

Between Intrinsic Value and Market Price

An Integrated Analysis of Fundamental and Market-Based Equity Valuation: A Case Study of Porsche AG

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Abstract

This paper examines the question of what lies behind a share price from two complementary perspectives: the corporate perspective of fundamental valuation methods and the market perspective of relative valuation and price formation. On the corporate side, the discounted cash flow method (DCF), Economic Value Added (EVA), Economic Profit (EP), the residual income method (Discounted Earning Stream, DES) and the dividend discount model (DDM) are presented systematically and computed in full with real data for a continuous case study – Porsche AG (P911), whose share price has lost roughly 40 per cent since its 2022 initial public offering. On the market side, the paper analyses price formation on the stock exchange, the market model (beta of 1.10 and R^2 of 0.34 against the DAX), the standard valuation multiples (P/E, P/B, P/S, EV/EBITDA, dividend yield) and the behavioural sources of systematic deviations of price from fundamental value.

Particular attention is devoted to the question of when a share is undervalued – and when an apparent undervaluation is a value trap: where an entire industry trades below book value, as the German automobile industry currently does (price-to-book ratios of 0.21 for Volkswagen, 0.38 for BMW and 0.45 for Mercedes-Benz), this typically signals no buying opportunity but a structural crisis: the market prices in the expectation that the industry's returns on equity will durably fall short of the cost of equity – and, should the transformation of business models fail, even considers the exit of individual manufacturers possible. The valuation range for Porsche AG spans, depending on method and peer group, from around €18 (volume-manufacturer multiples) to above €60 (luxury-goods multiples) against a price of €45; the DCF model yields €46.80 per share. For investors it follows: combine at least three methods, justify the peer-group choice explicitly, reconstruct

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the expectations embedded in the current price, and invest only with a margin of safety.

Keywords: share price · equity valuation · DCF · Economic Value Added · Economic Profit · residual income · multiples · P/E · P/B · beta · R^2 · market efficiency · behavioural finance · Porsche · automobile industry · margin of safety

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Non-Technical Summary

A share is acquired at a price – the question is what corresponds to that price. The stock market price of a company is neither its book value nor its “true” value, but the outcome of a continuous negotiation between buyers and sellers into which facts, expectations and emotions flow in equal measure. This paper explains what lies behind a share price – systematically, and by means of a real, fully computed example: Porsche AG, whose share has lost roughly 40 per cent since the initial public offering in September 2022, while Toyota and Chinese manufacturers such as Geely gained 60 to 70 per cent over the same period.

The first half of the paper adopts the corporate perspective: what is a company fundamentally worth? The discounted cash flow method discounts all future free cash flows to the present. Economic Value Added and Economic Profit measure whether a company earns more than its cost of capital – only then does it create value. The residual income method starts from the book value of equity and credits only excess profits as value-enhancing; the dividend discount model values the stream of future distributions.

The second half adopts the market perspective: how does the price actually arise on the exchange? Beta measures how strongly a share moves with the market (Porsche: 1.10 against the DAX); the R^2 shows that only about one third of Porsche’s price fluctuations are market-driven – two thirds are stock-specific. Multiples such as P/E, P/B or EV/EBITDA value a company relative to comparable firms; for Porsche, the choice of peer group – luxury-goods makers or volume manufacturers – shifts the verdict by a factor of three. And behavioural finance explains why prices systematically overshoot and undershoot.

A central documented case is provided by the German automobile industry: Volkswagen trades at 0.2 times, BMW at 0.4 times and Mercedes-Benz at 0.45 times book value. A price-to-book ratio below one is classically considered a buy signal – an acquisition below book value is made at less than the balance-sheet net assets are worth. When the undervaluation affects an entire industry, however, the message inverts: the market is then pricing in not firm-specific weakness but a structural crisis. The crisis can be traced to several structural core problems: (1) the slump in the China business, (2) margin erosion and declining earnings, (3) the cost structure of the German production base, (4) historical cost-cutting programmes, and (5) belated software and electrification strategies. If the turnaround via new business models fails, the exit of individual storied manufacturers is also possible. An industry-wide P/B below one is therefore not a sufficient undervaluation signal but a question of the viability of the business models that the investor must answer fundamentally.

Five core messages emerge for investors. First, book value is no measure of economic value – intangible assets such as the Porsche brand explain why some companies trade far above, others far below book value. Second, free cash flow is more reliable than reported earnings. Third, the relation between the return on capital and the cost of capital emerges as the central criterion of equity analysis: whether a company durably earns more than its capital costs determines

value creation or value destruction. In Porsche's case, the return on capital in fiscal year 2025 fell clearly short of the cost of capital after special items; on a normalised earnings basis, by contrast, it clearly exceeds it. Fourth, no valuation model should be used in isolation. Fifth, a margin of safety of 25–33 per cent protects against the inevitable errors of any forecast. What this means is: one buys only when the price lies a quarter to a third below the estimated intrinsic value.

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1 Introduction

Few numbers in financial markets are followed as attentively – and understood as little – as the share price. It flickers across screens by the second, decides fortunes and moods – and yet many investors cannot answer the simple question of what this price actually represents. Is it the value of the company? Its book value? The sum of its future profits? Or simply what the last buyer was willing to pay? The answer is: a little of everything – and disentangling this interplay systematically is the aim of this paper.

The question is of practical importance. For modern companies the book value of equity often explains less than one fifth of market value; intangible assets, growth expectations and quality premia account for the rest. At the same time, share prices fluctuate considerably more than fundamental news would justify – a finding prominently documented by Shiller (1981). A sound investment decision therefore requires both: a method for estimating the fundamental value of a company, and an understanding of how and why the market price can deviate from that value.

This paper accordingly pursues two thematic strands. The first strand adopts the corporate perspective and presents the standard methods of fundamental equity valuation in full: the discounted cash flow method (DCF), Economic Value Added (EVA), Economic Profit (EP), the residual income method (Discounted Earning Stream, DES), the dividend discount model (DDM) and asset-based value. The second strand adopts the market perspective: how does the price form on the exchange, what do valuation multiples such as P/E, P/B or EV/EBITDA accomplish, how efficiently does the market process information – and which behavioural forces drive prices systematically away from value? All methods are illustrated by a continuous case study computed in full with real data: Porsche AG (ticker P911), whose preference share has lost roughly 40 per cent since the initial public offering in September 2022 – while Toyota and listed Chinese manufacturers such as Geely or BYD gained substantially over the same period. The case study thereby also stands as an exemplar of the structural crisis of the German automobile industry, whose volume manufacturers currently trade uniformly below book value.

Three guiding questions structure the analysis. First: what fundamental value does a company have from the perspective of its cash flows, excess profits and assets – and how strongly do the results depend on the assumptions? Second: how does the market value the same company through multiples, and what do deviations between relative and fundamental valuation reveal? Third: what role do market efficiency, expectations and investor behaviour play in the short-run divergence – and long-run convergence – of price and value?

The contribution of the paper is thus twofold: a self-contained, methodologically consistent presentation of all major valuation methods with complete worked examples on a single set of figures – and the integration of this corporate perspective with the market perspective of price formation, making visible what a share price contains: substance, expected cash flows, expected excess profits, relative market valuation and a sentiment component.

The paper is structured as follows. Chapter 1 (the present chapter) serves as the introduction and frames the research question. Chapter 2 describes price formation on the stock exchange and the efficient market hypothesis. Chapter 3 develops the conceptual foundation of the distinction between book value, intrinsic value and market value. Chapter 4 derives the cost of capital – the CAPM for the cost of equity and the WACC as the weighted average cost of capital – and introduces the Porsche AG case study together with its share-price history since the IPO. Chapter 5 covers the discounted cash flow method, Chapter 6 the excess-profit methods EVA and Economic Profit, Chapter 7 the residual income method as well as dividend discounting and asset value. Chapters 8 and 9 switch to the market perspective and analyse the equity multiples (P/E, P/B, P/S, PEG, dividend yield) – including the question of when a share is undervalued and when an industry-wide P/B below one signals a structural crisis, illustrated by the German automobile industry – and the enterprise-value multiples (EV/EBITDA, EV/EBIT, EV/FCF) together with peer-group methodology, respectively. Chapter 10 examines market efficiency, behavioural economics and market sentiment as explanations for deviations between price and value. Chapter 11 brings both strands together in the Porsche AG case study and compares all valuation results. Chapter 12 addresses limitations, risks and a practical analysis checklist, and Chapter 13 concludes with chapter summaries and recommendations for investors.

2 Price Formation on the Stock Exchange: From the Order Book to Market Efficiency

2.1 Supply, Demand and the Order Book

A share price arises not from calculation but from trading. In the electronic order book of an exchange, limit buy and sell orders meet; the price is the level at which supply and demand most recently found each other. What moves prices is thus not information itself but the trading decisions investors derive from it. If buyers' willingness to pay rises – say, after unexpectedly good quarterly results – the price moves up until enough sellers appear again. The price is therefore always a marginal price: it reflects the

assessment of the marginal buyer and seller, not the average of all opinions, and certainly not an objective truth.

