to fair value, minimum quality, sector or industry (for example technology, semiconductors, banks, insurance or gold), region or country (US, Europe, UK and 27 more countries such as Germany, Switzerland, Canada, Hong Kong or India), only in an uptrend or exactly the stocks with all three buy rules of the strategy. Sorted by quality, with the buy rules like the strategy.	"Which European tech stocks are undervalued?"	Free
Compare stocks	Several stocks side by side with the same values. Free: 2 stocks as snapshots, with Pro up to 5 with fair value.	"Compare Microsoft, Alphabet and Meta."	Free
Show my watchlist	Your saved watchlist with today's verdict, distance in 10-point bands and quality of each stock, plus whether your email alert is on. With Pro each stock also says whether it is on track or should be reviewed.	"How does my watchlist look right now?"	Free

Function	What it does	You ask	
Add stocks to the watchlist	Adds up to 10 stocks per request to your watchlist. What is already on it stays unchanged. From then on the alert and the weekly briefing follow these stocks. For each added stock the answer says which of the three buy rules it meets.	"Put Coca-Cola and PepsiCo on my watchlist."	Free
Remove stocks from the watchlist	Removes up to 10 stocks per request from your watchlist. The previous list is kept on our side as a backup.	"Take Intel off my watchlist."	Free
Turn the email alert on or off	Turns the email alert for your whole watchlist on or off. The alert comes when one of your stocks changes from On track to Review: the price has reached the optimistic fair value, the Quality Score has fallen below 50 (the minimum of the buy rule) or the stock has been on it for five years. There are no price-target alerts.	"Turn on my watchlist alert."	Pro
Stocks that fit my portfolio	Suggests up to 8 stocks that fit your watchlist: below their fair value, high quality, and ranked by their measured correlation with your stocks. On request as a replacement for one particular stock in a matching size, or aimed at a new country, a new sector or a different company size. The same optimizer as on the site. Free accounts can try it once every 30 days.	"What would diversify my watchlist?"	Pro

What is sent to the AI

Only the results needed for the specific request: no complete stock database, no raw fundamentals, no model weights. Your watchlist only if you allow it when connecting, without share counts, entry prices and notes. You can revoke the connection in your account at any time. The wording of the answer comes from the AI; the numbers come from us. Not financial advice.

Free and Pro in the AI

Only your Fair Value Calculator plan counts; a ChatGPT or Claude subscription does not change it. Pro is the same Pro as on the website and applies at once to the connected account.

Per day and function	Free	Pro
Full verdicts with fair value	3	50
Quick snapshots and search	30	300
Show the watchlist	✓	✓
Change the watchlist	up to 10 stocks	✓
Switch the email alert	no	✓

What you can ask

- "Is Apple over- or undervalued right now?"
- "What is Siemens worth, and does the stock meet the three buy rules?"
- "Compare Microsoft, Alphabet and Meta by fair value and quality."
- "Which European tech stocks are undervalued with high quality?"

- ”Which stock on my watchlist is overvalued by now?”
- ”Put the two best of them on my watchlist and turn the alert on.”

IN SHORT

- Without the connection an AI estimates from memory; with it, the AI fetches fair value, quality, trend and verdict from us and names the source.
- Connecting takes three steps; a free account is enough.
- What counts is your Fair Value Calculator plan, not your subscription with the AI.
- The AI receives only the results for the request, and your watchlist only with your permission.
- The wording comes from the AI, the numbers come from us.

CHAPTER 9

The rules of the strategy

Three buy rules, one portfolio, a calm routine

> *”Essentially, a highly simplified one … that relies for its results on the performance of the portfolio as a whole.”*
>
> Benjamin Graham in 1976, asked which approach he would recommend to investors, Financial Analysts Journal [36]

The method is a short set of rules. The same rules drive the verdict on every card, the strategy ”Backtested Best”, the backtest and the live test.

The three buy rules

1. **Fair value at least 30% above the price.** The margin of safety.
2. **Quality Score of 50 or more.** Cheap for a good reason, not a value trap.
3. **Uptrend:** the price a month ago is higher than twelve months ago (21 against 252 trading days, that is, roughly one month against roughly one year). The market has stopped selling the stock down.

The strategy buys only stocks that meet all three. Among them it ranks 70% by quality and 30% by upside. The portfolio holds 15 stocks with equal weight, at most two per sector, and is checked once a year. ”Backtested Best” picks only stocks from the USA and Europe, like the backtest and the live test; the three ticks themselves are shown for every stock worldwide.

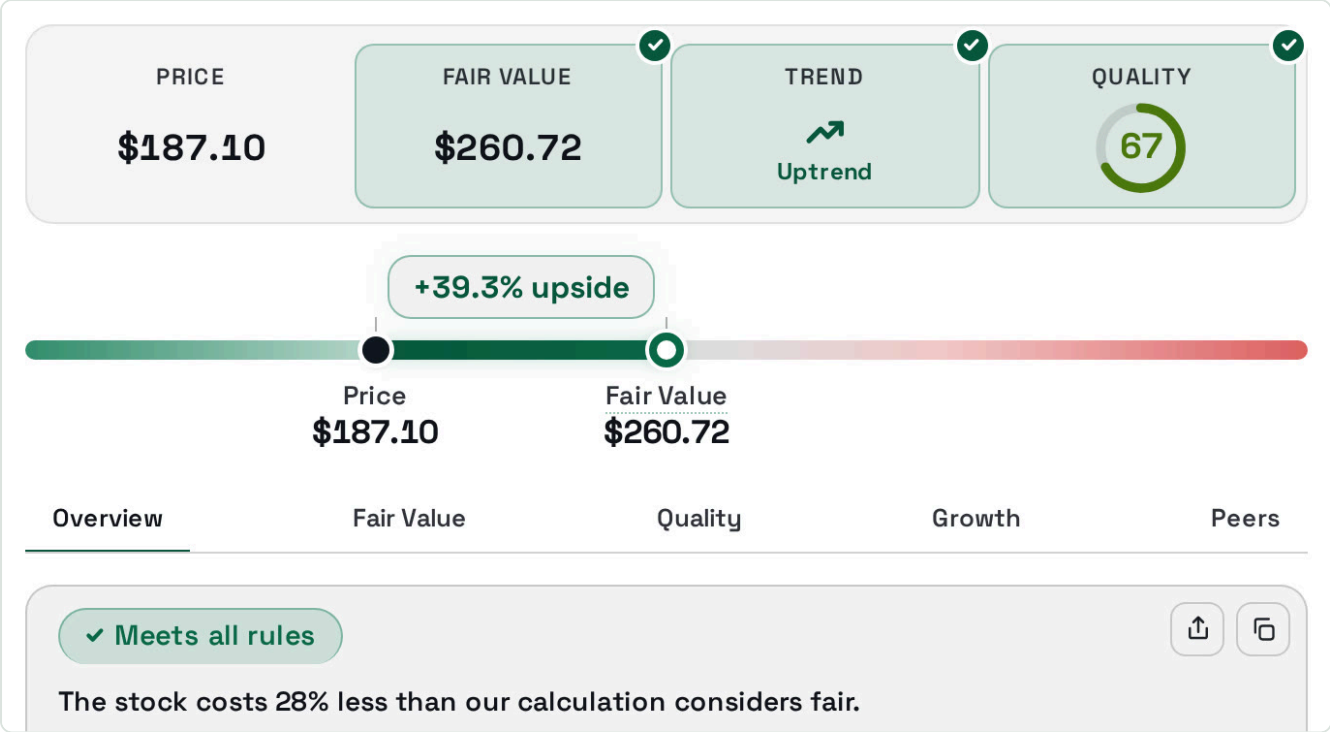


Figure 20 The three buy rules in the stock window: three green fields with a tick, and the badge "Meets all rules".

TRY IT

Check three ticks

Open SAP and count the green fields with a tick. If one is missing, read in the verdict which one. Then find the shaded area in the chart: it spans the two points at which the trend is measured.

fairvalue-calculator.com/?lang=en&q=SAP.XETRA

The Nifty Fifty: quality at any price

In the early 1970s around fifty American growth companies were seen as stocks you only had to buy and never had to sell: the "Nifty Fifty", among them Coca-Cola, IBM, Xerox and Polaroid. Hardly anyone talked about the price. Many of the companies really were that good. The price had simply already anticipated it. What became of them is worked through with all the numbers in Chapter 26. This is exactly the risk the first buy rule is meant to catch: the strategy demands all three ticks, not just good quality.

The routine

The method is top-down, then bottom-up. First, glance at the market valuation: is the whole market cheap, fair or expensive? This is not market timing; it tells you how patient you may need to be. Second, read the sectors: some are cheap for good reasons, others expensive for bad ones. Third, let the strategy or the screener surface the stocks that meet the three rules. Fourth, open the stock window for each one and ask the same three questions every time: is it cheap versus value, is the business good, and does it fit what I already own? Fifth, build and maintain the portfolio on the watchlist.

The power is in the repetition. The more often you walk the same path, market, sector, stock, watchlist, portfolio, the less any single headline, tip or frightening day can knock you off course. A boring, repeatable routine is exactly what protects you from your own impulses.

Portfolio logic

A stock can be attractive on its own and still be a bad addition if it makes the portfolio too concentrated in one sector, one country or one story. You build portfolios, not heroic one-stock bets.

IN SHORT

- Three buy rules: fair value at least 30% above the price, Quality Score of 50 or more, uptrend.
- The strategy buys only what meets all three and holds 15 stocks with equal weight, at most two per sector.
- The routine walks the same path every time: market, sector, stock, watchlist, portfolio.
- You build portfolios, not heroic one-stock bets.

CHAPTER 10

Timing, exits and money management

A strategy becomes real only through rules

> *"Some people automatically sell the 'winners'... and hold on to their 'losers'... which is about as sensible as pulling out the flowers and watering the weeds."*
>
> Peter Lynch, "One Up on Wall Street" (1989), Chapter 16 [35]

The perfect entry is usually an illusion. Waiting forever for the absolute bottom can hurt as much as buying everything at once at the top. You will never buy the exact bottom. You can, however, choose your position size, decide when to add, and define in advance what would prove you wrong, and those choices matter far more than nailing the day.

Fair value is not tomorrow's target price; it is a multi-year orientation. Many value effects need three to five years to unfold (Frankel and Lee found the value-to-price signal pays over about three years [6]). If you cannot hold through several difficult years, the method will feel far harder than it looks on paper.

The sell rules

The strategy flags a holding for **Review** in three cases, and only then:

- the price reaches the **optimistic fair value**, the upper end of the fair value range: the favourable scenario is priced in;
- the **Quality Score falls below 50**, the minimum of the buy rule: the business is weakening;
- the position has been held for **five years**: it is reviewed and the money moves to a fresh stock with all three ticks.

Otherwise the status is **On track**. The same words appear on the watchlist card, in the email alert, in the weekly briefing, in the AI connection and in the live test.

Selling in the optimistic range

Buy only what meets all three buy rules. Then give the business room until the price reaches the optimistic fair value. There the favourable scenario is priced in, and the strategy exits by rule, not by mood. Do not cut a position only because it finally works or only because it makes you nervous.

”I talked when I should have walked”

At the end of 1998 Berkshire Hathaway’s 200 million Coca-Cola shares stood at $13.4 billion in the report to shareholders. Warren Buffett himself considered some of his large positions too highly valued at the time, and said so. He did not sell. Six years later, at the end of 2004, the same number of shares was listed at $8.3 billion. In his letter for 2004 he wrote that he could rightly be faulted for merely grumbling about dizzying valuations during the bubble instead of acting: ”I talked when I should have walked.” A sell rule that is fixed beforehand takes this decision off your hands at the very moment it is hardest to make [33].

Your own reasons

Your life adds reasons the strategy cannot know: you need the money, or a position has grown so large that it now threatens the whole portfolio. ”The price dropped and I am scared” is not on that list, unless the fundamentals dropped with it. A falling price alone is not a reason.

IN SHORT

- There is no perfect entry; what matters more is the size of the position, when you add, and what would show you that you are wrong.
- Fair value is a multi-year orientation, not tomorrow’s target price.
- ”Review” applies in exactly three cases: price at the optimistic fair value, Quality Score below 50, held for five years.
- A falling price alone is not a reason to sell.

CHAPTER 11

Psychology and the forgotten portfolio

The hardest part of investing is not the formula

> *"... the investor's chief problem, and even his worst enemy, is likely to be himself."*
>
> Benjamin Graham, "The Intelligent Investor", Introduction [18], punctuation adapted

The most dangerous opponent is not the market; it is your own mind. Behavioural finance exists because humans repeat the same mistakes:

- We sell winners too early because locking in a gain feels good.
- We hold losers too long because admitting an error hurts.
- We chase hype because others seem to get rich faster.
- We panic in crashes because headlines turn fear into a social experience.

Kahneman and Tversky's prospect theory explains much of it: we feel a loss roughly twice as intensely as an equivalent gain, which pushes us to take the wrong risks at the wrong times [21]. Fair-value thinking helps because it hands you a reference point. You do not just see that a price fell; you see whether it fell **below value**, whether value itself changed, or whether the case is simply broken.

Psychological edge

A rule-based process does not remove fear and greed. It gives you something stronger to hold onto when they appear.

I learned each of these lessons the expensive way. Penny stocks with wonderful stories and terrible substance taught me that a low share price is psychologically seductive (you can buy "so many") but not safer. A 30-cent share can fall to 3 cents just as easily as it can double, and the story is always thrilling right up until it is not. Leverage taught me that borrowing to invest does not merely magnify returns; it magnifies emotion. A normal market wobble then feels like a personal emergency, and you sell at exactly the wrong moment. Products that make the first win feel brilliant make the first big loss feel impossible.

When the smartest borrow

Long-Term Capital Management, founded in February 1994, was a hedge fund with a team that included two Nobel laureates. The idea was sensible: exploit small price differences between very similar securities and wait until they close. For four years it worked, with returns of 20, 43, 41 and 17%. Because the differences were tiny, the fund worked with borrowed money: at the end of 1997 there were about $30 of debt for every dollar of its own. In August 1998 Russia stopped its payments, and the gaps grew wider instead of narrower. The fund lost 44% of its value in that one month. On 23 September 1998 the Federal Reserve Bank of New York brought the creditors together at one table; fourteen banks and securities firms put in around $3.6 billion. Whoever waits on credit for a convergence has less time than the convergence needs [37].

The opposite lesson was the most valuable of all. A small portfolio of solid companies I bought and then almost forgot, left alone for years to quietly compound, outperformed nearly everything I actively fiddled with. Doing less, on purpose, is a strategy. A written process is what lets you do less without feeling like you are doing nothing.

IN SHORT

- The most dangerous opponent is your own mind: selling winners too early, holding losers too long, chasing hype, panicking in crashes.
- We feel a loss roughly twice as intensely as an equivalent gain.
- A fair value hands you a reference point: has the price fallen below value, or has the value changed?
- Penny stocks and leverage were expensive lessons; the almost forgotten portfolio of solid companies was the most valuable one.
- Rules do not remove fear and greed; they give you something to hold onto.

A TEAR-OUT PAGE FOR YOUR HEAD

The method on one page

Everything the chapters before it justify, without the justification

The idea

The price is what you pay. The fair value is a reasoned estimate of what you get, shown as a range from cautious through base to optimistic. The gap between the two is your margin of safety (Chapters 3 and 12).

The three buy rules

1. **Value:** the fair value is at least 30% above the price.
2. **Quality:** the Quality Score is 50 or more. Cheap for a good reason, not a value trap.
3. **Trend:** the price a month ago is higher than twelve months ago. The market has stopped selling the stock down.

Only what meets all three is bought (Chapter 9).

The portfolio

15 stocks with equal weight, at most two per sector, checked once a year. You build portfolios, not heroic one-stock bets.

The routine

1. Look at the market valuation: how patient may you need to be?
2. Read the sectors: cheap for a good reason or for a bad one?
3. Let the strategy or the screener find the stocks with three ticks.
4. Open each stock and ask the same three questions: is it cheap versus value, is the business good, does it fit what I already own?
5. Build and maintain the portfolio on the watchlist.

Holding

Fair value is a multi-year orientation, not tomorrow's target price. As long as no sell rule applies, the status is **On track** (Chapter 10).

The three sell rules

A position changes to **Review** when

- the price reaches the optimistic fair value: the favourable scenario is priced in;
- the Quality Score falls below 50: the business is weakening;
- the position has been held for five years: it is reviewed.

A falling price alone is not a reason to sell.

What each building block is for

Table 1 The five building blocks and their purpose

Building block	What it is for
Fair value	reduces the risk of paying for fantasy
Quality	reduces the risk of buying a trap
Trend	keeps you from catching a falling knife
Diversification	reduces the risk of one wrong company destroying you
Time	gives good businesses room to compound

What we leave out

Chart patterns in isolation, news and tips, a single ”magic” ratio, day trading, leverage and penny stocks, dozens of correlated factors (Chapter 19).

The one habit

Before any buy or sell, say out loud what the business is worth, what you are paying, and why the gap exists (Chapter 22).

> **Read this honestly**
>
> The rules do not rule out losses. They make sure that isolated mistakes do not become fatal. Backtests are simulations, past results are no guarantee, and nothing on this page is financial advice.

CHAPTER 12

Fair Value, deeply

The models, and why it is a range, not a point

> *"For such purposes an indefinite and approximate measure of the intrinsic value may be sufficient."*
>
> Benjamin Graham and David Dodd, "Security Analysis", Chapter 1 [18]

Behind the single number on a card sits a family of models, not one formula. The methodology page on the site describes the way from the annual report to the number you see in six stations [30]; here they are in short.

1. **Raw data, verified.** Everything starts from the company's annual reports, never from the share price: at least three annual reports or no valuation. Figures are cross-checked across sources; prices are converted from pence, cents or agorot (the Israeli subunit) into the main currency. Growth comes from the company's own multi-year history and is capped, so that a single freak year or one optimistic assumption cannot dominate.
2. **The discount rate.** Future profits are worth less than today's. How much less is what the discount rate says, and it depends on risk: a base rate by company size, the country risk premium of the home country on top (a surcharge for riskier countries), and a damped market beta (beta measures how sensitively a stock reacts to moves of the market as a whole).
3. **26 models, three scenarios each.** Discounted cash flow variants (future cash flows, discounted to today), earnings-power models (Graham and Dodd, Peter Lynch, residual income, that is, profit above the cost of capital, and others), dividend models for reliable payers (what counts as a payout there was changed by a round with a critic, Chapter 34), multiples anchored to the sector (valuation ratios such as the P/E), and asset models. Every model computes a cautious (bear), a base and an optimistic (bull) case.
4. **Rules by type of business.** A revenue model unleashed on a bank produces nonsense. That is why not every company gets every model: banks and insurers, real estate trusts and holdings get only the models that suit them; funds and certificates get no fair value at all.
5. **One value with a range.** The model families are blended into one fair value and one range from bear to bull. How strongly a family counts depends on the profile of the company and on how much reliable data backs it.
6. **Display guards.** Before you see a number, guards re-check it at read time: fresh stock splits, cyclical peaks, dilution, share classes of the same company. A value far above the price without evidence is withheld: better no number than a wrong one.

FROM THE ENGINE ROOM

When London looked a hundred times too expensive

In June 2026 we ran a new checking program for the first time, one that probes randomly drawn stocks for internal consistency. The very first run reported a finding: for almost the entire London exchange, the fair value by our calculation sat about 99% below the price, well-known blue chips included.

The cause was a unit. Many London prices are quoted in pence, while the companies' accounts are in pounds. So the fair value per share came out in pounds and was placed next to a price that looked a hundred times as large. For one London blue chip, a price of just over a thousand stood next to a fair value of just under fifteen. A thousand pence, fifteen pounds.

Why did it take the new checking program to notice? Until then the plausibility check only looked for values that sat suspiciously high above the price; it was not set up for suspiciously low ones. Who expects a whole country to be too expensive?

Today prices in pence, cents or agorot are converted into the main currency before any calculation (station 1), we look for outliers in both directions, and a sample of randomly drawn stocks keeps checking regularly whether everything fits together. The lesson is older than any software: you only find what you look for. That is why the sample draws its stocks at random.

FROM THE ENGINE ROOM

The split that wasn't

In 2016 a member of the forum wrote that a stock split must not change the result (Chapter 34). Ten years on we still check splits with particular care, and a case from autumn 2026 shows why.

At a large corporation the data contained a split with an odd ratio. The price fell markedly, the fair value stayed where it was, and the stock suddenly looked like the bargain of the year. Our check considered the split dealt with: price fresh, data fresh, valuation freshly calculated. Only the number of shares used in the calculation had not gone through the split at all yet.

The first lesson: the fact that all data carries a fresh date does not yet mean that it fits together.

The second came an hour later. It was not a split at all. The corporation had listed a division on the stock exchange as a company of its own, and in the data the spin-off looked like a split. Had we simply divided the fair value by the ratio, it would have been wrong again, only in the other direction: after a spin-off the remaining company is a different one than before. Since then, at every odd ratio, we first ask what was actually divided. And when in doubt, the sentence from station 6 applies: better no number than a wrong one.

Why a family of models instead of one magic formula? Because every business reveals itself differently. A steady consumer brand is best seen through its earnings power; a capital-heavy utility through its cash flows; a bank or holding company through its assets and book value; a mature payer through its dividends. Looking through only one lens guarantees blind spots.

The honest output is a range, not a point. A narrow range from bear to bull says "we can see this business clearly, act on a modest gap". A wide range says "this one is genuinely uncertain, demand a much larger margin of safety, or simply pass". Treating a wide range as if it were a precise number is one of the most expensive mistakes in investing.

Two more things belong to an honest number. Every value carries its **data coverage** (broad, some or thin data), so you see how much evidence backs it.

And where no valuation model fits, for example at a company with losses that only asset models could value, some stocks show an **Estimate** badge instead of a calculated fair value. Such a stock is never shown as undervalued and triggers no signal.

A fair value is not a fixed point in time either. It is recalculated with every new set of accounts, and for stocks trading far below it, it usually grows more slowly in the following years than at other companies; in the first year it even falls some way for about one in two. So the market was often partly right to be cautious. How often that happens, and how much of it would also have happened to a random stock, is measured in Chapter 17.

Model	Bear	Base	Bull	Coverage
GROWTH DCF				
Growth DCF	$317	$638	$1159	74
Rev-Margin DCF	$71.42	$171	$286	69
ECONOMIC PROFIT				
Residual Income	$70.84	$91.53	$137	75
DCF MODELS				
Owner Earnings	$291	$617	$1158	72
5Y P/E Exit	$68.28	$160	$257	68
10Y P/E Exit	$151	$261	$399	62
EARNINGS-BASED				
Graham-Dodd	$73.00	$314	$429	64
Lynch FV	$80.48	$115	$149	61
DIVIDEND DISCOUNT				
Gordon GGM	$37.87	$77.37	$120	66
DDM Multi-Stage	$37.87	$65.91	$81.40	67
MULTIPLES				
P/E Multiple	$105	$140	$174	63
P/B Multiple	$59.43	$79.24	$99.05	55
ASSET-BASED				
NCAV (Graham)	$28.30	$37.92	$56.60	54

Figure 21 The model table of one stock: every model that fits, each with bear, base and bull.

Why a range beats a point

A precise wrong number feels scientific and is dangerous. An honest range, anchored to stable fundamentals and widened for shaky ones, is what actually protects capital. Fair value is an **orientation**, not a prophecy. In our data most undervalued stocks touched their fair value at some point, but only some of them stayed above it; reached is not held (Chapter 17).

IN SHORT

- Behind the single number sits a family of 26 models with three scenarios each, not a single formula.
- The way has six stations: verified raw data, discount rate, models, rules by type of business, one value with a range, display guards.
- The honest output is a range; the wider it is, the larger the margin of safety has to be.
- Every value carries its data coverage; where no model fits, the stock shows "Estimate" instead of a calculated fair value.

CHAPTER 13

The Quality Score and its science

Every factor family, and the research behind it

> *"It's far better to buy a wonderful company at a fair price than a fair company at a wonderful price."*
>
> Warren Buffett, letter to the shareholders of Berkshire Hathaway for the year 1989 [38]

"Cheap" alone is a trap. The graveyard of investing is full of stocks that were statistically cheap and deserved to be. That is why every company also earns a **Quality Score** from 0 to 100, built from up to 37 fundamental factors in 10 families, separate from the fair value. Valuation and quality are two separate questions: what is it worth, and how good is the business? The score describes the business; it does not change the fair value.

We did not invent these signals; we selected the kind of evidence that replicates. Here is the map of the research the score draws on, finding by finding:

Research family	What it captures	Scientific basis
Value: earnings yield, book-to-market, sales and free cash flow yield, EV/EBITDA	Cheap relative to fundamentals tends to outperform	Basu (1983) [1]; Fama and French (1992) [2]; Lakonishok, Shleifer and Vishny (1994) [3]
Quality and profitability: gross profitability, returns on assets and equity, margins	Highly profitable firms earn higher future returns	Novy-Marx (2013) [7]; Fama and French five-factor (2015) [9]; Asness, Frazzini and Pedersen, "Quality minus Junk" (2019) [8]
Fundamental strength: F-Score, solvency, coverage	Financially strong firms avoid the distress that kills cheap stocks	Piotroski (2000) [5]; Altman Z-Score (1968) [17]
Earnings quality: accruals, manipulation screen	Cash earnings beat paper earnings; flags aggressive accounting	Sloan (1996) [15]; Beneish M-Score (1999) [16]
Intrinsic-value reversion: value to price	Price drifts back towards model-based intrinsic value	Frankel and Lee (1998) [6]; De Bondt and Thaler (1985) [4]

Research family	What it captures	Scientific basis
Momentum: 3, 6 and 12 months, 52-week high	Recent relative strength tends to persist for months	Jegadeesh and Titman (1993) [10]; George and Hwang (2004) [11]
Low risk: low volatility, low beta	Lower-risk stocks have earned better risk-adjusted returns	Ang et al. (2006) [12]; Frazzini and Pedersen (2014) [13]
Conservative investment: restraint in asset growth	Firms that do not over-expand tend to outperform empire builders	Titman, Wei and Xie (2004) [14]; Fama and French (2015) [9]

On a stock these become a transparent set of bars: you can see why a company scores well or badly, factor by factor, with an explanation for each. On top of the numbers, an AI reads 6 qualitative factors that no ratio measures, such as pricing power, innovation and governance; together with the 26 valuation models and the 37 quality factors that makes up to 69 criteria per stock. The colour of the score runs in steps from red through orange to green; the verdict calls quality ”solid” from 50 and ”strong” from 75.

TRY IT

One bar, one explanation

Open the tab Quality for Apple. Find the weakest bar and read the explanation that goes with it. Would you have expected this weakness at this company? Then open a company you consider solid and check whether the score agrees with you.

fairvalue-calculator.com/?lang=en&q=AAPL.US#quality

What the Quality Score of a stock looks like with its factor families is shown in the figure for the tab Quality in Chapter 6.

The combination is the point

Value tells you it is cheap. Quality, strength and earnings quality tell you whether it is cheap for a good reason or a bad one. Asness, Frazzini and Pedersen showed that ”quality minus junk” earns significant risk-adjusted returns in the USA and internationally [8], exactly why we never screen on cheapness alone.

IN SHORT

- Cheap alone is a trap; the Quality Score from 0 to 100 asks, separately from the fair value, how good the business is.
- It draws on up to 37 factors in 10 families, each backed by published research.
- The score describes the business; it does not change the fair value.
- The combination is the point: value tells you that something is cheap, quality tells you whether it is cheap for a good reason or a bad one.

CHAPTER 14

How we test

The rules for building an honest test, and why every single one is needed

> *Test enough variants on the same history and you will always find one that shines.*
>
> Paraphrased from Bailey, Borwein, López de Prado and Zhu (2014) [24]

A backtest is an experiment on the past. It can show whether a rule would have held up under real conditions, and it can just as easily tell a beautiful story that was never true. Bailey, Borwein, López de Prado and Zhu worked out that with enough trials you can almost always find a strategy that shines in hindsight and fails afterwards [24]. Harvey, Liu and Zhu reached the same conclusion for published research: whoever tests hundreds of signals has to set the hurdle for each single one much higher [22].

This chapter describes how we build our own tests so that they do not lie to us. There are ten rules for building a test. We invented none of them; most can be found in this or a similar form in the literature of statistics and financial research. Behind several of them there is an experience of our own: an error that a cross-check found, and the rule that came of it. Chapter 21 tells that story.

1. First the question, then the numbers

Since November 2026 we write down before a test what it is meant to prove: the question, the measure, the hurdle and the period in which it is tested. Only then do we calculate. Earlier tests were not always built this way; Chapter 21 shows why we have insisted on it since. If the result falls just short of the hurdle, the rule has not passed, even if it would be tempting to lower the hurdle a little after the fact.

The hurdle usually has two parts. First, a new rule has to be better in a **selection period**, for instance the years up to 2009. Second, it has to be better once more in a **confirmation period** after that, which we did not look at while selecting. A rule that helps in only one half of the history has usually learned a quirk of those years and not the stock market.

When we test several variants at once, the hurdle for each single one becomes stricter. Whoever tests nine variants has, at the usual error threshold of five per cent, a good chance that at least one passes by chance alone. The simplest defence is to divide the threshold by the number of trials. It goes back to the Italian mathematician Carlo Emilio Bonferroni and is strict, but honest.

2. Know nothing you could not have known back then

The most common mistake of a backtest is the **look into the future** (look-ahead bias): the calculation uses a number that was not yet known on the decision day. It happens faster than you would think. A company publishes its annual accounts only weeks after the end of the year; a data provider corrects old figures years later; a company changes its sector; a stock is split.

Our rule: fair value, quality and trend use only financial years and prices that were available on the decision day. The figures of those financial years, however, come from our data as it stands today; later corrections may already be in them. In the test, the fair value of a financial year applies only from the day the accounts were available, and where that day is missing, only after a cautious interval

following the end of the financial year; before that the test works with the previous year's. The trend uses only prices before the decision day.

One thing comes from today all the same, and we say so openly: the valuation model and the rules themselves. They were chosen on the same history we test them on. That is the reason we take the confirmation period so seriously, and the reason a backtest is never the same as a live test that runs in public into the unknown future.

3. The companies that no longer exist

Whoever tests only the stocks that are still listed today tests a world without bankruptcies. This **survivorship bias** is one of the most powerful distortions of all, because it removes precisely the worst outcomes from the data. Tyler Shumway showed that even large databases long underestimated the final losses of companies that disappeared [28].

Our evidence test [29] therefore contains 2,361 companies from the USA and Europe that later disappeared, through bankruptcy, takeover or delisting. They are held until the last trading day; after a collapse a further loss of 30 to 55% is added, as research has measured it for the time after a stock leaves the exchange. Of the purchases in the test, 46% involved companies that later no longer existed; these are mostly takeovers and delistings, only a small part of them bankruptcies.

For many of these companies the old annual reports are missing. We estimate them from similar companies that also disappeared. So that this estimate does not fool us, we tested it ourselves: for the companies from 2010 onward whose real figures we have, we hid the real figures and estimated them as well. This shifted the result by only a few tenths of a percentage point a year, sometimes up, sometimes down.

One observation from this work belongs here. Companies that collapsed while they were held, or shortly afterwards, were only a small part of the purchases in the test. For these few, though, the last annual accounts often still looked solid; their quality frequently stayed high to the end, and so the quality-break rule rarely triggered for them. Annual accounts, then, do not always announce a collapse. The test includes such cases, together with the loss after the stock leaves the exchange, and the strategy does not rely on a single measure: the protection against the single bankruptcy lies, in our assessment, above all in diversification.

4. Count costs, even small ones

Every purchase and every sale costs 0.1% in the test. The market we compare against pays 0.25% a year, as much as a low-cost index fund. Taxes are not included, on either side. Costs look unremarkable, but they grow with every trade. A rule that reshuffles twice as often therefore first has to earn back twice the costs before it adds anything; trading around quarterly reports (section 8) failed for exactly that reason.

5. The right benchmark

The strategy holds fifteen stocks, each with the same weight. An index in which the largest companies weigh the most measures something else: it is carried by a few giants. Compare an equal-weighted portfolio with it and you mix three things that have nothing to do with one another: whether smaller companies happened to do better than large ones, whether equal weight happened to do better than weight by size, and whether the selection is any good. Only the third is the question.

That is why our market is the MSCI ACWI Equal Weighted: stocks from all countries, each with the same weight as in the strategy's portfolio, with dividends, in US dollars, over exactly the same days. We did not make this choice by accident. Early tests of our own had drawn a large part of the apparent edge from exactly this mix-up: almost any equal-weighted basket from our universe was ahead of a market weighted by size, even one that was put together without any valuation at all. The difference between good and bad selection was much smaller than the difference between the weightings.

For questions about individual stocks, such as whether undervalued stocks do better in the following years, the benchmark is closer still: the typical stock of the same universe in the same year. That way a crisis or a boom hits both sides equally.

6. Price and value on the same basis

A fair value applies per share as the share is cut today, that is, after all stock splits. The price you compare it with must have the same basis. But price data comes in three versions, and each answers a different question:

Table 2 Three versions of the same price

Version of the price	Apple, end of March 2013	What it is good for
As traded, the way it stood on the price list back then	$442.66	What a buyer paid back then, per share of that time
Per today's share, after the splits of 7:1 (2014) and 4:1 (2020)	$15.81	Comparison with a fair value per today's share
Additionally adjusted for all later dividends	$13.45	Total return with dividends reinvested

For the gap between price and fair value we take the middle row: per share after splits, but without dividend adjustment, because on the decision day exactly this price stood on the list, only converted to today's shares. For the return we take the bottom row, because dividends belong to the return. London prices quoted in pence we convert into pounds. And a listing whose historical fair value is not available in the trading currency, such as a London stock with an annual report in US dollars, stays out rather than being compared through an uncertain conversion.

That sounds like bookkeeping. It is the spot where we found and fixed a measurement error three times in 2026. Whoever compares the top row with a fair value per today's share takes Apple in 2013 to be around twenty-eight times too expensive. Chapter 21 tells how a cross-check found the error and which rules came of it.

7. Many portfolios instead of one

A single portfolio is a single story. It depends on the starting month and on which of several tied stocks happened to be drawn. In an early test one stock shifted the result by several percentage points a year.

