



INVESTMENT & FINANCING STRATEGY

Pirelli vs Hankook

A comparative investment and financing analysis

GROUP NUMBER 3

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Contents

1	COMPANY SELECTION & BACKGROUND	3
1.1	Tyre Industry and Competitive Landscape	3
1.2	Pirelli & C. S.p.A.	3
1.3	Hankook Tire & Technology Co., Ltd.	3
2	FINANCIAL ANALYSIS	4
2.1	Ratio Analysis	4
2.1.1	Profitability Analysis	4
2.1.2	Liquidity Analysis	5
2.2	Cost of Capital and Valuation	6
2.2.1	Cost of Equity & Cost of Debt	6
2.2.2	DCF Valuation	7
2.2.3	Comparative and Patrimonial Approaches	7
2.2.4	Valuation Summary: All Methods against the Market Price	8
2.2.5	Conclusions	9
2.3	Investment Projects: NPV, IRR and Profitability Index	9
2.3.1	The Two Projects	10
2.3.2	Results	10
2.3.3	Scenarios, Simulation and Break-even	10
3	SUSTAINABILITY ASSESSMENT	11
3.1	Pirelli & C. S.p.A. ESG	11
3.2	Hankook Tire & Technology Co., Ltd. ESG	12
3.3	Comparison of Sustainability Approaches	12
3.4	Climate-Related Risks and Opportunities	12
4	INVESTMENT RECOMMENDATION	13
	ANNEXES	15
	Methodology	15
	Annex 1: Hankook's Acquisition of Hanon Systems	15
	Annex 2: Cost of Debt and Cost of Equity Computation	16
	Annex 3: Limits of the Assumptions (Cost of Capital and Valuation)	16
	Annex 4: Method and Assumptions (Investment Projects)	17
	Annex 5: Limits of the Assumptions (Investment Projects)	18
	Annex 6: Assumptions Sensitivity (Investment Projects)	18
	Annex 7: Assumptions Simulation (Investment Projects)	19
	REFERENCES	20
	Excel Files	20
	Sources	20

1. COMPANY SELECTION & BACKGROUND

1.1 Tyre Industry and Competitive Landscape

The tyre industry is a large, **mature manufacturing sector** closely linked to the automotive market. Asia-Pacific is the main production and consumption area, driven by strong vehicle demand and infrastructure growth. Europe and North America are more stable and replacement-driven. The market splits into **Original Equipment (OE)**, which supplies carmakers with tyres for new vehicles, and the **Replacement Market (RM)**, which serves consumers replacing worn tyres and accounts for most global demand.

Competition at the top is concentrated among eight manufacturers (Michelin, Bridgestone, Goodyear, Continental, Pirelli, Hankook, Sumitomo and Yokohama), which compete on product quality, technology and brand. Michelin and Bridgestone are the largest and most diversified, while Pirelli and Hankook are **mid-sized players of comparable scale**.

Size is not the only reason we chose Pirelli and Hankook. Both are accelerating towards the **High Value segment**, which makes them the closest match in strategic focus and innovation effort. They also differ in ways that enrich the analysis. They follow **different sustainability philosophies**. Pirelli is controlled by industrial shareholders, whereas Hankook is family-controlled. Their plants are geographically distant, which brings different climate-related risks and opportunities.

1.2 Pirelli & C. S.p.A.

Pirelli & C. S.p.A. is an Italian multinational founded in 1872 and headquartered in Milan. It designs, produces and sells high-performance tyres, and it is one of the world's leading tyre manufacturers. It has 18 plants in 12 countries, sells in over 160 countries and employs around 29,900 people.

Pirelli operates only in the **Consumer Tyre market** and focuses on the High Value segment, where it leads the Premium categories. It supplies more than half of the Original Equipment tyres for top automakers such as Ferrari and Lamborghini. Its 13 research centres, 2,100 R&D experts and over 6,000 patents make it a technology-driven company.

In FY2025 Pirelli reported **revenues of €6.78bn**, an EBIT margin of 13.2%, and High Value products accounted for 79% of sales.