Two properties central to valuation follow from this mechanism. First, the price is liquidity-dependent: in thin markets even small orders can trigger large price moves without anything having changed at the company. Second, the price is expectations-driven: what is traded is not the present but the future expected by market participants – future profits, dividends and risks. The share price is thus in essence an aggregated expected value whose quality depends on the quality of the expectations.

2.2 The Efficient Market Hypothesis

The theoretical reference for information processing on exchanges is the efficient market hypothesis (EMH) of Fama (1970). In its semi-strong form it states that prices reflect all publicly available information immediately and without bias. Were this fully the case, no investor could systematically earn excess returns through fundamental analysis – the price would always be the best estimate of value. That prices do process new earnings information rapidly was first documented empirically by Ball and Brown (1968); a modern defence of the hypothesis is given by Malkiel (2003). Grossman and Stiglitz (1980) showed, however, that perfectly efficient markets would be a paradox: if prices contained all information, gathering information would no longer pay; but then no information would reach prices at all. Real markets are therefore “efficient enough” to render simple strategies worthless, yet inefficient enough to reward careful analysis.

The empirical evidence paints a differentiated picture. On the one hand, very few active funds beat their benchmark durably, which speaks for a high degree of market efficiency. On the other hand, systematic anomalies are documented: value stocks with low P/E or P/B ratios historically earned excess returns (Basu, 1977; Fama and French, 1992), prices overreact to series of news (De Bondt and Thaler, 1985), and the volatility of prices clearly exceeds the volatility of fundamentals (Shiller, 1981). For the investor this means: the market price is a referee to be taken seriously, but not an infallible one.

2.3 Beta and R^2 : Market Risk and Stock-Specific Risk

Before asking whether a share is undervalued, an investor should know what kind of risk they are buying with it. The market perspective provides two measures from a simple regression of the stock’s returns on the returns of a market index – for German stocks typically the DAX, for Austrian stocks the ATX (market model following Sharpe, 1964), formally in equation (1):

$$r_{i,t} = \alpha_i + \beta_i \cdot r_{M,t} + \varepsilon_{i,t} \quad (1)$$

Beta measures the sensitivity of the share to the market: a beta of 1.3 means that when the DAX rises by 1 per cent, the share rises on average by 1.3 per cent – and falls correspondingly harder in downturns. Cyclical stocks (automobiles, chemicals, banks) typically show betas above one, defensive stocks (utilities, telecommunications, consumer staples) betas below one. For Porsche AG, the regression of monthly returns on the DAX since the IPO (44 monthly observations, October 2022 to June 2026) yields a beta of 1.10 – despite the luxury-goods profile a clearly cyclical value, reflecting the business’s dependence on the economic cycle and on China. Beta is also the risk parameter of the CAPM (Chapter 4): the higher the beta, the higher the required return – and, *ceteris paribus*, the lower the fair valuation multiple.

The R^2 of the same regression answers a different question: what share of the stock’s fluctuations is explained by the market at all? For Porsche the R^2 of this regression is 0.34: only about one third of the variance is market-driven (systematic) – the remaining two thirds are stock-specific (idiosyncratic) risk: earnings revisions, model policy, China sales, tariffs, management changes. Three practical insights follow for the investor. First: stock-specific risk is diversifiable – a holding of only a few individual stocks bears risks for which the market pays no premium (Markowitz, 1952). Second: for stocks with a low R^2 , beta says little about total risk; a share can have a moderate beta and still exhibit volatility far above the DAX – for Porsche, the bulk of the risk stems precisely not from the market. Third: high stock-specific risk is the flip side of the opportunity of stock picking – exactly where the market explains little, fundamental analysis can play out its edge. It remains to be noted that beta and R^2 are historical estimates, unstable across estimation windows, and should always be combined with fundamental judgement.

2.4 Implications for Valuation

From the mechanics of price formation follows the programme of this paper: an analysis of what lies behind a share price requires decomposing the price into its components – into the fundamental value of cash flows and excess profits (corporate perspective, Chapters 4 to 7), into the relative valuation against comparable companies (market perspective, Chapters 8 and 9), and into the expectations and sentiment component overlaying both (Chapter 10). Only the synthesis of these components permits a well-founded investment judgement (Chapter 11).

3 Book Value, Intrinsic Value and Market Value: The Conceptual Foundation

3.1 Three Concepts of Value

The analysis begins with a clean separation of three concepts that everyday usage frequently conflates. The book value of equity is the balance-sheet residual of assets and liabilities – a backward-looking accounting figure shaped by accounting standards (HGB/UGB, IFRS, US GAAP), prudence principles and discretionary choices. The intrinsic value is the economic value of the company from the perspective of a rational investor: the present value of all future cash flows to the providers of capital (Graham and Dodd, 1934) – formalised as a present-value calculus as early as Williams (1938). The market value, finally, is the price observable on the exchange – market capitalisation equals price times number of shares.

Systematic gaps exist between these three quantities. The gap between book value and market value – quantified by the price-to-book ratio (P/B), conceptually related to Tobin's q , the ratio of market value to replacement cost (Tobin, 1969) – is explained above all by unrecognised intangible assets (brands, customer relationships, human capital, network effects), by growth expectations and by the franchise value of a durable spread of the return on capital over the cost of capital. For knowledge-intensive companies, more than 80 per cent of market value today frequently rests on such intangibles; Lev and Gu (2016) see in this a fundamental loss of relevance of the classical balance sheet for valuation. A P/B well above one is therefore not per se exaggeration but can be fundamentally justified; a P/B below one signals either a value opportunity or structural value destruction – making the distinction is the task of analysis (Penman, 2013).

3.2 The Guiding Question: ROIC versus WACC

Economically, a single relation links all three concepts of value: the ratio of the return on invested capital (ROIC) to the weighted average cost of capital (WACC). If a company durably earns more than its cost of capital ($ROIC > WACC$), every euro invested creates value beyond book value – the market value rightly exceeds the book value. If ROIC durably falls short of WACC, growth even destroys value (Koller et al., 2020). This guiding question runs like a thread through all the valuation methods that follow: the DCF values the cash flows resulting from the spread; EVA and Economic Profit measure the spread directly; the residual income method applies the same logic to equity.

3.3 The Share Price as an Expectations Variable

Market value can be decomposed conceptually into the value of the existing business (steady-state value of current earnings power) and the present value of expected future value creation (Rappaport, 1986; Miller and Modigliani, 1961). What the price contains beyond the steady-state value are priced-in expectations – of growth, margins and returns on capital. Fundamental analysis therefore asks not only “What is the company worth?” but equally “Which expectations are already embedded in the current price – and are they plausible?”. This expectations perspective makes it understandable why excellent companies can be poor stocks (when the price anticipates even better results) and mediocre companies good stocks (when the price is too pessimistic).

4 Cost of Capital and the Porsche AG Case Study

4.1 The Case Study: Porsche AG (P911)

All worked examples in this paper are based on Dr. Ing. h.c. F. Porsche AG, the Stuttgart sports-car manufacturer whose preference shares have been listed on the Frankfurt Stock Exchange since September 2022 (stock ticker P911). Porsche suits the case study in two respects: as a luxury manufacturer with exceptional brand strength, the company illustrates the importance of intangible assets; as a German automobile manufacturer it simultaneously stands in the midst of the industry’s structural crisis – the transition to new drivetrain technologies, price and technology competition from China, and the weakness of the Chinese sales market. The 2025 financial year was correspondingly exceptional: revenue fell to 36.3 billion euro, and the operating result – burdened by special items of around 3.9 billion euro from restructuring (approx. 2.4 billion euro), the realignment of the battery activities (approx. 0.7 billion euro) and US tariffs (approx. 0.7 billion euro) – fell to 0.4 billion euro (Porsche AG, 2026). Figure 1 shows the share-price history since the IPO; Table 1 contains the base data.



Figure 1: Porsche AG (P911), weekly closing prices of the preference share since the initial public offering on 29 September 2022 (Xetra, in euros). The dotted line marks the region of the issue price.

Table 1: Base data, Porsche AG (financial year 2025; market data as of early July 2026)

Item	Value	Note / source
Revenue 2025	€36,272m	2024: €40,083m
Operating result 2025	€413m	margin 1.1% (2024: 14.1%)
Special items 2025	approx. –€3,900m	restructuring, battery, US tariffs
Operating result, adjusted	approx. €4,300m	before special items
Group profit after tax	approx. €440m	distribution equalled 210% thereof
Automotive net liquidity	+€7,346m	net cash, no net debt
Equity (book value)	approx. €23,000m	€25.24 per share
Total shares	911 million	455.5m ordinary and 455.5m preference each
Preference share price	€45.20	early July 2026
Market capitalisation	approx. €41,200m	price × 911m shares
P/B	1.79	price / book value per share
P/E (forward)	approx. 19.7	on 2026 consensus earnings
Dividend per preference share	€1.01	yield 2.2%
Beta vs. DAX (since IPO, monthly)	1.10	own regression, 44 months
R ² of the market regression	0.34	66% stock-specific risk

Source: own compilation based on data from Porsche AG, Annual Report 2025; market data as of early July 2026.