That is why we run each of the twelve possible review months with a hundred portfolios each, 1,200 in total, and report the median. From 2001, the range across the twelve months runs from 10.4 to 12.3% a year; 91% of all portfolios were ahead of the market. This range is nothing to be embarrassed about; it is the most honest number in the whole test: it shows how much of the result depends on the chance of the timing.

The same caution applies between two runs. When the data is refreshed, because a provider has corrected old figures or delivered new companies, the results of individual periods move by a few tenths of a percentage point without anything having changed in the rules. Differences of this size therefore prove nothing. When we recalculated the evidence at the beginning of November 2026 with refreshed data and a changed rule, the figure for the period from 2016 fell visibly; we published it the way it came out.

8. Chance as the opponent: the placebo

In medicine a new drug has to be better than a sugar pill, not just better than nothing. We do the same. Since November 2026 every new rule of ours goes up against a **placebo**: a rule that changes just as much, but without any sense behind it.

It comes in several forms:

- **Random selection:** Instead of the stocks a new rule excludes, the test excludes the same number of randomly chosen ones. If the real rule achieves no more than chance, it has learned nothing.
- **Placebo event:** If an event is supposed to have an effect, a quarterly report for instance, the test measures the same stock for the same length of time at a moment without an event. This separates the effect of the event from mere time in the market.
- **Shuffled changes:** If a rule raises the fair value of some companies, the test distributes the same increases at random among the same companies. If the real distribution is no better, the rule only shifts the level.
- **Randomly assigned targets:** If the price of an undervalued stock is supposed to move to its fair value, the test measures how often a random other stock would have reached a target equally far away.

How much this matters is shown by a test of an obvious idea we had ourselves in 2026: is it worth buying the best-rated stocks shortly before the quarterly report and selling them shortly after? Without a placebo it looked good, and the longer the window around the report, the better. With a placebo, that is, the same stock for the same length of time a few weeks later without a report, almost the whole effect disappeared. All we had measured was that stocks rise on average when you hold them. The small remainder that really does exist around reporting days showed up in the stocks we had sorted out just as much as in the best ones, and randomly drawn stocks beat our top selection in the majority of draws.

9. Samples by companies, not by rows

In a test over thirty years a company appears up to thirty times, once per financial year. Its years are connected: a company that was undervalued in 2010 often still is in 2011, and a holding period of three years from 2010 overlaps with the one from 2011. Count every row as an independent observation and you think you are far more certain than you are.

In the value check and in the analysis of the paths we therefore estimate the uncertainty across companies, not across rows. The procedure is called the **bootstrap**, after Bradley Efron [39]: from the companies, a sample of the same size is drawn with replacement several hundred to a thousand times, each company with all its years, and the result is recalculated. The middle 95% of these results is the range we report. If it is wide, we know little, even when the number of rows looks large.

10. One case by hand and an independent witness

Before we trust a new measurement, we recalculate one case by hand: the price on the reference date, the unit, the currency, the fair value, the result three years later. Then we compare the price used in the calculation with a source that is independent, such as the unadjusted month-end closing prices that were actually traded on the exchange. An example: for Microsoft at the end of March 2009 the analysis in Chapter 17 works with $18.39 per share; on that day the stock traded at $18.37. If this comparison does not match, it is the measurement that is broken, not the stock market.

This rule sounds trivial. It has uncovered mistakes several times, and that is why it now stands at the start of every new measurement.

METHOD

Profile of the evidence test

Question	Would the rules of the strategy have earned more than the market?
Data	Companies from the USA and Europe with a point-in-time fair value from up to 26 models and high data coverage, plus 2,361 companies that later disappeared (1,518 from the USA, 833 from Europe); only stocks, no funds and trusts.
Period	1992 to 2026; comparison with the market from 2001, because before that most failed US companies are missing from the data.
Rules	the three buy rules and the sell rules from Chapters 9 and 10, fifteen stocks, equal weight, reviewed once a year.
Measure	Return per year in US dollars with dividends reinvested, after 0.1% costs per purchase and per sale, before taxes.
Benchmark	MSCI ACWI Equal Weighted after 0.25% a year in ETF costs, over the same days.
Against chance	twelve review months with a hundred portfolios each (1,200), median and range; cross-check of the estimated figures of failed companies.
Limits	Rules and model of today, chosen on the same history; failed companies partly estimated; the USA in the 1990s and Europe before about 2013 incomplete; no taxes.

METHOD

Profile of the value check (since November 2026)

Question	Does a change to the fair value calculation bring the fair value closer to what the stock actually did afterwards?
Data	all company-years in the USA and Europe whose fair value moves because of the change, with prices on the reference date and three years later.
Measure	the distance between the ratio of fair value to price at the time and the total return of the following three years, before and after; plus the ranking: do stocks with a larger gap also end up ahead later?
Price basis	price per today's share after splits, without dividend adjustment, pence in pounds; only fair values in the trading currency.
Against chance	bootstrap across companies; two placebos: the same average increase for all companies that move, and the same increases shuffled at random.
Verdict	fixed in advance. If the change does not pass against both placebos, it only shifts the level.
Limits	Three years is an arbitrary horizon; the check measures the closeness of the value, not the return of a strategy.

Two instruments, two questions

The evidence test and the value check answer different questions. The evidence test asks whether the **strategy** earns. The value check asks whether the **fair value** becomes more accurate. A change can make the fair value of many companies more accurate and still change nothing in the result of the strategy, because the companies affected were never among the candidates. Conversely, a rule can improve the strategy without making a single fair value more accurate.

That is why, with every change to the fair value calculation, we ask both: does the fair value become more accurate in the value check, and does the evidence test stay at least the same? Only what harms neither of the two is switched on. Where a change does not demonstrably improve the value check, we say so and name the reason why it applies anyway, such as the logic (Chapter 21) or a verdict that was too strict (Chapter 20). And where the result only says "no worse", we say exactly that instead of calling it "better".

Limits of this method

Even the most careful backtest remains a look back. Our selection and confirmation periods come from the same history of a good three decades; only the future delivers truly new data, and that is why the live test runs in public. The figures of failed companies are estimated to a large extent. In the tool, stocks from Asia, Japan and the emerging markets are valued like all others; in the evidence test they do not appear. For Japan and many emerging markets we lack long price series and accounts; in some Asia-Pacific markets the strategy ran weakly in early tests, and the restriction to the USA and Europe was also chosen in view of this result. That too is a choice made on the same history. Taxes, spreads when buying small stocks and the behaviour of a real person in a crisis appear in no simulation.

And finally: a rule for building a test protects only if you apply it. The mistakes our checks found rarely came from ignorance. Mostly a second program was still calculating on an old basis, or a known check

was missing. That is why every value check now reads its prices exactly as the evidence calculator does, and the case by hand comes first (Chapter 21).

IN SHORT

- First fix the question and the hurdle, then calculate; nothing is moved afterwards
- Only financial years and prices that were available back then, and the companies that no longer exist
- The benchmark must have the same weighting as the portfolio: hence the equal-weighted world market
- Since November 2026 every new rule goes up against a placebo, and uncertainty is estimated across companies
- Before every new measurement, one case by hand and an independent witness

CHAPTER 15

The evidence: backtest and live test

Rules tested over 34 years, with failed companies, and a portfolio that runs in public

> *"... a true margin of safety is one that can be demonstrated by figures, by persuasive reasoning, and by reference to a body of actual experience."*
>
> Benjamin Graham, "The Intelligent Investor", Chapter 20 [18]

A strategy deserves trust only if it has a reason to work and that reason shows up in data. The reason is in the chapters before: the value effect, quality, and the reversion of price to value. The data is here, with the same numbers and rules as the evidence window on the site (as of 5 November 2026).

The headline

11.7%
Strategy per year
from 2001, median of the 12 review months

8.6%
MSCI ACWI Equal Weighted per year
after 0.25% ETF costs a year

+3.1 pp
Gap per year
ahead in 12 of 12 review months

2,361
failed companies
in the test, USA and Europe

We simulated the rules of the strategy from 1992 to 2026, including companies from the USA and Europe that later failed. The market is the MSCI ACWI Equal Weighted: every stock with the same weight, with dividends, in US dollars, over the same days, minus 0.25% a year in ETF costs; the strategy pays 0.1% per purchase and per sale. The comparison starts in 2001, because before that most US companies that failed are still missing from the data.

Periods

from	Strategy	MSCI ACWI Equal Weighted	Gap	Months ahead
2001	11.7%	8.6%	+3.1 pp	12 of 12
2009	12.3%	8.3%	+4.0 pp	12 of 12
2016	11.4%	8.1%	+3.3 pp	12 of 12
1992	12.9%	no comparison: the index starts in 1997, and failed US companies before 1999 are largely missing		

Per year, in US dollars, dividends reinvested, up to 2026. MSCI ACWI Equal Weighted after 0.25% ETF costs a year. Each row is the median over the 12 review months (100 portfolios each); "months ahead" counts in how many of the 12 review months the strategy was ahead of the MSCI ACWI Equal Weighted.

The rules the test used

Buy

1. Fair Value at least 30% above the price
2. Quality Score of 50 or more
3. Uptrend: the price a month ago higher than twelve months ago

The strategy buys only stocks with all three checks. Among them, ranked 30% by upside and 70% by quality. 15 stocks, equal weight, at most 2 per sector, checked once a year.

Sell

- Sell in the optimistic range: the price reaches the optimistic Fair Value
- Quality break: the Quality Score falls below the median
- Review after 5 years

Market: MSCI ACWI Equal Weighted, every stock with the same weight, with dividends, in US dollars, over the same days, minus 0.25% a year in ETF costs. The strategy pays 0.1% per purchase and per sale. Only stocks, no funds, ETFs or trusts. Including companies that later failed; their Fair Values are estimated, the USA in the 1990s and Europe before about 2013 are incomplete. The headline figure is the median over all 12 possible review months, 100 portfolios each.

In the backtest the Quality Score of a company is its rank among all companies of the same year, so "below the median" is the same mark as the minimum of 50 in the buy rule.

What the status means

Status	Case	What happens
On track	Below the optimistic Fair Value, quality intact	The price has not reached the optimistic Fair Value yet and the business is sound. The position stays.
Review	Optimistic Fair Value reached	The price has reached the optimistic Fair Value. The strategy sells here and rotates into the next stock with all three checks.
Review	Quality break	The Quality Score dropped below the median, the business is weakening. The position is flagged before it becomes a value trap.
Review	Held 5 years	After five years a position is reviewed and rotated into a fresh stock with all three checks.

How the test was run

Since 1992, compared from 2001

Tested from June 1992 to June 2026. The comparison with the market starts in 2001: before 1999 most US companies that failed are still missing from the data, so the early years are less reliable.

Three checks to buy

The strategy buys only stocks with all three checks: Fair Value at least 30% above the price, Quality Score of 50 or more, and an uptrend (the price a month ago higher than twelve months ago).

Sold in the optimistic range

A position is sold once the price reaches the optimistic Fair Value, when quality breaks below the median, or it is reviewed after five years. The proceeds roll into the next stock with all three checks.

All 12 decision months

The portfolio is checked once a year, and the month changes the result. So we ran every month from January to December, 100 portfolios each, and report the median of the 12 months.

Failed companies included

2,361 companies from the USA and Europe that later disappeared are in the test, held until their last trading day; a bankruptcy then costs another 30 to 55%. Their Fair Values are estimated from similar companies. The USA in the 1990s and Europe before about 2013 are incomplete.

Only stocks, one quality formula

Only stocks are tested: funds, ETFs, closed-end funds, investment trusts, VCTs and SPACs are left out, for failed and for listed companies by the same rule (201 and 188 securities). The Quality Score uses the same six measures for every company; where interest cover is missing, the average of the other five counts.

Dividends reinvested, in US dollars

Every return uses adjusted closes, so dividends and splits are reinvested. European stocks are converted to US dollars at the exchange rate of the day. Costs: 0.1% per purchase and per sale, returns before taxes.

Point-in-time, said openly

Fair Value, quality and trend only use figures that were available on the decision day. What is from today: the valuation model and the rules, which were chosen on this same history.

One market: MSCI ACWI Equal Weighted

The market is the MSCI ACWI Equal Weighted: stocks from all countries, each with the same weight, as in the strategy's portfolio, with dividends, in US dollars, over exactly the same days, minus 0.25% a year for the costs of an ETF on it. Since 2016 the strategy is ahead of the MSCI ACWI Equal Weighted.

Failed companies

The test contains companies that later disappeared from the exchange (bankruptcy, takeover, delisting), from the USA and Europe. They are held until their last trading day; after a collapse another 30 to 55% is lost (Shumway 1997). Where their annual reports are missing, they take the figures of a similar failed company; their Fair Values are estimated from surviving companies with similar quality, momentum and profit. In a cross-check the real annual figures of failed companies from 2010 were hidden and estimated as well: the result changed −0.3 over the whole period, by −0.4 since 2009 and by +0.4 since 2016, in percentage points a year; the estimate can shift the result slightly.

Risk

The strategy does not avoid falls; it carries roughly the same largest drawdown as the market and swings a little more.

	Strategy	MSCI ACWI Equal Weighted
Largest drawdown	−57.1%	−57.4%
Volatility per year	18.7%	16.9%

monthly portfolio value from 2001, median of all portfolios and decision months, against the MSCI ACWI Equal Weighted after ETF costs

The tested universe

Sector	Companies	Country	Companies
Industrials	698	United States	2,778
Financials	589	United Kingdom	787
Consumer Discretionary	428	France	491
Information Technology	380	Germany	472
Health Care	280	Spain	156
Materials	198	Switzerland	155
Consumer Staples	181	Finland	154
Real Estate	161	Norway	145
Communication Services	151	Sweden	106
Utilities	105	Denmark	95
Energy	103	Italy	92
		Netherlands	80
		Austria	71
		Belgium	21
		Portugal	8
		Ireland	6

Counted are companies still listed today.

Read this honestly

A backtest is a simulation on historical data, and the rules were chosen on the same history. Past results are no guarantee of future outcomes. Prices and figures of failed companies are partly estimated, the USA in the 1990s and Europe before about 2013 are incomplete, and taxes are not included.

The live test

One running portfolio of 15 positions, equally weighted when bought: picked by the backtested screen and sold by the very rule the watchlist and its improvement suggestions set. Updated daily.

Until 10 September 2026 the curve shows the monthly picks from 1 July 2026 (25 stocks each, bought and held), since 10 September 2026 the running portfolio.

+8.0%
Fair Value Calculator
since 1 July 2026

−2.0%
MSCI ACWI Equal Weighted
since 1 July 2026

+10.0 pp
Outperformance since July 2026
as of 11 November 2026

Month	Portfolio	Index	Gap
July 2026	+3.0%	−0.4%	+3.4 pp
August 2026	+2.6%	+2.4%	+0.2 pp
September 2026	−2.8%	−4.1%	+1.3 pp
October 2026	−1.9%	−2.4%	+0.5 pp
November 2026	+7.4%	+2.7%	+4.7 pp
Total	**+8.0%**	**−2.0%**	**+10.0 pp**

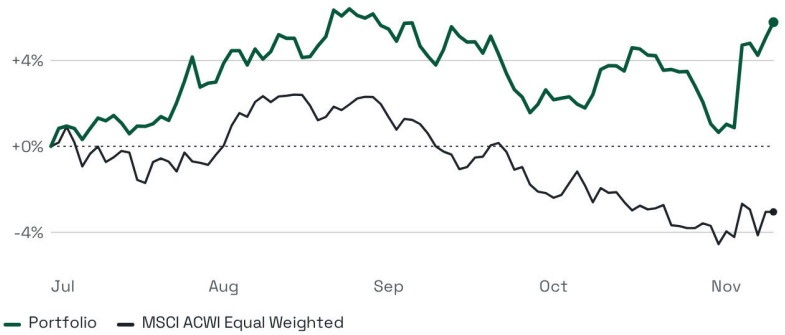
The live test runs in public on the site, with every position, every purchase and every sale and the rule that triggered it. It is young; returns need time to play out. When the rules change, it continues in the same table.

Live test: a model portfolio that follows the selection and the rules of fairvalue-calculator.com

One running portfolio of 15 positions, equally weighted when bought: picked by the backtested screen and sold by the very rule the watchlist and its improvement suggestions set. Updated daily.

Until Sep 10 the curve shows the monthly picks from Jul 1 (25 stocks each, bought and held), since Sep 10 the running portfolio.

Fair Value Calculator	MSCI ACWI Equal Weighted	Outperformance since July 2026
+5.8%	-3.1%	Δ +8.9 pp



Month	Portfolio	Index	Gap
Jul 26	+3.0%	-0.4%	+3.4 pp
Aug 26	+2.6%	+2.4%	+0.2 pp
Sep 26	-2.8%	-4.1%	+1.3 pp
Oct 26	-1.9%	-2.4%	+0.5 pp
Nov 26	+5.1%	+1.6%	+3.5 pp
Total	**+5.8%**	**-3.1%**	**+8.9 pp**

▸ **Positions (15)**

▸ **What the portfolio did (67)**

Figure 22 The live test in the evidence window: the running portfolio against the MSCI ACWI Equal Weighted.

IN SHORT

- The rules of the strategy were simulated from 1992 to 2026, including the companies from the USA and Europe that later failed.
- The comparison market is the MSCI ACWI Equal Weighted: every stock with the same weight, with dividends, in US dollars, after costs.
- The strategy does not avoid falls; it carries roughly the same largest drawdown as the market and swings a little more.
- A backtest is a simulation, and the rules were chosen on the same history.
- The live test continues to run in public; it is young.

CHAPTER 16

Earlier tests by hand

32 stocks from 2005, followed to 2025

> *"Many shall be restored that now are fallen and many shall fall that now are in honor."*
>
> Horace, "Ars Poetica", as the motto on the title page of Graham and Dodd, "Security Analysis" [18]

Long before the automated backtest I tested the method by hand. In 2005 I wrote down 32 German and US stocks that my method flagged as undervalued, with their price and their fair value, and followed them: first to 2010, then to 2019, 2022 and 2025. A first version with 33 stocks from 2005 to 2015 has been in the forum since 3 June 2016 (Chapter 33). It was a small selection of my own and the market then was the average of the DAX and the Dow. Today's backtest in Chapter 15 is the automated, much larger test. These are the results of the hand-kept test as I recorded them.

+12% vs +3%
per year, 2005 to 2010
market: average of DAX and Dow, a 9-point edge despite the 2008 crisis

+7 / +8 points
per year, 2005 to 2019 and 2005 to 2022
17% against 10% and 18% against 10% per year

+846% vs +162%
2005 to August 2025
average of the 32 stocks against the market

+180%
median stock, 2005 to 2025
lower quartile −29%, upper quartile +460%

The advantage persisted over the longer windows. Of the 32 stocks, 26 reached their fair value; the remaining 6 had not after 17 years. The mean time to fair value was about 5.5 years. The outcomes are very uneven: 9 of the 32 lost money, the typical (median) stock made +180%, and a few outliers lift the average far above the median, with strong winners such as Goldman Sachs and Eventim beside losers such as Leoni and Salzgitter. This skew is exactly why diversification matters.

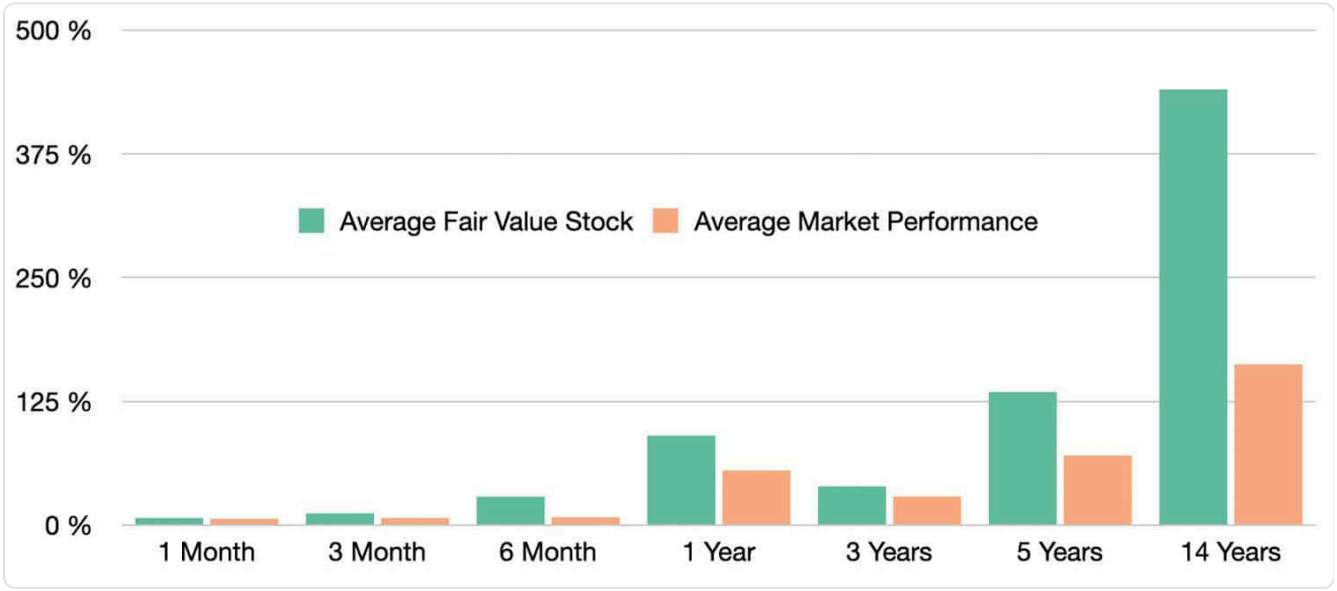


Figure 23 Average return of the stocks from the 2005 list against the market, by holding period.

Convergence: how long price and value need

Fair value is the fundamentally justified worth of a company, independent of sentiment. Over time the price tends to revert towards it; sometimes the price moves to the value, sometimes the fundamentals grow into the price, often both. A study of 100 stocks since 2015 put the median time to fair value at about five years; the later survivorship-robust test from 2015 to 2026 found that about 80% of undervalued stocks reached their fair value within about five years, with a median of about three years. The premium comes early, which is why the strategy sells once the price reaches the optimistic fair value and reviews every position after five years.

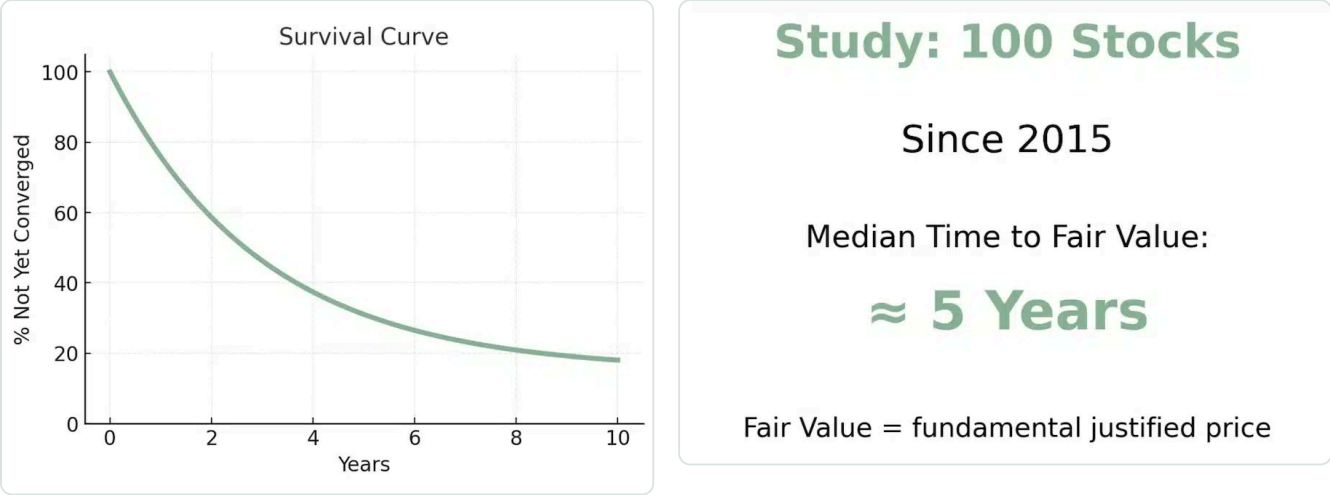


Figure 24 Left: the share of undervalued stocks that have not yet reached their fair value, year by year. Right: the study of 100 stocks since 2015.

Mean reversion is not one pattern

Sometimes the price rises to meet a steady fair value; sometimes the fair value falls to the price; sometimes the fundamentals grow into a flat price; often both move towards each other. The convergence is real; the path varies.

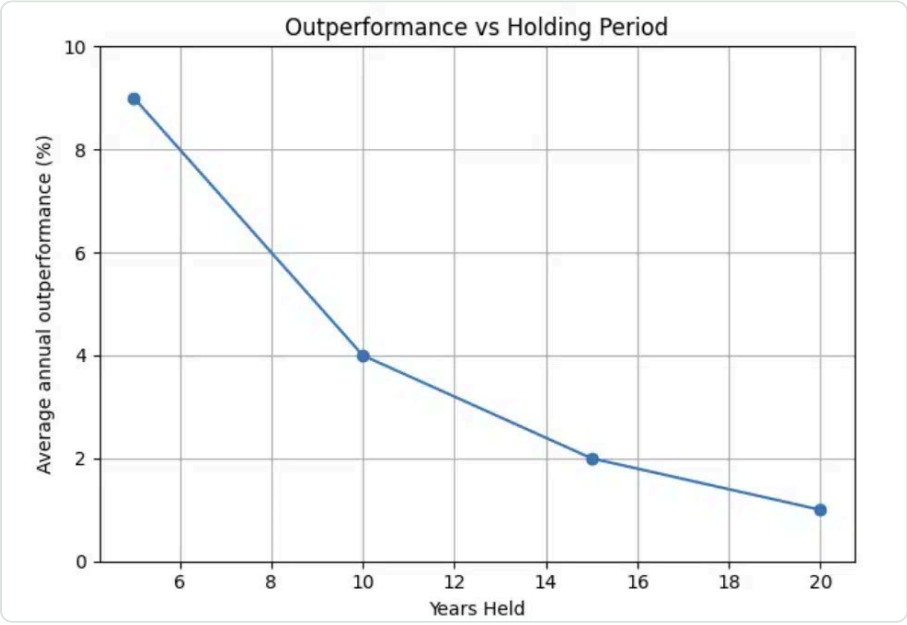


Figure 25 The edge per year by holding period: largest in the first years while price converges to value (about +9% per year over five years), then flattening but staying positive.

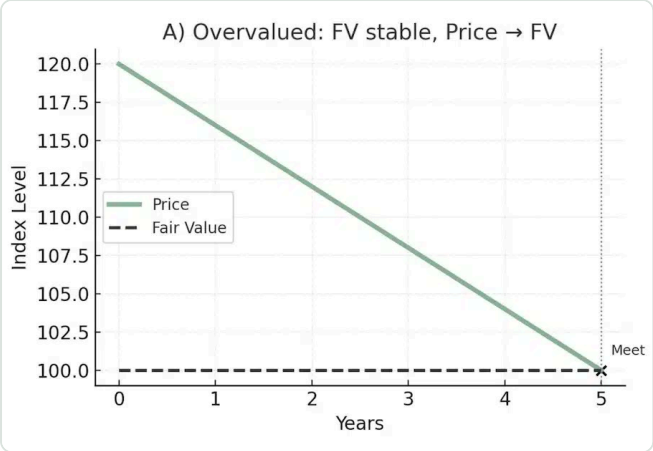
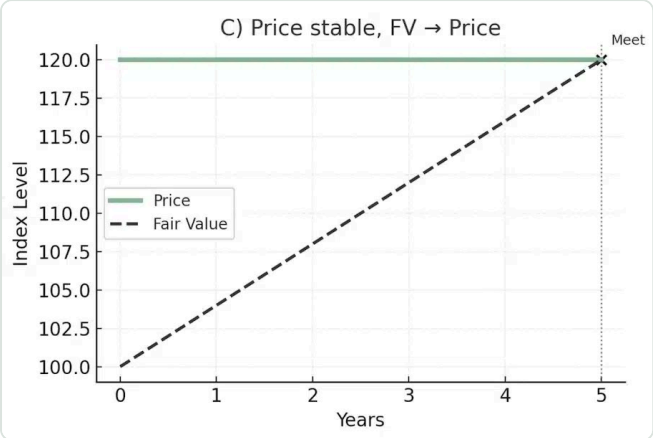




Figure 26 Paths A and B: the price moves to a steady fair value, from above (overvalued, A) or from below (undervalued, B).



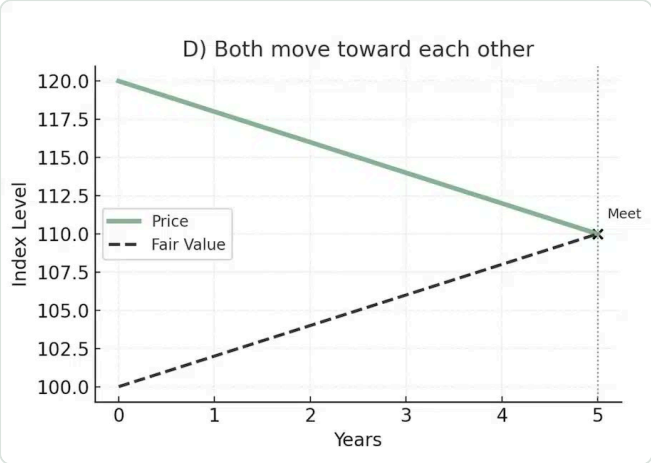


Figure 27 Paths C and D: the fair value moves to a steady price, as the fundamentals grow into it (C); both move towards each other (D).

Mapped onto the literature, the picture is consistent: low valuation [1] [2] [3], quality and profitability [5] [7] [8] [9], and the reversion of price to intrinsic value [4] [6] have all historically mattered. Piotroski's fundamental signals separated winners from losers within the value stocks and added about 7.5% per year over 1976 to 1996 [5]. We have since repeated the idea at scale: an automated study screened more than 45,000 stocks and invested on paper only in those trading below their computed fair value; an outperformance remained.

The tables

Name	$ Price ´05	Value ´05	$ Price ´15	$ Price ´19	Perf. ´05-19	$ Price ´22	Value ´22	Perf. ´05-22	Time to FV
JohnDeere	29	43	71	141	387 %	383	338	1221 %	1Y
BASF	43	65	77	66	54 %	46	72	7 %	6Y
EON	29	56	9	9,5	-67 %	8	21	-72 %	not yet
ThyssenKrupp	18	28	18	11,5	-36 %	5	15	-72 %	1Y
Lufthansa	12	16	14	20	67 %	7	9	-42 %	2Y
Henkel	27	38	103	87	223 %	63	44	133 %	2Y
Dt.Bank	73	125	22	7	-90 %	9	19	-88 %	not yet
DialogSemicon	2	9	31	34	1600 %	67	-	3250 %	5Y
Stratec	15	48	53	62	313 %	82	52	447 %	10Y
Utd.Intern	9	22	51	35	288 %	19	33	111 %	8Y
Adva Opt.	6	18	11	7	17 %	20	12	233 %	17Y
Morphosys	13	21	57	91	600 %	21	15	62 %	6Y
Carl Zeiss	17	28	28	88	417 %	116	64	583 %	11Y
Leoni	27	54	36	18	-	7	22	-74 %	8Y
Aurubis	21	47	46	41	96 %	60	47	186 %	7Y
Salzgitter	45	188	22	28	-37 %	23	167	-49 %	not yet
F.Petrolub	5	12	43	34	580 %	22	23	400 %	2Y
Stada	27	38	37	85	214 %	103	85	282 %	2Y
Fielmann	14	21	66	61	336 %	30	21	114 %	2Y
DMG Mori	5	8	38	44	780 %	41	24	720 %	1Y
Krones	28	39	110	77	175 %	94	77	236 %	2Y
Rhön Klinik	16	42	28	27	69 %	16	8	-	not yet
K+S	12	18	24	17	41 %	22	100	83 %	2Y
Eventim	5	8	34	46	820 %	46	26	820 %	2Y
JP Morgan	32	73	58	113	253 %	122	200	281 %	11Y
Intel	21	34	32	51	142 %	27	54	29 %	9Y
GoldmanS.	106	170	168	182	71 %	325	985	207 %	1Y
Exxon Mob.	47	117	72	77	64 %	105	113	123 %	not yet
Cisco	14	22	25	54	285 %	43	50	207 %	1Y
Chevron	47	142	82	118	182 %	173	201	268 %	17Y
Caterpillar	49	84	59	133	171 %	190	159	288 %	3Y
BoA	39	74	15	26	-33 %	35	37	-10 %	not yet
% since ´05 (Market)					**241%** (162%)			**299%** (162%)	5Y (82%)
% Annual	(Market)				**17%** (10%)			**18%** (10%)	
% ´05-10	**Annual**	(Market)	**12%** (3%)						

Figure 28 The hand-kept table up to 2022: price and fair value ("value") per reference year, performance from 2005, time to fair value, and the totals against the market.

The 32 stocks one by one, price and fair value ("value") per reference year:

Name	Price '05	Value '05	Price '15	Price '19	Perf. 05-19 (%)	Price '22	Value '22	Price '25	Perf. 05-25 (%)
JohnDeere	29	43	43	71	387	383	338	488.80	1585.5
BASF	43	65	65	77	54	46	72	13.49	-68.6
EON	29	56	56	9	-67	8	21	15.79	-45.6
ThyssenKrupp	18	28	28	18	-36	5	15	9.75	-45.8
Lufthansa	12	16	16	14	67	7	9	8.34	-30.5
Henkel	27	38	38	103	223	63	44	19.15	-29.1
Dt.Bank	73	125	125	22	-90	19	16	36.56	-49.9
DialogSemicon	2	9	9	31	1600	67	-	67.42	3271.0
Stratec	15	48	48	53	313	82	52	25.55	70.3
Utd.Intern	9	22	22	51	288	19	33	25.20	180.0
Adva Opt.	6	18	18	11	17	20	12	20.80	246.7
Morphosys	13	21	21	57	600	21	15	18.96	45.8
Carl Zeiss	17	28	28	28	417	116	64	51.47	202.8
Leoni	27	54	54	36	-1	7	22	0.16	-99.4
Aurubis	21	47	47	46	96	60	47	96.35	358.8
Salzgitter	45	188	188	22	-37	23	167	21.80	-51.6
F.Petrolub	5	12	12	34	580	22	23	31.55	531.0
Stada	27	38	38	37	214	103	-	-	-
Fielmann	14	21	21	61	336	30	21	54.90	292.1
DMG Mori	5	8	8	38	780	41	24	46.10	822.0
Krones	28	39	39	110	175	94	77	137.00	389.3
Rhön Klinik	16	42	42	28	69	16	8	11.30	-29.4
K+S	12	18	18	24	41	22	100	12.51	4.2
Eventim	5	8	8	34	820	46	26	97.35	1847.0
JP Morgan	32	73	73	58	253	122	200	290.49	807.8
Intel	21	34	34	32	142	27	29	24.56	17.0
GoldmanS.	5	106	106	168	71	325	985	730.72	14514.4
Exxon Mob.	47	117	117	72	64	105	113	106.49	126.6
Cisco	14	62	62	54	285	43	50	66.20	372.9
Chevron	47	142	142	82	182	173	201	156.55	233.1
Caterpillar	49	84	84	59	171	190	159	407.79	732.2
BoA	39	74	74	15	-33	35	37	46.98	20.5

How to read the earlier tests

They were kept by hand on a small selection and are shown here as I recorded them, next to the automated backtest. Backtests are hypothetical and can be affected by survivorship and look-ahead bias. A high average hides real losers, and past results do not guarantee future ones.