Sustainability is one of Pirelli's four strategic pillars. Pirelli is targeting Net Zero emissions by 2040, the most ambitious goal in the industry. Its approach focuses mainly on the product, and 26.9% of its materials already come from natural or recycled sources.

1.3 Hankook Tire & Technology Co., Ltd.

Hankook Tire & Technology is a South Korean tyre manufacturer founded in 1941 and headquartered in Pangyo. It has 8 plants in 5 countries, which can produce over 100 million tyres a year, and it sells in more than 160 countries.

Hankook's portfolio is broader than Pirelli's and covers passenger, SUV, EV and truck/bus tyres. It has steadily expanded its OE supply to premium automakers, with the aim to grow in the high-end, supercar and EV markets to earn higher margins.

In FY2025 Hankook's tyre business passed **₩10 trillion in sales** for the first time (~€6.4bn), with an operating margin of about 16%. Including the newly consolidated Hanon Systems, group revenue reached ~€13.2bn.

Hankook is committed to eco-friendly innovation and it is targeting Net Zero by 2050 and a 46.2%

cut in Scope 1+2 emissions by 2030 compared with 2019. Its approach covers the whole value chain, with an ESG strategy built on three pillars: Eco Value Chain, Sustainable Product and Responsible Engagement.

2. FINANCIAL ANALYSIS

This section assesses the financial position of Pirelli and Hankook over 2022–2024 and asks whether their different business and financing models lead to different capacities to create value. We start from past performance, looking at **profitability** and **liquidity**. We then estimate each company’s cost of capital and use it in two ways. First, we value both firms at 31 December 2024 with a **DCF** and cross-check the result with a **multiples-based** and **patrimonial** valuation. Second, we use it as the hurdle rate for a real investment decision, the **US plant expansions** that each company has announced or already has under way.

The analysis stops at FY2024 on purpose. From 2025 Hankook consolidated **Hanon Systems**. The acquisition makes Hankook roughly twice Pirelli’s size and moves it partly into thermal management components, so it is no longer a pure tyre player. Including 2025 would mean comparing two companies that are structurally different. The acquisition and its effects on Hankook’s financials are analysed separately in the Annexes.¹

2.1 Ratio Analysis

2.1.1 Profitability Analysis

The first step of the financial analysis assesses the profitability and liquidity of Pirelli and Hankook. Profitability shows whether a company earns an adequate return on the capital provided by lenders and shareholders. Liquidity shows whether a company can meet its short-term obligations and fund its operations. The two need to be read together because a profitable company can still face financial distress if its cash is tied up, and plenty of liquidity combined with weak returns means capital is not being used efficiently.

For the profitability analysis we selected two ratios, **ROI** and **ROE**. Together they show profitability from the point of view of the company as a whole and from that of its shareholders.

ROI

$$ROI = \frac{EBIT}{Invested\ Capital}$$

ROI measures how efficiently a company generates **operating profit** from its **Invested Capital**.

Both companies improved their operating returns between 2022 and 2024, but in different ways.

Hankook’s ROI doubled: in 2022 its margins were squeezed by high raw material and freight costs; EBIT then rose by 81% in 2023 and by another 27% in 2024, as lower input and logistics costs and a richer product mix cut “Cost of sales” from 75.0% to 63.2% of revenues. **Pirelli’s ROI rose more steadily:** in 2023 a small increase in EBIT came together with lower Invested Capital; in 2024 EBIT grew by 11.7%, driven by higher volumes, a better price/mix and efficiency programmes, with High Value products reaching 76% of sales.

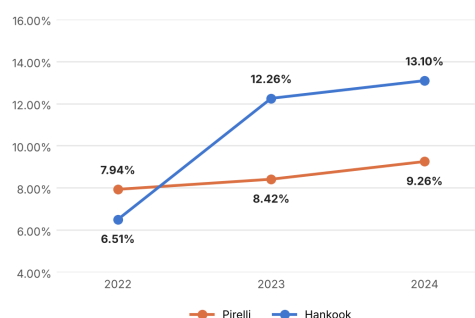


Figure 1: ROI, 2022–2024

¹ See Annex 1 for the full analysis of Hankook’s acquisition of Hanon Systems.