Two features distinguish Porsche from a typical industrial company. First, the balance sheet: the automotive business reports net liquidity of 7.3 billion euro – Porsche has no net debt but net cash, which adds to enterprise value in the valuation. Second, the earnings situation: the year 2025 is massively distorted by special items; any serious

valuation must distinguish between the reported result (0.4 billion euro) and the adjusted, sustainable earnings power (on the order of 4 billion euro operating before special items, with a double-digit margin targeted in the medium term). Precisely this distinction – current crisis versus normalised earnings power – runs through all the valuation steps that follow.

4.2 Cost of Equity: The CAPM

The cost of equity states what return shareholders demand for the risk they assume. The standard model for deriving it is the Capital Asset Pricing Model (Sharpe, 1964; Lintner, 1965; Mossin, 1966), formally in equation (2):

$$k_E = r_f + \beta \cdot (r_m - r_f) \quad (2)$$

With a risk-free rate of 2.80 per cent (ten-year German government bond), the empirically estimated beta of 1.10 (Chapter 2.3) and a market risk premium of 6.50 per cent (Damodaran, 2024), the cost of equity comes to 9.95 per cent. That is considerably more than for a defensive utility – the market demands a substantial premium for the cyclicalities and the structural industry risks.

4.3 Total Cost of Capital: The WACC

For valuations at the level of the entire firm, the costs of equity and debt are combined at market-value weights (Modigliani and Miller, 1958), formally in equation (3):

$$WACC = \frac{E}{V} \cdot k_E + \frac{D}{V} \cdot k_D \cdot (1 - s) \quad (3)$$

For Porsche the weighting is a special case: since the automotive business is net debt-free, the WACC approximately equals the cost of equity. Conservatively, a discount rate of 9.95 per cent is therefore used in what follows – almost twice as high as for a regulated utility, with correspondingly lower present values for every future euro of cash flow. The discount rate is also the hurdle rate of value creation: in 2025 the ROIC (on invested capital of around 15.7 billion euro) stood at just 1.8 per cent – far below the cost of capital; on the basis of adjusted earnings power it would stand at around 19 per cent – far above it. Whether Porsche creates or destroys value thus depends entirely on which level of earnings one considers sustainable.

5 The Discounted Cash Flow Method

5.1 Concept and Valuation Equation

The DCF method is the theoretically best-founded valuation approach: the value of the firm is the present value of all future free cash flows to all providers of capital (free cash flow to the firm, FCFF), discounted at the WACC (Koller et al., 2020; Damodaran, 2012). In the two-stage model, an explicit forecast period is planned in detail and the residual value is estimated by a growing perpetuity, formally in equations (4) and (5):

$$EV = \sum_{t=1}^n \frac{FCFF_t}{(1+WACC)^t} + \frac{TV_n}{(1+WACC)^n} \quad (4)$$

$$TV_n = \frac{FCFF_{n+1}}{WACC - g} \quad (5)$$

The market value of equity is obtained by adding net liquidity to enterprise value (for indebted companies: deducting net debt); division by the number of shares yields the intrinsic value per share.

5.2 DCF Valuation of Porsche AG

The assumptions: discount rate of 9.95 per cent; recovery of FCFF from 2.0 billion euro (2027) to 3.3 billion euro (2031), carried by restructuring relief and the model offensive; thereafter growth of 2.0 per cent p.a. (years 6–10) and perpetual growth of 1.5 per cent – deliberately moderate to reflect the structural industry risks. Table 2 shows the present-value calculation.

Table 2: DCF calculation, Porsche AG – explicit forecast period (€bn)

Year	t	FCFF	Discount factor	Present value
2027	1	2.00	0.9095	1.82
2028	2	2.40	0.8272	1.99
2029	3	2.80	0.7523	2.11
2030	4	3.10	0.6843	2.12
2031	5	3.30	0.6223	2.05
2032	6	3.37	0.5660	1.91
2033	7	3.43	0.5148	1.77
2034	8	3.50	0.4682	1.64
2035	9	3.57	0.4258	1.52
2036	10	3.64	0.3873	1.41

Source: own calculation; data basis: Porsche AG, Annual Report 2025.

Table 3: DCF result, Porsche AG

Item	Value	Note
PV explicit period (FCFF, yrs 1–10)	€18.3bn	52% of enterprise value
PV terminal value	€17.0bn	48% of EV
Enterprise value (DCF)	€35.3bn	
+ Automotive net liquidity	+€7.3bn	net cash instead of debt
Equity value	€42.6bn	
Total shares	911 million	
Intrinsic value per share	€46.79	
Current price (preference share)	€45.20	
Deviation	+3.5%	within estimation uncertainty

Source: own calculation; data basis: Porsche AG, Annual Report 2025.

5.3 Critical Appraisal

The DCF result of 46.79 euro, summarised in Table 3, lies only 3.5 per cent above the price of 45.20 euro – on these assumptions the share appears fairly valued. Noteworthy is the terminal-value share of 48 per cent, low by industry standards: the high cost of capital of almost 10 per cent compresses the distant future; for a utility with 5 per cent cost of capital the residual value dominates at over 70 per cent. The key sensitivities: if Porsche reaches its medium-term double-digit operating margin sooner, the FCFF

paths and the value rise towards 60 euro; if earnings power instead remains at the 2025 level, today's price is carried almost entirely by net liquidity and the brand – the DCF value would fall below 30 euro. The strengths of the method – theoretical foundation, independence from market valuations and accounting policy – face its familiar weaknesses: extreme sensitivity to assumptions and spurious precision. Precisely in an industry upheaval, the range matters more than the point estimate.

6 Excess-Profit Methods I: Economic Value Added and Economic Profit

6.1 Economic Value Added (EVA)

Economic Value Added (Stewart, 1991) measures the surplus a company earns in a period over and above its cost of capital, formally in equation (6):

$$EVA_t = NOPAT_t - WACC \cdot IC_{t-1} = (ROIC_t - WACC) \cdot IC_{t-1} \quad (6)$$

Table 4: EVA calculation, Porsche AG (financial year 2025 vs normalised)

Item	2025 (actual)	Normalised	Note
Operating result	€0.41bn	€4.30bn	2025 distorted by special items
NOPAT (30% tax rate)	€0.29bn	€3.01bn	
Invested capital	€15.7bn	€15.7bn	equity less net liquidity
Capital charge (9.95%)	€1.56bn	€1.56bn	
EVA	−€1.27bn	+€1.45bn	
ROIC	1.8%	19.2%	
Spread (ROIC − WACC)	−8.1 pts	+9.2 pts	

Source: own calculation; data basis: Porsche AG, Annual Report 2025.

Table 4 shows the ambivalence of the case study: on the basis of the 2025 actual figures, Porsche destroyed value massively, with an EVA of −1.27 billion euro – the ROIC of 1.8 per cent missed the cost of capital by more than eight percentage points. On the basis of adjusted earnings power, the EVA would stand at +1.45 billion euro, with an ROIC of a good 19 per cent almost twice the cost of capital – the classic profile of a luxury-goods manufacturer with pricing power. The market values the company, at a capitalisation of 41.2 billion euro, well above its invested capital of 15.7 billion euro (market value added of roughly 18 billion euro after deducting net liquidity) – it thus

predominantly believes in the return to normalised value creation, albeit with discounts to the IPO euphoria of 2022.

6.2 Economic Profit (EP)

Economic Profit (Koller et al., 2020) turns the same logic into a complete valuation: the enterprise value is today's invested capital plus the present value of all future economic profits, formally in equation (7):

$$EV = IC_0 + \sum_{t=1}^{\infty} \frac{EP_t}{(1+WACC)^t} \quad (7)$$

Mathematically, the EP valuation is equivalent to the DCF valuation under consistent assumptions (Lücke theorem; Preinreich, 1937; Lücke, 1955); its advantage is the transparency of period-by-period value creation. For Porsche, a recovery of NOPAT from 1.4 billion euro (2027) to 3.1 billion euro (2031) is assumed – deliberately more cautious than full normalisation – with invested capital growing at 2 per cent p.a.

Table 5: EP valuation, Porsche AG – economic profits by period (€bn)

Year	t	IC (start)	NOPAT	ROIC	EP	PV of EP
2027	1	15.65	1.40	8.9%	−0.16	−0.14
2028	2	15.96	2.10	13.2%	+0.51	+0.42
2029	3	16.28	2.60	16.0%	+0.98	+0.74
2030	4	16.61	2.90	17.5%	+1.25	+0.85
2031	5	16.94	3.10	18.3%	+1.41	+0.88

Source: own calculation; data basis: Porsche AG, Annual Report 2025.