IN SHORT

- Written down by hand in 2005: 32 German and US stocks that counted as undervalued, followed to 2025.
- 26 of the 32 reached their fair value, after about 5.5 years on average.
- The outcomes are very uneven: 9 of the 32 lost money, the typical stock made +180%, and a few outliers lift the average far above the median.
- Price and value converge on different paths: sometimes the price moves, sometimes the fair value, often both.
- It was a small selection of my own; the automated, much larger test is in Chapter 15.

CHAPTER 17

The paths of price and fair value

Who moves when the gap closes, and how much of it chance would have managed too

Chapter 16 shows four small pictures: the price rises to the value, the price falls to the value, the value grows into the price, both move towards each other. The pictures are right, but they do not say how often each path occurs. That is exactly what we wanted to know for this book, and not from a handful of examples but from all companies listed today that our evidence test knows over just over three decades.

This chapter asks three questions:

1. **How often and how fast** does the price of an undervalued stock reach its fair value?
2. **Who moves** in the process, the price or the fair value?
3. **How much of it would chance have managed too?** Prices rise on average, fair values move, and a gap can also close without the fair value having known anything at all.

The answers are partly reassuring, partly uncomfortable. We show both, because if you know what is usual, you wait more calmly.

Six paths

Before we count, we need names. A gap between price and fair value can develop in six ways:

Table 3 Six paths along which a gap can develop

Path	What happens	How you recognise it
1. The price rises to the value	The fair value stays roughly where it was; the price catches up	The market lets go of its excessive scepticism
2. The price falls to the value	The mirror image for an overvalued stock	Enthusiasm cools off

Path	What happens	How you recognise it
3. The value grows into the price	The business grows, the fair value rises towards the price	The market had seen the growth earlier than the accounts
4. Both move towards each other	The price rises, the fair value falls somewhat	Both sides were a little off
5. Both fall behind	The fair value falls or grows more slowly than at other companies, and the price falls behind as well	The market was not wrong to be cautious; if price and value even fall in absolute terms, it is a value trap: the business is getting worse
6. Price and value drift apart	The price falls behind, the fair value pulls away	The wait gets longer, or the thesis is wrong

Research knows most of them. That price and intrinsic value converge in the long run was shown by Lee, Myers and Swaminathan for the Dow Jones index: a ratio of intrinsic value to price reliably predicted the later returns there, while the usual ratios such as the price-earnings ratio predicted hardly anything [40]. Poterba and Summers found indications in long price series of a transitory component that recedes over years, that is, of paths 1 and 2, though not statistically significant [41]. De Bondt and Thaler showed that the extreme losers of the past later did better than the extreme winners [4].

For path 3 and path 5 a different paper matters more. Fama and French found that companies with a low price relative to book value earn little for years before and after the classification; their earning power recovers afterwards only to a small extent [42]. So the low price was largely justified. Lakonishok, Shleifer and Vishny saw the same thing from the other side: after the classification, the highly valued companies grew faster than the cheaply valued ones only for a short while longer, then at about the same pace; their prices had priced in a much longer lead [3]. And Chan, Jegadeesh and Lakonishok showed that markets and even analysts react to new earnings figures only step by step [43], which explains why a gap rarely closes in a single day.

What these studies do not provide is a time after which a single undervalued stock reaches its value. Lee, Myers and Swaminathan measure the reversion at the level of a whole index; Poterba and Summers assume their half-life instead of estimating it. Anyone who gives you such a number as "scientifically proven" should be able to show you the source. Part IV of this book follows the studies and their limits in more detail, above all Chapter 24; here we measure for ourselves.

What we measured

A remark on the benchmark, because it carries the whole chapter. We show every result first as it actually happened and then in the stricter comparison. If we only asked whether the price of an undervalued stock rises, the answer would mostly be yes, because prices rise on average. And if we only asked whether its fair value falls, the answer would often be yes, because fair values fluctuate. Both views are correct; they simply answer different questions. Only the comparison with the median stock of the same cohort and with the placebo separates what the fair value knew from what happens anyway.

The calculation splits the gap into two parts:

Change in the gap = change in the price minus change in the fair value (each logarithmic) (1)

If the price rises by more than the fair value, the gap gets smaller; if the fair value falls, likewise. Logarithmic changes can be added; a rise of 0.10 corresponds to about 10.5%, a fall of 0.10 to about 9.5%.

METHOD

The path analysis

Question	How often, how fast and along which path does the gap between price and fair value close, and how much of it would a random stock have managed too?
Data	the same fair values, prices and filters as in the evidence test (Chapter 15): companies in the USA and Europe, only those listed today, that is, without the failed and without the taken-over companies, with high data coverage and a sufficient number of models, only stocks, fair value in the trading currency. Reference dates from 1990 to 2025, prices up to June 2026. In total about 51,000 company-years from about 3,300 companies.
Groups	undervalued = fair value at least 30% above the price, as in the first buy rule; overvalued = price equally far above the fair value; the rest in between.
Price basis	per today's share after splits, without dividend adjustment, pence in pounds, that is, the same price as in the evidence test. For returns, the total return with dividends.
Fair value over time	in every month the fair value that was known at the time, that is, the one from the latest accounts that count as known in the test up to then. Years with thinner data coverage that would not qualify as a reference date count here too.
Benchmark	the median stock of the same cohort (the stock in the middle). "Ahead" means: better than it; "behind": worse than it, not necessarily down.
Time to target	Kaplan-Meier estimator [44], a method from survival statistics that also correctly counts cases that may still reach their target; needed because the data ends in June 2026 and more recent cases have not yet been observed to the end.
Placebo	Every undervalued stock gets a twin, a randomly drawn stock of the same reference month. Its target lies equally far above its price, and over time it moves exactly as the fair value of the real stock moved. Twenty draws.
Uncertainty	bootstrap across companies [39], 300 draws, 95% ranges; for the placebo, the spread across the twenty draws.
Cross-check	the overvalued stocks, which would have to fall towards the value.
Check of the calculation	The number of company-years and of buy candidates matches exactly an earlier recalculation of the filters of the evidence calculation. One case by hand: Microsoft on 31 March 2009, price in the calculation $18.39, traded at $18.37; fair value verified against the database.

Result 1: How often and how fast

Take as the target the fair value that was known in the respective month, and just over a quarter of the undervalued stocks had reached it after one year, just over three fifths after three years, about three quarters after five and more than nine in ten after ten years. Half had arrived after just over two years. Take the fair value of the reference date as a fixed target instead, and it takes longer: just over half reached it within five years; half needed just under five years.

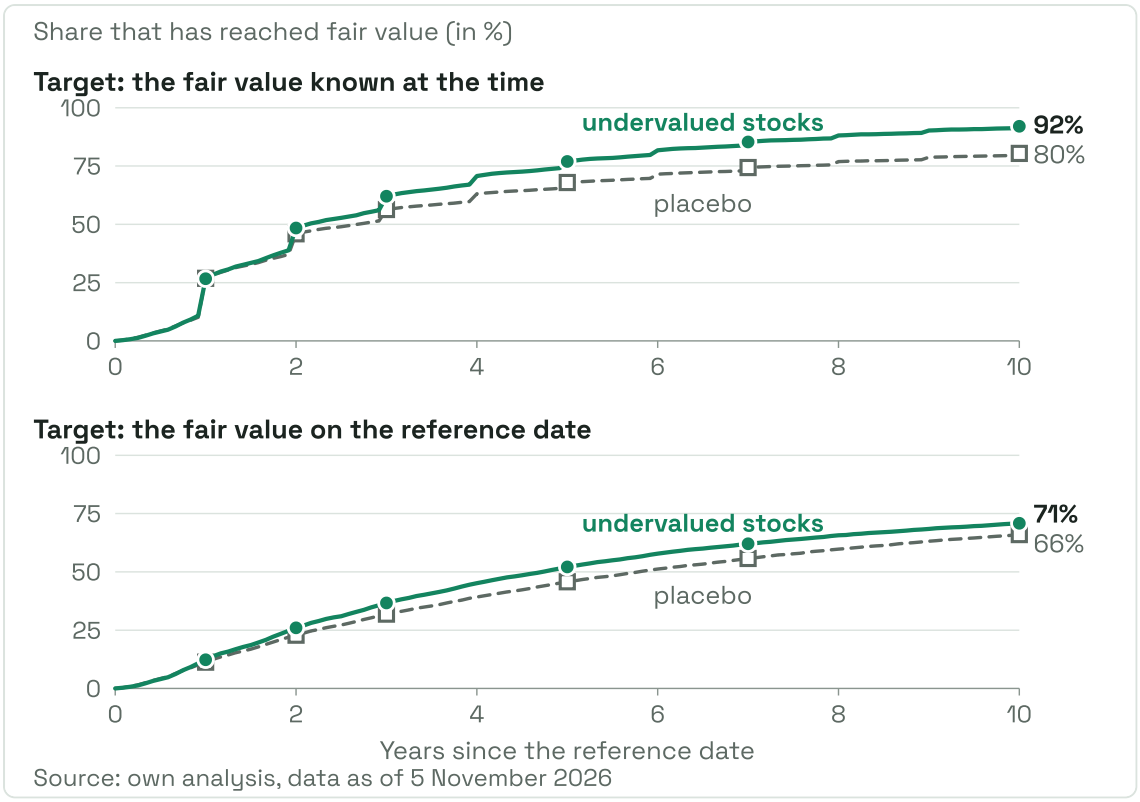


Figure 29 Share of undervalued stocks whose price has reached the fair value, against a placebo of random stocks with an equally distant target. Top: the target as it shifts with every new set of annual accounts; bottom: the fair value of the reference date. Source: own analysis, companies listed today in the USA and Europe, reference dates 1990 to 2025, prices up to June 2026.

These numbers are of the same order of magnitude as those of the earlier studies from Chapter 16 (about 80% in about five years, a median of a few years). The new analysis confirms the orders of magnitude on a larger basis. But it adds something that is in none of the earlier numbers: the placebo.

In the first year the undervalued stocks were no faster than chance. The random twin with an equally distant, equally moving target reached it just as often after one year. The difference grows only with time: a few percentage points after three years, about nine after five years, about twelve after ten years. With the fixed target the picture is similar, only flatter.

The comparison with the placebo brings the first uncomfortable insight of this chapter: **most of these hits would also have been managed by a random stock with an equally distant, equally moving target.** This changes nothing about the returns of the hand-kept test, which are measured against the market; something else is measured here, namely how often the price reaches a target and how much of that a random target would have managed too. Prices rise on average, and the fair values of undervalued companies lag behind those of the others on average, as we are about to see; in the first year they even fall for just over half of them. Both close gaps without the fair value needing to have known anything. What the fair value actually knows about the later price is the distance between the two lines. It is real, and the lead of the undervalued stocks over the median stock of their cohort shows in both halves of the period; but it is smaller than the lines themselves, and it takes years.

The steps in the upper curve stand out, after twelve, twenty-four and thirty-six months each. These are the months in which, in this series, the next annual accounts count as known and the fair value is set anew. Of the quarter that reaches its target in the first year, more than half reached it in exactly this month, mostly not because the price rose but because the new fair value was lower. That brings us to the second question.

Result 2: Who moves

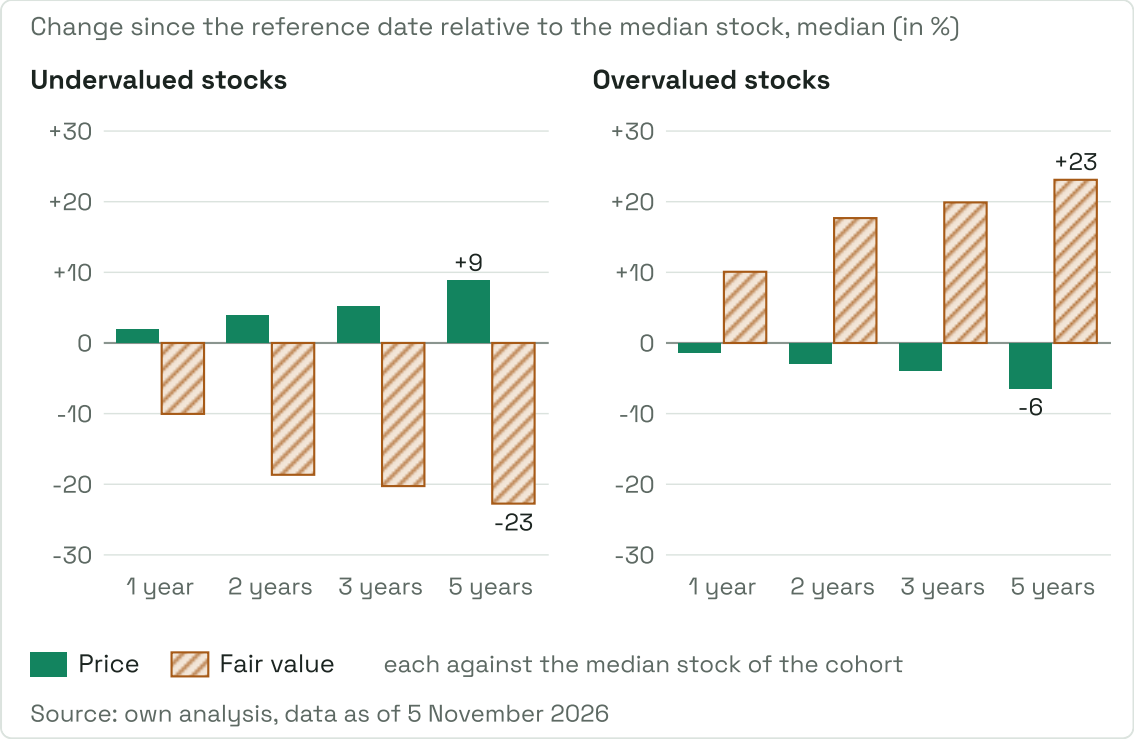


Figure 30 Price and fair value of undervalued and overvalued stocks, each relative to the median stock of the same cohort, median by holding period. The chart shows only this comparison: in absolute terms the price of the undervalued stocks rose by just over half in five years, and their fair value stayed almost the same. Source: own analysis, companies listed today in the USA and Europe, reference dates 1990 to 2025, prices up to June 2026.

First the absolute figures. In five years the price of the typical undervalued stock rose by just over half, while its fair value stayed almost where it was; in absolute terms the gap therefore closed mostly through the price. The stricter comparison with the median stock of the same cohort shows a different picture, because the median stock also gained strongly, and its fair value grew by just over a third over the same period. In this comparison the decomposition shows a clear pattern, and it is a mirror image for undervalued and overvalued stocks.

For the **undervalued** stocks the price did better than the median stock of their cohort, but only a little: at the median by just under 9% over five years. Their fair value, by contrast, fell well behind the median fair value, by just over a fifth. Measured against the median stock, only a sixth to a quarter of the closing over five years therefore came from the price, the rest from the fair value. In the first year the share of the price was even smaller.

For the **overvalued** stocks it is the other way round, and here both views point the same way. In absolute terms their fair value grew by just over two thirds in five years, their price by only about a quarter. Relative to the median stock their price did somewhat worse, by just over 6%, and their fair value rose markedly more than the median one, by just under a quarter. Path 2, the price falls to the value, did occur, but more often the value grew into the price: for just over three fifths their fair value did better than that of the median stock. That is also why the price fell to its old fair value of the reference date within five years for only about one in four overvalued stocks, while about three in five met the moving fair value within the same five years.

The comparison with the median stock brings the second uncomfortable insight: **measured against the median stock, the gap mostly closes from the side of the value.** In this comparison the market was right in its distrust of the cheap stocks and in its confidence in the expensive ones more often than

our fair values assumed on the reference date: the fair value of the cheap ones grew far more slowly than that of the other companies, that of the expensive ones far faster. In absolute terms, by contrast, the convergence of the cheap stocks came mainly through the price. This fits what Fama and French found for companies with a low price relative to book value: the weak earning power persists [42].

Part of it is also a statistical effect you need to know. Whoever picks, among thousands of stocks, the ones with the largest distance to fair value will also find among them those whose fair value happened to be too high in the year of the selection. Later it falls back. This **regression to the mean** is present in every selection based on an estimated quantity, not only in ours.

And yet: the price of the undervalued stocks did do better than that of the median stock, and that of the overvalued ones worse. Counting dividends, the typical undervalued stock was about 8% ahead of the median stock of its cohort after five years, the typical overvalued one about 6% behind, and random stocks of the same month were close to the middle. The ranges of the differences for undervalued and overvalued stocks do not include zero in any period. That is the part of the gap the fair value predicted correctly. It is small relative to the gap itself, and large enough to make a difference over many stocks and many years.

This number cannot be compared directly with the roughly 9% a year from the hand-kept test, because the two measure different things: the roughly 8% is the lead over five years in total, not per year, of the typical (median) stock among all undervalued stocks from 1990 to 2025, without selection and without a sale, against the median stock of the same cohort. The hand-kept test measures the lead per year as the average of a hand-picked list from a single starting year against the average of the DAX and the Dow, and with returns as unevenly spread as these, an average lies far above the median.

Result 3: Which paths occur how often

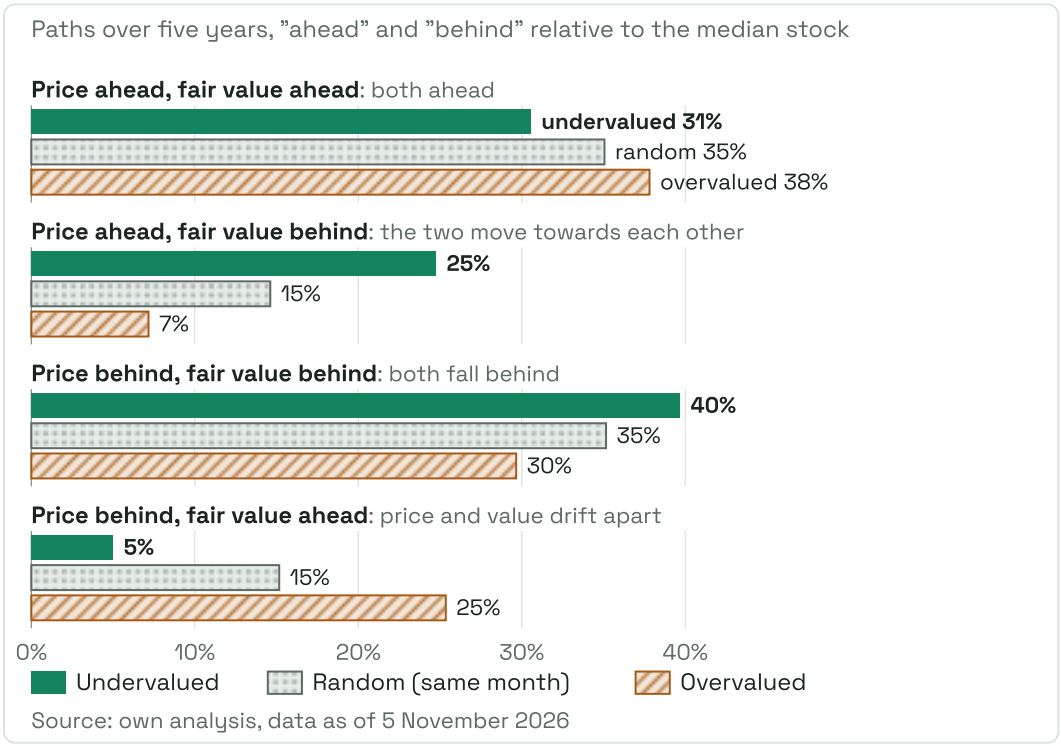


Figure 31 The four basic paths after five years, measured against the median stock of the same cohort: undervalued stocks, random stocks of the same month and overvalued stocks. "Behind" means worse than the median stock, not necessarily down. Source: own analysis, companies listed today in the USA and Europe, reference dates 1990 to 2025, prices up to June 2026.

Sort every observation by whether its price and its fair value did better or worse than the median stock of its cohort, and four fields emerge. For random stocks they are not equally large: price and fair value mostly move in the same direction. Just over a third therefore lies in "both ahead", just over a third in "both behind", and about a seventh each in the two mixed fields.

The undervalued stocks deviate markedly from this in three fields:

- **"Price ahead, fair value behind"**, that is path 4, both move towards each other: about a quarter of the cases, markedly more than for random stocks. This is the path you hope for when buying an undervalued stock, even though it means that your own fair value was too high.
- **"Price behind, fair value behind"**, that is path 5, both fall behind: at four in ten cases the most common single path, more common than for random stocks. Not every case in this field is a value trap, because "behind" here only means worse than the median stock. Apple, for instance, rose by just over a fifth in the first year after the reference date in March 2013 and still landed in this field, because the price and the fair value of the median stock gained a touch more. Total return and fair value falling in absolute terms over five years, the real value trap, affected about one in six undervalued stocks.
- **"Price behind, fair value ahead"**, that is path 6, price and value drift apart: rare, about one case in twenty, only a third as often as for random stocks.

The field "both ahead" was somewhat rarer for the undervalued stocks than for random stocks, at just under a third. For them it matches no single path of the table: price and fair value both did better than for the median stock, and the gap could close or open in the process. For the overvalued stocks this field is the most common, at almost four in ten cases, and the field "price behind, fair value ahead", path 4 in their direction, occurs for them in a quarter of the cases.

For you as an investor this means two things. First: an undervalued stock whose fair value falls in the next year is not an exception; it happened to just over half of them. Whoever gets nervous at every decline of the fair value will often be nervous with this method. Second: the price falling behind while the fair value pulls away was rare for undervalued stocks, far rarer than for random ones. Valuation alone does not protect you from a value trap, though.

Reached is not held

One finding from the count fits a rule of the strategy well. Within five years, the price touched the fair value at some point for about three quarters of the undervalued stocks. At the end of the five years, though, it was still at or above it for only just over a third, and for just over one in ten it was then even further above the fair value than it had been below it at the start. For just under a quarter, the price after five years was further below the fair value than at the start.

So the convergence is often a moment and not a state. Prices swing through the fair value, fair values move on. This fits two rules of the strategy that come from other tests: it sells in the optimistic range as soon as the price reaches it (Chapter 10) instead of waiting for it to stay there, and it reviews every position after five years. The hand-kept test in Chapter 16 supports the same two rules but saw the lead earlier; the two measure different things, the former a selected list against the market, this analysis every undervalued stock against the median stock of its cohort.

Do quality and trend change the path?

The strategy does not buy every undervalued stock, only those that also meet the two other buy rules: good quality and an uptrend. Whether these rules hold up is answered by the evidence test, not by this analysis. There the companies that later disappeared from the exchange are included, a collapse then costs a further, substantial loss, and the buy rules with quality and trend have been tested on exactly this history (Chapters 15 and 14). The path analysis cannot do that: it knows only companies listed today, and its quality is a rough ranking from figures in the accounts, the same as in the evidence test, but ranked here only among the companies listed today; it is not the Quality Score the tool shows for each stock. The trend is the same rule as in the buy rule.

What the paths still show are three observations on companies that survived:

- **The trend works early.** Undervalued stocks in an uptrend did noticeably better in the first year than the median stock and than the undervalued stocks without an uptrend, and more of their convergence came from the price instead of the fair value. This fits the research on price momentum that persists for some months [10]. After five years this lead could no longer be told apart from that of the other undervalued stocks.
- **Among the companies that survived, the paths hardly differed by quality.** The share of the path "both fall behind" was about the same after five years for undervalued stocks with all three ticks as for the other undervalued stocks, about four in ten each, and by quality alone it differed little as well. That is no verdict on the quality rule: the companies it is meant to protect against, those that later failed, are not in this analysis at all.
- **With an uptrend, the convergence takes somewhat longer.** For these stocks the fair value fell less in the first year, and so the gap closed less often solely because the next accounts lowered the value. After five years the difference in the fair value was only small.

The two tests measure different things, and each answers its own question. The evidence test in Chapter 15 measures the whole strategy: with the failed companies and the further loss after a collapse, with the ranking of the candidates, which is 70% by quality, with the diversification across fifteen stocks and sectors, and with the sale in the optimistic range. The path analysis measures individual surviving stocks against the median stock of their cohort and knows no sale. Statements about the rules and their risk therefore come from the evidence test; this analysis shows how the price and fair value of individual stocks move.

By size and by time

The paths differ less by the size of the companies than we had expected. We split every cohort into three equally large parts by market value. The mid-sized companies reached their fair value fastest, but their lead amounts to only a few months at the median and a few percentage points after five years; between the small and the large companies no reliable difference was visible. The two halves of the period, reference dates up to 2009 and from 2010, also show the same picture; in the more recent half the convergence took somewhat longer.

What this means for you

None of these numbers is a recommendation, and none says how a single stock will fare. But they give your waiting a frame:

- **Think in years, not in months.** In the first year an undervalued stock hardly differs from a random one. What the fair value knows shows over three to five years.

- **Expect the fair value to move.** In the first year it falls for just over half of the undervalued stocks, and over five years it mostly lags behind the fair value of the other companies; in absolute terms the gap still closes mainly through the price. A falling fair value is therefore no proof that you were wrong, but it is a reason to check the thesis: is the business getting worse, or was the value too high from the start?
- **Reached is not held.** The convergence is often a moment and not a state. The strategy sells in the optimistic range.
- **Diversification carries the load.** For four in ten undervalued stocks, price and fair value fell behind the median stock; for about one in six, total return and fair value even fell over five years, the real value trap. Against this risk, what helps above all is the number of stocks in the portfolio.

Limits of this analysis

- **Only companies that still exist today.** We have fair value histories only for companies listed today; for failed companies the evidence test knows only estimated values. So companies that went bankrupt do not appear in this side analysis, and neither do those that were taken over. The proportions in this analysis, including that of the real value trap, therefore describe the paths of surviving companies, not the risk of the strategy. The evidence test in Chapter 15 includes the failed companies and deducts a further loss after a collapse; statements about risk and rules therefore come from the evidence test, not from this analysis.
- **One fair value per year.** In this series the fair value changes only with every new set of annual accounts. In the tool itself it changes more often. The steps in the curves and the fair value's share of the convergence in the first year depend on that. The moving fair value also takes in years with thinner data coverage. Using only well-documented years, half of the undervalued stocks had reached their target after just over two and a half years instead of just over two, and just under three quarters reached it within five years.
- **Today's model.** The fair values of the past are calculated with today's model from the figures of the financial years of that time, as they stand in our data today. So what we have learned about the model is in the old values too. Some inputs even come from today, such as beta, the measure of how strongly a stock moves with the market.
- **Not a strategy.** The analysis knows no purchases, sales or costs and no diversification. It measures individual stocks against the median stock of their cohort, not against the market from Chapter 15.
- **Fixed boundaries.** The division into four paths draws the line exactly at the median stock; a stock just above it and one just below it land in different fields. Quality is ranked here among the companies listed today, in the evidence test also among the failed ones.
- **Overlapping years.** A company appears with many reference dates whose periods overlap. The ranges are therefore estimated across companies, not across rows.

IN SHORT

- Half of the undervalued stocks reached their moving fair value after just over two years, three quarters after five
- In the first year they were no faster than random stocks with an equally distant target; the lead grows over years
- In five years their price rose by just over half while their fair value stayed almost the same; measured against the median stock, though, the gap mostly closes from the side of the value, most often both fall behind, and among the companies still listed today a real value trap hit about one in six
- Even so, the price of undervalued stocks did better and that of overvalued ones worse than the median stock
- Reached is not held: this fits the sale in the optimistic range, the review after five years and broad diversification

CHAPTER 18

Case studies

What the value gap looked like in the wild

> *"... we simply attempt to be fearful when others are greedy and to be greedy only when others are fearful."*
>
> Warren Buffett, letter to the shareholders of Berkshire Hathaway for 1986 [33]

Numbers in the aggregate are convincing, but a single story makes the idea concrete. Here are real names the value lens looked at when they were out of favour, and where they trade now. Read them honestly: they are chosen with hindsight to show what the method looks for, they are not buy recommendations, and they are not typical. For every winner there were stocks that went nowhere or fell; the averages and their wide spread are in Chapters 15 and 16.

How to read these honestly

Case studies are selected after the fact and make the method look easy; it is not. Prices come from our own price history (adjusted for dividends and splits), past performance does not repeat, and value can stay cheap for years. The point of a case is to show what the value gap looks like in the wild, not to promise the next one.

Meta Platforms: the market priced in permanent decline

In October 2022 we worked through Meta (formerly Facebook) as a teaching example. The stock had collapsed to about $129, down roughly two thirds from its peak, as the market extrapolated falling profits and heavy spending into permanent decline. But the fundamentals told a different story: enormous cash flow, a dominant advertising franchise, and a balance sheet that could fund the experiment. Price had detached from value, which is exactly the gap the method hunts.

On 11 November 2026 Meta traded at $629, +389% from that level. The lesson is not that we predicted it; it is that when a sound business is priced for catastrophe, the gap between price and value is where patient money is made.

Salad oil, 1963

In November 1963 a fraud came to light in New Jersey: a trader had borrowed money against tanks full of salad oil that held mostly water. The warehouse receipts for them came from a subsidiary of American Express. The stock fell from just under $62 to a little over $35 in June 1964, a drop of 43%. A young money manager from Omaha went into restaurants, banks and hotels and checked whether people were still paying with the card and the traveller's cheques. They were. The scandal hit one year's cash, not the business. Warren Buffett gradually put around 40% of his partnership's capital into the stock, $13 million, the largest position it ever had. Meta in 2022 is the same pattern, sixty years later [33] [45].

Two more from the same period

- **Goldman Sachs:** about $298 in late October 2022, $927 on 11 November 2026 (+210%).
- **Apple:** about $147 in late October 2022, $356 on 11 November 2026 (+142%).

The same pattern shows up over much longer horizons: in the hand-kept test of Chapter 16, the 32 stocks flagged undervalued in 2005 returned on average +846% by 2025 against +162% for the market, but 9 of them lost money. The average is strong; the spread is the truth.

IN SHORT

- Meta in October 2022: the market extrapolated falling profits into permanent decline, the fundamentals told a different story.
- Case studies are chosen with hindsight and are not typical.
- For every winner there were stocks that went nowhere or fell.
- The average is strong; the spread is the truth.

CHAPTER 19

Why we leave everything else out

The factor zoo, and the discipline of less

If value and quality work, why not add fifty more signals? Because most "signals" are noise wearing a lab coat. Academics now describe a "factor zoo" of hundreds of published predictors. When Harvey, Liu and Zhu re-examined them with proper statistics, they argued that most should be viewed with deep suspicion: test enough variables and some will look significant by pure luck [22]. Eugene Fama had shown as early as 1998 that most long-term anomalies disappear once the method of measurement is changed in a reasonable way [26]. Hou, Xue and Zhang found that a large share of published anomalies simply fail to replicate once you correct for obvious flaws [25].

It gets worse after publication. McLean and Pontiff measured that predictability decays by roughly half once a factor is published and arbitraged [23]. And Bailey, Borwein, López de Prado and Zhu showed that with enough trials you can always produce a beautiful backtest that is pure overfitting, "pseudo-mathematics" [24]. A clever-looking strategy is often just a story fitted to the past.

Butter in Bangladesh

David Leinweber, then at Caltech, wanted to show how easily data can fool you. He searched a United Nations database for the time series that best matched the path of the S&P 500. The winner: butter production in Bangladesh. It "explained" 75% of the index's variation over ten years. When he added butter and cheese from the USA, it was 95%, and with the number of sheep in Bangladesh and the USA, 99%. It was meant as a joke, Leinweber wrote, and for that reason he did not even publish it for a long time. Reporters picked it up anyway, and the example ended up in a business school's curriculum. Try enough series and you will always find one that fits. Whether it means anything is another question [46].

So we apply a hard filter. We keep a factor only if it meets three conditions:

1. It is **economically motivated**: there is a reason it should work.
2. It is **replicated**, across decades, countries and asset classes.

3. It **survives out of sample**, not just in the window where it was discovered.

We hold our own ideas to the same bar: many extra signals we tested ourselves, from insider buying to news and earnings momentum, did not improve the rules on data they had not seen. So none of them is in the rules. Insider trades and news are shown on a stock for information only. How many ideas there were, how we tested each one and what each one showed is in Chapter 20.

> FROM THE ENGINE ROOM
>
> **Three good ideas, one hurdle**
>
> In early November 2026, three proposals landed on the table in a single day, and all of them sounded sensible. When executives buy shares in their own company, surely they know something? When the news on a company turns, shouldn't you notice? And when a company beats the analysts' expectations, doesn't that last for a while?
>
> For each idea we wrote down beforehand what counts as success: one period for selecting, a later one for confirming, and a minimum improvement in both. Only then did we look at the returns. On top of that came random controls, meaning the same calculation with a signal that knows nothing.
>
> None of the variants passed. The best one was ahead in one period and behind in the other, and its lead was no larger than that of the random controls. We learned the most from a side finding on insider buying; Chapter 20 tells it.
>
> We built none of it into the rules. You still see the insider trades, wherever there are filings on them, as information, not as a rule. How each of the three ideas was tested and what else failed is in Chapter 20.