ROE

$$ROE = \frac{\text{Net Profit}}{\text{Shareholders' Equity}}$$

ROE measures how effectively a company uses **Equity** to generate **value for its Shareholders**.

At shareholder level the picture changes. The main difference comes from **capital structure**.

Pirelli relies much more on debt, with a Financial Debt-to-Equity ratio of 0.83 in 2022 and 0.65 in 2024. Because its ROI stayed above its cost of debt throughout the period, this leverage increased returns to shareholders. In 2024 Pirelli's ROE dipped slightly for two reasons: Equity grew faster than Net Profit, and the cost of debt rose.

Hankook, on the other hand, has a very **conservative capital structure**, financed mostly with equity (D/E between 0.12 and 0.22), which fits its family-driven governance. Leverage therefore has almost no effect, and its ROE depends mainly on what happens below EBIT. This was clear in 2023. EBIT grew by 81%, yet Net Profit was flat, because financial costs were high and the effective tax rate jumped to about 38%. In 2024 the record operating result finally reached the bottom line, with Net Profit up 49%, and Hankook's ROE clearly overtook Pirelli's.

Overall, **the two companies reach similar shareholder returns with opposite models**. Hankook combines stronger operating profitability with a low-risk, equity-heavy structure, but its results below EBIT are more volatile. Pirelli improves its operations more steadily and uses financial leverage to boost returns.

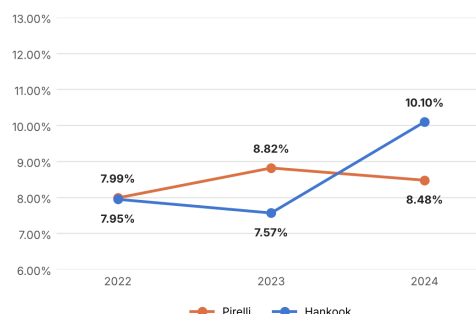


Figure 2: ROE, 2022–2024

2.1.2 Liquidity Analysis

To assess the liquidity we selected the **Quick Ratio** and the **CAPEX Coverage Ratio**. The first matters in the tyre industry, where long production cycles, volatile raw material prices and high inventory levels tie up cash. The second is essential in a **capital-intensive business** that needs regular investment in plants and technology.

Quick Ratio

$$QR = \frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}$$

The Quick Ratio shows whether a company can meet its **short-term obligations**.

Hankook's Quick Ratio stays **well above 1** throughout the period, thanks to a large base of current assets. It peaked in 2023, when the company generated much more cash from operations and at the same time reduced its short-term borrowings by more than half. Pirelli's Quick Ratio stays **below 1**, which means it could not fully cover its short-term obligations. This does not signal a cash shortage. It reflects a small base of current assets, with low receivables and long payment terms with suppliers, a working capital model that frees up cash rather than absorbing it.

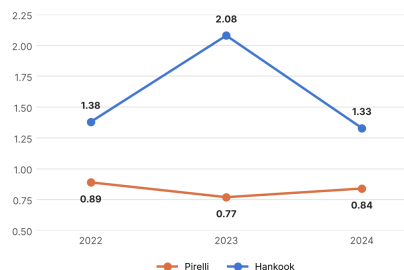


Figure 3: Quick Ratio, 2022–2024

CAPEX Coverage Ratio

$$CAPEX\ Coverage = \frac{Operating\ Cash\ Flow}{CAPEX}$$

The CAPEX Coverage Ratio shows whether a company can pay for its **investments** with the **cash generated by its operations**.

Both companies stay above 1 in every year, so they can fund their investments entirely with operating cash flows, without needing external financing. Pirelli is very stable at around 3.2–3.4x, and this stability is typical of a mature company with a well-established asset base. Hankook’s ratio is more volatile. In 2022 operating cash flow was weak because the company built up inventories, especially raw materials, as a precaution after the Russia-Ukraine conflict. In 2023 the ratio jumped as those inventories were reduced and released cash. This was a temporary effect: in 2024 the ratio fell because CAPEX more than doubled, signalling a new phase of capacity investment.