As Table 5 shows, economic profit remains negative only in the first year of recovery; from 2028 Porsche again earns its cost of capital comfortably. The sum of the present values of years 1–5 amounts to +2.75 billion euro. The terminal value (EP of year 6 of 1.44 billion euro, divided by 9.95% – 1.5%) comes to 17.1 billion euro, its present value to 10.6 billion euro. This yields: enterprise value of 29.0 billion euro (15.65 + 2.75 + 10.6), plus net liquidity of 7.3 billion euro, an equity value of 36.4 billion euro – or 39.93 euro per share. The EP result thus lies around 15 per cent below the DCF value and around 12 per cent below the current price: the more conservative recovery assumption makes visible how much of today's price already anticipates full normalisation.

7 Excess-Profit Methods II: Residual Income, Dividend Discounting and Asset Value

7.1 Discounted Earning Stream (DES) / Residual Income Method

The residual income model (Edwards and Bell, 1961; Ohlson, 1995) derives the value of equity from book value and the present value of future residual income; its empirical forecasting power is documented by Frankel and Lee (1998) and Dechow, Hutton and Sloan (1999), formally in equation (8):

$$V_0 = BV_0 + \sum_{t=1}^{\infty} \frac{RI_t}{(1+k_E)^t}, \quad RI_t = NI_t - k_E \cdot BV_{t-1} \quad (8)$$

For Porsche (book value 23.0 billion euro or 25.24 euro per share; cost of equity 9.95 per cent), group profit is assumed to rise from 0.9 billion euro (2027) to 2.6 billion euro (2031), with half of earnings retained. The result is sobering: even at the end of the recovery phase the return on equity, at around 10 per cent, just reaches the cost of equity – residual income remains negative to neutral over the entire planning horizon. The model value amounts to 19.7 billion euro or 21.68 euro per share – well below book value and less than half the price.

This deliberately strict result has analytical value: the residual income method prices equity and its return alone – it neither counts the net liquidity as a safety buffer nor rewards the optionality of a margin recovery beyond the assumptions. It answers the question: “What is the share worth if Porsche durably earns only average returns on equity?” – and the answer (“roughly book value, at a discount”) explains precisely why the industry’s volume manufacturers, whose returns on equity lie structurally below the cost of capital, rightly trade below book value (Chapter 8.6). Relative to this scenario, the 45 euro price contains a substantial expectations premium on the brand and on margin recovery.

7.2 Dividend Discount Model (DDM)

The Gordon growth model (Gordon and Shapiro, 1956; Gordon, 1962) values the share as a perpetually growing stream of dividends, formally in equation (9):

$$P_0 = \frac{D_1}{k_E - g} \quad (9)$$

The current dividend of €1.01 per preference share is crisis-reduced and in 2025 amounted to 2.1 times group profit – unusable as a valuation basis. Using a normalised

dividend of 1.80 euro (a payout of roughly 50 per cent on a normalised result) and growth of 2.5 per cent yields a value of 24.77 euro. The DDM thereby confirms the message of the residual income method: from the pure distribution perspective, the share is worth today's price only if the dividend grows well beyond the normalised level in the medium term – the valuation lives on the brand and the recovery expectation, not on current income.

7.3 Asset Value and the Intangible Value of the Brand

Asset-based valuation systematically falls short for Porsche – and precisely thereby teaches the essential lesson. The balance-sheet net assets of 23 billion euro plus net liquidity cover only a good half of market capitalisation. The difference is, at its core, a single unrecognised asset: the Porsche brand – regularly ranked among the most valuable automotive brands in the world, with the ability to command prices far above production costs (normalised operating margins in the double digits, against 3–6 per cent for volume manufacturers). Internally generated brands may not be capitalised under IAS 38; book value therefore structurally understates the economic asset base. This explains why Porsche trades at 1.8 times book value despite the industry crisis, while Volkswagen – whose brand portfolio does not translate into comparable pricing power – changes hands at 0.2 times. Intangible value is not a valuation bonus but the capitalised future excess profits from pricing power – and for precisely that reason it vanishes when the excess profits durably fail to materialise.

8 The Market Perspective I: Equity Multiples and the Question of Undervaluation

8.1 The Logic of Relative Valuation

With this chapter the perspective changes: instead of deriving value from the company's own fundamentals, relative valuation prices a company by comparison with similar companies (Damodaran, 2012). Multiples set the price in relation to a reference quantity such as earnings, book value, sales or cash flow. Their strengths are speed, market proximity and communicability; their central weakness is circularity: a valuation relative to a peer group inherits its valuation level – if the entire industry is over- or undervalued, the verdict is passed on to the individual company. The Porsche case makes this weakness more tangible than any textbook example, for here even the choice of peer group is contested: luxury-goods makers or German volume manufacturers?

8.2 The Price-Earnings Ratio (P/E)

The P/E ratio – price per share divided by earnings per share – states how many annual profits the market pays for the company. Its fundamental anchoring becomes visible when the Gordon model is solved for the P/E: the fair P/E rises with the payout ratio q and growth g and falls with the cost of equity, formally in equation (10):

$$P/E = \frac{P_0}{EPS_1} = \frac{q \cdot (1+g)}{k_E - g} \quad (10)$$

Porsche simultaneously illustrates the most important source of error of the P/E: on the basis of reported 2025 earnings (EPS approx. 0.48 euro), the P/E optically exceeds 90 – the share would appear absurdly expensive. On expected 2026 earnings it stands at around 20, on normalised earnings power (EPS around 3.10 euro) at about 15. The P/E is only as good as its denominator: in crisis and cycle troughs it takes on extreme values arithmetically, although precisely then the buying opportunities may lie – which is why smoothed measures (the Shiller P/E) or normalised earnings should be used. Empirically, Basu (1977) and later Fama and French (1992) nonetheless documented a long-run excess return of lowly valued stocks – the value premium. For Porsche AG, a peer P/E of European luxury names is contested; at a P/E of 18 on an EPS of 1.90 euro the value would be 34.20 euro per share; the share’s current P/E of about 21 (on forward earnings) already embeds a premium over the volume peer group.

8.3 Price-to-Book, Price-to-Sales and PEG

The price-to-book ratio measures the gap between market and book value developed in Chapter 3; its fundamental justification comes from residual income logic: a P/B above one is justified where the return on equity durably exceeds the cost of equity (Penman, 2013). Porsche trades at 1.79 times book value – the market premium of roughly 18 euro billion on equity is the capitalisation of the brand’s strength (Chapter 7.3). The price-to-sales ratio of a good 1.1 is a multiple of that of the volume manufacturers (0.2–0.3) and reflects the structurally higher margins; the PEG ratio is of little use in the recovery phase because the growth base is distorted.

8.4 Dividend Yield

Following the crisis-related cut to 1.01 euro, the dividend yield of the Porsche preference share is only 2.2 per cent – well below the 7–8 per cent of the volume manufacturers. This discrepancy is instructive: the high yields of Volkswagen, BMW and Mercedes-Benz are not gifts but risk premia – the market doubts the sustainability

of the distributions given the burdens of transformation. A dividend yield is only ever as reliable as the cash flow feeding it; as a standalone valuation criterion it is unsuited to an industry in upheaval.

8.5 When Is a Share Undervalued? Identifying Undervaluation in Practice

The practically most important question of the market perspective is: how does an investor recognise that a share is undervalued? The classical starting point is the P/B below one: acquiring a share below its book value means paying less than the balance-sheet net assets are worth – in effect, one euro of equity for less than one euro. Benjamin Graham built his strictest variant on this logic, the net-net strategy: buy only when the price lies below two thirds of net current assets (current assets less all liabilities) (Graham, 1949). Empirical research confirms the core of this intuition: portfolios of lowly valued stocks (low P/B, low P/E) earned systematic excess returns over long periods – the value premium (Basu, 1977; Fama and French, 1992; Lakonishok, Shleifer and Vishny, 1994); Banz (1981) additionally documented the related size premium of small stocks.

A P/B below one is, however, a buy signal only if book value reasonably reflects economic reality – and precisely here intangible assets come into play. Intangibles are a company's non-physical assets: brands, patents, licences, software, customer relationships, data, human capital, network effects. Only fractions of these are recognised on the balance sheet – essentially acquired intangibles and goodwill from takeovers; internally generated brands and knowledge may, under IAS 38, largely not be capitalised. For brand-rich companies such as Porsche, book value therefore dramatically understates the true asset base – a P/B of 1.8 can indicate greater undervaluation there than a P/B of 0.9 at a company without hidden assets. Conversely, book value can be overstated where it largely consists of goodwill from expensive acquisitions, or contains assets whose business basis is eroding – for automobile manufacturers, for instance, factories and development platforms for combustion engines whose residual value is questionable in the drivetrain transition.

A low P/B must moreover be tested against its fundamental justification: by residual income logic, a P/B below one is justified – and hence no undervaluation – where the return on equity durably lies below the cost of equity; the company then destroys value, and the market prices this correctly. Distinguishing value opportunity from value trap is thus the true analytical task. Table 6 summarises the common valuation guidelines – expressly as starting points for analysis, not as mechanical buy signals.