We leave out	Because, statistically
Chart-pattern "astrology", most technical signals in isolation	Little robust out-of-sample evidence; easy to overfit; not economically motivated
News, hype and tip-chasing	Already in the price by the time you read it; a negative-sum game after costs [19]
A single "magic" ratio	One metric is fragile and gamed; the edge is in the combination of value and quality
Day trading and market-timing magic	Costs and taxes dominate; the average active dollar must trail the market [19] [20]
Leverage and penny-stock lottery tickets	Raise the risk of ruin and the emotional temperature without raising expected return
Dozens of correlated "factors"	The factor zoo: most do not replicate and decay after publication [22] [23] [25]
Changing how the models are combined to follow the backtest winner	Worse in the full test with costs: it had learned the past, not the market [24]
A first beautiful calculation	A larger check with a hundred repetitions showed the opposite; one calculation is a story, not evidence (Chapter 21)

It is tempting to believe more signals must mean more edge. In practice the opposite is usually true. Each extra rule you bolt on is another chance to fit the past instead of the future, another knob to fool yourself with. Almost nothing clears the bar above, and the short list that does is a feature, not a limitation.

TRY IT

Read a backtest like an auditor

On the evidence page, look for three things: Are failed companies in the test? Which costs are deducted? Which market is it compared against? You can put these three questions to any backtest anyone shows you, ours included. The page is open to everyone.

fairvalue-calculator.com/evidence

The discipline of less

Complexity feels sophisticated and quietly destroys returns. We would rather own a handful of effects that have survived fifty years of scrutiny than a hundred that survived one backtest. Less, done honestly, is the edge.

IN SHORT

- Most published "signals" do not stand up to proper statistics, and many fail to replicate.
- After publication, a factor's predictability decays by roughly half.
- We keep a factor only if it is economically motivated, replicated and has survived out of sample.
- Our own ideas, such as insider buying, news and earnings momentum, did not improve the rules either; they are shown for information only.
- Each extra rule is another chance to fit the past instead of the future.

CHAPTER 20

What we tested and discarded

Well over two hundred ideas, one hurdle, and why only a few are in the rules

Chapter 19 uses other people's research to explain why most signals are noise. This chapter explains it with our own experiments. In 2026 alone we tested well over two hundred variants of the fair value calculation and of the strategy: rules that raise or dampen the fair value, extra signals, other buy and sell rules, other measures of quality. Almost none passed.

We write them down here because a book that shows only the winners makes exactly the mistake it wants to warn you about. Whoever tests two hundred ideas and shows one of them is not showing the method, but chance. And because every discarded idea reveals something about the market. The buy and sell rules in this book were tested in the same way and passed; that is in here too.

Exactly how we calculate a rule is not stated here, and neither is how a discarded variant was built in detail. The chapter tells what we asked, how we tested, what came out and what we learned from it.

METHOD

How a new idea is tested here

Before the run	Question, measure and hurdle are written down. The hurdle demands an advantage in the selection period and once more in the confirmation period after it.
Strategy ideas	in the evidence test with failed companies, against the unchanged run, twelve review months with a hundred portfolios each; plus random controls that change just as much as the idea, but without any sense behind it.
Fair value ideas	additionally in the value check (Chapters 14 and 21): does the fair value of the affected companies move closer to their later return, and does the idea beat the placebos?
Several variants	The error threshold is divided by the number of variants.
Verdict	Whatever misses the hurdle in one half has not passed, even if the overall result looks good.
Afterwards	We put discarded ideas on a list, with the date, so that they are not repeated without new data.

Raising the fair value where it looks too cautious

The most common criticism of any fair value is this: it is too low for good companies. Fast-growing companies, companies of high quality, companies with a lot of free cash flow are said to look too cheap with us. The criticism is understandable, and we have taken it seriously several times.

A markup for growth. In August 2026 we tested whether a flat markup for companies with high sales growth improves the strategy's return, at several levels. A first calculation looked good, and the markup was briefly switched on. A larger check with a hundred repetitions on the actual strategy showed every version falling short of the unchanged strategy. In September we tried a third time, with flat markups, graded ones and ones applied only to growth companies: every version that raised the fair value without a limit cost return over the three decades and more. Research knows the reason: high growth rates rarely persist, and investors regularly pay too much for extrapolated growth [3].

Increases for quality, growth and cash flow. In a large test in July 2026 we examined fifteen versions that raise the fair value for high quality, strong growth or a lot of free cash flow. None was better in both halves of the period. A side finding spoke against the basic assumption: in the broad universe, overvalued companies with weak quality did no worse than overvalued ones with high quality. Among the very largest companies it looks different, more on that in a moment.

An allowance that stayed. In September 2026 a test by company size showed that our verdict "overvalued" had not been a good guide for the largest American companies since the mid-1990s; this test still ran on the older price basis from Chapter 21. Out of it came a narrowly drawn rule that applies today: the **allowance for quality growth.** It raises the model value of certain companies with quality growth within narrow limits and can never produce a buy signal. The tool shows it with the badge "Quality growth" and states the value without the allowance. We tested it like any strategy idea, in two time windows: it left the strategy's return in the backtest unchanged. That is its entire claim. It adds no return; it makes a verdict more honest that was too strict for such companies.

Changing the combination to follow the winner. Another obvious idea is to give more influence to the models that predicted best in the past. We did that, and one such change was even switched on for a

few weeks in the summer of 2026. In the full test with costs and portfolios it was worse than the earlier version, in both time windows, and we reversed it in September. It had learned the past, not the market. Since then we have had a fixed rule: we do not change how the models are combined on the basis of backtests.

The lesson from this section: pushing a fair value upwards did not produce return in any version. Chapter 17 shows why: with overvalued companies the value usually grows into the price, but prices knew that beforehand, and a rule that writes it into the fair value after the fact earns nothing from it. An increase can still be right if it corrects a verdict that was demonstrably too strict and costs nothing in doing so. That is exactly how, and only within this narrow frame, the allowance for quality growth is built.

Dampening the fair value where it looks too optimistic

The opposite direction had more success, but in a surprising way.

Caution at cyclical peaks and with dilution. Chapter 5 tells how a company's best year made a fair value look far too high, and Chapter 12 names the guards that watch for this before a value is displayed. In a test over three decades this caution made the fair value more discriminating, in both halves of the period, and later value checks pointed in the same direction. That test still ran on the older price basis from Chapter 21, and one of the later checks on a price basis that favours lowering rules; this has not been recalculated yet. The tool tells you with a badge and a line of its own when such caution moves the value shown.

But as a buy block it cost return. When we tested whether the strategy would get better if the caution also held back buying, the opposite came out, and a random exclusion of the same number of candidates cost return as well. That is why the caution remains a note on the card and not a buy block.

The lesson: a more discriminating fair value and a better strategy are two different things. Chapter 14 calls them two instruments; here you can see why both are needed.

One-off effects in earnings

A year's profit can be inflated or depressed by things that do not repeat.

We tested several versions of taking such effects out of the fair value. A narrowly drawn one applies (Chapter 4 names it): where the fair value is calculated without a documented one-off effect, the stock carries a badge that names it. Versions that went further we tested and discarded: they did not make the fair value more accurate in the value check, or they made the evidence worse.

The lesson: what is correct in accounting terms is not always what the market values. Part of these effects is already in the price, and a fair value that corrects for it a second time moves away from the price instead of towards the truth.

Payouts

Chapter 34 tells this round, Chapter 21 the measurement that went with it. In short: we switched on two rules on payouts in November 2026 because they are logically right, hit the right companies and make nothing worse, not because they are demonstrably more accurate. One version that would have needed today's price we discarded: a model value that moves along with the price measures nothing. Two further rows of the model table we tested, kept and explained better.

Companies that no model fits

Some companies earn no money, and no valuation model really fits them. What matters here above all is a principle: where the tool shows a number anyway, it carries the badge **Estimate** (Chapter 12), is never shown as undervalued and triggers no signal. A number we cannot back up must not move anyone to buy.

Other buy and sell rules

At the end of October 2026 we ran the rules of the strategy through on a corrected price basis, around a hundred and fifty variants. What passed, in all the versions tested, were the rules that stand in Chapters 9 and 10, among them buying only in an uptrend and selling in the optimistic range of the fair value. Everything else failed, in four groups:

- **Stricter buy rules:** fewer purchases, not more return.
- **Additional exits,** by trend or by loss: no better.
- **Larger portfolios:** on this basis no better than fifteen stocks.
- **Other measures of value and quality,** including well-known ones from the literature: no better. One version was better in the selection period and worse in the confirmation, the textbook picture of overfitting.

In early November further versions of the trend followed. None passed. One of them is instructive: it lowered the portfolio's fluctuation markedly and cost return in exchange. Calm has a price.

Shortly afterwards came a wish every investor knows: with all the improved data, surely a clearly higher return than 11.7% a year must be possible. We tested thirteen further ideas. None passed. The best gain lay within what the random controls produced as well. Our honest expectation for any further rule change is: a few tenths of a percentage point, if anything.

Additional signals

Chapter 19 already mentions them: insider buying, news, earnings momentum. Here is what the testing looked like.

Insider buying. We loaded two decades of filings by executives and board members with the American securities regulator and, as far as possible, matched them to the companies. On its own, a signal looked good in the older half; in the more recent half it reversed, and as a preference in the strategy it did not pass the confirmation. An instructive side finding: even knowing the future insider purchases was no safe shortcut, because insiders buy mainly after price declines. The tool therefore shows insider trades as information and as a filter in the screener, but counts them neither into quality nor into the fair value nor into the buy rules.

News sentiment. Postponing the purchase at companies with very negative press achieved nothing. The data for this only goes back a few years, though, so the test is a short one.

Earnings momentum. Whether companies beat analysts' earnings estimates and earn more than in the year before is something we tested in several versions. In the strategy, which checks only once a year and holds for a long time, none passed.

The metrics in the stock window. Further metrics that the tool shows in the stock window we tested as a buy filter or a buy block. None passed, and the warning notes as a buy block even cost return. They stay in the tool as what they are: notes you should read, not rules.

Buying before the quarterly report. Chapter 14 tells that story: with a placebo, almost nothing was left of the handsome effect, and the little that remained belonged not to our best stocks, but to the whole market.

Table 4 Tested groups of ideas and their result

Group	Type of test	Result	Lesson
Flat markups for growth	Strategy, 100 repetitions	worse	A first calculation is not evidence
Increases for quality, growth, cash flow	Strategy, two time windows	none robust	No systematic underestimation in the broad universe
Allowance for quality growth, narrowly drawn	Strategy, two time windows	return unchanged, switched on with a badge	Corrects a verdict that was too strict, without costing anything
Changing how the models are combined to follow the winner	full test with costs	worse	Overfitting; we do not change it on the basis of backtests
Caution at cyclical peaks and with dilution	Strategy test, value checks	more discriminating, costlier as a buy block	More accurate and more profitable are two questions
More far-reaching adjustment for one-off effects	Value check, evidence	not more accurate, or worse	What the market already sees, you do not correct twice
Two rules on payouts	clean value check with placebos	level, no harm	Switched on as logically right, not as proven
A version using today's price	Logic	discarded	A valuation model must not depend on its own price
Stricter buy rules, additional exits, larger portfolios	Strategy, around 150 variants	no better	Less trading is not automatically better
Other measures of value, quality and trend	Selection and confirmation	none passes	What wins in only one half is overfitting; calm costs return
Thirteen ideas for more return	with random controls	within the noise	Expectation: a few tenths
Insider buying, news, earnings momentum	Selection and confirmation, random controls	none passes	Too short or too erratic for a strategy that checks once a year
Metrics of the stock window	as filter and block	none passes, blocks do harm	Notes, not rules
Buying before the quarterly report	with a placebo event	effect belongs to the market	Worthless without a placebo

Why so little is left

That so little is left is not for lack of ideas but because of the hurdle, and the statistics show why it has to be that high. If results already vary by a few tenths of a percentage point between two runs with the same rule (Chapter 14), and random controls without any information produce gains of the same size, then a real improvement of that size cannot be reliably detected at all. What we can test for are

large improvements. And large improvements are rare in a market where thousands of clever people have the same data. McLean and Pontiff measured that even published effects decay by roughly half after publication [23].

There is also a reason that lies in our own rules. The strategy buys only every twelve months and holds for a long time. A signal that works over a few weeks, such as earnings momentum or one quarter's report, has long since fizzled out by the time of the next check. Many ideas that are real in the research simply do not suit a calm strategy. That is the fault of neither the idea nor the strategy; the two simply do not fit together.

And finally: a discarded idea is not lost. We write it down with date, question and result. If someone, ourselves included, proposes it again in a year, the first question is: what is new in the data?

Limits of this analysis

- All tests use the same history of a little over three decades. Selection and confirmation period are two halves of it, not new data.
- Results before the end of October 2026 stood on the older price basis whose errors Chapter 21 describes. We report them only as an indication of direction; some of them might turn out differently on today's basis.
- Some ideas we could not test because the data for them is missing.
- Our evidence test covers the USA and Europe. What does not pass there might pass elsewhere, and vice versa.

IN SHORT

- Well over two hundred variants tested, only a few passed
- Raising the fair value for good companies never produced return; the one allowance that applies costs nothing and makes a too-strict verdict more honest
- Caution at cyclical peaks made the fair value more discriminating in the test, as a buy block it costs return; that is why it is a note and not a block
- Extra signals such as insider buying and earnings momentum work too briefly for a strategy that checks once a year
- Differences of a few tenths are within the noise; we count only what holds up against chance

CHAPTER 21

How we check our own tests

A measurement error that the cross-check found, and the rules that came of it

> *"The first principle is that you must not fool yourself, and you are the easiest person to fool."*
>
> Richard Feynman, "Cargo Cult Science", commencement address at Caltech, 1974 [47], punctuation adapted

Most books on investing show tests that worked. This chapter shows what happens when a measurement turns out too good: how a cross-check found the error in it, how we rebuilt the measurement the same day, and which rules have applied since. We tell it at length because it shows you how things are checked here, and because it reveals something about every kind of backtest, including the ones you read elsewhere.

The story takes place on a single day in November 2026. The end of the chapter says where the same kind of error had already turned up and been fixed twice this year, and which rules have applied against it since.

A good question from the forum

In the morning, in the forum where this platform has been discussed in public since 2016 (Chapter 33), a critical question came in about Lennox, the maker of heating and air-conditioning systems. A reader marked five rows of the model table that looked nonsensical for this company. Chapter 34 tells the whole round; this chapter is about the measurement afterwards.

The reader was right on three points, and we changed two rules on payouts; here we call them the buyback rule and the dividend rule.

For a change like this we test in the **value check** whether the fair values of the affected companies move closer to what these stocks actually did afterwards. To do so, the value check compares, for each affected company-year, the ratio of fair value to price at the time with the total return of the following three years.

The first measurement: clearly better

The result of the first value check was unambiguous. In around four out of five affected company-years the new fair value was closer to the later reality than the old one. The average error fell, in the older half of the data just as in the more recent one. The buyback rule went live before noon, and the draft of the reply to the forum said what the measurement showed: with the new calculation, the fair values of the affected companies were on average closer to the later price.

With the dividend rule, a question came up that everyone should ask before believing a beautiful result: "Is it logically right?" It was not. The first version needed the stock's current price. That made the value of this model depend on the price of the same stock, and that is exactly what a valuation model must not do: it should say what the company is worth, not where the price happens to stand. Where our calculation does draw on the price, for instance in the guardrails against implausibly high values or in the allowance for quality growth, this is visible in the tool. We discarded this version, although it looked good in the value check, and built a version without today's price. Not every one of those passed the check either.

Up to here this is a tidy story: criticism, check, improvement. Then a cross-check brought a side finding.

A side finding on currency

To make sure, in the early afternoon we checked one more small thing: whether the value check anywhere compares a fair value in one currency with a price in another, say an annual report in US dollars with a London price in pounds. It did, but that changed little about the picture. What we saw along the way was more important: the prices themselves stood on three different bases in the value check, depending on how old the data point was and where the stock was listed.

Three errors in a single column

The value check read its prices from a single column that was regarded as unadjusted. That was only partly true.

First error: splits. For older years, the column held the price as it was quoted at the time, that is, before all later stock splits. But the fair value applies per today's share. Apple traded at $442.66 at the end of March 2013; after the splits of 2014 and 2020 that corresponds to $15.81 per today's share. The check compared a fair value per today's share with twenty-eight times the price. That made Apple look hopelessly overvalued, and every rule that raises the fair value automatically moved it "closer" to reality.

Second error: dividends. For more recent years, the same column held a price that was adjusted not only for splits but also for all later dividends. Coca-Cola traded at about $42.44 at the end of March 2017; the column said $32.06. Here the price was too low, then, and the error worked in the opposite direction.

Third error: pence. London stocks that are quoted in pence were in pence in the column, but their fair value was in pounds. The engineering company IMI cost 581.91 in the column at the end of March 2007; pence were meant, so 5.82 pounds. A price that is a hundred times too high makes every fair value look too low by a factor of a hundred.

Taken alone, each of these errors is banal. Together they distorted the check: at older and London points the price was far too high, so the fair value there seemed to lie far below it, and every increase automatically moved these points "closer". On top of that came something the clean check still showed as well: the fair values of the affected companies were on average below what their stocks delivered afterwards. Under both circumstances almost every increase looks better. The check said yes to almost every increase.

> **How to recognise a broken measuring instrument**
>
> A measurement that always says yes is not a measurement. If every change in the same direction looks good, that is not a sign that all the changes are good, but that the instrument is tilted. The cross-check is simple: send a change that you know to be dumb through the same measurement, say the same increase for everyone. If that looks good too, you are measuring the level, not the cleverness.

The clean check

We rebuilt the value check that same day, in such a way that it calculates exactly like the calculator behind the published evidence. There the right price basis had been built in since the end of October (more on that in a moment): price per today's share after splits, without dividend adjustment, pence in pounds, and only fair values whose reporting currency matches the trading currency. In the measure itself we changed only these two things, price basis and currency; what we added was resampling across companies and two placebos. We fixed the criteria for the verdict before the first number.

Before we trusted it, we checked it in three ways:

- **Against the evidence calculator:** at twenty randomly drawn points, price and fair value of the new check matched those of the calculator down to the fourteenth decimal place.
- **Against an independent witness:** for most of the points we set the month-end closing prices actually traded alongside. At the median, the new price basis was less than one per cent away from the price actually traded, the old column several per cent.
- **By hand:** Apple 2013, Coca-Cola (financial years 2011 and 2016) and IMI (financial year 2006) we recalculated step by step, with the prices from the database.

Then came the two placebos from Chapter 14. The first gives all affected companies the same average increase, without distinction. The second takes exactly the increases of the new rule and redistributes them at random among the same companies, two hundred times. A rule that knows something must beat both: it must not only raise, but raise the right companies more than the wrong ones.

What the clean check showed

The buyback rule stayed good in the simple measures. The error fell markedly, in about four out of five company-years, in both halves of the period and in every kind of company. The ranking, that is, whether stocks with a larger gap to fair value also did better later, remained unchanged. So the statement in our forum reply still held.

Against the placebos, however, the rule did not quite pass. It was better than the uniform increase for everyone, but not better than the randomly shuffled increases: about one in four random distributions of the same increases lowered the error just as much. The verdict under the criteria fixed beforehand was therefore: **level, no harm.** The fair values of these companies were on average too low, the rule raises them, and that helps. That it raises the individual companies by exactly the right amount is something the check could not show. For the dividend rule the same verdict came out, in the USA and Europe as well as in the markets outside them, which we tested as a second, untouched sample.

An additional check went one level deeper: does at least the **selection** know something? For this we compared the companies the rule raises with similar companies it does not raise. The raised companies had previously been clearly lower than this comparison group, and the rule closed this shortfall by just over two thirds, on the whole without overshooting. So the rule hits the right companies. The dividend rule closed the shortfall of its companies by about a quarter.

We left the buyback rule switched on and switched on the dividend rule afterwards, both with a different justification than in the morning: not "demonstrably more accurate", but "logically right, hits the right companies, does no harm". A difference in the justification that shows up in no price, but in honesty.

What the error revealed about our fair value

The clean check had a side effect that pleased us. The ranking of the fair values in the affected company-years, that is, the question of whether stocks with a larger gap to fair value also delivered the better return later, was barely distinguishable from zero in the old check. In the clean check it was clearly positive, around five times as strong. So the old measurement had not only made every increase look too good, it had also made the fair value itself look worse than it is. The price error blurred exactly the signal it was supposed to measure.

Where the same kind of error had turned up before

Part of the follow-up was the question whether this error was new. It was not: the same kind of error had already turned up twice this year, and both times we had fixed it.

At the end of October 2026 we had found it once before, that time in the evidence calculator itself. In older years it compared the fair value per today's share with the price before the splits. Companies that later split their stock, and those are very often the later winners, looked overvalued many times over in the years before and were never bought in the test. London stocks were never bought, because of the pence error. We corrected the calculator back then, before today's evidence was produced; that evidence stands on the right basis. The value check, a smaller test program beside it, had not received the correction.

In the summer of 2026 the market comparison we used at the time also contained an error of the same family: instead of a real index, we had built the market from our own universe, and the market value in this comparison had been calculated on the wrong price basis. Since the end of October 2026 we compare only with the real MSCI ACWI Equal Weighted, over the same days, after costs.

A third pattern belongs to the same family, although it was not a price error. In August 2026 a first calculation showed that a markup for fast-growing companies improves the strategy's return, and for a short time it was even switched on. A larger check with a hundred repetitions on the actual strategy showed the opposite: every version of the markup fell short. The first advantage was chance and a quirk of the first test setup. We switched the markup off again.

What we do differently now

Five rules came out of this day; most of them already appear in Chapter 14 as rules for building a test. Here is where they come from.

1. **One case by hand before we believe a new measurement.** Price basis, unit, currency, fair value: one stock, a few minutes. A single older point is enough to show an error of this kind.
2. **Every value check gets a dumb comparison rule.** If the same increase for everyone looks almost as good as the clever rule, the check is measuring the level.
3. **One price basis for every measurement.** The rule now is that every value check reads its prices exactly as the evidence calculator does. Two test programs with two price bases drift apart, and then one of them is wrong.
4. **List the error class, not just the case.** We wrote down the earlier decisions that we could trace to the same check. A check on fully adjusted prices, by the way, does the reverse and favours rules that lower the fair value; those decisions are on the list too. We are recalculating them on the clean check.
5. **Name the verdict as it is.** "Level, no harm" is a different result from "better", and we write it down that way.

METHOD

What the clean value check measures

Question	Does a change to the fair value calculation move the fair value of the affected companies closer to their later total return?
Points	all company-years in the USA and Europe whose fair value moves because of the change; the reference date is the day from which the annual accounts count as known in the test; plus the price three years later.
Price basis	like the evidence calculator: per today's share after splits, without dividend adjustment, pence in pounds; only fair values in the trading currency. Checked at twenty random points against the calculator, against unadjusted monthly prices and on four cases by hand.
Measures	share of points that move closer; average error before and after; average shift; ranking of gap and later return.
Against chance	bootstrap across companies; placebo 1 = the same average increase for everyone; placebo 2 = the same increases randomly shuffled two hundred times.
Verdict (fixed in advance)	better only if the error falls reliably, both placebos are beaten, the ranking does not suffer and neither half of the period gets worse; otherwise "level only" or "does not pass".
Limits	Three years is a chosen distance. The check does not separate whether a company's fair value was too low or whether the company did better for other reasons.

Limits of this analysis

The clean check is not perfect either. For part of the more recent price series the evidence calculator knows no unadjusted price and calculates there with a price reduced by dividends, that is, one that is somewhat too low; this affects a small part of the candidates, mainly in the most recent years. Outside the USA and Europe the clean price basis does not exist at all; there we ran the check on two approximations, one of which is too high and the other too low, and judged only where both said the same. And the earlier decisions that rested on the old check are listed and are being recalculated on the clean check.

IN SHORT

- A measurement that says yes to every increase measures the level, not the cleverness of a rule
- Three price errors (splits, dividends, pence) and a fair value that was too low anyway for the affected companies made almost every increase look too good
- Only two placebos showed that the new rules hit the right companies, but do not size the increases more accurately than chance
- The clean check showed the fair value itself to be stronger than the old one had measured it
- The rule now: one case by hand, one dumb comparison rule, one price basis for all measurements

CHAPTER 22

What remains when the noise fades

The method in one calm picture

> *"Stick with big, 'easy' decisions and eschew activity."*
>
> Warren Buffett, letter to the shareholders of Berkshire Hathaway for 2017 [33]

Turn down the volume and the method becomes simple. Separate price from value. Buy only when the three buy rules line up: a margin of safety to fair value, good quality and an uptrend. Diversify. Hold long enough for the case to work. Review with rules. Sell in the optimistic range or when the case breaks, not when the headline is loud.

The process is not built to eliminate losses; it is built to stop isolated mistakes from becoming fatal. Fair value reduces the risk of paying for fantasy. Quality reduces the risk of buying a trap. The trend keeps you from catching a falling knife. Diversification reduces the risk of one wrong company destroying you. Time gives good businesses room to compound.

A rules-based approach also changes your emotional life. A crash becomes an environment to classify, not a reason to panic. A hype stock becomes a story to test, not a command to buy. A falling holding becomes a question: is the fair value still intact? A rising winner becomes another: has the price reached the optimistic fair value yet?

Newton too

In 1720 Isaac Newton was a wealthy man, with a little over 30,000 pounds. In April he sold his holdings in the South Sea Company within a few days and took about 20,000 pounds in profit. Then the price kept rising, without him. In June he bought again, almost at the peak, and bought more when the price was already sliding. In September the bubble collapsed. The mathematician Andrew Odlyzko has analysed the surviving records: Newton lost the whole early gain and a good deal more. The famous line that he could calculate the motions of the heavenly bodies but not the madness of people is attributed to him; it is not documented. What is documented is that one of the cleverest minds of his time did the right thing once and then followed the noise. Cleverness alone is no protection against that [48].

Final word

You do not need to be a genius. You need a process you can explain and repeat: knowing what you own, why you own it, when the case is broken, and how each position fits the whole. The goal is not to predict every move. It is to make better decisions, often enough, calmly enough, and long enough for probability to work in your favour.

Strip everything away and the craft is almost embarrassingly simple to state, and genuinely hard to live: know what you own and why, pay less for it than it is worth, spread your bets, and give good businesses the years they need. The difficulty was never the formula; it is doing the calm thing repeatedly while the world around you alternates between euphoria and panic. If this handbook leaves

you with one habit, let it be this: before any buy or sell, say out loud what the business is worth, what you are paying, and why the gap exists.

IN SHORT

- Separate price from value, and buy only when all three buy rules line up.
- Fair value, quality, trend, diversification and time each reduce a different risk.
- The process does not eliminate losses; it stops isolated mistakes from becoming fatal.
- Before any buy or sell, say out loud what the business is worth, what you are paying, and why the gap exists.

CHAPTER 23

What the market really does

Twelve numbers almost nobody knows, and what they say about diversification, patience and humility

> *"... the best-performing 4% of listed companies explain the net gain for the entire US stock market since 1926 ..."*
>
> Hendrik Bessembinder, Journal of Financial Economics 2018 [49]

Ask ten people what happens in the stock market over the long run, and nine will say something like: "In the long run, stocks go up." That is true, on average. But behind that average lies a world that looks very different from what most people imagine. The following twelve numbers come from peer-reviewed research, from official sources or from our own calculations with freely available data that anyone can check. Each one breaks a common expectation. Together they explain why the method of this book is built the way it is: with diversification, with patience and with the admission that nobody knows the future.

Table 5 The twelve numbers at a glance

Number	What it measures	Source
4%	Share of US companies that explain the entire net gain of the market since 1926	Bessembinder 2018
57.4%	Share of stocks outside the USA that did worse than US Treasury bills from 1990 to 2020	Bessembinder et al. 2023
40%	Share of US stocks since 1980 with a permanent decline of 70% or more	J.P. Morgan 2014
30% and 0.1%	Share of one-year and of twenty-year periods with a real loss, USA since 1871	own calculation, Shiller data
12%	estimated probability of a real loss over 30 years, 39 developed countries	Anarkulova et al. 2022
65 against 44,043	one real dollar from 1871 today, without and with dividends reinvested	own calculation, Shiller data
25 or 7	years to the old high after 1929, in the price index and in real terms with dividends	own calculation, Shiller data
3.0% against 3.1%	companies with five straight years of above-average earnings growth, actual and by coin toss	Chan, Karceski, Lakonishok 2003
5% against 12%	return per year in the five years after the IPO, newcomers against companies of the same size	Loughran, Ritter 1995
5 of 153	recessions that the consensus of forecasters saw a year ahead	An, Jalles, Loungani 2018
−52.6%	worst month of a trend strategy that works on average	own calculation, French data
1.2 points	how much less per year the average dollar invested earned than the US funds it was in, 2015 to 2024	Morningstar 2025

1. Four per cent

Hendrik Bessembinder of Arizona State University asked a simple question in 2018: of the nearly 26,000 stocks that have been listed on US exchanges since 1926, how many returned more over their entire time on the market than one-month US Treasury bills, that is, practically risk-free money? The answer: fewer than half. And then the real surprise: the best 4% of companies, 1,092 names, explain the entire net gain of the US stock market since 1926; all other stocks together returned only as much as Treasury bills [49].

That sounds like a contradiction of the experience that "the market" rises over the long run. It is not. The market rises because a small share of companies grow enormously and weigh ever more in the index. The typical stock, by contrast, has a short, mediocre or poor life on the exchange. For an investor with five stocks this means: the probability of not owning a single one of the big winners is high. For an investor with a broad portfolio it means: the winners are certain to be in it.

2. More than half, outside the USA too

Is that only true in America? Together with colleagues, Bessembinder extended the calculation to 64,000 stocks from around the world, from 1990 to December 2020. The result: 55.2% of US stocks and 57.4% of stocks outside the USA trailed one-month US Treasury bills over that period. The best 2.4% of companies accounted for the entire net wealth creation of $75.7 trillion; outside the USA it was just 1.41% of companies [50].

Comparing in dollars against American Treasury bills is a strict test for stocks from other currency areas, because currency losses are part of the result. It changes little about the picture: everywhere, the return of the stock market is the return of a few companies.

3. Forty per cent

Michael Cembalest, head of market and investment strategy at J.P. Morgan's asset management arm, counted in 2014, for clients with large single positions, how often a stock truly collapses. Of all companies that had been in the broad Russell 3000 index since 1980, around 40% suffered a permanent decline of 70% or more from their peak, without ever recovering to any meaningful degree. The median stock trailed the index by 54 percentage points since its first listing, two thirds of all stocks lagged the index, and 40% even had a negative return [51].

The 2024 update contains a sentence that should make anyone cautious who believes catastrophes can be spotted from bad numbers: 54% of the later catastrophic decliners were profitable at their peak, and 63% had net debt of no more than twice their operating earnings [52]. Healthy-looking numbers do not protect against a collapse, they only make it rarer. The 70% threshold is a definition set by the study itself, and the index contains many small stocks; but the order of magnitude is clear.

4. Thirty per cent and zero point one

How often does the stock market lose money in real terms, that is, after inflation? With Robert Shiller's monthly data for the broad US market since 1871, this can be worked out for every starting month, with dividends reinvested [53]. In 30% of all one-year periods, the result at the end was a real loss. Over five years it was 19%, over ten years 11%, over fifteen years 4%. Over twenty years it was 0.1%, and over thirty years not a single case [53].

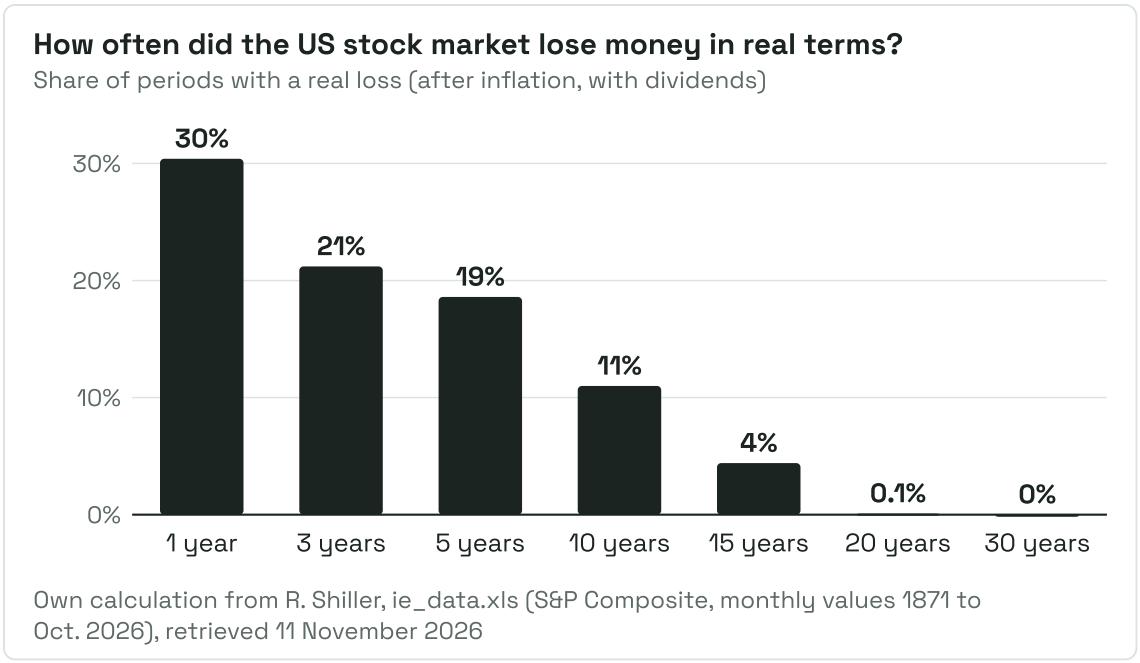


Figure 32 How often did the US stock market lose money in real terms? Share of all periods with a real loss (after inflation, with dividends reinvested) by holding period. Own calculation from Shiller's data, monthly values from 1871 to October 2026 [53].

This staircase is the strongest argument for patience that stock market history has to offer. The worst single one-year period returned −58.1% in real terms, the worst ten-year period −5.9% a year; it began in March 1999 [53]. But the staircase has a catch, and that catch is number five.

5. Twelve per cent

The US numbers come from the country that became the most successful stock market in the world in the 20th century. Anyone who looks only at the winner underestimates the risk; specialists call this survivorship bias. In 1999, Philippe Jorion and William Goetzmann compiled the price history of many countries from 1921 to 1996: at 4.3% a year, the USA had the highest real price return of all countries, and the median of the others was 0.8% [54]. Both figures exclude dividends, and total returns are considerably higher; but the gap remains.