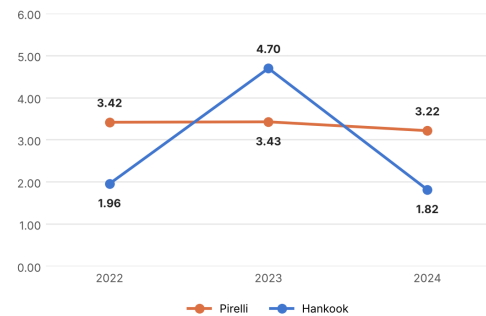


Figure 4: CAPEX Coverage Ratio, 2022–2024

2.2 Cost of Capital and Valuation

Ratio analysis shows how the two companies have performed so far; the next step is to see how the market prices them. We value both companies at 31 December 2024, in euro (Hankook’s accounts converted at the 2024 ECB average rate, ₩1,475.40 per €). The cost of equity follows the **CAPM**, using the 10-year Bund (2.36%), a mature-market premium plus each country’s risk premium (Italy 2.93%, Korea 0.66%) and Damodaran’s Rubber & Tires beta relevered at each company’s leverage. The cost of debt adds each company’s rating spread to the risk-free rate, net of tax. Detailed computations are reported in the annexes.²

2.2.1 Cost of Equity & Cost of Debt

Component	Pirelli	Hankook
Cost of Equity (R_e)	10.90%	7.48%
Cost of Debt after tax	2.91%	2.56%
Equity / debt weights	58.8% / 41.2%	67.4% / 32.6%
WACC	7.61%	5.88%

Table 1: Cost of capital at 31/12/2024³

Pirelli discloses a post-tax WACC of 8.14% in its 2024 impairment test, about 0.5 pp above our estimate; Hankook discloses none.

Implications. Country risk drives the gap. Hankook’s capital is 1.73 pp cheaper than Pirelli’s: about 1.6 pp comes from the country premium alone and the rest from **leverage**, while operating risk plays no role because both companies share the same industry beta. Measuring Pirelli’s country risk by revenue rather than domicile would lower its WACC to about 6.6% and the gap to about 0.7 pp. Pirelli’s shareholders also carry more **financial risk**: its debt equals

² See Annex 2 for the computation of the cost of debt and cost of equity.

³ For the full computation, see the Excel file “Valuation & Investment Projects”, sheet “WACC”.

70% of its market capitalisation (48% for Hankook), lifting its equity beta from 0.76 to 1.18 and its cost of equity above 10%, although the larger weight of cheap debt almost offsets this in the WACC. The resulting hurdle rates are **7.61%** for Pirelli and **5.88%** for Hankook, so Hankook can accept projects that Pirelli would reject.

2.2.2 DCF Valuation

Following the course method, free cash flows for 2025–2029 are discounted at the WACC, and a Gordon terminal value is added with 2% growth, net of the reinvestment needed to grow (g / ROIC; 2024 ROIC of 8.8% for Pirelli and 14.0% for Hankook). Revenue grows 3% a year for both companies; Pirelli keeps its 2024 EBIT margin (13.3%), while Hankook’s 18.7% is treated as exceptional and fades to 14% by 2029, close to its 2022–24 average.

Component	Pirelli	Hankook
Enterprise Value (€m)	11,262	14,971
Terminal Value share of EV	70%	84%
Equity Value (€m)	9,222	16,446
Value per Share	€9.22	₩198,912 ⁴
Market Price (30/12/2024)	€5.47	₩38,400
Upside	+69%	+418%

Table 2: DCF valuation at 31/12/2024⁵

Testing the valuation against changes in assumptions confirms this conclusion: moving the **WACC** by ± 1 pp and **growth** between 1.5% and 2.5% gives €7.6–11.9 for Pirelli and ₩154,000–298,000 for Hankook: even the most conservative case stays well above the market price, so the gap is not explained by the discount rate alone.