Table 6: Rules of thumb for identifying undervalued equities from the market perspective

Measure	Valuation guideline	Economic logic	Principal pitfall
P/B	< 1.0	purchase below balance-sheet net assets	justified where $ROE < k_E$; industry crisis (Ch. 8.6)
P/E	$< 10\text{--}12$ or below historical median	few annual profits as purchase price	cyclically distorted earnings (Porsche 2025: $P/E > 90$)
Shiller P/E (CAPE)	below long-run average	smooths earnings cycles over 10 years	long phases of deviation possible
PEG	< 1.0	P/E relative to earnings growth	growth forecasts often too optimistic
Dividend yield	$> 4\%$ sustainably	running return on capital	cut risk at payout ratios $> 80\%$
FCF yield (FCF/price)	$> 7\%$	earnings power hard to manipulate	capex cycles distort single years
EV/EBITDA	$< 6.0x$	capital-structure neutral, M&A standard	conceals depreciation needs and leases
P/S	< 1.0 with solid margin	useful in cyclical earnings troughs	ignores margin and debt quality
Graham net-net	price $< 2/3$ net current assets	extreme asset discount	rare today; often business-model problems

Source: own compilation based on data from Banz (1981) and Piotroski (2000).

For practical application a three-stage sequence is recommended. First, screen: identify stocks that satisfy several of the criteria in Table 6 simultaneously – the combination is more informative than any single criterion. Second, the value-trap test: is the balance sheet solid, is free cash flow positive and stable, are fundamental trends improving? Earnings with a high cash component are more sustainable than accrual-driven earnings (Sloan, 1996). Simple quality filters such as the F-Score of Piotroski (2000) – nine binary criteria on profitability, leverage and efficiency – empirically succeed in separating fundamentally sound from fundamentally weak value stocks. Third, seek the catalyst: undervaluation alone generates no return; a mechanism is needed that closes the gap – dividends and buybacks (whose disciplining effect on management Jensen, 1986, already emphasised), earnings recovery, takeovers, or the build-up of book value over time.

8.6 Industry-Wide Undervaluation as a Crisis Signal: The German Automobile Industry

The most important qualification of the heuristic “P/B below one equals buying opportunity” deserves its own subchapter, for it currently concerns the key industry of the German economy. Where a single company trades below book value, it may be an

overlooked, genuinely undervalued single case. Where an entire industry trades below book value, however, the probability is high that the market is not erring but pricing in a structural crisis: the expectation that the industry will not earn its cost of capital for the foreseeable future – and that a substantial part of the assets on its balance sheets (plants, equipment, development platforms of old technologies) will lose its earnings basis. Formally, an industry-wide P/B below one is consistent with two readings – expected negative residual income (Ohlson, 1995) or elevated required risk premia – and the empirical value literature counsels differentiation: low-P/B portfolios have historically earned above-average returns (Rosenberg, Reid and Lanstein, 1985; Fama and French, 1992); whether this reflects risk compensation (Fama and French, 1993) or mispricing (Lakonishok, Shleifer and Vishny, 1994) remains debated. Precisely this picture is shown by the German automobile industry: Volkswagen trades at 0.21 times, BMW at 0.38 times and Mercedes-Benz at 0.45 times book value; the dividend yields of 7–8 per cent are risk premia, not gifts. The structural crisis can be traced to five structural core problems: (1) the slump in the China business, (2) margin erosion and declining earnings, (3) the cost structure of the German production base, (4) historical cost-cutting programmes, and (5) belated software and electrification strategies. Figure 2 shows the price development since autumn 2022.

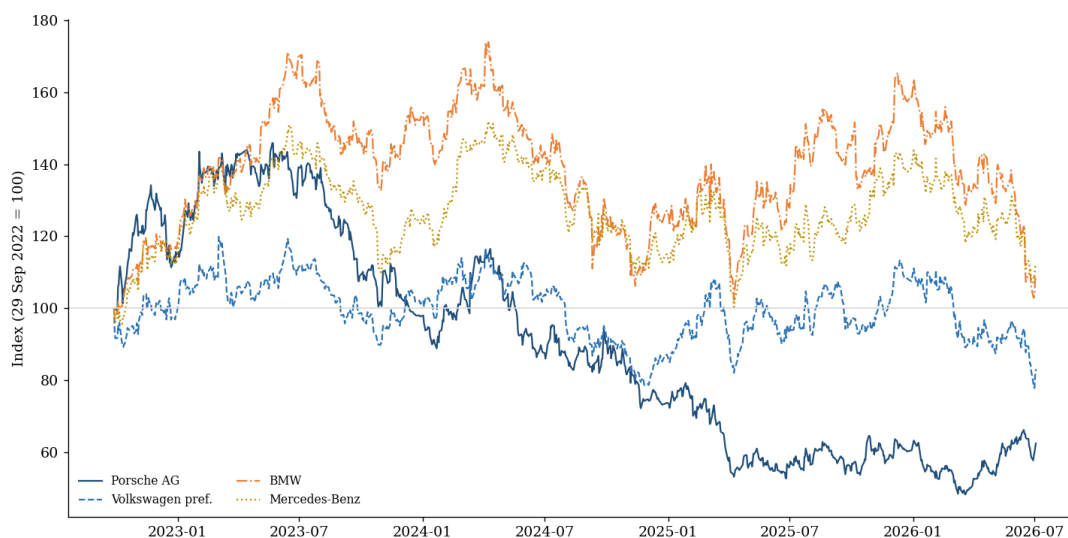


Figure 2: German automobile manufacturers – indexed price performance since the Porsche IPO (29 Sep 2022 = 100; Porsche AG, Volkswagen pref., BMW, Mercedes-Benz).
Source: Yahoo Finance, as of early July 2026.

The causes of the crisis are structural, not cyclical. First, the drivetrain transition: the shift to battery-electric vehicles – flanked by hydrogen and hybrid paths – devalues the core competencies in combustion engines and transmissions built up over decades,

which simultaneously form the core of balance-sheet assets and supplier chains. Second, China’s cost and technology lead: Chinese manufacturers control large parts of the battery value chain, produce at significantly lower cost and have built a considerable lead in battery technology (energy density, charging speed, cost per kilowatt-hour). Third, the shift in customer preferences: Chinese vehicles define themselves through software, connectivity and playful user experiences – the “gamification” of display, assistance and entertainment – which appeals precisely to young prospective buyers, while German manufacturers traditionally differentiate through driving dynamics and build quality. The capital market has long priced in this shift: Figure 3 shows that Toyota and listed Chinese manufacturers such as Geely or BYD have dramatically outpaced the Porsche share (–41%) since its IPO.

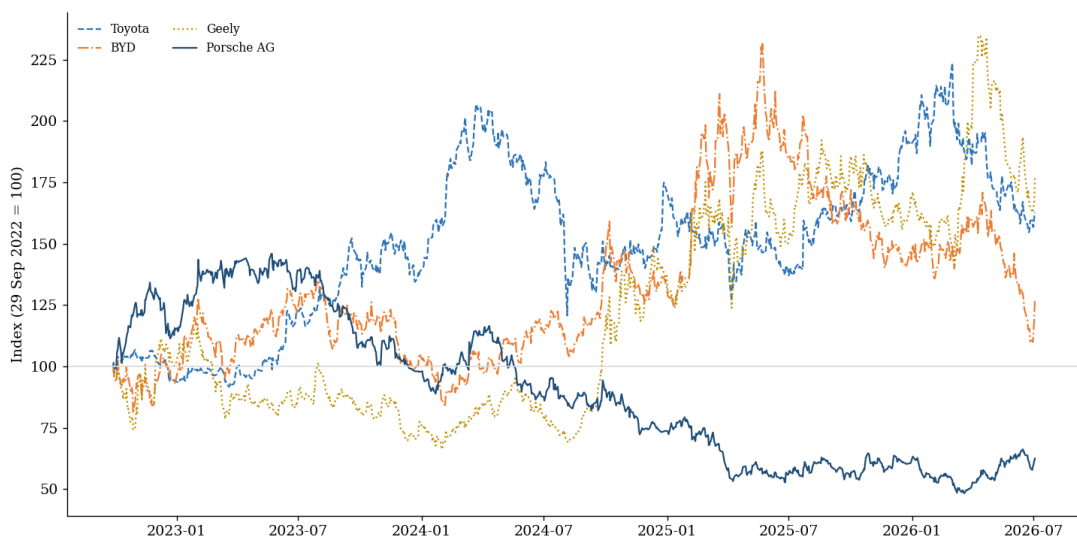


Figure 3: Toyota and listed Chinese automobile manufacturers (BYD, Geely) compared with Porsche AG – indexed price performance (29 Sep 2022 = 100, local currency).
Source: Yahoo Finance, as of early July 2026.