In 2022, Aizhan Anarkulova, Scott Cederburg and Michael O'Doherty presented the broadest calculation so far: 39 developed countries from 1841 to 2019, including the markets that went under through war, expropriation or closure. Their estimate: a broadly diversified investor in a country index has a 12% probability of losing in real terms over 30 years [55]. The number is a simulation from drawn monthly returns, not a counted frequency. It still contradicts the comfortable formula that stocks are "safe in the long run". In the long run they are very likely to be rewarding in a healthy country, but in any single country that is not guaranteed. This is one more reason to measure results against a worldwide benchmark rather than against a single country; the tests in Chapter 15 measure against the MSCI ACWI Equal Weighted.

6. Sixty-five against forty-four thousand

A dollar put into the broad US stock market in January 1871 was worth $65 in today's purchasing power by October 2026 if you count only the price gains. With dividends reinvested, it was around $44,000 [53]. The price alone returned 2.7% a year in real terms; with dividends it was 7.1% [53]. So more than half of the real return of a century and a half came not from rising prices, but from the money the companies paid out, and from the compounding on it.

The calculation describes an ideal case: no taxes, no costs, reinvestment at the monthly average, and the price data of the 19th century was reconstructed after the fact. The order of magnitude still remains one of the most underestimated facts of investing. Anyone who talks about a price index without dividends, such as the Dow Jones or the Nikkei, is telling less than half the story. Chapter 25 shows why the form of the payout and the handling of capital also count when selecting individual stocks.

7. Twenty-five years or seven

The crash of 1929 is the standard example of the danger of stocks. In the price index the picture holds: in Shiller's monthly averages, the broad US market fell 85% from September 1929 to June 1932, and only in September 1954, 25 years later, was the price index back at its old high [53]. In daily prices the fall was deeper still: the Dow Jones closed at 381.17 on 3 September 1929 and at 41.22 on 8 July 1932, 89% lower, and did not reach its 1929 level again until 23 November 1954 [56]. But if you calculate the way an investor experienced it, with dividends reinvested and after inflation (prices fell sharply in the 1930s), the drawdown was somewhat smaller at 77%, and the old level was reached as early as November 1936, after just over seven years [53]. After that, however, came a new slump: from 1937 to 1942 the market lost another 48% in real terms and needed until 1945 to make it up [53].

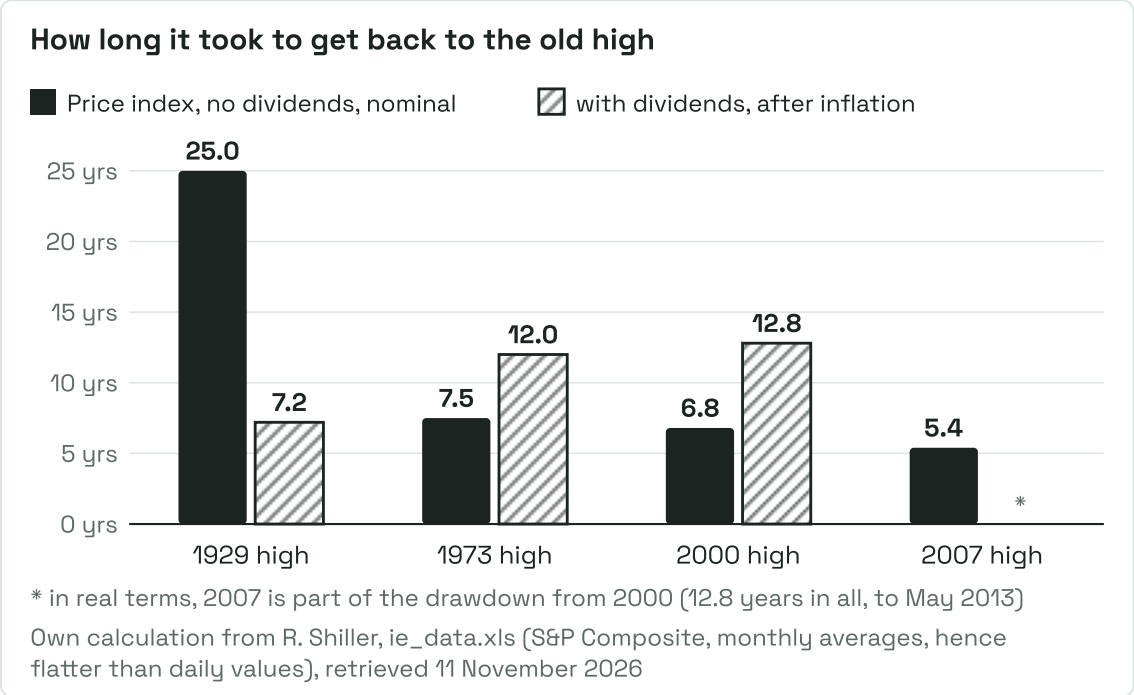


Figure 33 How long it took to get back to the old high. Years from the peak to the return to the old level, in the price index without dividends (nominal) and in real terms with dividends reinvested. Own calculation from Shiller's data, monthly averages, hence flatter than daily values [53].

It also works the other way round: after the high of August 2000, the price index needed just under seven years, but in real terms with dividends almost thirteen, because the slump of 2008 came in between and inflation kept running [53]. The longest wait in a major market came from Japan: the Nikkei 225 closed at 38,915.87 yen at the end of December 1989, and only on 22 February 2024, after 34 years, did it close higher for the first time [57]. There too, dividends softened the picture only a little: at the end of 2012 the price index was 73% below its high, the index with dividends 65.8% [58]. The price-earnings ratio of the Tokyo Stock Exchange had stood at 54.3 at the end of 1988 [59]. The lesson is not

that crises are harmless. It is this: how long a crash lasts depends on how you measure it, and a portfolio that receives dividends and is broadly diversified lives a different story from the headline about the index.

8. Three per cent against three point one

Hardly any expectation is as widespread as this one: a company that has grown fast in recent years will keep growing fast. In 2003, Louis Chan, Jason Karceski and Josef Lakonishok tested this on all US companies from 1951 to 1997. On average, 57 of 1,884 companies managed earnings growth above the median five years in a row; that is 3.0%. With pure chance, that is, if a coin decided each year between "above" and "below the median", 59 companies would have been expected, 3.1% [60]. For earnings, in their words, there is "essentially no persistence" in growth across the entire sample [60].

The analysts saw it differently; how far off their forecasts were is shown in Chapter 27. For sales there is somewhat more persistence than for earnings, and only survivors were counted. Chapter 26 shows what this means for the prices the market pays for growth.

9. Five per cent against twelve

An IPO is the moment when the people who know a company best sell shares to people who know it less well. In 1995, Tim Loughran and Jay Ritter measured what happened afterwards: in the five years after going public, 4,753 newly listed US companies from 1970 to 1990 returned 5% a year on average, while companies of the same size that had not newly come to the market returned 12% [61]. To end up with the same wealth, you had to put 44% more money into the newcomers [61].

Ritter continues the statistics to this day. For 9,253 IPOs from 1980 to 2024, the three-year return from the first closing price is on average 20.5 percentage points below the market. Companies without profits at the IPO returned −0.5% on average over three years, companies with profits +33.6% [62]. Adjusted for size and valuation, the shortfall shrinks considerably, and there were cohorts that did well. But the pattern is old and stubborn: new and exciting is rarely cheap in the stock market.

10. Five out of one hundred and fifty-three

If individual stocks are already hard to predict, then surely at least the economy can be? For the International Monetary Fund, Zidong An, João Tovar Jalles and Prakash Loungani evaluated the forecasts for 63 countries from 1992 to 2014. There were 153 recessions, that is, years of shrinking economic output. In April of the year before, the consensus of forecasters predicted a decline in 5 of them; 148 were missed. Even in October of the recession year, when the recession was already under way, 35 had still not been spotted [63]. Private and official forecasts were "virtually identical" [63].

For the stock market this matters twice over. First, strategies that rest on forecasting the economy are built on a foundation that even the professionals do not have. Second, number four shows that you do not need to foresee the downturn at all if you hold long enough. Chapter 27 follows the professionals' forecasts in the stock market itself.

11. Minus fifty-two point six per cent

A strategy that works on average can lose a large part of its value in a single month. Momentum, that is, buying the winners and selling the losers of the past months, is one of the best-documented effects in financial research (Chapter 13). In Kenneth French's data library, the classic momentum factor in the USA returned 6.1% a year on average from 1927 to September 2026 [64]. Its worst month was August

1932 at −52.6%, the third worst April 2009 at −34.4%; from June 1932 to September 1939 it lost 78.4% in total [64].

Kent Daniel and Tobias Moskowitz examined these crashes closely in 2016: they typically come when the market suddenly turns after a deep slump. In July and August 1932, the losers of the preceding months rose 232%, the winners only 32%; from March to May 2009, the losers rose 163%, the winners 8% [65]. So an effect can be real and dangerous at the same time. That is one more reason why the trend never stands alone in the rules of this book, but next to value and quality (Chapter 9).

12. One point two percentage points

Buy a fund and you get the fund's return, one would think. For years, Morningstar has measured what investors actually earn, that is, including the timing of their purchases and sales. In the 2025 edition, covering more than 25,000 US funds and exchange-traded funds over the ten years to the end of 2024, the average dollar invested earned 7.0% a year, the funds themselves 8.2% [66]. So around 1.2 percentage points a year, about a seventh of the return, were lost through the investors' timing. The more restless a fund's inflows and outflows were, the larger the gap [66]. The authors themselves stress that sensible habits such as regular saving can also produce a gap; but the direction is clear. Chapter 28 follows this opponent inside your own head.

What the twelve numbers have in common

Read the numbers together once more, and three patterns emerge.

Returns are skewed. A few companies do almost everything, many do little or lose (numbers 1 to 3). That makes single stocks a risky game and broad portfolios a sensible one. It is also the reason why the hand-kept test in Chapter 16 shows such different results per stock: some of the stocks lost money, and a few outliers carried the average (figures in Chapter 16).

Time changes the risk. In a single year the market lost money in real terms in almost one case in three; twenty years were nearly always good in the USA (number 4), and mostly good in the world (number 5). Dividends and their compounding make up a large part of the return, but only for those who stay in (numbers 6 and 7).

The future is hard to predict, especially the bright one. Growth rarely lasts (number 8), exciting newcomers disappoint on average (number 9), the economy surprises even the professionals (number 10), even good strategies have terrible months (number 11), and investors cost themselves a good part of the return through their timing (number 12).

The case against

Each of these numbers has limits, and the most important ones belong here. Bessembinder's calculation over the whole lifetime of a stock mixes companies that were listed for only two years with companies that were listed for eighty; it says nothing against the return of a broad portfolio, which after all contains the winners [49]. The J.P. Morgan study is not peer-reviewed research, and its threshold is a choice [51]. The US staircase from number 4 comes from a single, very successful country, and the periods overlap [53]. The 12% from number 5 is a simulation [55]. The study on earnings growth counts only companies that survived, which if anything overstates persistence [60]. And the studies on IPOs and on momentum depend heavily on individual cohorts and episodes [62] [65]. None of these limits reverses the message; each is a reminder to read the number as an order of magnitude, not as a constant of nature.

What this means in practice

- **Diversification is not cowardice, it is mathematics.** When a few stocks do almost everything, the greatest danger is not owning a loser but owning no winner. A portfolio with many positions from several sectors takes that into account (Chapter 9).
- **The holding period is a decision about risk.** Anyone who needs the money in one or two years carries a different risk from someone with twenty years ahead. Stock market history rewards patience, but it gives no guarantee.
- **Healthy numbers are a filter, not a shield.** Profitability and a solid balance sheet lower the probability of a collapse; they do not rule it out (number 3). That is why rules for getting out belong to the method just as much as rules for getting in (Chapter 10).
- **Be careful with the most beautiful story.** High past growth, a dazzling IPO, an economic forecast: everything that sounds like a certain future has a weaker record in the data than it feels.

IN SHORT

- The best 4% of US companies explain the entire net gain of the market since 1926; more than half of all stocks trailed Treasury bills.
- Over one year the US market lost money in real terms in 30% of cases, over twenty years in 0.1%; across 39 countries the risk over thirty years is an estimated 12%.
- Without dividends, a real dollar from 1871 became $65; with dividends reinvested, around $44,000.
- Above-average earnings growth five years in a row is no more common than five heads in a row on a coin toss.
- Diversification, patience and humility about forecasts are not matters of style; they are the answer to the shape of stock market returns.

CHAPTER 24

Valuation predicts the future, but slowly

What the price reveals about the next ten years, and why it says almost nothing about the next one

> *"But how do we know when irrational exuberance has unduly escalated asset values …?"*
>
> Alan Greenspan, speech of 5 December 1996 [67]

On the evening of 5 December 1996, Alan Greenspan, then chairman of the US Federal Reserve, gave a lecture in Washington on central banking in a democratic society. Deep in the text sat a question: how do we know when "irrational exuberance" has unduly escalated asset values? [67] The phrase became a household expression.

Greenspan had good reasons for his question. The Shiller P/E, that is, the price divided by the average of inflation-adjusted earnings over the past ten years (CAPE for short, the "cyclically adjusted price-earnings ratio", smoothed so that a single boom or crisis year matters little), stood at 27.7 for the broad

US market in December 1996 [53]. Its average since 1881 is 17.8. So the market was clearly more expensive than usual.

What happened next looks like a refutation at first glance. Anyone who sold the day after the speech watched the US market rise a further 89% in real terms, that is, after inflation and with dividends reinvested, by the end of 1999. The Shiller P/E climbed to 44.2 in December 1999, the highest value in more than 150 years of data [53]. At second glance Greenspan was right, only too early: anyone who bought in December 1996 and held for fifteen years got 2.9% a year in real terms, not even half of the 6.8% that a fifteen-year investment returned on average in this data [53].

That is the whole chapter in one story. Valuation says something about the future, but over decades, not over months. Anyone who confuses the two loses either patience or trust in an idea that actually works.

What 155 years of data shows

Robert Shiller, Nobel laureate of 2013, puts the data he uses to calculate this measure freely online: prices, dividends and earnings of the broad US market (today the S&P 500, before that its predecessor) and consumer prices, month by month since January 1871 [53]. With this data, a simple question can be answered for every single starting month: how expensive was the market at purchase, and what did it return in the ten years that followed?

METHOD

How Shiller's data was evaluated

Data	Robert Shiller, online data for "Irrational Exuberance" (file ie_data.xls): S&P Composite, dividends, earnings, consumer prices and Shiller P/E, monthly values from January 1871 to October 2026, retrieved in November 2026 [53].
Measure	Real total return per year (dividends reinvested, after inflation) over 1, 2, 3, 5, 10, 15 and 20 years from every starting month [53].
Sample	For the ten-year horizon, 1,630 starting months from January 1881 to October 2016 [53].
Cross-check	The ten-year return calculated here matches Shiller's own column in all 1,750 months for which he reports it himself [53].
Limits	The periods overlap; there are only around 14 truly independent decades. A single country that was among the most successful of the 20th century. Monthly averages instead of daily prices. No costs, no taxes.

The result fits into one table.

Table 6 Shiller P/E at purchase and real return of the following ten years, USA

Shiller P/E at the start	Starting months	Mean per year	Worst start	Best start	Share with a loss
below 10	229	11.3%	1.8%	20.0%	0%
10 to 15	461	7.6%	-4.2%	17.6%	10%
15 to 20	514	6.0%	-4.6%	16.1%	9%
20 to 25	260	4.6%	-4.0%	14.2%	24%

Shiller P/E at the start	Starting months	Mean per year	Worst start	Best start	Share with a loss
25 to 30	109	5.9%	-1.2%	11.8%	5%
above 30	57	-1.0%	-5.9%	4.5%	60%

Source of the table: own calculation from Shiller's data, starting months 1881 to 2016 [53].

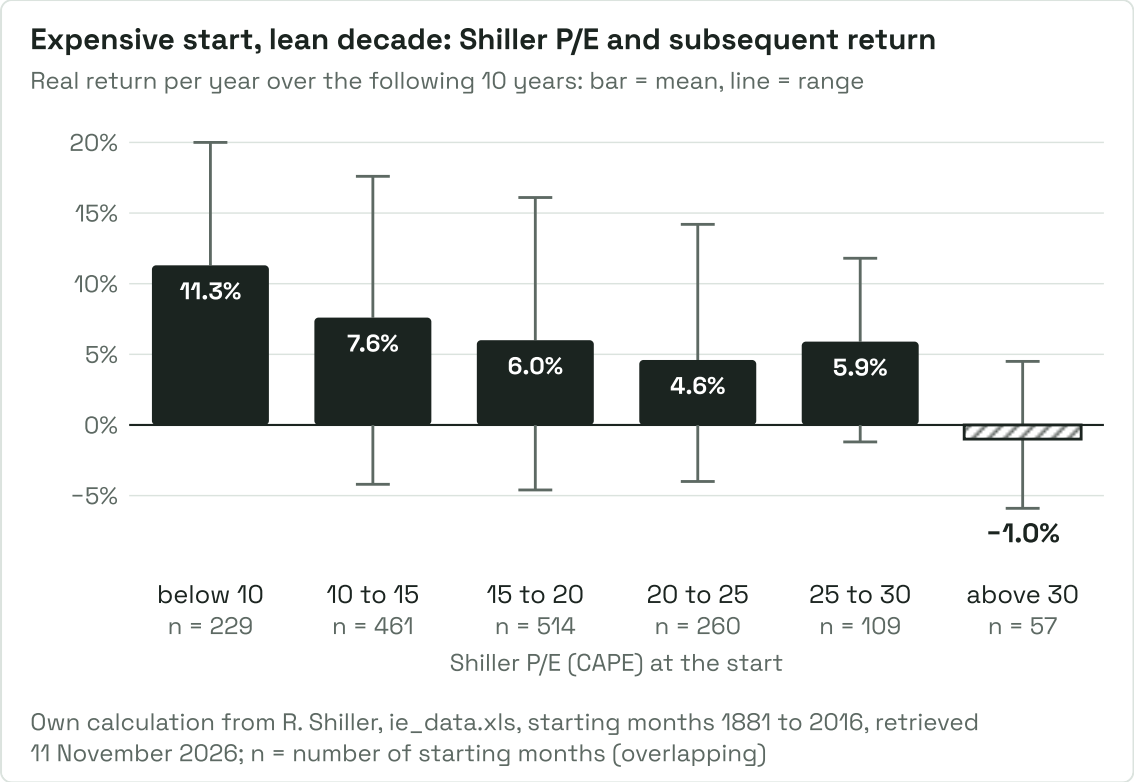


Figure 34 Expensive start, lean decade. Mean real return per year over the ten years after purchase, by Shiller P/E at the start, with the worst and the best starting month of each band. Own calculation from Shiller's data (USA, starting months 1881 to 2016, as of October 2026) [53].

Three things stand out. First: anyone who bought cheaply, at a Shiller P/E below 10, did not see a single decade with a real loss in this data, and earned 11.3% a year on average. Such times were 1917 to 1925, 1932 and 1933, 1942, 1948 and 1949, and 1974 to 1985, that is, years after wars, crises and high inflation, when hardly anyone wanted stocks. Second: anyone who bought very expensively, at a value above 30, lost money in real terms over the entire following decade in six out of ten cases. Third, and this is the honest half: the bands in between do not form a staircase. The band from 25 to 30 did better than the band from 20 to 25, and in every band the worst and the best start lie far apart [53].

Clifford Asness, founder of the asset manager AQR, did the same calculation in 2012 with deciles instead of fixed bands for 1926 to 2012 and found an almost evenly descending staircase: from the cheapest decile with a real return of 10.3% a year to the most expensive with 0.5%. He added a sentence that belongs in every textbook: sometimes the Shiller P/E is wrong for a whole decade, let alone shorter periods [68].

One year is too short

The table answers the question about ten years. But most people ask a different one: what happens next year? Here the answer is sobering.

One measure of this is the coefficient of determination R^2, the share of the variation in one quantity that another quantity explains statistically (0% means nothing at all, 100% everything). In Shiller's data, the Shiller P/E at the start explains only 4% of the variation in the following year's return. Over five years it is 14%, over ten years 26%, over fifteen and twenty years 37 and 38% [53].

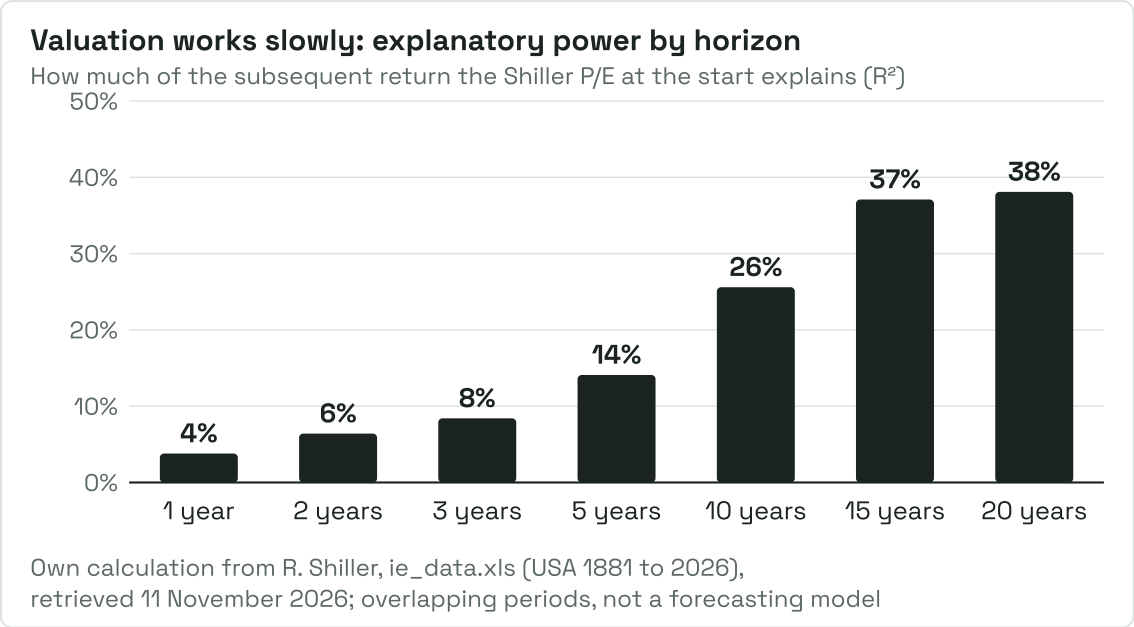


Figure 35 Valuation works slowly. Share of the variation in the subsequent real return that the Shiller P/E at the start explains (R^2), by length of the horizon. Own calculation from Shiller's data, USA 1881 to 2026 [53]. Overlapping periods, not a forecasting model.

Using January values from 1872 to 2000, John Campbell and Robert Shiller arrived at 40% for the ten-year horizon, and they found the reason for the pattern along the way: the Shiller P/E predicts almost nothing about future earnings growth (R^2 of 1% over one year and 5% over ten years), but it does predict future price changes [69]. So a high price does not announce that earnings will grow especially fast from here. It announces that the price will have less tailwind later.

In 2008, John Cochrane turned this into one of the most elegant arguments in financial economics. If the ratio of price to dividend fluctuates, then either expected dividend growth or the expected return must change. In the US data from 1926 to 2004, this ratio predicts dividend growth practically not at all (R^2 of 0.0001%). So all the variation in valuation must come from varying expected returns [70]. For next year's return the signal is weak, statistically only "marginal" in Cochrane's own words; with the horizon, the explanatory power grows to 30 to 60% [70].

The reason for this slow-then-clear pattern is simple. Over the next year, the price moves mainly on news, sentiment and interest rates, and these moves are much larger than the small drag that a high valuation costs each year. Over ten years, many of these swings cancel each other out, while the small annual drag adds up. As early as 1988, James Poterba and Lawrence Summers estimated that temporary deviations of prices from the fundamental level have a standard deviation of 15 to 25% and fade over several years [41].

The same pattern in individual stocks

What holds for the whole market holds in a similar form for the selection of individual stocks. Josef Lakonishok, Andrei Shleifer and Robert Vishny sorted the stocks of the NYSE and AMEX by their book-to-market ratio every year from 1968 to 1990. The most expensive decile, the popular "glamour" stocks, returned 9.3% a year on average, the cheapest decile, the "value" stocks, 19.8%; over five years the lead

added up to 90 percentage points [3]. Even adjusted for company size, 7.8 percentage points a year remained [3]. The authors sum it up as a lead of "approximately 10 to 11 percent per year" [3]. Their explanation: investors extrapolate past growth too far into the future, upwards for the darlings, downwards for the spurned (Chapter 26 follows this trail).

The finding is not an American one. In 1998, Eugene Fama and Kenneth French found for 13 major markets from 1975 to 1995 that value stocks worldwide returned 7.68 percentage points a year more than growth stocks and were ahead in 12 of the 13 markets; the US premium was not even particularly large [71]. Clifford Asness, Tobias Moskowitz and Lasse Pedersen found a value premium in every one of the eight markets and asset classes they studied. Across the four major equity regions together, the cheapest third returned 14.6% a year above the money market rate, the most expensive 8.1% [72].

With Kenneth French's freely available data, it can be shown here too how much the horizon matters [64]. If you sort US stocks every year since July 1926 by book-to-market and compare the cheapest third with the most expensive, the cheap third returned 13.1% a year up to September 2026, the expensive one 10.2%. Yet in any single year, value was ahead in only 60% of cases, hardly more often than a coin toss. Over five years it was 69%, over ten years 76%, over twenty years 92% [64]. Chapter 25 shows this picture for quality and investment in one figure; there it is clearer still.

How long the gap takes, and why many never close

When price and value converge, how long does it take? For individual stocks there is no general number, because the answer depends on how you measure value. Richard Frankel and Charles Lee found that their value-to-price signal paid off over about three years [6], and the hand-kept test in Chapter 16 needed even longer on average for its stocks.

An uncomfortable study belongs here. In 2003, Randolph Cohen, Christopher Polk and Tuomo Vuolteenaho decomposed the differences in the book-to-market ratio between US companies from 1937 to 1997. Their result: around 80% of these differences are explained by the profitability of the following fifteen years and by persistently different valuation levels, only around 20% by temporarily different expected returns [73]. In other words: most cheap stocks are cheap largely for good reason. Only a smaller part of the gap is the mispricing that later turns into return. This is the value trap in numbers, and it is the reason why valuation alone is not enough (Chapters 13 and 25).

The same study has a consoling second half: the further apart the valuations of cheap and expensive stocks, the higher the subsequent return of the cheap relative to the expensive [73]. When the gap is widest, it is most valuable. It just feels worst at that moment.

The case against

A chapter on valuation without the counterarguments would itself be a case of irrational exuberance. Five objections carry weight.

In advance, it would often not have helped. In 2008, Amit Goyal and Ivo Welch tested the well-known predictors for the overall market, from the dividend yield to the book-to-market ratio, the way an investor could have used them at the time, that is, only with the data available up to each day. Their verdict: over the 30 years to 2004, the models failed both in sample and out of sample [74]. For the dividend yield, more than half of the best forecasting performance (0.0477 of 0.0845) came from a single episode, the oil shock of 1973 to 1975 [74]. Cochrane counters that a weak forecast in a single year is no proof against long-run predictability [70]. Both are right in their own way: as a traffic light for getting in and out, the valuation of the overall market is useless; as a pointer to the range of the next decade, it is not.

The mean may have shifted. Before 1990 the median of the Shiller P/E was 14.6, since 1990 it has been 26.4, and in 95% of all months since 1990 it was above the long-run mean of 17.8 [53]. Taking only the starting months up to 1990, the Shiller P/E explains 34% of the ten-year return; with all data to date, only 26% [53]. Anyone who bought in September 2012, when the Shiller P/E by Asness's calculation at the time stood at 22.2 and thus higher than in 80% of the time since 1926 [68], got 9.6% a year in real terms over the following ten years [53]. Whether the fair normal value has risen permanently, for example through different accounting rules, lower interest rates or more profitable companies, is disputed among specialists; the data alone does not settle it.

The sample is smaller than it looks. 1,630 starting months sound like a lot. But because the ten-year periods overlap, they contain only around 14 mutually independent decades. Asness names the problem himself [68]. Every table in this chapter is therefore a description of history, not a law of nature.

This is the data of a winner. The USA is among the markets that came through the 20th century best. Whether the patterns hold equally in markets with wars, expropriations and closures can only be tested to a limited extent (Chapter 23).

Value can suffer for a very long time. From 2007 to 2020, the cheapest third of US stocks by book-to-market returned 5.3% a year, the most expensive 12.8% [64]. Relative to each other, value lost around two thirds (−65.9%) from February 2007 to September 2020, and despite a strong lead since 2021, this shortfall had still not been made up in September 2026 [64]. Eugene Fama and Kenneth French found the premium to be much lower on average in the second half of their data from 1963 to 2019, but because of the large variation could not rule out that the expected premium had stayed the same [75].

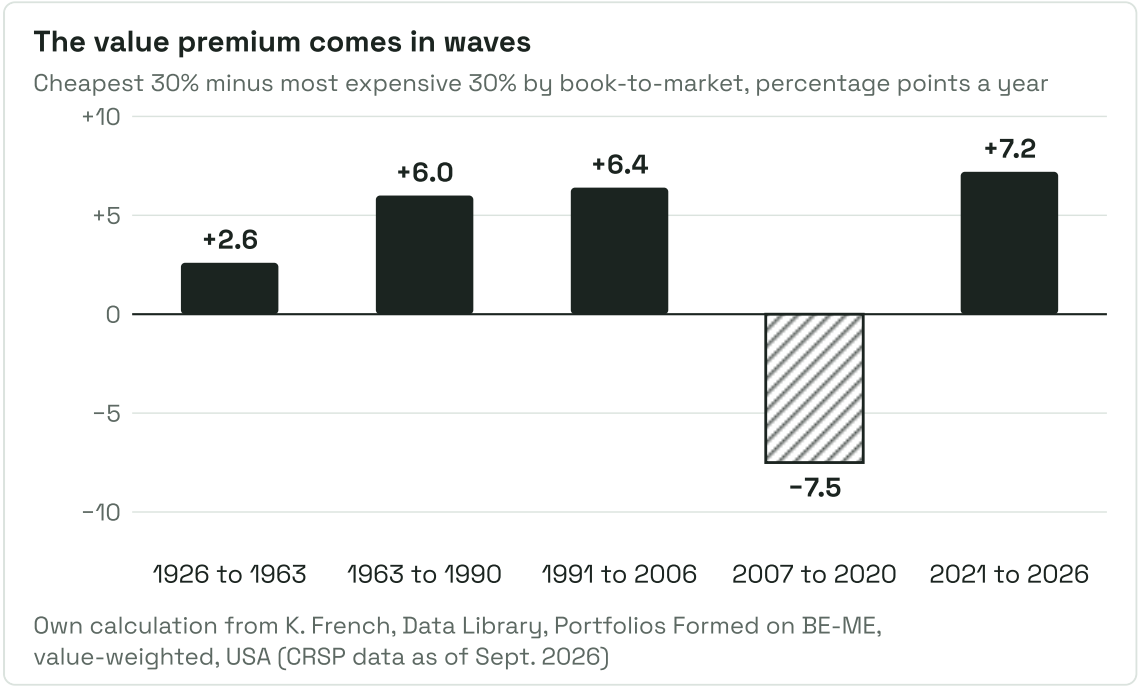


Figure 36 The value premium comes in waves. Annual lead of the cheapest third of US stocks by book-to-market over the most expensive third, per period, in percentage points. Own calculation from Kenneth French's Data Library (CRSP, the US stock price database, as of September 2026) [64].

Robert Arnott, Campbell Harvey, Vitali Kalesnik and Juhani Linnainmaa showed that the value factor's drawdown of 55% up to mid-2020 was the largest since 1963. By their calculation, the shift in valuation alone, that is, cheap stocks becoming ever cheaper relative to expensive ones, explains the entire drawdown; on top of that, book value does not capture intangibles such as research and brands [76]. Ronen Israel, Kristoffer Laursen and Scott Richardson showed that the weakness hit the book-to-

market ratio above all, while a valuation based on the earnings yield did much better for large US companies from 1987 to August 2020; their conclusion: declaring value dead is premature [77]. The authors do, however, work for a provider of value strategies.

What this means in practice

No rule for buying or selling follows from these findings, but an attitude does.

- **Valuation is a statement about decades.** Anyone who reads a high valuation as a signal for the next year will often be too early, like Greenspan in 1996. Anyone who reads it as a pointer to the range of the next decade has historically been right far more often.
- **An expensive market changes the expectation, not the calendar.** In October 2026 the Shiller P/E of the US market stood at 40.7; since 1881 it has been higher only in 19 months of the years 1999 and 2000 [53]. That does not tell you what will happen next year. It only means that for expensive starting points, history shows a narrower and lower range for the following decade. That is exactly how the market valuation in the tool is meant: as context for patience, not as a timing signal (Chapter 6).
- **For individual stocks the same applies, only louder.** A gap between price and value is a statement about years. A large share of cheap stocks is cheap for good reason, which is why the question "How cheap?" always needs the second question "How good?" (Chapter 25).
- **The horizon decides the hit rate.** In any single year, value was ahead in the US data hardly more often than a coin toss; over twenty years, in nine out of ten periods. Anyone who cannot hold through several weak years experiences mostly the bad sides of the idea.

IN SHORT

- About the next year, valuation says almost nothing: in Shiller's data the Shiller P/E explains 4% of the following year's return, but 26% over ten and 38% over twenty years.
- Expensive start, lean decade: at a Shiller P/E above 30, the following decade returned −1.0% a year in real terms on average; below 10, an average of 11.3%.
- A high price does not announce faster earnings growth, but lower returns later.
- Most cheap stocks are cheap for good reason; only a smaller part of the gap is mispricing.
- Value can lose for a decade; the evidence is strong over the long run and weak over the short run.

CHAPTER 25

Why quality pays off even though everyone can see it

Profitability, restrained investment and healthy balance sheets in the research

One of the first lessons about markets is: what everybody knows is in the price. That a company has high margins, little debt and earns money reliably is in every annual report and on every finance portal. So, the logic goes, such a company is priced accordingly, and whoever buys it gets a good company but not a good return.