Implications. First, it is important to note that value is a **bet on the long term**: 70% of Pirelli’s value and 84% of Hankook’s come after 2029, so the DCF is mainly a statement about sustainable margins and growth. Second, the market prices Hankook as if it had no future beyond 2029: the present value of its 2025–29 cash flows alone (€2.37bn) exceeds its market enterprise value excluding associates by 39%, whereas for Pirelli the same flows cover 45% of it (€3.38bn against €7.51bn). The two companies also have different **cash-flow profiles**: in particular growth costs Hankook cash but not Pirelli. In fact, Hankook’s **working capital** equals 31.5% of revenue, while Pirelli’s is close to zero because its trade payables finance inventories and receivables, a sign of its **bargaining power with suppliers**. Furthermore, Hankook’s value is the more fragile: its WACC is only 3.9 pp above long-term growth (5.6 pp for Pirelli), and ± 1 pp on the WACC moves its value by +32% / –19%, against +25% / –17% for Pirelli. Growth, however, creates more value at Hankook, whose ROIC (14.0%) is well above its WACC (5.9%); Pirelli’s ROIC (8.8%) is only just above its 7.6%, and it must reinvest about 23% of operating profit to grow at 2%.

2.2.3 Comparative and Patrimonial Approaches

The DCF alone is not enough to value Pirelli and Hankook. Its result rests on a handful of long-term assumptions: 70% of Pirelli’s value and 84% of Hankook’s come from the terminal value,

⁴ Hankook’s per-share value is converted back to won at the same rate used for its accounts, so it can be compared with its Seoul price; comparisons between the two companies use percentages and multiples, which do not depend on currency. As the exchange rate cancels out, won-based flows are in effect discounted at a euro rate, ignoring the Korea–euro area inflation differential; the effect is small.

⁵ For the full computation, see the Excel file “Valuation & Investment Projects”, sheets “DCF_Pirelli” and “DCF_Hankook”.

and moving the WACC by one point changes Hankook's value by up to a third. We complement it with two approaches that start from different information: the **comparative approach**, which looks at what investors actually pay for similar companies, and the **patrimonial approach**, which looks at what each company owns.

Comparative approach. This method values a company at the multiples at which comparable firms trade. Because it relies on observed market prices rather than on our forecasts, it is the natural counterweight to the DCF. We apply **Damodaran's global Rubber & Tires averages** at January 2025 (EV/EBITDA 5.73x, P/E 10.92x and P/B 1.07x) to each company's 2024 results and take the average of the three values obtained: €5.90 per share for Pirelli and ₩107,373 for Hankook.

Patrimonial approach. This method values a company as the difference between what it owns and what it owes, and it suits **asset-based companies** best, whose value rests on identifiable assets. Tyre makers are capital-intensive, and plants, inventories and receivables make up most of their balance sheets, so net assets are a meaningful reference for both groups. However, the approach ignores future profits, so for an operating business it gives a minimum value rather than a fair value. In principle, the patrimonial approach would use the adjusted net asset value (**adjusted NAV**), which restates each asset and liability from its accounting value to its current value. That restatement requires detailed information on the assets each company holds, such as appraisals of plants and land or the condition of inventories, which only a due diligence process would provide. Since we work from public information only, we use **book value**: total assets minus total liabilities, minus the share of equity that belongs to minority shareholders of subsidiaries, since we are valuing one share of the parent company. This gives €5.76 per share for Pirelli and ₩90,995 for Hankook.

2.2.4 Valuation Summary: All Methods against the Market Price

The table below brings together the values obtained with each method and compares them with the market price at the end of 2024.

Value per Share	Pirelli (€)	Hankook (₩)
Patrimonial – Book Value	5.76	90,995
Comparative (average of three multiples)	5.90	107,373
DCF	9.22	198,912
Valuation range	5.8 – 9.2	91,000 – 199,000
Market Price (30/12/2024)	5.47	38,400

Table 3: Value per share: all methods against the market price⁶

Taken together, the methods give a range, with the book value as the floor and the DCF as the upper bound: €5.8–9.2 for Pirelli and ₩91,000–199,000 for Hankook. The two companies sit in very different positions within their ranges. Pirelli's price (€5.47) is just below the bottom of its range, at 0.95 times its net assets and within 10% of the sector-multiple value. Hankook's price (₩38,400) is far below every method, at less than half even of its net assets.