A double lesson follows for the investor. First: an industry-wide P/B below one is not a sufficient entry signal; it demands a fundamental assessment of whether the industry's business models can again earn their cost of capital. The market considers it possible that individual manufacturers will not manage the turnaround via new business models – software and ecosystems, battery technology, new mobility services, radical cost structures; in that case not only sustained value destruction but, in the extreme, the exit of storied manufacturers from the market is possible, as industrial history has repeatedly shown (from the US manufacturers of the 2000s to Nokia in the mobile-phone market). Second: within a crisis-ridden industry the market differentiates sharply – Porsche, as a luxury provider with pricing power, is priced at 1.8 times book value, Volkswagen at 0.2 times. An investment on the premise of undervaluation here requires

justifying why the market errs with the survival-risk premium it prices – the burden of proof lies with the buyer, not with the market.

The German automobile industry is, moreover, no isolated case but follows a recurring pattern. The most recent precedent is the European banking sector: under the ECB's unconventional monetary policy – negative interest rates from 2014 and large-scale bond purchase programmes – the interest margin at the core of the business model eroded, and practically the entire industry traded below book value for years; individual institutions at 0.2 to 0.4 times. Heider, Saidi and Schepens (2019) show how negative rates structurally damaged banks' earnings mechanics – the market was accordingly pricing in not a cyclical dent but a business model called into question. The resolution is also instructive: only the regime change of the 2022 interest-rate turnaround let earnings and valuations rise again. Industry-wide P/B discounts can thus persist for years and typically resolve not through patience but through a fundamental regime change – a lesson directly transferable to the automobile industry.

Sharply to be distinguished from the industry crisis is the third case: where the market as a whole falls below book value – as the DAX did at the height of the financial crisis (P/B of 0.89 on 6 March 2009) and again, for a few days, in the Covid crash (P/B of 0.97 on 18 March 2020) – history records a very strong buy signal. The reasoning is twofold. First, mean reversion: valuation ratios are strongly mean-reverting over long horizons – extremely low market valuations were historically followed by above-average returns (Campbell and Shiller, 1998); that an entire diversified market durably misses its cost of capital is far less likely than for a single industry in structural upheaval. Second, the substance argument: acquiring the whole market below book value obtains the entire balance-sheet net assets at a discount – and all the intangibles (brands, patents, customer relationships, human capital) that in normal times make up the bulk of market valuation, at no imputed value. In such moments the market does not even price the substance in full – the classic case of Graham's (1949) erratic Mr. Market in his pessimistic phase; the systematic excess return of low-P/B portfolios was documented as early as Rosenberg, Reid and Lanstein (1985).

Figure 4 illustrates this relationship over a good eighteen years: the price-to-book ratio of the DAX oscillates around its long-run average of about 1.5 – with exactly two exceptional phases in which it fell below one: the height of the financial crisis (0.89 in March 2009) and – for only a few trading days – the Covid crash (0.97 on 18 March 2020). Remarkably, the P/B by no means follows the index: between 2014 and 2019 it fell from around 1.9 to 1.4 even as the DAX rose – book values grew faster than prices through retained earnings. Both times, buying at or below book value was followed by exceptional multi-year returns – the index more than doubled from the Covid trough to mid-2026. The dashed average line simultaneously makes the mean-reversion

argument visible: extreme deviations downwards as well as upwards have so far always been corrected back towards the mean.



Figure 4: DAX index level (grey line, left scale) and price-to-book ratio of the DAX (black line, right scale), January 2008 to May 2026. Dashed horizontal line: average P/B of the period (1.53); dotted line: $P/B = 1$; marked: the two below-one episodes (0.89 on 6 March 2009; 0.97 on 18 March 2020). Daily data. Book-value data: Refinitiv (author's database) up to November 2023; from December 2023 book value extrapolated at the historical growth rate of 8% p.a. (dashed line segment); price data: Yahoo Finance.
Source: own illustration and calculation based on public market data.

In all of this, two yardsticks of comparison must be observed. First, the level of the respective market: the S&P 500 and the Swiss equity market traditionally exhibit considerably higher price-to-book ratios than the DAX – not because they are chronically overpriced, but because of their sector composition: technology, pharmaceutical and brand-goods companies with high returns on equity and large unrecognised intangible assets structurally justify higher P/B ratios (Penman, 2013; current market data in Damodaran, 2024), while the industry-heavy DAX is more balance-sheet-intensive. A P/B of 3 can be average in the S&P 500 and expensive in the DAX – absolute thresholds without market context mislead. Second, the industry average: a single stock with a P/B below one must always be set against the average of its industry. If the whole industry stands at 0.9 and the stock at 0.8, the discount is unremarkable; if the industry stands at 1.8 and the stock at 0.6, the market is pricing in a company-specific problem – in the extreme case the path towards insolvency, which the market often recognises earlier than the balance sheet does. The apparently low P/B then proves deceptive. For cross-checking such suspect cases, established insolvency-prediction models are suitable, such as the Z-Score of Altman (1968) and

the F-Score of Piotroski (2000); a low P/B becomes a buying argument only once both give the all-clear.

Figure 5 makes the structural level differences visible over the same period: the P/B of the S&P 500 oscillates around an average of about 3.1 and – carried by the highly profitable technology companies – has risen to roughly five times book value by mid-2026; the Swiss market, with its pharmaceutical and brand-goods companies, holds an average of about 2.5; the DAX manages only 1.5 over the same period. Striking, moreover: even at the troughs of 2009 and 2020, the American and Swiss markets never fell below book value – the P/B-below-one threshold was reached exclusively by the DAX. A comparison of valuation levels across markets thus always also compares sector structures and returns on equity – and must measure every ratio against its own market and industry average, not against a universal threshold.

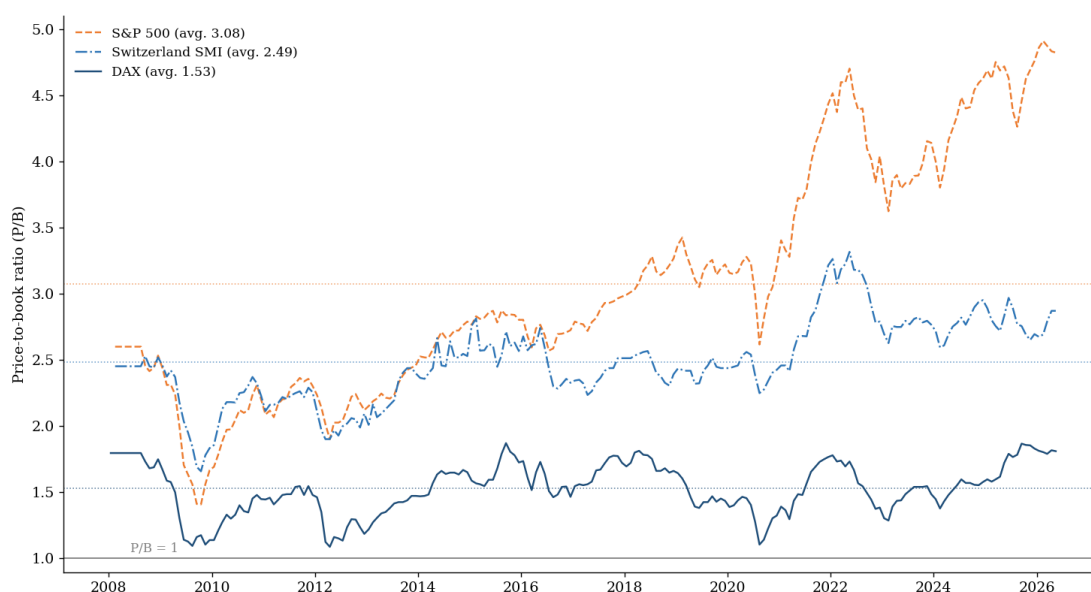


Figure 5: Price-to-book ratios compared: DAX, S&P 500 and the Swiss market (SMI as proxy for the SPI, covering roughly 80% of its capitalisation; the SPI itself is not freely available as a data series), monthly data January 2008 to May 2026. Dotted lines: the respective average P/B of the period (S&P 500: 3.12; Switzerland: 2.49; DAX: 1.52). P/B paths approximately reconstructed (calibration to published valuation levels, log-linear interpolation); own calculation based on Yahoo Finance price data.

Source: own illustration and calculation based on public market data.

8.7 Rule-Based Combination of Ratios: The O’Shaughnessy Approach

The ratios developed individually in Chapters 8.2 to 8.5 can also be combined systematically rather than used in isolation. The best-known rule-based approach stems from James P. O’Shaughnessy, who in his standard work “What Works on Wall Street” evaluated the historical returns of practically all common valuation ratios over decades of US capital-market data (O’Shaughnessy, 2011). His central finding coincides with

the logic of this paper: no single ratio works in all market phases – the price-to-sales ratio proved the historically most consistent single indicator, but only the combination of several ratios into a composite score delivers robust results, because it offsets the weaknesses of the individual measures against each other (cyclical earnings in the P/E, intangible distortion in the P/B, accounting policy in cash flow).