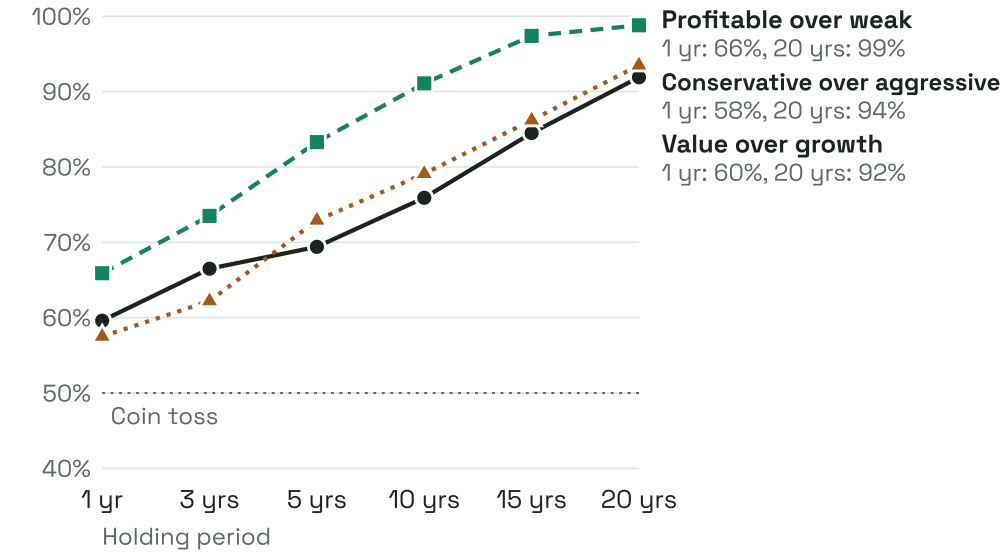


Figure 37 The longer the horizon, the more reliable the lead. Share of all rolling periods in which the first group was ahead of the second: cheap against expensive (from 1926), profitable against weakly profitable and conservative against heavily investing companies (from 1963). USA, value-weighted (large companies count for more). Own calculation from Kenneth French's Data Library (CRSP as of September 2026) [64].

The data says something else. In 2013, Robert Novy-Marx measured how much gross profit a company gets out of its assets (revenue minus cost of goods sold, divided by total assets). The most profitable fifth of US stocks returned 0.31 percentage points a month more than the least profitable from 1963 to 2010, although it was more highly valued on average [7]. So profitability predicted returns about as well as the classic book-to-market ratio, and did so even though it was visible to everyone.

With Kenneth French's freely available data, this can be carried forward to today [64]. If you sort US stocks every year since July 1963 by their operating profitability (operating profit relative to book value), the most profitable third returned 12.2% a year up to September 2026, the least profitable 8.6%. More important than the average is the reliability: over ten years the profitable third was ahead in 91% of all periods, over fifteen years in 97% [64].

Table 7 Profitability and investment in the US data, return per year

Period	profitable	weak	Gap	conservative	aggressive	Gap
1963 to 1990	10.9%	8.8%	+2.1	13.1%	8.5%	+4.6
1991 to 2006	13.4%	8.8%	+4.6	14.8%	10.6%	+4.2
2007 to 2020	12.4%	7.3%	+5.2	10.0%	11.6%	-1.6
2021 to Sept. 2026	14.8%	10.5%	+4.3	15.6%	13.0%	+2.5
whole period	12.2%	8.6%	+3.6	13.0%	10.1%	+2.9

Source of the table: own calculation from Kenneth French's Data Library, CRSP as of September 2026 [64].

The table shows the top against the bottom third of US stocks in each case, value-weighted, before costs [64]. The third row is remarkable: in the years 2007 to 2020, when cheap stocks went through their worst decade since the data began (Chapter 24), the profitable third stayed clearly ahead. The largest drawdown of the profitable third relative to the weak one since 1963 was 31.5%, from October 1998 to February 2000, that is, during the internet bubble, and it had already been made up by November 2000 [64]. For comparison: the shortfall of cheap against expensive stocks from 2007 was around two thirds and had not been made up by 2026.

Good and cheap are opponents that complement each other

Why has the lead of profitable companies not long since been bought away? Part of the answer is that quality and a low price rarely come together. Novy-Marx found a correlation of −0.57 between profitability and value: profitable companies are mostly expensive, cheap ones mostly not very profitable [7]. Buy on price alone and you end up with the weaker businesses; buy on quality alone and you often pay too much. Precisely because the two signals run against each other, they complement each other. In Novy-Marx's data from 1963 to 2010, a mix of the two did not have a single five-year period with a loss [7].

Eugene Fama and Kenneth French, who had made the value factor famous themselves, extended their model in 2015 to include profitability and investment. Their most remarkable finding: with these two factors, the value factor became redundant in the US data from 1963 to 2013, because its return was captured by the others [9]. In other words: a large part of what "cheap" delivers in return lies in the question of whether a company is profitable and handles its money sparingly.

In 2019, Clifford Asness, Andrea Frazzini and Lasse Pedersen summed up the topic under the name "Quality minus Junk" (Chapter 13 already mentions the study). Their core finding is a question of price: quality stocks, that is, profitable, growing and safe companies, are indeed valued more highly in the market, but only a little. This "price of quality" varies; it was lowest during the internet bubble, and when it was low, high returns for quality followed [8]. So the market sees the quality; it just does not pay for it in full.

The value trap in numbers

In 2000, Joseph Piotroski published a number that should sober any bargain hunter: among the cheapest stocks in the USA, measured by the book-to-market ratio, fewer than 44% beat the market in the two years after the portfolio was formed [5]. So the majority of cheap stocks were a

disappointment. The average of all cheap stocks was good all the same, because a few winners delivered a lot; the pattern from Chapter 23 repeats itself on a small scale.

Piotroski separated the cheap stocks with nine simple questions put to the financial statements (the F-Score, Chapter 13 and glossary). The financially strongest among the cheap stocks were 13.4% above the market in the year after selection, the weakest 9.6% below it; all cheap stocks together 5.9% above [5]. Selecting the strong ones improved the return by at least 7.5 percentage points a year (Chapter 16 already cites this figure [5]). However, the lead sat mainly in small and mid-sized companies with little trading and no analysts, that is, where costs and liquidity get in the way most [5].

The trap becomes even clearer at the bottom end. In 2008, John Campbell, Jens Hilscher and Jan Szilagyi measured what stocks with high distress risk deliver. Intuition says: high risk, high return. The data said the opposite. The riskiest one per cent of stocks was 17.0% a year below the market, the safest 5% were 3.4% above it [78]. The characteristics that herald a failure are hardly surprising: high debt, low profitability, a small market value, weak and volatile prices in the previous year and little cash [78].

Profit that arrives as cash

A profit in the accounts is not the same as money in the bank. The difference is called accruals: revenue that has been booked but not yet paid, inventories that grow, costs that are spread over time. In 1996, Richard Sloan showed that the market long overlooked this difference: companies whose profit consisted largely of accruals subsequently returned less than companies whose profit arrived as cash [15]. The effect has become smaller; in the strict replication by Hou, Xue and Zhang, with large companies weighted more heavily, −0.27% a month remained, about a third of the original value [25].

In 2016, Ray Ball, Joseph Gerakos, Juhani Linnainmaa and Valeri Nikolaev showed how closely the two are connected: if you measure a company's profitability closer to the actual cash flow, that is, without the accruals, it predicts returns considerably better. The risk-adjusted return of a profitability strategy rose by almost 40% as a result, and the accruals no longer had any explanatory power of their own alongside it [79]. Profit that arrives as cash counts; paper profit that exists only in the accounts is the part the market falls for.

Those who invest a lot disappoint on average

Investment sounds like the future. For shareholders it is, on average, a warning sign. In 2004, Sheridan Titman, John Wei and Feixue Xie found that companies that raised their investment sharply subsequently did around 2% a year worse than restrained ones; the effect was strongest in companies with plenty of cash flow and little debt, where management therefore had a free hand [14]. The authors interpret this as empire building: money that is easily available is not always well invested. In 2008, Michael Cooper, Huseyin Gulen and Michael Schill found that the growth of total assets alone strongly predicts later returns, even among large companies and alongside the familiar variables such as valuation and company size [80]. In the replication by Hou, Xue and Zhang, the investment effect clearly persisted at −0.46% a month [25].

This fits the finding on new issues from Chapter 23: companies that issue new shares, whether at the IPO or later, did considerably worse in the five years afterwards than comparable companies [61]. In 2008, Jeffrey Pontiff and Artemiza Woodgate showed that since 1970, the change in the number of shares has predicted returns more strongly than size, valuation or momentum on their own: those who dilute deliver less, those who buy back deliver more [81]. In the replication by Hou, Xue and Zhang, this effect, at −0.66% a month, is among the strongest of all [25]. In French's data, the most conservative

third of US companies, measured by the growth of total assets, returned 13.0% a year from 1963 to September 2026, the most aggressive 10.1%; over twenty years the conservative third was ahead in 94% of all periods [64]. But not always: from 2007 to 2020 the aggressive companies were ahead, and since December 2022 they had built up a lead of around one third that had not been made up by September 2026 [64].

What companies do with their money

The way a company returns money to its shareholders has changed within a generation. In 2001, Eugene Fama and Kenneth French showed that the share of listed US companies paying any dividend at all fell from 66.5% in 1978 to 20.8% in 1999 [82]. Gustavo Grullon and Roni Michaely found that in 1980, US industrial companies spent on share buybacks 13.1% of what they paid in dividends; in 2000 it was 113.1%, and in 1999 and 2000 they spent more on buybacks than on dividends for the first time [83].

Buybacks send a message, and the market hears it too slowly. David Ikenberry, Josef Lakonishok and Theo Vermaelen studied announcements of open market buybacks in the USA from 1980 to 1990. In the four years that followed, the stocks were on average 12.1% ahead of their comparison group; for cheaply valued stocks it was 45.3%, for expensive ones there was no lead [84]. So a buyback is a good sign mainly when the company really is cheap; for an expensive stock it merely hands out money at a high price.

Why the market does not pay for quality in full

For a puzzle that has been in plain sight for decades there are several explanations, and research has not settled on one.

- **Boredom has a price.** Many investors look for the stock that can double, not the one that earns reliably. Andrea Frazzini and Lasse Pedersen showed that investors who are unwilling or not allowed to borrow seek their return through volatile stocks and thereby make them too expensive; calm stocks returned more on a risk-adjusted basis (Chapter 13 [13]).
- **Quality looks expensive.** Anyone who buys strictly on simple measures such as the P/E avoids profitable companies because they are valued more highly. Anyone looking for growth often finds them too boring. They fall between two stools.
- **Risk you cannot see.** Part of the research interprets the premiums as compensation for risks that are invisible in calm times. Asness, Frazzini and Pedersen themselves write that the quality premium cannot be explained by the usual risk measures and that it is open whether it is a mispricing or a chance finding in the data [8].

The case against

The evidence for quality is good, but not unassailable. In the 2017 working paper version of their study, Kewei Hou, Chen Xue and Lu Zhang replicated 447 published effects with uniform, strict rules; 64% of them were not even significant at the usual 5% level [25] (Chapter 19 cites the same study in its journal version; those figures are in Chapter 31). Some quality measures fared badly in the process: the measure Fama and French use to build their profitability factor was not significant on its own (0.25% a month, t-statistic 1.2; from about 2 an effect counts as statistically significant) [25]; Novy-Marx's gross profitability only just held up and lost its power almost entirely once the investment effect was taken out [25]; the distress risk effect was "virtually nonexistent" in their replication [25]; and Piotroski's F-Score, applied to all stocks instead of only cheap ones, was not significant [25]. Confirmed, by contrast, were profitability close to cash flow (0.63% a month, t-statistic 3.44) and the investment effect [25].

Ball and his co-authors report themselves that the explanatory power of profitability and of accruals sank towards zero from around 2004 [79]. And Juhani Linnainmaa and Michael Roberts collected the accounting data of US companies by hand back to 1918 and tested the known effects in the period before their discovery. Profitability and investment, today two central factors, delivered only 2 and 9 basis points (hundredths of a percentage point) a month before 1963, statistically indistinguishable from zero; from 1963 to 2014 it was 30 and 25. The value effect, by contrast, was there before 1963 as well [85]. This is the most serious objection to the quality premium: it is much stronger in the decades in which it was discovered than before. And most of the study figures in this chapter are returns of portfolios that buy good stocks and sell bad ones short, before costs and before taxes. A private investor who only buys experiences a smaller, but also cheaper, part of it.

What this means in practice

- **Ask the second question.** After "How cheap?" comes "How good?" Most cheap stocks disappoint; a sober look at profitability, cash flow and balance sheet has historically separated bargains from traps better than the price alone.
- **Cash before paper profit.** A profit that is not followed by cash flow is a question, not an answer.
- **Distrust great ambition.** Sharply rising investment and new shares are not always bad, but on average they were not a good sign for the existing shareholders.
- **Quality is a slow advantage.** As with value, the lead shows up reliably only over many years; in single years, especially in bubbles, it can reverse.

IN SHORT

- Profitable companies are mostly more expensive and still returned more: in the US data since 1963 around 3.6 percentage points a year, and over ten years in 91% of the periods.
- Good and cheap run against each other, and that is exactly why they complement each other.
- Fewer than 44% of the cheapest stocks beat the market; stocks with high distress risk returned less, not more.
- Profit that arrives as cash says more than paper profit; heavy investment and new shares were on average not a good sign.
- Not every quality measure survives a strict replication; profitability close to cash flow and the investment effect did.

CHAPTER 26

Growth: the most expensive hope in the stock market

How rarely high growth lasts, and what the price already assumes

> *"Ignoring cycles and extrapolating trends is one of the most dangerous things an investor can do."*
>
> Howard Marks, memo "The Most Important Thing", 2003 [86]

In December 1972 there was a group of stocks on Wall Street that, by common opinion, you only had to buy and never sell again: the "Nifty Fifty", fifty large, fast-growing American companies such as Xerox, IBM, Polaroid and Coca-Cola, the darlings of the big asset managers [87]. Their growth seemed so certain that the price did not matter. On average they cost 41.9 times their annual earnings, more than twice as much as the S&P 500 at 18.9 [87].

In 1998, Jeremy Siegel worked out what became of them. An equally weighted portfolio of the fifty returned a respectable 12.5% a year up to August 1998, not bad for a group regarded as the textbook example of a bubble [87]. But within the group the price decided: the 25 most expensive stocks, with a P/E averaging 54, delivered only about half the subsequent return of the 25 cheapest, whose P/E was 30 [87]. Jeffrey Fesenmaier and Gary Smith extended the calculation to the end of 2001: at 11.64% a year, the portfolio of the fifty was now below the S&P 500 at 12.01%, and every ten points more in the P/E of 1972 cost around 2 percentage points of return a year on average [88]. Even among the best companies of their time, the price was the most important ingredient of the later return.

How rarely high growth lasts

In 2016, in their "Base Rate Book" for Credit Suisse, Michael Mauboussin, Dan Callahan and Darius Majd counted how often large companies have grown fast. The basis was the 1,000 largest companies in the world at each point from 1950 to 2015, including those that later disappeared. Over ten years, sales after inflation grew by a median of 4.9% a year. More than 20% a year over ten years was achieved in only 4.5% of cases, 1,852 of 41,645; more than 45% a year in only 0.3% [89]. Over three years it looked friendlier: there, just under 12% of cases were above 20% a year [89]. So short bursts of growth are not rare at all. What is rare is their duration.

For earnings the picture is stricter still, as Chapter 23 showed: across US companies from 1951 to 1997, Chan, Karceski and Lakonishok found essentially no persistence in earnings growth; five good years in a row were no more common than with a coin toss [60]. Only about 10% of companies grew their operating performance by more than 18% a year over ten years [60]. In 2000, Eugene Fama and Kenneth French described the force behind it: profitability reverts to the mean, in their simple model by about 40% of the gap per year, and all the faster the further a company is from the mean [90]. High profits attract competitors, low ones force cost cuts.

Table 8 Base rates of growth

What was measured	Result	Data	Source
real sales, median over ten years	4.9% a year	1,000 largest companies in the world, 1950 to 2015	Mauboussin et al. 2016
real sales over ten years above 20% a year	4.5% of cases	same	Mauboussin et al. 2016

What was measured	Result	Data	Source
real sales over three years above 20% a year	around 12% of cases	same	Mauboussin et al. 2016
operating performance over ten years above 18% a year	about 10% of companies	US companies 1951 to 1997	Chan, Karceski, Lakonishok 2003
earnings growth above the median five years in a row	no more common than with a coin toss (Chapter 23)	same	Chan, Karceski, Lakonishok 2003
reversion of profitability to the mean	about 40% of the gap per year	US companies	Fama, French 2000

What a high price demands in growth

Base rates only become useful when you connect them with the price. A simple calculation shows how. Suppose a stock costs 50 times its earnings today, and in ten years it is to cost only 20 times, like a mature company. For the price not to fall along the way, earnings must rise to two and a half times their level within ten years; that is 9.6% a year. If the stock is also to gain 8% a year in price, earnings must rise to just over five times their level, around 18% a year, for ten years. Exactly this hurdle was cleared by only about 10% of companies in the data of Chan, Karceski and Lakonishok [60].

The calculation is deliberately simple and leaves out dividends. But it shows the core: a high price is a bet that a company belongs to a small minority. Sometimes you win that bet; Chapter 23 showed that a few companies generate the bulk of all stock market gains. You should just know that you are making it. The figures 20 and 8% are freely chosen, purely for illustration.

Mauboussin and his co-authors give an example that was much discussed in 2016. Tesla had set itself the goal of growing sales by 50% a year for ten years, starting from around $6 billion. In their database there was not a single precedent in this size class that had managed it [89]. That is not a verdict on a company, but a measure of how exceptional an expectation is.

Those with the highest expectations disappoint most often

In 1996, Rafael La Porta sorted stocks by how much earnings growth the analysts expected for them. In the decile with the lowest expectations, on average 2.3% growth a year, the stocks returned 29.5% in the following year. In the decile with the highest expectations, on average 26% growth a year, they returned 8.6% [91]. That was the period from 1982 to 1991. The most revealing part of the study is a detail: in the three days around the announcement of quarterly results, the high-hope stocks fell by 1.6%, added up over a year [91]. So their prices dropped exactly when the actual earnings became known. That suggests the expectations were too high, rather than that the stocks were simply less risky.

Patricia Dechow and Richard Sloan reached a related conclusion in 1997: more than half of the higher returns of cheap stocks can be explained by prices adopting the analysts' overly optimistic long-term growth forecasts [92]. How optimistic these forecasts are is shown in Chapter 27 [93].

Countries: growth is not return

The best-known form of the growth hope concerns whole countries: invest in the fastest-growing economies, the idea goes, and you earn the most. In 2005, Jay Ritter tested this on 16 countries over the whole 20th century. The correlation between per capita growth in economic output and the real stock return was negative, minus 0.37 [94]. From 1900 to 2000, Japan had the highest per capita growth

at 2.9% a year, but a real stock return of only 4.1%, and the real dividend per share shrank by 3.3% a year over the century [94].

Ritter's explanation: growth comes from savings, more work and technical progress. If the new capital flows into new companies, or into existing ones as new shares and loans, the profit from it does not reach the existing shareholders; and technical progress raises profits only if companies have a lastingly strong market position [94]. His conclusion: countries with high growth potential are good investments only when the valuation is low [94]. The correlation is not statistically significant and rests on 16 markets that all survived; but the direction clearly contradicts intuition.

The case against

Growth is not worthless, and this chapter is not a plea against growing companies. The few companies that, according to Bessembinder, generated the entire net gain of the US market almost all grew strongly over a long time (Chapter 23). From 2007 to 2020, the most expensive stocks in the US data returned considerably more than the cheapest (Chapter 24). Siegel's own calculation shows that even the Nifty Fifty delivered a decent return from 1972 to 1998, because some of them really did sustain their growth for decades [87]. The base rates themselves have limits: Mauboussin counts only the largest companies and himself mentions a certain survivorship bias [89]; Chan and his co-authors count only survivors [60]. And finally, today's financial statements record part of investment, for example in research, software and brands, as costs rather than as assets. Robert Arnott and his co-authors show that the classic value factor lost 54.8% from 2007 to June 2020, but only 43.0% with intangibles included [76]. So anyone who measures growth companies only by their current earnings may judge them too harshly.

What this means in practice

- **Translate the price into growth.** The question is not whether a company grows, but whether it grows faster than the price already assumes. The higher the price, the smaller the minority of companies that have ever managed it. In the tool, the tab Growth shows what the company delivered and how much growth the price already assumes (Chapter 6).
- **Put the base rate next to the story.** Every growth story sounds unique. The question "How often has a company of this size managed something like this for ten years?" is the best protection against the most beautiful tale.
- **Do not extrapolate short bursts.** Three good years are common, ten are rare. Profitability reverts to the mean, and on average quickly.
- **Growth is welcome as long as you do not pay dearly for it.** The best results in the data of this chapter came not from the companies with the highest growth, but from those where the price still left room for disappointments.

IN SHORT

- In 1972 the Nifty Fifty cost 41.9 times their earnings; every ten points more then cost around 2 percentage points of return a year.
- Over ten years, only 4.5% of the large companies managed more than 20% real sales growth a year; over three years, around 12%.
- A P/E of 50 demands around 18% earnings growth over ten years for a decent return; about 10% of companies managed that.
- Stocks with the lowest growth expectations returned 29.5% in the following year, those with the highest 8.6%.
- For countries too, the stock return did not hinge on economic growth; what mattered was the price.

CHAPTER 27

The professionals' forecasts

What analysts, price targets, economists and funds actually get right

> *"In this business if you're good, you're right six times out of ten. You're never going to be right nine times out of ten."*
>
> Peter Lynch, interview with PBS Frontline, 1996 [95]

Professionals have everything a private investor lacks: databases, conversations with management, teams of analysts who have followed an industry for years. It seems natural to trust their forecasts more than your own judgement. For a method that rests on estimating a value, this is a central question: if the professionals already predict the future well, why bother with a fair value of your own?

The answer begins with a number from the consulting firm McKinsey. In 2010 Marc Goedhart, Rishi Raj and Abhishek Saxena compared analysts' forecasts of earnings growth for the companies in the S&P 500 over 25 years with what actually happened. Year after year the analysts expected long-term earnings growth of 10 to 12% a year. The actual figure was 6% [93]. On average the forecasts were almost 100% too high, and only twice in 25 years did actual growth beat the expectation, both times in the recovery after a recession [93].

Earnings forecasts: systematically too high

The finding does not stand alone. Louis Chan, Jason Karceski and Josef Lakonishok found for the USA from 1982 to 1998 that the median of analysts' long-term growth forecasts was about 14.5% a year, while the five-year growth actually achieved was about 9% [60]. In 1995 David Dreman and Michael Berry evaluated 66,100 consensus estimates and found that only a minority fell within a range many professionals consider acceptable; the errors hardly depended on the business cycle or the industry [96].

Two things explain the lean towards optimism without having to assume that analysts are incompetent. First, the future of individual companies is simply hard to predict; Chapter 23 showed that above-average growth persists hardly more often than a coin toss would suggest. Second, according to a common explanation, the profession rewards optimism: analysts need access to management, and their firms do business with the very same companies. The studies cited here measure the optimism, not its cause. In the same article McKinsey noted that the market itself was "less giddy": except in the years 1999 to 2001, actual price-earnings ratios were around 25% below those that the analysts' forecasts would have implied [93]. So prices already build in a discount to the forecasts.

Price targets: more promised than delivered

A price target is an analyst's forecast of where a stock will stand in twelve months. Mark Bradshaw, Lawrence Brown and Kelly Huang evaluated price targets issued by US analysts in the years 2000 to 2009. At the end of the twelve months the target had been met in only 38% of cases; at some point during the twelve months it was touched once in 64% of cases [97]. The return implied by the price target was on average 15 percentage points above the actual return, and the average absolute error was 45% [97]. Analysts who set persistently better price targets did exist statistically, but not to an economically meaningful degree [97].

Recommendations: information yes, profit after costs hardly

So are analysts' recommendations worthless? No, and that is the fair part of the story. In 1996 Kent Womack showed that new buy and sell recommendations from major brokers move prices and that prices then keep drifting in the same direction for a while: after buy recommendations modestly and briefly (+2.4%), after sell recommendations more strongly (−9.1%) and over six months [98]. Sell recommendations are rare and therefore worth taking seriously.

In 2001 Brad Barber, Reuven Lehavy, Maureen McNichols and Brett Trueman tested whether you can make money with this. Buying the stocks with the best consensus recommendations and selling short those with the worst earned more than 4% a year extra before costs, but only with daily rebalancing. After trading costs the excess return was not reliably greater than zero [99]. The information is there; it is just in the price quickly.

Economists: recessions come as a surprise

Chapter 23 already gave the number: the consensus of forecasters saw almost no recession a year ahead [63]. The study has a second, less well-known side: conversely, the forecasters also almost never predicted a recession that then failed to arrive. In April of the preceding year there were only 8 false recession forecasts in 1,153 years without a recession [63]. Economists are not too fearful, they are too sluggish: they extrapolate the normal. For investors this means that a strategy built on predicting the next downturn relies on knowledge that even the experts lack.

Table 9 What the professionals predicted and what happened

Forecast	expected	actual	Period	Source
S&P 500 earnings growth, analyst consensus	10 to 12% a year	6% a year	25 years to 2009	Goedhart, Raj, Saxena 2010
long-term earnings growth, analyst median	about 14.5% a year	about 9% a year (five years)	1982 to 1998	Chan, Karceski, Lakonishok 2003
price targets for twelve months	price target met	in 38% of cases at the end of the period	2000 to 2009	Bradshaw, Brown, Huang 2013
recessions one year ahead	economy shrinks	almost never predicted (Chapter 23)	1992 to 2014, 63 countries	An, Jalles, Loungani 2018

Funds: the arithmetic and its consequences

Chapter 2 explained the basic arithmetic: before costs the average actively managed dollar must earn the market return, after costs it must fall short of it [19]. Research has since filled this arithmetic with numbers.

In 2008 Kenneth French estimated the costs that all US investors together pay for the search for an excess return: fees, trading costs, distribution costs. From 1980 to 2006 they came to 0.67% of the total market value per year. The typical investor would have raised their annual return by that amount if they had simply invested passively [100]. In 2010 Eugene Fama and Kenneth French showed that the aggregate portfolio of all active US equity funds is close to the market portfolio and that the high costs show up intact as lower returns to investors; only a few funds earn enough to cover their costs [101]. In the same year Laurent Barras, Olivier Scaillet and Russ Wermers estimated that around 75% of active US equity funds have no excess return after costs, and that the share of truly skilled funds had fallen almost to zero by 2006 [102].

The half-yearly SPIVA scorecards from S&P Dow Jones Indices confirm the picture for the USA and Europe: over ten and twenty years the large majority of active equity funds lag their benchmark index [27].

Money follows yesterday's winners

Why does so much money still flow into active funds and to individual managers? Because investors, private and professional alike, take past returns as proof of skill. In 1998 Erik Sirri and Peter Tufano showed that disproportionately large amounts of money flow to the funds that did very well in the prior year, while weak funds do not lose money to a corresponding degree [103].

Even professionals who select professionals follow the pattern. In 2008 Amit Goyal and Sunil Wahal studied around 3,400 US pension plans and other large plan sponsors that hired and fired investment managers from 1994 to 2003. The sponsors hired managers after large excess returns; after that, the managers no longer delivered a positive excess return. Where a manager was fired and a new one hired, the sponsors would have done no worse with the fired manager than with the new one [104]. The switch cost money and achieved nothing.

The case against

These findings do not excuse overconfidence, and they do not prove that professionals are useless. Analysts provide information that shows up in prices, especially with sell recommendations [98]. Bradshaw and his co-authors show that just under two thirds of price targets are at least reached at some point within a year [97]. The McKinsey study is a consulting study without peer review and looks at the index as a whole, not at individual companies [93]. Before costs, Fama and French find genuine outperformance and underperformance in the extreme tails [101], and the estimates of Barras and his co-authors are methodologically disputed in the literature [102]. Finally, comparing a fund after costs with an index without costs is strict; an index fund costs something too, if only a little.

What this means in practice

- **Forecasts as an ingredient, not a verdict.** A growth forecast is an assumption whose history is biased upward. Anyone who uses one does well to compare it with the base rate: how often have companies managed something like this in the past?
- **Price targets are snapshots of sentiment.** A price target says more about the analyst's expectation than about the price a year from now.
- **Costs are the most reliable forecast.** The only number you know for certain about a fund's future is its fee. French puts the cost of the active search for the market as a whole at around two thirds of a percentage point a year [100].
- **Yesterday's winners prove nothing.** Anyone who picks funds, managers or strategies by last year's return is, on average, buying the end of a good run. Several of the legends in Chapter 29 trailed for years at a time.

IN SHORT

- For 25 years analysts expected earnings growth of 10 to 12% a year; it came in at 6%.
- Only 38% of price targets had been met after twelve months; the implied return was on average 15 points too high.
- Recommendations contain information, but after trading costs no reliable profit remained.
- The search for excess returns costs the US market around 0.67% of its value a year; around three quarters of funds have no excess return after costs.
- Sponsors hire managers after good years and fire them after bad ones; the switch achieved nothing.

CHAPTER 28

The investor as their own worst enemy

Trading, attention, loss aversion and the gap between funds and investors

> *"... most investors think quality, as opposed to price, is the determinant of whether something's risky."*
>
> Howard Marks, memo "It's Not Easy", 2015 [105]

Anyone who puts more time into their investments, looks more often, reacts faster and trades more should get better results. That is how it works in most areas of life: practice, attention and effort pay off.

On the stock market the data shows the opposite. In 2000 Brad Barber and Terrance Odean analysed the accounts of 66,465 households at a large US discount broker from 1991 to 1996. The fifth of households that traded the most earned 11.4% a year after costs. The market returned 17.9%. The households that traded the least came to 18.5% [106]. Before costs the busy and the idle investors hardly differed; the difference arose almost entirely from the trading itself. The title of their paper sums it up: "Trading Is Hazardous to Your Wealth".

The more trading, the lower the return

The pattern repeats in every kind of data researchers have found on the subject.

Among fund investors. Every year Morningstar compares the return of funds with the return their investors actually earn, that is, taking into account when they put money in and take it out. You already know the 2025 edition from the twelve numbers: over the ten years to the end of 2024 the average dollar invested earned 7.0% a year, the funds themselves 8.2% [66]. For the funds with the calmest inflows and outflows the gap was 0.8 percentage points, for the most volatile 1.8 percentage points [66]. For allocation funds, which combine stocks and bonds in one product and are therefore switched in and out of less often, there was almost no gap; for sector funds, which invite bets on themes, it was 1.5 percentage points [66].

Across the whole market. In 2007 Ilia Dichev calculated what all investors in a market earned together, weighted by the money they had invested at the time. On the NYSE and AMEX, from 1926 to 2002, this return was 1.3 percentage points a year below the return of an investor who had simply bought and held; on Nasdaq from 1973 to 2002 it was 5.3 percentage points below; across 19 major markets the average was 1.5 percentage points [107]. So most of the money arrived when prices were high and left when they were low.

In an entire country. Brad Barber, Yi-Tsung Lee, Yu-Jane Liu and Terrance Odean had access to every trade on the Taiwan stock exchange from 1995 to 1999. Through their trading, private investors together lost 3.8 percentage points of return a year. Scaled up, that was equivalent to 2.2% of Taiwan's entire economic output [108]. Only around a quarter of the loss came from poor selection; the rest was commissions, transaction taxes and bad timing. The professional investors on the other side gained 1.5 percentage points a year after costs [108].

In day trading. Fernando Chague, Rodrigo De-Losso and Bruno Giovannetti tracked all individuals who began day trading in the index futures market in Brazil from 2013 to 2015. Of those who persisted for more than 300 days, 97% lost money. Only 1.1% earned more than the minimum wage [109].

Table 10 What your own behaviour costs

Study	Data	Finding
Barber and Odean 2000	66,465 US households, 1991 to 1996	most active fifth 11.4% a year, market 17.9%
Morningstar 2025	more than 25,000 US funds and ETFs, 2015 to 2024	investors earned less than their funds
Dichev 2007	NYSE and AMEX 1926 to 2002, Nasdaq 1973 to 2002	investors 1.3 and 5.3 points a year below buy and hold
Barber, Lee, Liu, Odean 2009	all trades in Taiwan, 1995 to 1999	private investors lose 3.8 points a year, 2.2% of GDP
Chague, De-Losso, Giovannetti 2019	day traders in Brazil, 2013 to 2015	97% of those who persisted lost money

Why we trade too much

Overconfidence. In 2001 Barber and Odean compared men and women. Men traded 45% more than women, and trading reduced their net returns by 2.65 percentage points a year, against 1.72 for women [110]. Among single men the difference was even larger. The authors read this as overconfidence: those who believe they know more than everyone else trade more often, and every trade has someone on the other side who believes the opposite.

Attention. In 2008 Barber and Odean showed that private investors mainly buy stocks that happen to be grabbing attention: stocks in the news, stocks with unusually high trading volume, stocks with an extreme one-day move. Among the stocks with the lowest volume, the customers of a large broker bought considerably less than they sold (the imbalance was −18.15%); among the 5% with the highest volume, considerably more (+29.5%) [111]. When buying we can choose among thousands of stocks and take the ones that happen to cross our path; when selling we choose only from what we own. Professional investors showed the pattern least.

Disposition effect. In 1998 Terrance Odean measured in 10,000 accounts what every investor knows from experience: we would rather sell winners than losers. The proportion of gains realised was 14.8%, of losses realised 9.8% [112]. Only in December, when losses reduce the tax bill, did the ratio reverse. The mistake was expensive: the winners that were sold did 3.4 percentage points better over the following year than the losers that were held [112]. Peter Lynch called this watering the weeds and cutting out the flowers (Chapter 29).

Myopic loss aversion. Chapter 11 explained prospect theory: losses hurt more than gains of the same size give pleasure. In 1995 Shlomo Benartzi and Richard Thaler showed what follows from that if you look often. They asked how often a loss-averse investor would have to evaluate their portfolio for the historically high premium of stocks over bonds to be just right for them. Their answer: about once a year [113]. Anyone who looks daily sees losses far more often than they would with an annual look, and experiences the same investment as much riskier. The US data from Chapter 23 show the same thing from the other direction: over one year the market often lost money in real terms, over twenty years almost never.