The gap becomes clearer when each value is expressed as a multiple of 2024 results.

The market values Pirelli at 5.2 times EBITDA, close to the sector's 5.7, while our DCF implies 7.7. Hankook trades at only 1.9 times EBITDA, a third of the sector multiple, while our DCF implies 10.5. Another way to read the gap is to ask which discount rate would make our cash flows match today's price. For Pirelli the answer is 10.7%, about 3.1 pp above our WACC; for

⁶ For the full computation, see the Excel file "Valuation & Investment Projects", sheet "Multiples".

Multiple	Sector	Pirelli Market	Pirelli DCF	Hankook Market	Hankook DCF
EV/EBITDA	5.73x	5.16x	7.70x	1.90x	10.50x
P/E	10.92x	11.69x	–	4.20x	–
P/B	1.07x	0.95x	–	0.42x	–

Table 4: Market and DCF-implied multiples against the sector

Hankook it is 34%, a rate no investor would require of an investment-grade company. The market is therefore not simply applying a higher discount rate: it expects lower cash flows than our base case.

2.2.5 Conclusions

Overall, our analysis shows that **the market prices Pirelli in line with its sector**. Trading slightly below book value is consistent with Pirelli's returns. Its return on equity (8.5%) is below its cost of equity (10.9%), and a company that earns less on its equity than shareholders require is expected to trade below that equity. Our DCF still values it at 1.6 times book because it keeps the 2024 margin forever, and at firm level ROIC (8.8%) still beats WACC (7.6%). The gap therefore comes from expectations about the whole industry, not about Pirelli: low-cost Asian competition, US tariffs, weak European car production and the shift to electric vehicles. Uncertainty about the role of its main Chinese shareholder adds a company-specific factor. The upside in our DCF holds only if Pirelli's margins prove more durable than the sector's.

Hankook's discount, by contrast, **does not match its returns**. Its return on equity (10.1%) exceeds its cost of equity (7.5%), which should justify a price above its net assets, not less than half of them. The likely causes are:

- the **“Korea discount”**, linked to the governance of family-controlled groups and low payouts, which a country risk premium based on sovereign default cannot capture;
- the market's view that 2024 margins are a peak;
- doubts about the Hanon acquisition as a strategic choice.

What does this mean? For an investor, Pirelli looks fairly valued: buying it is a bet on durable margins. Hankook looks cheap on every metric, but a cheap stock can stay cheap. Its discount will close only with a trigger, such as better governance and payouts, proof that 2024 margins can last, or a successful integration of Hanon. **For management**, the cost of capital implied by market prices is well above our CAPM estimate, especially for Hankook. Issuing shares at less than half of book value would heavily dilute existing shareholders, so growth like the Hanon deal is better financed with cash and debt.⁷ The main limits of our assumptions are discussed in the annexes.⁸

2.3 Investment Projects: NPV, IRR and Profitability Index

For each company we value one announced US plant expansion, driven by the same **‘local-for-local’ logic** of producing close to customers and avoiding import tariffs, hence the results are directly comparable. Each project is valued *ex ante* at its decision date,⁹ in US dollars, at the company's WACC, which the course allows when a project carries the company's risk and does

⁷ See Annex 1 for the full analysis of Hankook's acquisition of Hanon Systems.

⁸ See Annex 3 for the limits of the valuation assumptions.

⁹ Hankook's plant was largely built by our valuation date: valuing it today would treat most of its capex as sunk, so both projects are assessed at their decision date.

not change its financing.¹⁰ Given the model's limitations analysed in the annexes,¹¹ we focus more on **how the two projects compare**: Pirelli's project creates value under most assumptions, while Hankook's needs several favourable assumptions at once.