The approach works in two stages. In the first stage – the “Value Composite” – every stock in the universe is ranked into percentiles on six valuation ratios and the ranks are averaged into an overall score: price-to-sales, price-to-earnings, price-to-cash-flow, price-to-book, EV/EBITDA, and shareholder yield as the sum of dividend yield and the buyback yield from share repurchases. Only the lowest-valuation decile – the 10 per cent of stocks with the best combined valuation score – enters the shortlist. In the second stage these value candidates are ranked by price momentum: the 25 to 50 names with the highest price return over the past six months are bought. A minimum-size criterion (market capitalisation typically above 150–200 million US dollars) ensures tradability.

The combination is conceptually remarkable because it joins two empirically documented but opposed capital-market anomalies: the value premium (Basu, 1977; Fama and French, 1992) and the momentum effect – the continuation of price moves over six to twelve months, as documented by Jegadeesh and Titman (1993), integrated into the standard factor models by Carhart (1997) (cf. Fama and French, 1993), and explained behaviourally by investors’ delayed information processing (Chapter 10). Asness, Moskowitz and Pedersen (2013) show, moreover, that the combination of value and momentum delivers robust premia across asset classes and countries. For practice, the momentum criterion solves precisely the catalyst problem described in Chapter 8.5: it prevents the investor from buying undervalued stocks that remain undervalued for lack of a trigger – purchases occur only once the market has already begun the re-rating. Applied to the German automobile industry, the approach would in recent years have done in a disciplined way what many investors found difficult: not buying the optically low-priced names, despite the lowest valuation scores, as long as momentum remained negative.

The limits must nonetheless be named. Rule-based approaches rest on historical backtests and carry a data-mining risk – what worked in fifty years of US data need not hold equally in the future and in other markets; the returns of quantitative value strategies at times lagged their historical patterns considerably after such systems were published and popularised (factor crowding). Added to this are the turnover and transaction costs of semi-annual re-sorting, and long phases of trailing the market that demand considerable discipline. The O’Shaughnessy approach therefore does not replace the fundamental analysis of individual companies in Chapters 4 to 7, but

complements it: as a systematic pre-filter condensing the investment universe to those names for which deeper analysis is worthwhile – and as protection against one’s own behavioural errors, because rules are not subject to the mood of the day.

9 The Market Perspective II: Enterprise-Value Multiples and the Peer-Group Problem

9.1 Why Enterprise-Value Multiples?

Equity multiples such as the P/E compare quantities after interest and are therefore dependent on capital structure. Enterprise-value multiples avoid this by setting the total firm value (market capitalisation plus net debt, or less net liquidity) in relation to quantities before interest – EBITDA, EBIT, sales or free cash flow (Koller et al., 2020). The route back to the share value runs over the bridge of equation (11)

$$P_0 = \frac{EBITDA \cdot \text{multiple} + \text{net liquidity}}{\text{number of shares}} \quad (11)$$

9.2 The Peer-Group Problem of Porsche AG

Porsche makes the core problem of any relative valuation visible like few other names: which peer group is the right one? As a luxury-goods maker, Porsche belongs to be priced alongside Ferrari – Ferrari trades at an EV/EBITDA above 20 and a P/B close to 10. As a German automobile manufacturer, Porsche belongs alongside Volkswagen, BMW and Mercedes-Benz – with EV/EBITDA multiples of 2–3 and P/B ratios below 0.5. Table 7 shows how dramatically the choice shifts the verdict (basis: normalised EBITDA of roughly 7.5 billion euro, net liquidity 7.3 billion euro, normalised EPS 3.07 euro).

Table 7: Multiple-based valuation, Porsche AG – two peer groups (normalised basis)

Multiple	Volume-manufacturer level	Value per share	Luxury-goods level	Value per share
EV/EBITDA	2.5x	€28.60	11.0x	€98.60
P/E	6.0x	€18.40	20.0x	€61.50
P/B	0.35x	€8.80	1.5–2.0x	€38–50
P/S	0.25x	approx. €18	2.0x	approx. €88
for comparison: price		€45.20		€45.20

Source: own calculation; peer-group multiple levels based on public market data.

The finding is unambiguous: on volume-manufacturer multiples Porsche would be priced at 9 euro to 29 euro per share, on luxury-goods multiples at 50 euro to 99 euro. The actual price of 45.20 euro positions Porsche almost exactly between the two worlds – the market prices the company as “half a luxury stock”: too good for the industry, too dependent on it for the full luxury premium. This classification is not a weakness of the method but its essential insight: the multiple reveals which narrative the market is currently following. If the narrative shifts – say, through sustained margin recovery towards the luxury profile, or through further sales crises towards the volume profile – the price moves by a multiple of the fundamentals themselves.

9.3 Rules of Good Peer-Group Construction

The quality of any multiple-based valuation stands and falls with the comparison group. Comparability demands similarity in the three value drivers growth, profitability (ROIC) and risk – not mere membership of the same industry (on the accuracy of peer-group selection Alford, 1992; on the empirical superiority of forward earnings-based multiples Liu, Nissim and Thomas, 2002); the Porsche example shows that industry membership can even mislead where business model and pricing power diverge. Practical rules: at least six to eight comparable companies; identify outliers instead of averaging mechanically; prefer forward multiples on normalised earnings; neutralise leverage differences via EV multiples; adjust for accounting differences (IFRS 16, capitalised development costs, special items as at Porsche in 2025) before comparing; and for hybrid profiles like Porsche, disclose both peer groups rather than hiding one.

10 The Market Perspective III: Market Efficiency, Behavioural Economics and Sentiment

10.1 Excess Volatility and the Limits of Arbitrage

If prices always corresponded to fundamental value, their fluctuation should not materially exceed the fluctuation of fundamentals. Shiller (1981) showed, however, that share prices fluctuate many times more than subsequently realised dividends would justify. Why rational arbitrageurs do not simply arbitrage such mispricings away is explained by Shleifer and Vishny (1997) through the limits of arbitrage: mispricings can persist longer than arbitrageurs remain solvent. Black (1986) added the role of “noise”: a substantial share of trading rests not on information but on noise – opinions, liquidity needs, fashions; De Long, Shleifer, Summers and Waldmann (1990) showed

formally that this noise-trader risk can deter rational investors from taking opposing positions. The sharp decline of the Porsche share from above 120 euro at the peak (2023) to below 40 euro at times cannot be explained without this expectations and sentiment dynamic: fundamental earnings power deteriorated, but it did not fall to a third.

10.2 Systematic Behavioural Patterns

Behavioural economics has systematised the psychological sources of these deviations. Prospect theory (Kahneman and Tversky, 1979) shows that investors weight losses about twice as heavily as equal-sized gains – loss aversion explains stress-driven selling as well as holding losing positions too long: the disposition effect, theoretically grounded by Shefrin and Statman (1985) and demonstrated empirically across thousands of investor accounts by Odean (1998). Overreaction to series of news produces systematic reversal patterns (De Bondt and Thaler, 1985); herding and narratives amplify trends far beyond what fundamentals justify (Shiller, 2015) – the IPO euphoria around Porsche in 2022/23 (“the next Ferrari”) and the subsequent slump (“the German auto crisis”) are a textbook case of two competing narratives about the same asset. Added to these are anchoring effects, overconfidence and confirmation bias; a systematic survey of this research is given by Barberis and Thaler (2003).

10.3 The Share Price as the Sum of Value and Sentiment

For understanding the share price, a simple, practical model follows: the price equals fundamental value plus a time-varying sentiment component that oscillates around zero but can dominate in extreme phases. Graham coined for this the image of “Mr. Market”, who quotes the investor prices daily that depend on his mood of the day (Graham, 1949). The consequence is not to ignore the market but to measure its offers against one’s own judgement of value: the fundamental analysis of Chapters 4 to 7 supplies the value anchor, the market perspective of Chapters 8 and 9 the relative classification – and the assessment of sentiment decides whether the market is currently demanding premia or granting discounts.

11 Case Study Porsche AG: All Methods Compared

11.1 The Valuation Range

Chapters 5 to 9 have valued Porsche AG with all the standard methods. Table 8 brings the results together.

Table 8: Overall comparison of all valuation methods – Porsche AG

Method	Value per share	Key assumption	Note
Discounted cash flow (DCF)	€46.79	FCFF recovery to €3.3bn by 2031	TV share only 48% (high cost of capital)
Economic Profit (EP)	€39.93	NOPAT recovery to €3.1bn	more conservative than DCF; ROIC explicit
Residual income / DES	€21.68	ROE only reaches the cost of equity	strict case: no durable excess profits
DDM (Gordon growth)	€24.77	normalised dividend €1.80, g 2.5%	current dividend crisis-reduced
Multiples, volume manufacturers	€9–29	EV/EBITDA 2.5x; P/E 6x; P/B 0.35x	industry-crisis pricing
Multiples, luxury goods	€50–99	EV/EBITDA 11x; P/E 20x	Ferrari analogy
Book value per share	€25.24	balance-sheet equity	without brand and expectations
Current market price	€45.20	—	early July 2026

Source: own calculation (consolidation of Tables 2 to 7).