Chasing the winners. Fund investors' money flows disproportionately to the funds that did best in the prior year [103]. Peter Lynch reported that in his first three years at Magellan around one third of the shares were redeemed, even though the fund was already doing well at the time [95]. Anyone who buys

after good years and sells after bad ones turns a good fund return into a mediocre investor return, as the numbers from Morningstar and Dichev show.

The case against

The findings of this chapter are robust in their direction, but their size should be read with caution. The Barber and Odean studies date from the 1990s, when a trade at a discount broker still cost many times what it does today [106]. A large part of the losses in Taiwan consisted of a transaction tax and high commissions [108]. Day trading in Brazil concerns a futures market, not the selection of stocks [109]. According to its authors, Morningstar's gap also arises from sensible behaviour, such as regular saving into rising markets; for the market as a whole there is no gap, because every seller faces a buyer [66]. And Dichev's numbers measure the market as a whole, including the companies that issue new shares when prices are high [107].

Also frequently cited is an annual study by the consulting firm DALBAR, which reports a much larger gap between funds and investors. We do not use its numbers. According to a widespread criticism, its method mixes investor behaviour with the sequence of market returns: someone who pays in regularly has little money invested at the start of a rising market and therefore earns a lower money-weighted return even without making any mistake. Harry Sit showed this with an example in which a market doubles in the first year and then stays flat for nine years: the index returns 7.2% a year, an investor with equal regular contributions 1.7%, although they did nothing wrong [114].

And finally: an anecdote often told on this subject, that the average investor in Peter Lynch's Magellan fund lost money, is not documented (Chapter 29).

What this means in practice

- **Doing less is a strategy.** The data reward not diligence in trading but stamina in holding. Chapter 11 tells the same lesson as a personal experience with the forgotten portfolio.
- **Write the rules down beforehand.** Overconfidence, attention and loss aversion act at the moment of decision. A rule fixed in advance for when to buy and when to sell takes the stage away from them (Chapter 10).
- **Look less often.** Anyone who looks at their portfolio once a month or once a quarter sees fewer losses and makes fewer gut decisions.
- **Check the attention.** When a stock is suddenly everywhere, the question is not "Should I buy it?" but "Would I have found it if nobody were talking about it?"
- **Do not sell winners by reflex, do not hold losers by reflex.** The question is always the same: where does the price stand today relative to the value, and does the thesis still hold?

IN SHORT

- Those who traded the most earned considerably less than the market after costs; before costs the difference was small.
- Fund investors earned less than their own funds; the more volatile the flows, the bigger the gap.
- We buy what grabs attention, sell winners too early and hold losers too long; the winners that were sold then did 3.4 points better.
- Anyone who looks at their portfolio daily experiences the same investment as much riskier than someone who looks once a year.
- The well-known DALBAR number and the Magellan anecdote do not stand up to scrutiny; the direction of the finding does.

CHAPTER 29

The legends in numbers

What is actually documented about the most successful investors, their mistakes included

> *"You have to let the big ones make up for your mistakes."*
>
> Peter Lynch, interview with PBS Frontline, 1996 [95]

Stories circulate about famous investors that get better with every retelling. Benjamin Graham, the father of value analysis, is said to have earned around 20% a year with his fund for twenty years. The average investor in Peter Lynch's Magellan fund is said to have lost money despite the record. Both are often told. Neither is documented; according to a 1996 newspaper report, Fidelity explicitly denied the second story [115].

This chapter takes a different approach. It includes only what can be read in a source: in the investors' own letters, in fund reports, in studies that recalculated their results. Wherever possible, every number was checked by recalculation. The result is less smooth than the legends, but more instructive. The expectation it breaks is this: great investors always win. The evidence shows the opposite. They trailed for years, suffered drawdowns of a third, made expensive mistakes and still became legends, because they held on to a few principles.

Table 11 Documented results of famous investors against their benchmark

Investor, vehicle	Period	per year	Benchmark per year	Evidence
John Maynard Keynes, King's College, discretionary portfolio	1922 to 1946	16.0% (average)	UK equities 10.4%	study
Benjamin Graham, Graham-Newman Corporation	1945 to 1956	17.4% before, 15.5% after fee	S&P 500 18.3%	1977 monograph
Benjamin Graham, 100 Graham-Newman shares including GEICO	1948 to 1976	11.4% (without dividends)	S&P 500 7.1%	1977 monograph

Investor, vehicle	Period	per year	Benchmark per year	Evidence
Warren Buffett, Buffett Partnership	1957 to 1969	29.5% before, 23.8% after profit share	Dow 7.4%	his own essay
Warren Buffett, Berkshire Hathaway, market value per share	1965 to 2025	19.7%	S&P 500 with dividends 10.5%	shareholder letter
Walter Schloss, WJS Partnership	1956 to 1984	21.3% before, 16.1% after profit share	S&P 500 8.4%	Buffett 1984
Charlie Munger, Wheeler, Munger & Co.	1962 to 1975	19.8% before, 13.7% after profit share	Dow 5.0%	Buffett 1984
Bill Ruane, Sequoia Fund	1970 to 1984	18.2% before, 17.2% after fee	S&P 500 10.0%	Buffett 1984
Rick Guerin, Pacific Partners	1965 to 1983	32.9% before, 23.6% after profit share	S&P 500 7.8%	Buffett 1984
John Neff, Vanguard Windsor	1964 to 1995	13.8%	S&P 500 10.7%	Forbes 1997, recalculated
Peter Lynch, Fidelity Magellan	1977 to 1990	29.2%	S&P 500 15.1%	Lynch's own figure, benchmark our own calculation
Jim Simons (counterexample), Renaissance Medallion	1988 to 2018	63.3% before, around 38% after fees	US total market 10.0%	study, data from Zuckerman

The table mixes things that cannot simply be mixed: returns before and after fees, price indices with and without dividends, average and compounded annual rates, different markets and decades. It therefore shows orders of magnitude, not a ranking. The footnotes for each person say exactly what was measured.

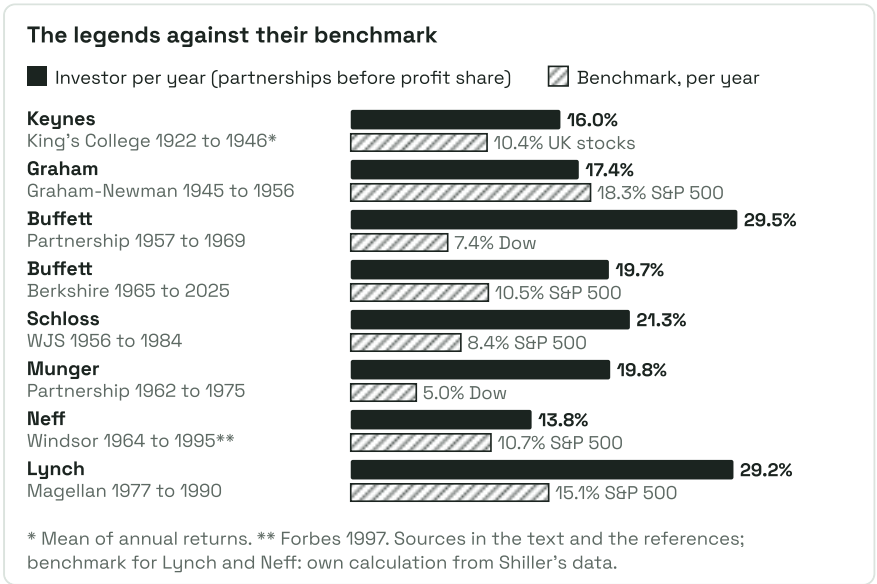


Figure 38 The legends against their benchmark. Documented return per year of great investors (dark) and of their benchmark over the same period (hatched), without Jim Simons, whose 63% would go off the scale. Sources: Chambers, Dimson 2013 [116]; Kahn, Milne 1977 [117]; Buffett 1984 [118]; 2025 shareholder letter [119]; Forbes 1997 [120]; PBS 1996 [95]; benchmark for Lynch and Neff our own calculation from Shiller's data [53].

John Maynard Keynes: the economist who failed at timing

From 1921 Keynes managed the endowment of King's College, Cambridge. In 2013 David Chambers and Elroy Dimson analysed the records in the college archive. From 1922 to 1946 the discretionary portfolio returned an average of 16.0% a year, the UK stock market 10.4% [116]. His risk-adjusted return, with a Sharpe ratio of 0.73, was clearly better than the market's 0.49 [116]. The Sharpe ratio measures how much return above the risk-free rate an investment delivers per unit of volatility.

But the most interesting number comes at the beginning. Keynes started out as a macro investor: he wanted to foresee when the business cycle would turn and switch between stocks, bonds and cash accordingly. By August 1929 he was lagging the UK stock market by a cumulative 17.2%, and he did not see the sharp fall of the following month coming [116]. Chambers and Dimson's formal tests find no evidence that he was able to time the market successfully [116]. In the early 1930s he changed his method: away from predicting the cycle, towards selecting a few well-understood companies, with a tilt towards smaller stocks and high dividends. Only after that did he beat the market reliably [121].

He explained the change himself. In 1934 he wrote that he was becoming more and more convinced that the right method is to put fairly large sums into enterprises one thinks one knows something about and in whose management one thoroughly believes [116]. In 1938 he wrote about switching back and forth between stocks and cash that in practice it needs "phenomenal skill" to make much out of it after expenses and loss of interest [116].

Benjamin Graham: the father of value analysis and his one great exception

Graham is the intellectual father of this book (Chapter 3). His results are harder to pin down than his ideas. The most reliable source is a 1977 monograph by Irving Kahn, a long-time associate, and Robert Milne, published by the Financial Analysts Research Foundation [117]. According to it, the Graham-Newman Corporation returned 17.4% a year before the management fee and 15.5% after it from January 1945 to August 1956. The S&P 500 returned 18.3% over the same period [117]. So in those eleven years the father of value investing trailed the market with his fund.

That is only half the truth. The fund fluctuated far less than the market; its beta, the measure of dependence on the overall market, was 0.39. Adjusted for this lower risk, Kahn and Milne find, it did 7.7 percentage points a year better than would have been expected [117]. Graham mainly bought special situations and stocks trading below their net current asset value, widely diversified, with little market risk.

And then there is GEICO. In 1948 Graham-Newman bought a large stake in the insurer GEICO and later distributed the shares to its own shareholders. Anyone who bought one hundred Graham-Newman shares in 1948 and kept the GEICO shares had earned 11.4% a year without dividends by the end of 1976; the S&P 500 returned 7.1% on the same measure [117]. According to Kahn and Milne this one position brought in more profit than all his other investments combined [117]. Graham himself said dryly in 1976 that from the GEICO purchase on, "we seemed to be very brilliant people" [117]. The man who taught diversification and buying below asset value owed his fortune to a single, concentrated quality stock.

Graham, too, had his terrible years. His joint account lost around 70% from 1929 to 1932, barely less than the Dow's 74%; in 1930 alone 50%, partly because he was working with borrowed money [117]. That, he said in 1976, "was a mistake, and I had to sweat through the period 1929-1932. I didn't repeat that error after that." [117]

Warren Buffett: sixty years of compounding, and what size costs

From 1957 to 1969 Buffett's partnership returned 29.5% a year before his profit share and 23.8% for the limited partners; the Dow Jones with dividends returned 7.4% [118] [122]. For the limited partners one dollar became around $16 over those thirteen years, in the Dow around $2.5.

Berkshire Hathaway, which Buffett took over in 1965, is the longest publicly verifiable record of a single investor. According to the most recent shareholder letter, the first to be signed by his successor Greg Abel, in February 2026, the market value of a Berkshire share rose by 19.7% a year from 1965 to 2025, the S&P 500 with dividends by 10.5% [119]. In total that is 6,099,294% against 46,061% [119]. The annual rate is not even twice as high, yet the final wealth is more than 130 times as large: that is the power of compounding over six decades.

The letter also shows the limit. In the ten years from 2016 to 2025 Berkshire trailed the S&P 500 in four years, and the ten annual figures in the table work out to 14.3% a year for this period against 14.8% for the index [119]. Buffett had predicted this back in 1984: "Size is the anchor of performance. There is no question about it." [118]

His best-known sentences are about price. In 1987 he wrote about Graham's Mr. Market that he is there to serve you, not to guide you; it is his pocketbook, not his wisdom, that you will find useful [123]. In 1989 he described his change of mind: it is far better to buy a wonderful company at a fair price than a fair company at a wonderful price; Charlie Munger understood this early, he himself was a slow learner [38]. In the same letter: time is the friend of the wonderful business, the enemy of the mediocre [38].

Buffett is also the investor who puts numbers on his mistakes most openly. His first mistake, he wrote in 1989, was buying Berkshire itself, a textile company whose poor prospects he knew but which enticed him with its low price [38]. In 2007 he called the 1993 purchase of the shoemaker Dexter his worst deal: because he paid with Berkshire shares, it cost the shareholders not $400 million but $3.5 billion [124]; by 2014 the shares given up for it were worth around $5.7 billion, and he wrote that the company's competitive strengths were lost to foreign competition and that he "simply didn't see that coming" [125]. In 2025 he called delaying the correction of a mistake the cardinal sin [126].

What research says about Buffett's success

In 2013 (journal version 2018) Andrea Frazzini, David Kabiller and Lasse Pedersen took apart the record of Berkshire's stock from November 1976 to 2011. It returned 19.0% a year above the rate on short-term US Treasury bills, with a volatility of 24.9%; the Sharpe ratio was 0.76, nearly twice the market's 0.39 [127]. A dollar from November 1976 was worth more than $1,500 at the end of 2011 [127].

The explanation is less spectacular than the reputation. Buffett used moderate leverage of about 1.6 to 1 on average, mainly through the money that insurance customers pay in advance; this financing cost him only 2.2% a year on average, more than three percentage points below the Treasury bill rate [127]. And he bought stocks that were cheap, safe and of high quality. Once you control for the factors "Betting Against Beta" (calm stocks) and "Quality Minus Junk" (quality), Buffett's excess return can no longer be statistically distinguished from zero [127]. The authors conclude that his returns are neither luck nor magic but the reward for leverage and a focus on cheap, safe, quality stocks [127]. Their most remarkable sentence: the Sharpe ratio of 0.76 might be lower than many investors imagine [127]. Buffett's edge came from a well-founded rule that he applied decades before it was described scientifically and kept through all the bad years.

The Superinvestors of Graham-and-Doddsville

In 1984 Buffett gave a speech at Columbia Business School marking the fiftieth anniversary of Graham and Dodd's textbook. He met the objection that his success was chance with a parable: if 225 million people flip a coin every morning, about 215 are left after twenty rounds who called it right every time, and with 225 million orangutans it would be just the same [118]. What matters, though, is whether the winners come from the same "village". Then he showed the results of nine investors who had learned from Graham or adopted his teaching.

Walter Schloss, who according to Buffett diversified enormously and owned well over 100 stocks that cost less than they would have been worth to a private owner, returned 21.3% a year before profit share from 1956 to early 1984, the S&P 500 8.4% [118]. Tweedy, Browne returned 20.0% from 1968 to 1983 [118], Bill Ruane's Sequoia Fund 18.2% against 10.0% from 1970 to 1984 [118], Rick Guerin's Pacific Partners 32.9% against 7.8% from 1965 to 1983 [118], Stan Perlmeter 23.0% from 1965 to 1983 [118]. Their portfolios hardly overlapped; all they had in common, according to Buffett, was that they are "mentally, always buying the business, not buying the stock" [118].

The tables also show the hard years. Charlie Munger, whose partnership returned 19.8% a year from 1962 to 1975 against 5.0% for the Dow, lost 31.9% in 1973 and 31.5% in 1974 [118]. Guerin lost 42.1% in 1973 and 34.4% in 1974 [118]. With concentrated portfolios, high returns and deep setbacks go together.

Buffett names the honest limit himself: had he only recently searched among thousands of records to pick out a few names, he would advise you to stop reading right there [118]. He says he knew the nine beforehand. The tables have not been independently verified, and in one table the comparison figure labelled S&P 500 arithmetically matches the Dow column [118]. The results are not adjusted for risk.

Charlie Munger: the most expensive mistakes are the purchases that never happened

Munger moved Buffett from buying cheap, mediocre companies to buying good companies at fair prices; Buffett later called this the lesson that broke his cigar-butt habits [125]. In his retrospective on Berkshire's fiftieth year Munger wrote that Buffett displayed "almost inhuman patience" and seldom bought [125]. His record of mistakes is unusual: mistakes of commission were common, he wrote, but almost all the huge errors were purchases not made, such as Walmart when that was sure to work out well; Berkshire's net worth would be at least $50 billion higher if it had recognised several such opportunities [125]. That is Munger's own estimate, not a calculation.

John Neff: three points, thirty-one years

John Neff managed Vanguard's Windsor fund from June 1964 to the end of 1995. He bought large companies at below-average price-earnings ratios. According to Forbes the fund returned 13.8% a year over those 31 years; $10,000 became $587,000, against $248,000 in the S&P 500 [120]. Our recalculation with Shiller's data gives 10.7% a year for the S&P 500 over this period, consistent with Forbes [53]. Three percentage points a year sound modest; over three decades they turn into more than double the final wealth. The figure comes from Forbes.

Peter Lynch: 29% a year and a hundred missed ten-baggers

Peter Lynch ran Fidelity's Magellan fund from May 1977 to May 1990. In an interview with the television broadcaster PBS in 1996 he said that $1,000 had become $28,000 over those thirteen years [95]. That is 29.2% a year. According to Shiller's data the S&P 500 with dividends returned 15.1% a year over the same period [53]. The figure is Lynch's own.

Lynch's sentences from this interview are the lesson in brief: if you're good, you're right six times out of ten, never nine times out of ten. You have to let the big ones make up for your mistakes. Many investors sell stocks after a gain of 20 or 30% and hold on to the losers, which is like watering the weeds and cutting out the flowers [95]. And his most surprising admission: he once listed over a hundred stocks that went up more than tenfold during his time at Magellan, and he owned not a single one of them, although he owned thousands of stocks [95].

The story of the Magellan investor who on average lost money, by contrast, is not documented. A 1996 newspaper report quotes Fidelity as saying it had never done such a study, and the data provider named also denied it [115]. All that is documented is Lynch's own observation that in his first three years around one third of the shares were redeemed [95]. That fund investors on average do worse than their funds is shown by research in another way (Chapter 28).

Joel Greenblatt and the magic formula

Joel Greenblatt became known for the "magic formula", which ranks companies by two measures: how cheap they are relative to their operating profit and how high their return on capital is. The returns his book states for the formula and his former fund states for itself are not documented. What is documented are independent recalculations. In Finland the formula returned 19.26% a year from 1991 to 2013 against 13.63% for the market; but the simple cheapness metric alone, operating profit relative to enterprise value, returned 20.57%, more than the whole formula [128]. For the USA from 1974 to 2011, Wesley Gray and Tobias Carlisle arrived at the same pattern, according to a book review: the cheapness metric alone beat the magic formula by more than two percentage points a year [129]. According to these recalculations the "magic" lies almost entirely in the price. That fits Chapter 25: quality helps above all when you do not pay too much for it.

Howard Marks: risk is a question of price

Howard Marks, co-founder of the asset manager Oaktree, has written down his thinking over decades in memos to clients, which are public. His sentences belong in any book on valuation. 2003: the most important thing is a solidly based, strongly held estimate of intrinsic value; intelligent investing has to be built on estimates of intrinsic value [86]. On cycles: price swings usually overstate the swings in fundamentals, and extrapolating trends is one of the most dangerous things an investor can do [86]. 2015, on risk: most investors think quality, as opposed to price, determines whether something is risky; yet low-quality assets can be safe too, it is just a matter of the price [105]. And on the trade-offs: if you concentrate your portfolio, your mistakes will kill you; if you employ leverage, your mistakes will be magnified [105].

John Templeton: bargains among quality stocks

From 1954 John Templeton searched the world for cheap stocks with the Templeton Growth Fund. He wrote down his principles himself, in 1993, in sixteen rules for investment success [130]. If you buy the same securities everyone else is buying, you will have the same results as everyone else. When buying stocks, search for bargains among quality stocks. Buy value, not market trends or the economic outlook. Determining quality in a stock, he wrote, is like reviewing a restaurant: you don't expect it to be 100% perfect, but before it gets three or four stars you want it to be superior [130]. And on mistakes: the only way to avoid mistakes is not to invest, which is the biggest mistake of all; the investor who says "This time is different" has uttered among the four most costly words in the annals of investing [130].

Jim Simons: the counterexample

The best documented record in financial history belongs to no value investor. According to an analysis by Bradford Cornell, the Medallion fund of Renaissance Technologies, founded by the mathematician Jim Simons, turned $100 into $398.7 million before fees from 1988 to 2018, which is 63.3% a year, without a single losing year; the US total market returned 9.98% a year over the same period [131]. After the very high fees the arithmetic mean of the annual returns was 39.2%; compounded, Cornell's table yields an annual rate of around 38% [131]. Renaissance itself publishes no numbers; Cornell takes them from the book by the journalist Gregory Zuckerman.

Medallion is the counterexample to everyone else in this chapter: thousands of positions, very short holding periods, statistics instead of company valuation. You cannot buy this return: the Renaissance funds open to outsiders do not, according to Zuckerman, follow the same strategy and earn "relatively mundane" returns [131]. According to Zuckerman, as reported by Cornell, Medallion was right on only about 50.75% of its trades [131]; the edge came from the mass of small advantages. Cornell finds no explanation that would be compatible with a perfectly efficient market [131]. For private investors this is no model, but it is evidence: markets are not perfect, and anyone who finds mispricings can exploit them. Only the mispricings a private investor can exploit are the slow ones, not the fast ones.

A view from the German-speaking world: André Kostolany

One of the best-known stock market storytellers of the German-speaking world, André Kostolany, was a private speculator and writer; there is no audited return series for him. What is documented is an interview with the news magazine DER SPIEGEL from October 1997. In it he said it was pure superstition to expect a crash on the same day or in the same month, and about the many new investors: a public that has neither training nor principles is very dangerous [132]. His tersest sentence from that conversation fits Chapter 24: markets need no reason [132].

> **Not documented**
>
> These frequently cited numbers and sayings are not in this chapter because they could not be found in any source: Graham's supposed 20% or so a year over twenty years; the Magellan investor who is said to have lost money on average; the returns of Howard Marks, John Templeton, Seth Klarman, Philip Fisher and Anthony Bolton; the returns Joel Greenblatt states for his former fund and for the magic formula; many sayings attributed to André Kostolany. A number without a source is a story.

The case against

The legends in this chapter are a selection of winners, and that is their biggest problem. For every investor who was ahead for thirty years there were many who failed with similar ideas and whom nobody talks about any more. Buffett formulated the objection himself in 1984 [118]; it cannot be entirely dispelled. The numbers are also of very different quality: the Berkshire table is audited and public, Lynch's figure is a statement in an interview, Neff's comes from a magazine, the superinvestors' tables from a speech. They are almost never adjusted for risk, and some apply before fees, others after. Finally, many of these results belong to a time when fewer people analysed financial statements systematically. What was an edge in 1960 is partly in prices today. Keynes, Graham and Buffett himself show that even the best go through long stretches behind the market; Buffett trailed in four of the last ten years [119].

What this means in practice

- **The legends are evidence for principles, not for persons.** Anyone who wants to imitate Buffett does better to copy his rules (price against value, quality, patience) than his purchases.
- **Trailing is part of it.** Keynes was 17% behind after eight years [116], Graham was below the market for eleven years [117], Munger twice lost a third [118]. A method you give up after two weak years can never show its strength.
- **A few winners carry everything.** GEICO for Graham, the big winners for Lynch: the skew of returns from Chapter 23 applies to the best as well. Anyone who sells their winners too early cuts away exactly the part that makes the difference.
- **Distrust the pretty number.** Many figures about the legends are undocumented. A number without a source is a story.

IN SHORT

- As a market timer Keynes was a cumulative 17% behind by 1929 and beat the market only as a selector of a few well-understood companies.
- Graham's fund trailed the S&P 500 after costs from 1945 to 1956, with far less risk; what made him rich was a single quality stock.
- Berkshire returned 19.7% against 10.5% a year from 1965 to 2025; research explains this with cheap, safe, quality stocks, moderate leverage and stamina.
- Lynch returned 29% against 15% a year and, by his own account, missed more than a hundred ten-baggers.
- Many figures about the legends are undocumented; the documented ones show long dry spells and openly named mistakes.

CHAPTER 30

What the legends had in common

Eight principles, and what research confirms of them

> *"... these investors are, mentally, always buying the business, not buying the stock."*
>
> Warren Buffett, "The Superinvestors of Graham-and-Doddsville", 1984 [118]

Anyone who reads the life stories of great investors is looking for the secret. There must be something that Keynes, Graham, Buffett, Munger, Templeton and Lynch knew and others did not. The answer from Chapter 29 is sobering and comforting at once: what they had in common is boring, it fits on one page, and research confirmed most of it decades later in large data sets. The most remarkable number on this comes from the study of Buffett himself: once you take into account that he bought cheap, safe, quality stocks with moderate leverage, statistically nothing unexplained remains of his edge [127]. His success was not a mystery but a rule he stuck to for sixty years. What was rare was not the knowledge but the stamina.

Table 12 Eight principles of the legends and what research says about them

Principle	who said it	what research shows	Limit
Price against value	Graham, Buffett, Templeton, Marks	value premium in almost all major markets (Fama, French 1998)	value can lose for a decade (2007 to 2020)
Quality at a fair price	Buffett 1989, Templeton, Keynes, Munger	profitability earns more although it is plain to see (Novy-Marx 2013); the market pays too little for quality (Asness et al. 2019)	hardly detectable before 1963 (Linnainmaa, Roberts 2018)
No market timing	Buffett 1963, Keynes 1938, Kostolany 1997	valuation hardly predicts the next year (Goyal, Welch 2008); Keynes without timing success (Chambers, Dimson 2013)	over ten years valuation says a lot
Patience and little trading	Munger 2014, Lynch 1996	those who traded most earned least (Barber, Odean 2000)	1990s data with high costs
Let winners run, correct mistakes quickly	Lynch 1996, Buffett 2025	disposition effect: winners sold did better than losers held (Odean 1998)	one broker, 1987 to 1993
Independent of the crowd's judgement	Buffett 1965, Templeton 1993, Marks 2015	investors buy what grabs attention (Barber, Odean 2008); money follows last year's winners (Sirri, Tufano 1998)	direction documented, size differs by study
Little or cheap leverage	Graham 1976, Marks 2015	Buffett used moderate, cheap leverage (Frazzini et al. 2018)	leverage helped Buffett, hurt Graham in 1929
Concentration or diversification	Keynes: few; Lynch: thousands; Marks: concentration kills when you are wrong	a few stocks carry all the gains (Bessembinder 2018)	no agreement among the legends

1. Price against value

No sentence unites the legends as much as this one. Graham wrote that market quotations are there for the investor's convenience, either to be taken advantage of or to be ignored [18]. Buffett wrote in 1987 that Mr. Market is there to serve you, not to guide you [123]. Templeton: buy value, not market trends or the economic outlook [130]. Howard Marks: the most important thing is a solidly based, strongly held estimate of intrinsic value [86].

Research has confirmed this principle in almost every market [71] [72] and at the same time qualified it: the larger part of the valuation differences between companies is justified, only the rest is mispricing [73], and from 2007 to 2020 value lost against growth more heavily than at any time since 1963 [76]. The numbers are in Chapter 24. The principle is right; it needs time and a second question.

2. Quality at a fair price

Almost all the legends asked the second question at some point, often after an expensive mistake. Buffett called the purchase of a textile company that looked cheap his first big mistake [38], and wrote that it is far better to buy a wonderful company at a fair price than a fair company at a wonderful price

[38]. Templeton advised searching for bargains among quality stocks [130]. Keynes wanted to put his money into enterprises in whose management he thoroughly believed [116]. And Graham, the teacher of the cheap stock, owed his fortune to a quality company, GEICO [117].

Research confirms this with numbers that are in Chapter 25: profitable companies earned more although they were more expensive [7]; the stock market pays too little for quality [8]; and among the cheapest stocks fewer than half beat the market, but the financially strong ones did so clearly [5]. Buffett's own return can to a large extent be explained by the quality factor [127]. The honest qualification: before 1963 the quality premium is hardly visible in the data [85].

3. No market timing

In 1963 Buffett wrote to his partners that he was not in the business of predicting general stock market or business fluctuations [122]. Keynes tried it in the 1920s and was well behind the market by 1929; in 1938 he wrote that the switching back and forth needs phenomenal skill [116]. Kostolany said in 1997 that markets need no reason [132].

Research proves them right as far as the next year is concerned: the well-known valuation measures would not have helped an investor get in and out since 1975 [74], economists saw almost no recession a year ahead [63], and Chambers and Dimson find no timing ability in Keynes [116]. But it contradicts too strong a reading: over ten years and more the valuation of the overall market does say something (Chapter 24). No timing does not mean ignoring valuation, it means not misusing it as a calendar.

4. Patience and little trading

Munger described Buffett's "almost inhuman patience": he seldom bought [125]. Lynch advised letting the big ones make up for the mistakes [95]. Research on private investors supplies the mirror image: those who trade most earn least [106], and fund investors earned less than their own funds [66] (Chapter 28). The US data shows why patience works: in a single year cheap stocks were ahead hardly more often than a coin toss, over twenty years almost always [64] (Chapter 24).

5. Let winners run, correct mistakes quickly

Lynch compared selling the winners and holding the losers to watering the weeds and cutting out the flowers [95]. Buffett wrote in 2025 that the cardinal sin is delaying the correction of a mistake [126]. Terrance Odean measured the behaviour both warn against in 10,000 accounts: investors realised gains much more readily than losses, and the winners that were sold did better over the following year than the losers that were held [112]. Here the legends and the data say the same thing.

6. Independent of the crowd's judgement

"We derive no comfort because important people, vocal people, or great numbers of people agree with us. Nor do we derive comfort if they don't," Buffett wrote in 1965 [122]. Templeton: if you buy the same securities everyone else is buying, you will have the same results as everyone else [130]. Marks calls this "second-level thinking": first-level thinking says it's a good company, so let's buy the stock; just about everyone can do that [105]. Research shows why independence is rare: private investors buy what happens to be grabbing attention [111], fund money follows last year's winners [103], and investors extrapolate past growth too far [3]. Acting differently from the crowd does not automatically earn more; but anyone who acts exactly like the crowd cannot earn more than it does.

7. Little or cheap leverage

Graham lost around 70% from 1929 to 1932, partly because he was working with borrowed money, and called that a mistake he never repeated [117]. Marks: if you employ leverage, your mistakes will be magnified [105]. Buffett, by contrast, did use leverage, but of a special kind: the insurance customers' money cost him 2.2% a year on average, more than three percentage points less than the government paid, and his leverage was around 1.6 to 1 [127]. The lesson of the legends is not "never use leverage" but: only cheap, permanent leverage that is not called in during a crisis. For private investors such leverage is hardly available, and Chapters 11 and 32 tell what the other kind costs.

8. Concentration or diversification: where the legends disagree

Here the common ground ends. Keynes relied on a few large positions and attributed his success to the careful selection of a few investments [116]. Walter Schloss held well over 100 stocks [118], Lynch thousands [95]. Graham taught broad diversification and became rich through a single position [117]. Marks sums up the trade-off: if you concentrate your portfolio, your mistakes will kill you [105].

Research does not settle this dispute, but it shows its price. Because a few stocks generate the bulk of all gains [49], a concentrated portfolio is very likely to miss the big winners; but if it does hit them, the gain is enormous. The legends who succeeded with concentration are precisely the ones we tell stories about today. The many who failed with concentration are in no book. For an investor who does not know whether they are a Keynes, diversification is the choice that makes a single mistake survivable.

What research does not confirm

The legends saw many things correctly, but not everything told about them holds up. There is no evidence that their success came from secret knowledge; the study of Buffett explains it with known factors [127]. There is no evidence that they won every year; several of them had long stretches behind the market (Chapter 29). And there is a strong reason why their edges are harder to repeat today: published effects become considerably weaker on average after publication, because more money follows them [23] (Chapter 31). The principles of the legends are well known today. The discipline to carry them through ten difficult years is not.

The case against

This chapter compares statements by successful investors with research findings. Both have a bias. The legends are survivors, selected because they succeeded; other investors applied the same principles with less luck and never became famous. Research, for its part, confirms principles on average across large groups; it says nothing about whether an individual person can put them into practice. And some principles contradict each other, as the question of concentration shows. What remains is an overlap: price against value, quality, patience, independence, careful handling of leverage and of mistakes. For that there are both role models and data.

What this means in practice

- **Write the principles down before you need them.** All eight principles are easy to understand and hard to live by, because at the decisive moment they run against your feelings.
- **Examine your own leverage honestly.** Even a portfolio without a loan can be leveraged if the money will be needed in two years.

- **Answer the concentration question deliberately.** Anyone who concentrates should know they are betting on the exception; anyone who diversifies should know they are giving up the one really big hit in return.
- **Copy not the persons but their tests.** Buffett's purchases are public and usually long since expensive. His questions, whether the business is good, whether the price is fair and whether you understand the company, are not.

IN SHORT

- What the legends had in common is boring and measurable: price against value, quality, no market timing, patience, independence, cautious leverage.
- Research confirms most of it in large data sets; Buffett's edge can be explained by cheap, safe, quality stocks and moderate leverage.
- The legends disagree on concentration; the skew of returns argues for diversification for anyone who does not know whether they are the exception.
- Published effects become considerably weaker on average afterwards; what is rare is not the knowledge but the stamina.

CHAPTER 31

Our results in the mirror of research

Where this book's evidence fits the literature, where it departs, and what that means

> *"The most important thing is a solidly based, strongly held estimate of intrinsic value."*
>
> Howard Marks, memo "The Most Important Thing", 2003 [86]

The chapters of this part have shown what research has found out about valuation, quality, growth, forecasts, behaviour and the great investors. This chapter sets the published results of this book beside it: the backtest and the live test from Chapter 15 and the hand-kept tests from Chapter 16. The question is not whether our numbers look good. It is: do they fit what one would expect after decades of independent research? Where they fit, both gain credibility. Where they depart, an explanation is needed, and sometimes the honest explanation is that we do not know yet.

One expectation is worth breaking up front. One might think a good backtest is the best evidence for a method. Research says otherwise: effects published in the literature earned on average 26% less outside their original sample and 58% less after publication [23]; in a strict recalculation of 452 published effects, 65% failed even the simplest statistical hurdle [25]. So a backtest is never more than a hypothesis with good manners. Credibility comes from three other sources: from an economic reason why something should work, from agreement with independent research, and from a test that keeps running in public and without hindsight. This chapter examines the second.