2.3.1 The Two Projects

Project facts	Pirelli	Hankook
Project	Rome (Georgia) expansion	Clarksville (Tennessee) expansion
Expansion capex	\$1,200m	\$1,600m
Investment period	2027–2033	2023–2026
Added capacity	5.55m tyres (car)	6.5m tyres (car + truck)
Capex per tyre of capacity	\$216	\$246

Table 5: The two US expansion projects¹²

2.3.2 Results

Base case	Pirelli	Hankook
NPV (USD m / EUR m)	405 / 374	–90 / –83
IRR (global IRR, reinvestment at WACC)	12.2% (9.6%)	5.3% (5.6%)
WACC (hurdle rate)	7.6%	5.9%
Profitability index	1.45	0.94
Payback / discounted payback (years)	11.9 / 16.0	16.3 / not recovered

Table 6: Base-case results

Pirelli's project creates value: its IRR exceeds its WACC by 4.6 pp, and still by 2.0 pp when cash flows are reinvested at the WACC; Hankook's is 0.6 pp below its WACC and its discounted flows never recover the investment.

Implications. The Georgia plant is worth about 7% of Pirelli's market value (€374m against €5.47bn) and supports the margin-durability case behind our DCF, a premium, highly automated US plant is how Pirelli defends its margins against Asian imports and tariffs. Moving to Hankook's case, what is important to note is that **working capital** alone turns the NPV negative: its 31.5% working-capital ratio costs the project \$162m at present value: without it the NPV would be about +\$72m instead of –\$90m; a **lower price** and a **higher capex per tyre** explain the rest of the gap with Pirelli. As for the time horizon, both are **long-term bets**, with paybacks of 12 and 16 years that make value depend on conditions well beyond the tariff cycle that motivated the investments.

2.3.3 Scenarios, Simulation and Break-even

We performed scenarios to see changes resulting from simultaneous variations in **price, utilisation, margin** and **capex**.¹³

¹⁰ See Annex 4 for the method and assumptions.

¹¹ See Annex 5 for the limits of the project assumptions.

¹² For the full computation, see the Excel file “Valuation & Investment Projects”, sheets “NPV_Pirelli” and “NPV_Hankook”.

¹³ See Annex 6 for the scenario assumptions.

Scenario	Downside	Base	Upside
NPV Pirelli (USD m)	−100	405	740
NPV Hankook (USD m)	−643	−90	254
Profitability index Pirelli	0.90	1.45	1.81
Profitability index Hankook	0.61	0.94	1.18

Table 7: Scenario analysis

A simulation repeats the NPV calculation **500 times**, each time drawing random values within set ranges.¹⁴

Risk analysis	Pirelli	Hankook
NPV downside (USD m)	−100	−643
NPV base (USD m)	405	−90
NPV upside (USD m)	740	254
Mean NPV, 500 draws (USD m)	285	−235
Probability of NPV < 0	5%	88%
Break-even price per car tyre (base \$165 / \$95)	\$109	\$103
Security index	34%	−8%

Table 8: Risk analysis: simulation and break-even¹⁵

Implications. Pirelli’s project is robust but not risk-free: it destroys value only when several shocks combine, about one draw in twenty, and its sales could fall by a third before value is destroyed. Hankook’s project is not a narrow miss: almost nine draws in ten give a negative NPV, and it would need sales 8% above the base case, with prices of \$103 or a plant running at 98% for 25 years. Risks are also asymmetric: the mean NPV is below the base case for both projects, so the base case is a favourable central estimate rather than a prudent one.

3. SUSTAINABILITY ASSESSMENT

3.1 Pirelli & C. S.p.A. ESG

Pirelli’s premium positioning also shapes its sustainability strategy. The updated plan has **four pillars** (Climate, Product, Nature and People) across **three time horizons**: 2025, 2030 and 2040. Its most distinctive feature is climate ambition. Pirelli has an SBTi-validated Net Zero target for 2040, which puts the company about ten years ahead of the sector benchmark.

Environmental performance focuses on product and supply-chain transformation, especially natural rubber. In 2021 Pirelli became the first tyre manufacturer in the world to certify **FSC tyres**. It is targeting 100% FSC-certified natural rubber across all European plants by 2026, and it also launched the first mass-production tyre made of more than 70% bio-based and recycled materials. These innovations strengthen the premium brand, set Pirelli apart from competitors and align it with automakers that increasingly demand low-impact materials.