The valuation range is extraordinarily wide – from 9 euro (volume-manufacturer P/B) to 99 euro (luxury EV/EBITDA) – and precisely therein lies its message: the value of the Porsche share depends less on computational precision than on two fundamental questions. First: does the return to normalised earnings power succeed (then the DCF/EP region of 40–47 euro, with a luxury upside option), or does the company remain stuck in the industry crisis (then the residual-income region around 22 euro)? Second: will the market price Porsche in future as a luxury good or as an automobile manufacturer? The price of 45.20 euro lies almost exactly at the centre of the present-value-based methods – the market has currently priced opportunities and risks in a balanced way.

11.2 What the Price of 45.20 Euro Contains

Decomposing the price makes the paper’s findings concrete. Of the 45.20 euro price, 25.24 euro falls on the book value of equity and around 8 euro per share on the net liquidity of the automotive business – together about 33 euro of “hard” substance. The remaining roughly 12 euro per share (about 11 billion euro) is the capitalisation of the brand and the recovery expectation: the present value of those future excess profits that arise when Porsche again translates its pricing power into double-digit margins. The price thus contains all five layers from Chapter 13.2 in measurable form – and it shows at the same time what it no longer contains: the IPO euphoria of 2022/23, when the same share cost more than 120 euro and the sentiment component dominated value.

11.3 Margin of Safety

Benjamin Graham recommended buying shares only when the market price lies clearly – by at least 25 to 33 per cent – below intrinsic value (Graham, 1949). This margin of safety is not a precision instrument but an insurance against the inevitable errors of any valuation. For Porsche AG it does not exist at the price of 45.20 euro: the DCF value (46.79 euro) sits practically at the price level, the more conservative EP model (39.93 euro) below it. A value investor in Graham’s tradition would speak of a genuine margin of safety only at prices around 30–33 euro – close to the hard substance of book value and net liquidity. An acquisition at today’s price buys the recovery expectation at a fair price, but without a safety buffer; waiting for the safety margin risks the recovery occurring without participation. To weigh this honestly – instead of hiding it behind model faith – is the investor’s real task.

12 Limitations, Risks and a Practical Checklist

12.1 Limitations of the Valuation Methods

All the methods presented share three basic problems. First, forecast dependence: every valuation rests on assumptions about an uncertain future; the Porsche range of 9 euro to 99 euro shows how strongly defensible assumptions spread the results – and that the choice of peer group is an assumption like any other. Second, the terminal-value problem of present-value methods: even for Porsche, with almost 10 per cent cost of capital, nearly half the value falls on the period after the explicit plan – that is, on the least forecastable period. Third, data quality: balance-sheet quantities are distorted by accounting standards, special items (Porsche 2025: 3.9 billion euro) and unrecognised intangibles; unadjusted ratios – such as the optical P/E above 90 – systematically mislead.

12.2 Risks from the Investor’s Perspective

From the investor’s perspective, risks are added that lie outside the models: interest-rate risks (every present-value calculation reacts inversely to the discount rate), political and trade-policy risks (US tariffs cost Porsche around 0.7 billion euro in 2025), technology and disruption risks (battery technology, software), currency risks, and the investor’s own behavioural risk – procyclical buying during overvaluation (Porsche at 120 euro) and selling during price declines empirically destroys more return than poor stock selection (Barber and Odean, 2000). Valuation models do not replace risk management; they structure it.

12.3 A Practical Analysis Checklist

The checklist in Table 9 integrates both strands of the paper into a practicable analytical framework: the first rows test fundamental value creation, the last ones the relative valuation, the state of the industry and the market's mood.

Table 9: Practical analysis checklist for equity investors

Area	Core questions	Points to examine
Quality	ROIC > WACC? How durable is the spread?	pricing power, brand, moat
Balance-sheet strength	Net debt? Interest cover? Liquidity?	crisis resilience (Porsche: net cash)
Valuation	Present-value upside > 30%? Multiples vs. both peer groups?	margin of safety
Cash-flow quality	Cash conversion > 70%? FCF yield > 5%?	divergence of earnings vs. cash flow
Normalisation	Special items adjusted? Cycle smoothed?	P/E on normalised earnings
Intangibles	Does the brand explain the P/B? Goodwill risks?	sustainability of excess profits
Industry	Does the industry trade below book value? Why?	structural crisis vs. cyclical trough
Market & risk	Beta, R^2 , stock-specific risks?	need for diversification
Sentiment	Expectations embedded in the price: overvaluation or price decline	reconstruct implied expectations

Source: own compilation based on data from Graham and Dodd (1934).

13 Conclusion and Recommendations

The opening question can now be answered precisely. Behind a share price lie five layers: first, balance-sheet substance (book value and net financial position) – for Porsche around 33 euro of 45.20 euro; second, the present value of the cash flows of the existing business; third, the present value of expected future excess profits – positive only where ROIC exceeds WACC, and for Porsche embodied almost entirely in the brand; fourth, the relative market valuation, by which the comparison group sets the industry's level of expectations – for Porsche the unresolved dispute between luxury and volume pricing; and fifth, a sentiment component that oscillates around zero but dominates in extreme phases – as the share's journey from 82 euro (issue price) via 120 euro (euphoria) to 45 euro (crisis pricing) shows. No single valuation method captures all five layers; only their combination yields the complete picture.

The Porsche case study condenses these layers into a quantitative overall picture. The cost of capital is 9.95 per cent; the present-value methods deliver 46.79 euro (DCF) and 39.93 euro (Economic Profit) respectively, the strict book-value-anchored cross-checks 21.68 euro (residual income) and 24.77 euro (dividend model). The exceptional year 2025 shows its two faces – a reported EVA of –1.27 billion euro against +1.45 billion euro normalised – and the choice of peer group (volume manufacturers versus luxury goods) shifts the relative verdict by a factor of three. The price of 45.20 euro corresponds to hard substance of around 33 euro per share plus a brand and recovery premium of around 12 euro – without a margin of safety. Methodologically, the guiding quantity of this paper is thus confirmed: only the spread of ROIC over WACC decides on value creation, and only the combination of several methods makes the verdict robust.

Six recommendations follow from the analysis. First: combine at least three methods – one present-value method (DCF or EP), one book-value-anchored method (residual income) and the multiples as a market cross-check; derive judgements only from the intersection. Second: always normalise earnings – adjust for special items, cycles and one-off burdens before comparing ratios. Third: place the guiding question of ROIC versus WACC before any detailed analysis. Fourth: read industry-wide undervaluation as a warning signal – where a whole sector trades below book value, the market is pricing in a structural crisis; the burden of proof for the contrary lies with the buyer, and the exit of individual manufacturers is among the possible scenarios. Fifth: explicitly reconstruct the expectations embedded in the price (“What must happen for 45 euro to be fair?”) and judge their plausibility. Sixth: buy only with a margin of safety – 25 to 33 per cent distance to conservatively estimated intrinsic value – and use the market’s mood as timing information: the best opportunities arise when Mr. Market is pessimistic.

For Porsche AG the summary verdict is: a fairly priced brand-and-substance stock at the epicentre of a structural industry crisis – with hard substance of around 33 euro per share as a floor, a real but assumption-dependent recovery option towards 60 euro, and no margin of safety at the current price. Buying is the bet that the brand is stronger than the industry crisis; the price performance of Toyota, BYD and Geely warns against confusing that bet with home-market attachment.

For the case study and its industry, the outlook names the variables from which further developments can be read. At the company level, what matters is whether Porsche actually reaches its normalised earnings level – visible in the margin recovery, the success of the model cycle, and the pricing power of the brand in the luxury segment. At the industry level, the structural crisis remains the yardstick: the development of the China business, the stabilisation of margins and earnings, the cost

structure of the German production base, and the progress of the software and electrification strategies will determine whether the industry-wide price-to-book discounts prove an exaggeration or a correct anticipation; the relative price performance against Toyota, BYD, and Geely provides the running market benchmark. Catalysts in the sense of the analysis – strategy changes, capital measures, visible turnaround evidence – are likely to determine the moment at which the market undertakes a re-rating.

Beyond the single case, the paper points to three open fields. First, the accounting for intangibles: as long as brands, software, and data remain largely off balance sheet, the gap between book value and market value will keep widening and further strain the informativeness of book-value-based ratios – valuation practice will have to develop its methods accordingly. Second, the connection between fundamental valuation and price formation: reconstructing priced-in expectations and systematically evaluating sentiment and positioning data promise a closer integration of the two perspectives of this paper. Third, the continued empirical observation of the value anomaly in the transition to an increasingly intangible economy. The five-layer framework of this paper – substance, cash flows, excess profits, relative valuation, sentiment – remains the durable scaffolding with which future prices can be ordered just as today's.

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