Side by side

Table 13 Statements of the literature against the published results of this book

Statement in the literature	Evidence	our published result	Assessment
Cheap stocks beat expensive ones in the long run	worldwide 7.68 points a year, 1975 to 1995 [71]; USA since 1926 around 2.9 points [64]	backtest from 2001: 11.7% against 8.6% per year, gap +3.1 pp (Chapter 15)	fits in direction and order of magnitude
From 2007 to 2020 value lost more heavily than at any time since 1963	−55% to mid-2020 [76]; USA 2007 to 2020 −7.5 points a year [64]	backtest from 2009: 12.3% against 8.3%, ahead in 12 of 12 review months	departs, see section "Where it departs"
Quality and value complement each other	correlation −0.57, no five-year period with a loss 1963 to 2010 [7]	the buy rules combine value, quality and trend (Chapter 9)	fits the design, not measurable separately
Such strategies do not protect against crashes	momentum crashes 1932 and 2009 [65]; Munger lost around a third in each of 1973 and 1974 [118]	largest drawdown −57.1% against −57.4%, volatility 18.7% against 16.9%	fits
Returns of individual stocks are extremely skewed	a few companies carry the net gain [49]	hand-kept test: some of the stocks lost money, a few outliers carry the average (numbers in Chapter 16)	fits
The convergence of price and value takes years	about three years until it pays off [6]; deviations fade over years [41]	hand-kept test: most stocks reached their fair value, on average after several years (numbers in Chapter 16)	fits
Backtests without failed companies look too good	losses after delisting [28]; majority of stocks behind Treasury bills [49]	test with 2,361 failed companies from the USA and Europe (Chapter 15)	meets the requirement
Costs eat the edge	costs of the active search (Chapter 27) [100]	strategy pays 0.1% per purchase and per sale, market after 0.25% a year in ETF costs	meets the requirement; taxes are missing
It gets weaker after publication	−26% out of sample, −58% after publication [23]	live test since July 2026: +8.0% against −2.0%	still too young for a verdict

Where it fits

The direction of the edge. That a strategy which buys only stocks below their estimated value stays ahead of a broad market over a quarter of a century is what the literature would lead one to expect. The order of magnitude is plausible: the academic value premiums of 6 to 8 percentage points a year [71] [72] measure a portfolio that buys cheap stocks and sells expensive ones short, before costs. A portfolio that only buys, pays costs and is measured against a worldwide index should show considerably less. The gap of +3.1 pp a year from 2001 lies within this range.

The risks. According to Chapter 15 the strategy carries roughly the same largest drawdown as the market and swings a little more. That matches the literature: neither value nor quality nor trend protects against crises, and concentrated portfolios fluctuate more than the broad market; Munger twice lost around a third, in 1973 and 1974 [118]. A result that had got by without any notable drawdowns would be suspicious in the light of research.

The skew and the duration. The hand-kept test from Chapter 16 shows on a small scale what Bessembinder shows on a large one: some of the stocks lost money, and a few outliers lifted the average far above the typical stock. That most stocks reached their fair value only after years fits the finding that valuation differences fade over several years [6] [41] and that valuation explains a lot over decades and little over a single year (Chapter 24).

The design of the tests. The literature names three traps that backtests fall into: missing failed companies, missing costs and a convenient benchmark. The backtest in Chapter 15 includes 2,361 failed companies, charges costs for every purchase and sale, and measures against the MSCI ACWI Equal Weighted, a worldwide index in which every stock counts the same. That is no proof, but it avoids the best-known mistakes.

Where it departs

The value drought. The most striking difference concerns the years after 2007. In the literature and in Kenneth French's data, cheap stocks lost against expensive ones in this period more heavily than at any time since the 1960s [76] [64]. The backtest of this book, by contrast, shows an edge over the market for the period from 2009 as well. How does that fit together?

The literature offers several possible explanations, which we cannot weigh against each other. First, the value studies measure a pure sort on a single valuation measure, usually book-to-market; this very measure suffered especially after 2007, while valuations based on earnings did considerably better [77]. Second, the buy rules of this book combine value with quality and trend (Chapter 9). In the literature profitable companies clearly did better than weak ones in the years 2007 to 2020 as well [64], profitability and value run against each other and complement each other [7], and value and momentum are negatively correlated [72]. Third, the benchmark is a different one: the value studies compare cheap with expensive stocks, the backtest compares a portfolio with a broad world index.

The honest fourth possibility is in Chapter 15 itself: the rules were chosen on the same history on which they were tested. Research shows how much such selection can flatter a result [24]. That is why the live test matters, and why the comparison with independent literature that did not know our rules is a better touchstone than any further variant of the backtest.

The live test. Since July 2026 the portfolio has been running in public and most recently stood at +8.0% against −2.0% for the market. The literature urges caution twice over. Such a short period says almost nothing statistically; in the US data value was ahead in a single year hardly more often than a coin toss [64]. And anyone who takes the literature seriously expects a live result to come out weaker over the years than a backtest, as research shows on average for published effects [23]. A weak live year would therefore be no proof against the method, a strong one no proof for it.

What research says about our limits

The comparison has limits, and naming them is part of being honest. The literature almost always measures factors, that is, long-short portfolios (good stocks bought, bad ones sold short) across thousands of stocks before costs; a portfolio of 15 stocks is something different and its results scatter far more widely. Most studies come from the USA, our tests cover the USA and Europe. Many findings, especially on quality, are much weaker in the decades before their discovery [85], and on average after their publication too [23]. And finally: the hand-kept test in Chapter 16 was kept by hand on a small selection and stands there as it was recorded; the automated backtest tests the same idea on a much larger scale. Together the two are an indication, not a law.

The case against

One can object to this chapter that every comparison with the literature is a selection: whoever searches will find a study that fits their numbers. That is why we have listed the opposing findings in every chapter of this part, including those that speak against our method: the long value drought, the weakness of the quality premium before 1963, the decay of published effects, the impossibility of timing the market over one year. A second objection: the literature measures averages over decades, a reader experiences only their own years. Even a method that works on average can trail the market in the ten years in which a person actually invests.

What this means in practice

- **A backtest is a hypothesis.** That applies to ours just as to any other. It becomes more credible when it fits independent research, is calculated honestly and keeps running in public.
- **Departures are more interesting than agreements.** The question of why the backtest was ahead during the value drought is open. Anyone who considers it settled stops testing the method.
- **Set expectations for the future lower than for the past.** Research shows weaker results on average after publication. Anyone who counts on less is disappointed less often and is more likely to stay the course.

IN SHORT

- In direction and order of magnitude the backtest's edge fits decades of value research, and so does its risk.
- The skew and the long convergence in the hand-kept test match what the literature shows about individual stocks.
- The biggest departure is the period from 2007: pure value suffered, the backtest was ahead; the literature offers several explanations, the matter is not settled.
- Published effects become weaker on average; a live result should be expected to be lower than a backtest.

CHAPTER 32

Where this method comes from

A boy in Graz, a hundred books and a green lamp

> *"... the stock market serves as a relocation center at which money is moved from the active to the patient."*
>
> Warren Buffett, letter to the shareholders of Berkshire Hathaway for 1991 [33]

Everything in this handbook has a history, and I think you should know it before you trust the method. It did not start in a bank or at a fund. It started in 2004 in Graz, Austria. I was fourteen and could not get one question out of my head: how is it possible that a few investors build wealth with stocks decade after decade, while friends and relatives call the stock market a place where you lose house and home?

I answered the question the slow way. Over the next sixteen years I read more than a hundred books about the stock market, ordered one by one online. In the handbook I wrote in 2020 I did the sum: the books cost about 5,000 euros, and the same money put into the shares of the bookseller in 2004 would have multiplied about a hundred times. Education pays the best interest, people say. In this one case the shares would have paid more.

Two expensive lessons

At eighteen I made quick money with a single stock and decided I had a talent. I moved on to leveraged certificates, read candlesticks, trend lines and oscillators on several time frames, and refreshed the index on my phone even in the bathtub. Then the account was empty. That was lesson one: leverage and constant trading are a way to transfer money to the issuer.

While I licked my wounds I remembered a demo portfolio I had opened after a school stock market game: a handful of blue chips, bought once and forgotten. I reset the password and looked. It had roughly quadrupled between 2004 and 2008 without a single decision from me. The forgotten portfolio had beaten all my clever activity by a wide margin.

Lesson two came in the financial crisis. I rebuilt my portfolio with jobs and pocket money, watched it fall in 2008, and bet on falling prices almost exactly at the low. The market turned and the savings were gone a second time. Since then I have not used leverage or tried to time the market. Chapter 11 of this handbook grew out of those years.

The green lamp

After school and civilian service in a hospital I studied dentistry, like my father, and I run a dental practice today. The stock market never let go of me. In my student flat, a dark place with windows on one side only, I built a small office from a coffee table, a chair and a lamp with a green shade. It was the kind of lamp you would expect in a law firm. I called it the thinkers' club lamp. Under it I read annual reports, hundreds of them.

Reading annual reports is nobody's hobby, and without a business degree most of the numbers remain a closed book. But if you want to know what a company is worth, there is no way around them. Every established valuation method I studied had its merit, and all of them had one thing in common: hard to

learn and hard to apply for a normal person. So I looked for a way to get from a few reported numbers to a reasonable estimate of value, fast, and to test honestly whether it works.

I combined figures from the reports into formulas, first on paper. Calculating every stock by hand became tedious, so I had the formulas programmed and put the calculators on a website. That website is the reason this book exists.

In a few sentences

I built the Fair Value Calculator for myself first. It was never the plan to sell anything. I needed more and more tools, hired programmers, and decided it would be a pity if nobody else could use the method.

IN SHORT

- The method began in 2004 in Graz with one question and more than a hundred books about the stock market.
- Two expensive lessons: leveraged certificates after a quick first gain at eighteen, and the bet on falling prices almost at the low of 2008.
- The forgotten demo portfolio from school beat all the activity by a wide margin.
- Annual reports under the green lamp became formulas, and the formulas became calculators on a website.

CHAPTER 33

Ten years in public: the dated record

What was built when, each line with its source

Many products claim a long history. Ours can be checked. On 20 March 2016 fairvalue-calculator.com went online, and one day later I presented it in a large German investor forum and asked the members to test it. That thread still exists. It has grown to eight pages over ten years, and it contains what no company history written afterwards can offer: dated posts, concrete numbers, mistakes found by strangers, and my answers at the time.

The list below follows that record. After each line you see what kind of source carries it: a publication dated in public at the time, the handbook I published in 2020, or my own account where no outside record exists. The numbers in brackets point to the list of sources at the end of this part.

2004	Aged 14 in Graz, Peter Klein starts studying stocks and reads more than a hundred investing books over the following years. handbook 2020 [S9]
2004 to 2009	Apprentice years: losses with leveraged certificates, a forgotten demo portfolio of blue chips that quadruples between 2004 and 2008, and a lost short bet at the bottom of the financial crisis. The conclusion: long-term investing by value. handbook 2020 [S9]

2013	During his studies he writes his own valuation formulas by hand and runs first backtests. This is his own account; there is no public third-party record dated 2013. own account [S9]
20 March 2016	fairvalue-calculator.com goes online: a free calculator that estimates intrinsic value from earnings per share and growth, based on an extended Graham formula tuned to approximate a discounted cash flow valuation. dated in public at the time [S1]
21 March 2016	Public launch post in the German Wertpapier-Forum (user name petz00711), asking for tests. The very first post already invites users to publish their calculated fair values so that other investors can find new ideas. dated in public at the time [S1]
21 to 26 March 2016	Forum members test the calculator at once and find weaknesses: too little openness about the formula, implausible results for very small earnings, the stock split problem, and two inputs being too few for cyclical companies. On 22 March the calculator is adjusted for small earnings. dated in public at the time [S1]
30 March 2016	Start of the public wikifolio "Fair Value Calculator": a public model portfolio run by the method; the creation date is recorded by the provider. dated in public at the time [S10, S9]
3 June 2016	First larger backtest published in the forum (33 German and US stocks, 2005 to 2015), kept by hand on a small selection of his own. The hand-kept test is continued to 2025; today the automated 34-year test with companies that no longer exist stands beside it. dated in public at the time [S2]
12 to 15 June 2016	Three helper calculators (weighted earnings, linear and weighted growth), a tutorial video and a first indicator showing whether the whole market is over- or undervalued. dated in public at the time [S3]
15 September 2016	New website with database and hotlist: users enter fair values, much like Wikipedia, and check each other. First list of 18 stocks that appear undervalued. dated in public at the time [S3]
19 July 2017	Community database with more than 100 entries, an automatic hotlist and a way to report wrong values (three reports trigger a review). dated in public at the time [S3, S4]
8 May 2019	Relaunch after two years of development: automatic valuation from a large database, screener, watchlist, two languages, plus a premium area for diversified portfolios. dated in public at the time [S4]
4 December 2019	Detailed calculator in answer to the criticism "two inputs are too few": earnings growth, profitability, revenue growth, return on equity, EBIT margin and book value now feed in, weighted by his own statistical analysis. dated in public at the time [S4]
18 March 2020	After criticism of data quality and cyclical stocks: smoothing by median and geometric mean, a warning for highly leveraged companies, stars for data quality, a freshness indicator. dated in public at the time [S5]
2020	The handbook "Die Fair Value Calculator Methode" (77 pages) documents the method and the tools: automatic fair values for more than 33,000 stocks, market analysis, sector analysis, quality check, total score, watchlist and portfolio manager. handbook 2020 [S9]

24 July 2020	Discounted cash flow and the PEG ratio are integrated as further valuations. dated in public at the time [S6]
8 January 2021	Several valuation methods are computed automatically and combined into one fair value. A video series of six lessons follows. dated in public at the time [S6]
14 November 2021	Star ratings from fundamentals and price trend, industry comparison for every metric, a reworked market view. dated in public at the time [S6]
21 April 2022	Free version: all tools and five stocks a month at no cost. Mobile optimisation follows in June 2022. dated in public at the time [S6]
16 March 2024	The model blend is explained openly: more than twelve methods, among them DCF, analyst estimates, peer multiples, Peter Lynch and Graham. The sentence that goes with it: "There is no single correct fair value, but there are many methods to get as close to it as possible." dated in public at the time [S6]
8 September 2025	AI valuation for soft factors: brand strength, management quality, competitive advantages and scalability complement the numbers. dated in public at the time [S6]
28 July 2026	In its tenth year, the complete rebuild: about 35,000 stocks worldwide, valuation and quality as two separate questions, a range from cautious to optimistic case, the data coverage per stock, a portfolio optimizer and a 34-year test. dated in public at the time [S6, S7]
August 2026	Public corrections after hints from the forum: an error with one-off losses (Amazon, Rivian) is fixed, the cap on downside potential at 80% is removed, the search finds stocks by name, ISIN, German WKN and ticker. dated in public at the time [S7, S8]
October 2026	Current state: 26 valuation models, up to 37 quality factors, about 40,000 valued stocks, an AI verdict with the main risk per stock, user comments and votes, a free academy of 22 lessons and a connection for AI assistants. own account [S11]

In one sentence

Publicly documented since 20 March 2016: grown from a self-developed online calculator into a global platform for fair value and quality over more than ten years.

One detail from the first post matters to me. It already asked users to publish the fair values they had calculated, so that other investors could discover new ideas. The comments and votes you find on every stock today are that same thought, ten years later.

IN SHORT

- fairvalue-calculator.com has been public since 20 March 2016; one day later it was presented in a large German investor forum.
- The forum thread still exists; it contains dated posts, numbers, mistakes that were found and the answers from that time.
- Every line of the record names the kind of source that carries it.
- The request to share calculated fair values is already in the first post; the comments on every stock are that same thought.

CHAPTER 34

What the critics changed

Why the public arguments are the best part of the record

> *"He who knows only his own side of the case, knows little of that."*
>
> John Stuart Mill, "On Liberty" (1859), chapter 2 [133]

The forum was not kind. Within hours members called the formula a black box, demanded statistical proof, found a problem with stock splits and pointed out that two inputs cannot value a cyclical company. They were right more often than I liked at the time.

I keep these arguments in this handbook on purpose. A history that only shows applause proves nothing. A history in which outsiders find errors and the product changes in response is hard to invent afterwards. Here are the main objections and what became of it.

Year	The objection	What became of it
2016	The formula is a black box; proof needs a hundred stocks and more than ten years. [S1]	Today the methodology is published on the site, the test covers 34 years and is adjusted for companies that no longer exist.
2016	Two inputs (earnings and growth) are not enough for cyclical companies and tough industries. [S1]	Two inputs became 26 models with their own rules for each type of business (banks, insurers, real estate, holdings), plus a separate Quality Score from up to 37 factors.
2016	A stock split changes the result, which must not happen. [S2]	Every figure is computed per share on the current share count, splits are checked and adjusted daily.

Year	The objection	What became of it
2020	The best formula is useless if some of the underlying data is wrong. [S5]	Every stock shows its data coverage. Where the data is too thin, the fair value is withheld rather than showing a wrong number.
2020	Return on equity misleads when debt is high; return on capital employed is better. [S5]	Balance sheet strength is a family of its own in the Quality Score, high leverage is scored and shown, and return on invested capital is available in the screener.
2026	Growth stocks look permanently overvalued. [S7]	The fair value stays deliberately sober ("a yardstick, not a price target"); in return the site shows openly how much growth the price assumes, and a documented allowance for quality growth was added.

FROM THE ENGINE ROOM

A dividend with a minus sign

In October 2026, while answering a question from the forum, we noticed a dividend with a minus sign. We looked and found the same sign at a great many companies. The first reflex: the data was delivered wrong.

It was delivered correctly. Today's delivery showed the same amount with a plus sign. The error came from older deliveries, it had long been corrected, and the correction had never reached us. The reason was a safeguard we had built ourselves: it was meant to keep bad numbers out, and it kept the correction out along with them.

When we measured again, it turned out that this did not only affect dividends. We brought the corrections in afterwards, but not blindly: on review, the more recent number was the wrong one several times.

So the objection from 2020 still holds: the best formula is useless if the underlying data is wrong. What is new is that before we say "the delivery is to blame", we first put our own records next to today's delivery.

A round from November 2026: Lennox

How criticism works today is shown by a round from November 2026. A reader in the forum challenged the fair value of Lennox, the maker of heating and air-conditioning systems, and marked five rows of the model table that seemed nonsensical to him: the PEG model (the price-earnings ratio relative to growth), the two dividend models, the book value model and the asset model.

He was right about three of the five rows.

- **The two dividend models** counted only the cash dividend, although Lennox returns the larger part to its shareholders through buybacks of its own shares. They now count the total payout, buybacks included.
- **The PEG model** left out the dividend, although Peter Lynch, who devised it, counts it. It now counts it. We discarded a version that would have needed today's price: a valuation model should not depend on the price of the same stock.
- **The two remaining rows** we checked, kept and explained better.

The round changed nothing about the fair value of Lennox. The post came, like the discussions of 2016, from the Wertpapier-Forum; its address is given in the Sources for Part V.

That the review of this round itself contained a measurement error, which we found the same day, is the story of Chapter 21. It changed nothing about the answer in the forum: even after the clean measurement, the affected fair values were on average closer to the later price, and the ranking of the stocks did not change.

The pattern is the same as in 2016: an outsider finds a weakness, we check it against the logic and against the data, and what is logically right and does no harm in the data gets built in. Only the speed is new. This time only hours passed between the post and the change going live.

About the early numbers

The tests I posted in 2016 and printed in the 2020 handbook were kept by hand on a small selection of stocks; their results stand in Chapter 16. The figures of Chapter 15 come from the later automated test over 34 years, which includes companies that no longer exist, and from the live test since July 2026. Both are historical results, not a promise.

IN SHORT

- The criticism in the forum came within hours: black box, missing proof, stock splits, cyclical companies.
- The critics were right more often than I liked at the time.
- The objections turned into the open methodology, more models with rules per type of business, the data coverage and the Quality Score.
- A history in which outsiders find errors and the product changes in response is hard to invent afterwards.

CHAPTER 35

The original and where it stands today

What is proven, what is my own account, and what the platform does now

> *"If I have seen further, it is by standing on ye shoulders of giants."*
>
> Isaac Newton, letter to Robert Hooke of 5 February 1675, 1676 by today's reckoning [134], spelling modernised

What the sources prove

- A public, usable online calculator for the intrinsic value of stocks existed under this name and at this address on 20 March 2016, with a launch post dated the next day.
- The public model portfolio by the method was created on 30 March 2016 and is still listed by its provider.

- Screener, watchlist, automatic valuation from a database, a combination of several models, quality checks, a market valuation indicator and an AI valuation of soft factors each appear in dated public posts between 2016 and 2025.
- The development never stopped: every year from 2016 to 2026 has dated entries.

What is my own account

- The years before the launch: the first formulas and tests during my studies in 2013 and my private investing before 2016. I describe them as I remember them. No outside record with a date exists for them.

What I do not claim

I did not invent fair value. Benjamin Graham described the intrinsic value of a stock in the 1930s, and discounted cash flow is older than I am. What is mine is the product: the specific combination of models, the long public development and the decision to make this kind of analysis usable for private investors.

In recent years large financial websites have added automatic fair value figures of their own. I take that as confirmation that the idea was right. I cannot say and do not say that anyone copied anything. What I can say is simple: when you read Fair Value Calculator, this is the one that has carried the name in public since March 2016, and you can check every step of it.

Where the platform stands today

The single calculator of 2016 took two numbers. The platform of today values 40,000+ stocks worldwide with 26 valuation models and scores each company on up to 37 quality factors. Valuation and quality are two separate questions: whether a stock is cheap, and whether the business is good.

- Fair value as a range: a cautious, a middle and an optimistic case instead of one number that pretends to be exact.
- Three buy rules on every stock (fair value, quality, uptrend), with the trend shaded in the chart and a five-year forecast.
- The data coverage of every stock. Where the data is too thin, the fair value is withheld rather than shown wrong.
- A verdict per stock in one badge, with its strongest point or its main risk, and an AI analysis of the business with its risks and scenarios.
- A watchlist that reads like a portfolio check: valuation, quality and diversification at a glance, the status by the sell rules, an email alert, and an optimizer that suggests stocks which fit what you already hold.
- A backtest over 34 years with companies that failed, and a live test that runs in public.
- Comments and votes on every stock, the community idea from the first post of 2016.
- A free academy of 22 short video lessons, and a connection that lets 9 AI assistants and developer tools read the valuations directly.
- A methodology page that explains the models, the data sources and the limits in the open.

Browsing and valuing single stocks is free. The method is the same one this handbook teaches: separate price from value, insist on quality, diversify, and give it time.

Sources for Part V

All sources were read again on 11 October 2026. The forum thread is in German.

[S1] Wertpapier-Forum, thread "Fair Value Calculator", page 1: launch post of 21 March 2016 and first criticism. https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/

[S2] Wertpapier-Forum, page 2: backtests March to June 2016, stock split debate. https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/page/2/

[S3] Wertpapier-Forum, page 3: helper calculators, tutorial video, market valuation, database 2016 and 2017. https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/page/3/

[S4] Wertpapier-Forum, page 4: relaunch of 8 May 2019, detailed calculator of 4 December 2019. https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/page/4/

[S5] Wertpapier-Forum, page 5: criticism of data and cyclical stocks, replies January to April 2020. https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/page/5/

[S6] Wertpapier-Forum, page 6: 2020 to July 2026 (DCF and PEG, several models, free access, AI valuation, rebuild). https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/page/6/

[S7] Wertpapier-Forum, page 7: feedback and corrections in July and August 2026. https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/page/7/

[S8] Wertpapier-Forum, page 8: discussion up to 27 September 2026. https://www.wertpapier-forum.de/topic/48870-fair-value-calculator/page/8/

[S9] Klein, Peter (2020): "Die Fair Value Calculator Methode. Wahrer Wert schlägt den Markt", handbook, 77 pages (German). https://s0c1cccdcaae15a1c.jimcontent.com/download/version/1609693918/module/9220685476/name/ebook%202020.pdf

[S10] wikifolio "Fair Value Calculator" by Dr. Peter Klein, created on 30 March 2016. https://www.wikifolio.com/de/de/w/wf11224488

[S11] fairvalue-calculator.com: methodology, data and trust, current state. https://www.fairvalue-calculator.com/methodology

IN SHORT

- Proven: a public calculator under this name since 20 March 2016, with dated entries in every year up to 2026.
- My own account covers the years before the launch; no outside record exists for them.
- I did not invent fair value; what is mine is the product.
- Today the platform values 40,000+ stocks with 26 models and scores quality as a separate question.

APPENDIX

Evidence map, glossary and references

The research record, every term in plain language, and the limits

Evidence map

Evidence	Main finding	How it informs the method
Low valuation	Cheap (low P/E, high book-to-market, high value to price) has historically earned higher returns	Fair value at least 30% above the price is the first buy rule
Quality	Profitability, financial strength and clean accounting improve the value universe	Avoid cheap-but-bad value traps: Quality Score of 50 or more
Momentum and trend	Recent relative strength tends to persist	Uptrend as the third buy rule: no falling knives
Mean reversion	Extreme pessimism and overreaction reverse over multi-year horizons	Hold long enough for price and value to meet; sell at the optimistic fair value, review after five years
Diversification	Single-stock outcomes vary widely even when the average works	15 stocks, at most two per sector: portfolios, not heroic one-stock bets

Glossary: every term in plain language

No finance degree needed. Every word you will meet in the tool and in this book, explained for beginners. Skim it once, then come back whenever a term trips you up.

The essentials

- **Fair value:** a defensible estimate (shown as a range) of what a company is truly worth, built from its fundamentals, independent of today's mood-driven share price.
- **Intrinsic value:** the same idea, the "real" worth a business should command based on what it earns and owns.
- **Value gap / upside:** fair value minus price, in per cent. A big positive number means the stock looks cheap against its worth.
- **Margin of safety:** buying meaningfully below fair value, so you are protected if your estimate is a little off.
- **Mean reversion:** over years, price and fundamental value tend to drift back towards each other. This is the engine that makes value investing work.
- **Quality Score:** a score from 0 to 100 from up to 37 fundamental factors (profitability, growth, cash generation, balance-sheet strength, risk and more). It tells you how good the business is, separate from how cheap it is.
- **Data coverage:** how much data backs a fair value: broad, some or thin data. It is not a view on the company.
- **Bear / Base / Bull:** a cautious, a central and an optimistic fair-value estimate, so you see the realistic spread instead of one falsely precise number. The optimistic value is where the strategy sells.

- **Buy rules:** the three conditions of the strategy: fair value at least 30% above the price, a Quality Score of 50 or more, and an uptrend.
- **Uptrend / sideways / downtrend:** the price a month ago against twelve months ago (21 against 252 trading days). Above 0% an uptrend, down to −10% sideways, below that a downtrend. Unknown when the stock has less than a year of prices.
- **Verdict:** the judgement on value, quality and trend. On a feed card it is one sentence, for example "Fair value well above the price, solid quality and an uptrend.", with one line "Plus" and one line "Main risk" below; in the stock window and on the stock page it is a short badge, for example "Meets all rules" or "Undervalued, but in a downtrend".
- **Status (On track / Review):** the rule of the strategy for a holding. Review once the price reaches the optimistic fair value, the Quality Score falls below 50 (the minimum of the buy rule) or the position has been held for five years; otherwise On track.
- **Estimate:** a badge on a stock where no valuation model fits; such a value is never shown as undervalued and triggers no signal.
- **Market cap:** share price times number of shares, the company's total value on the stock market. The tool labels it in size classes from micro to mega.

Profitability and quality

- **Gross profitability:** gross profit divided by total assets; how much raw profit the company squeezes from everything it owns, a hard-to-fake sign of a strong business.
- **Return on assets (ROA):** net profit divided by total assets; how efficiently the company turns its assets into profit.
- **Return on equity (ROE):** net profit divided by shareholders' equity; how much profit is earned on the owners' money.
- **Profit margin:** net profit divided by revenue; how many cents of every sales dollar end up as profit.
- **Asset turnover:** revenue divided by total assets; how much revenue the company generates per dollar of assets.

Growth

- **Revenue growth (year over year):** sales against the prior year; is the business actually expanding?
- **Delta (Δ):** the sign before a metric means change against last year. A rising ROA, gross margin, asset turnover or EBITDA margin means the fundamentals are improving.
- **Equity growth:** how fast shareholders' equity (retained value) is compounding.
- **Asset growth (scored in reverse):** very fast asset growth often precedes weaker future returns, so a slower, disciplined grower can score better.
- **Growth the price assumes:** how much yearly growth today's price already needs to be fair; shown in the tab Growth.

Cash and balance-sheet strength

- **Operating cash flow margin:** operating cash flow divided by revenue; the real cash (not just accounting profit) the core business produces.
- **Free cash flow margin / yield:** free cash flow (what is left after running and maintaining the business) divided by revenue, or by market value; the cash owners can actually use.
- **Accruals quality:** operating cash flow against reported profit. Profits backed by real cash (a ratio near or above 1) are of higher quality than paper profits.

- **Solvency (equity to assets):** the share of the company funded by owners rather than debt. Higher means a stronger, safer balance sheet.
- **Debt to equity:** debt relative to equity; lower leverage means lower financial risk.
- **Altman Z-Score:** a classic bankruptcy-risk score from several balance-sheet ratios; higher means financially safer.
- **Current ratio:** short-term assets against short-term bills: can the company cover the near term?
- **Cash to assets:** cash as a share of assets; a liquidity cushion for tough times or opportunities.
- **Piotroski F-Score:** a checklist from 0 to 9 of fundamental health (profitability, cash, leverage, efficiency). Higher is stronger.

Momentum and risk

- **Price momentum (3, 6, 12 months):** the recent price trend; historically, stocks trending up have tended to keep outperforming in the short term.
- **52-week high proximity:** how close the price is to its one-year high; near the high often signals strength rather than being over-extended.
- **Volatility:** how much the price swings; calmer stocks have historically delivered better risk-adjusted returns.
- **Beta:** sensitivity to overall market moves; low-beta stocks have historically rewarded patient investors.
- **Net share issuance / buybacks:** fewer shares (buybacks) lift per-share value; issuing many new shares dilutes existing owners.

Valuation multiples

- **P/E:** price divided by earnings; what you pay per dollar of annual profit. **P/B:** price divided by book value (net assets). **P/S:** price divided by sales. **EV/EBITDA:** company value including debt divided by operating earnings, a debt-aware multiple. For all of these, lower usually means cheaper.
- **Dividend yield:** the annual dividend as a percentage of the share price.

Terms you will see in the tool

- **Feed:** the list of stock cards on the start page, with strategies, filters and sort orders.
- **Stock window:** the analysis that opens when you tap a card, with the tabs Overview, Fair Value, Quality, Growth and Peers.
- **Watchlist:** your saved stocks, each with its status On track or Review by the sell rules and the performance since you added it.
- **Diversification:** spreading across sectors, regions, company size and correlation so a single bad bet cannot sink your portfolio; shown as a score from 0 to 100.
- **Optimizer:** suggestions for stocks below their fair value, of high quality, that fit your watchlist by measured correlation.
- **Market valuation:** whether the overall market looks cheap, fair or expensive right now, by country on a world map.
- **Backtested Best:** the strategy that shows the stocks from the USA and Europe meeting all three buy rules.
- **Forecast:** the five-year path on the right of the chart with the expected return per year, a hypothetical estimate.

- **MCP / AI connection:** the server that lets AI assistants such as Claude or ChatGPT fetch our valuations instead of guessing (Chapter 8).
- **Few trades / low free float:** extra caution badges on stocks that trade very little or where only a small share of the stock is freely tradable.
- **ESG:** environmental, social and governance: how responsibly a company treats the planet and its people, and how it is run.

Terms from the tests and the research

- **Backtest:** an experiment on the past, a simulation on historical data: what would the rules of the strategy have earned? Past results are no guarantee of future ones (Chapters 15 and 14).
- **Live test:** the portfolio that runs in public on the site, with every position, every buy and every sell and the rule that triggered it (Chapter 15).
- **Survivorship bias:** if you test only the stocks that are still listed today, you test a world without bankruptcies. That is why the backtest also includes companies that later failed, and counts a further loss after a collapse (Chapter 14).
- **Out of sample:** on data a rule did not know while it was being developed, so not only in the time window in which it was discovered.
- **Placebo:** a comparison rule that changes just as much as a new rule, but without any sense behind it, for example a random selection. If the real rule delivers no more than chance, it has learned nothing (Chapter 14).
- **Value check:** our check of whether a change brings the fair value closer to what the stock actually did afterwards (Chapters 14 and 21).
- **Bootstrap:** a procedure that estimates the uncertainty of a result by redrawing the sample many times and recalculating the result each time (Chapter 14).
- **Median:** the value of the typical, middle stock in a series. A few outliers can lift the average far above the median (Chapter 16).
- **Quartile:** the quartiles divide an ordered series into quarters: a quarter of the values lies below the lower quartile, a quarter above the upper one (Chapter 16).
- **Percentage point (point):** the distance between two percentages. 17% against 10% per year is a lead of 7 points.
- **Index and ETF:** an index combines many stocks into one yardstick, for example the market the tests compare against. An ETF is an exchange-traded fund; a low-cost index ETF tracks an index.
- **Momentum:** recent relative strength, which tends to persist for months; listed above in this glossary as price momentum (Chapter 13).
- **Leverage:** investing on credit or with products such as leveraged certificates. Leverage magnifies not only the return but also the emotions and the risk of a total loss (Chapters 11 and 32).
- **Discounted cash flow (DCF):** a family of valuation models that discounts a company's future cash flows to today, because future profits are worth less than today's (Chapter 12).
- **Discount rate:** the rate that says how much less future profits are worth today. It depends on the risk (Chapter 12).
- **Multiple:** a valuation ratio expressed as a multiple, for example the P/E; see Valuation multiples.
- **Shiller P/E (CAPE):** the price of a market divided by the average of its inflation-adjusted earnings over the last ten years, smoothed so that a single boom or crisis year matters little (Chapter 24).

- **Value trap:** a stock that looks cheap and deserves to be: the business gets worse, the fair value falls, and even with dividends the stock loses value. In Chapter 17 this happened to about one in six undervalued stocks over five years among the companies still listed today; price and fair value merely falling behind the median stock is called "both fall behind" there and is more common.

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