Pirelli has repeatedly earned a **CDP Climate Change “A”** rating, and external ESG providers such as Sustainalytics and LSEG/Refinitiv cover it. On the **social** side, Pirelli puts strong emphasis on people and engagement. Its engagement index is 83%, and its injury frequency

¹⁴ See Annex 7 for the simulation assumptions.

¹⁵ For the full computation, see the Excel file “Valuation & Investment Projects”, sheet “Risk_Analysis”.

rate fell 14% in 2025 to 1.21. On **governance**, the main issue is ownership: Sinochem holds 34.1% and Camfin 25%, and the Italian government has used its golden power to limit the Chinese shareholder's influence. This protects Pirelli's access to the US market but leaves an open conflict between the two main shareholders. Overall, Pirelli's sustainability approach is relatively **vertical**. It centres on climate, premium products, responsible raw materials and value creation through innovation.

3.2 Hankook Tire & Technology Co., Ltd. ESG

Hankook follows a structured, **company-wide sustainability model**. Its ESG strategy rests on **three pillars** (Eco Value Chain, Sustainable Product and Responsible Engagement) and spreads environmental, social and governance targets evenly across the business. Hankook targets carbon neutrality by 2050, so its climate horizon is longer and less front-loaded.

Its main strength is the range of its quantified commitments. Beyond carbon, by 2030 it targets a 30% cut in water use and in waste per basic unit, 80% of its products classified as eco-friendly, and by 2050 it targets 100% sustainable raw materials. **Social** targets include 20% female leadership by 2030 and zero serious accidents. Hankook therefore treats sustainability not just as a climate or materials issue, but as an operating model covering manufacturing, labour practices, procurement and risk management.

Its reporting is also notable. Although Hankook is not an EU company, its 2024/25 ESG report adopts ESRS-style double materiality. This signals a deliberate effort to **benchmark against global best practice** and stay credible with international investors and customers. On **governance**, the main weakness is the controlling family. In May 2026 Korea's Supreme Court upheld a two-year prison sentence for embezzlement against Cho Hyun-bum, chairman of the holding company.

3.3 Comparison of Sustainability Approaches

The first difference is **ambition and delivery on climate**. Both have SBTi-validated targets, but Pirelli aims for Net Zero by 2040 rather than 2050 and sets a steeper 2030 target for its own operations (–80% against –46%), most of which it has already achieved. Hankook, on the other hand, spreads the transition over a longer period.

The second difference is **breadth versus verticality**. Pirelli's model is **product-led**. It focuses on premium tyres, certified natural rubber and materials innovation. Hankook's model is more **horizontal**: it attaches quantified targets to water, waste, safety, diversity, supplier risk and social value as well as to climate. Breadth, however, does not mean depth: on supply-chain traceability **Pirelli is ahead**, with all of its natural rubber traceable to the processing facility, while the origin of about 19% of Hankook's rubber is undisclosed.

The third difference is **regulatory posture**. Pirelli reports under the mandatory CSRD, while Hankook follows the ESRS on a voluntary basis. Both, however, are exposed to EU rules through what they sell in Europe, which accounts for more than 45% of Hankook's sales. The real difference is therefore timing and whether reporting is mandatory, not exposure.

3.4 Climate-Related Risks and Opportunities

Physical risks and geopolitical supply-chain exposure. On raw materials, the two firms are in a similar position. Both rely on natural rubber from **South-East Asia**, where Thailand and Indonesia produced about 8 of the 15 million tonnes harvested worldwide in 2023; droughts, floods and heat stress there therefore affect both in much the same way. The differences lie in where they produce and sell. Physically, **Hankook is more concentrated**: five of its eight

plants are in Korea and China, while Pirelli's 18 plants are spread across Europe, the Americas, Turkey, Russia and China. Geopolitically, the risks differ. Pirelli's exposure comes from sanctions and ownership: its two **Russian plants** produced about 8% of its 2023 output but lost access to the EU market. Hankook's exposure comes from trade routes: over 45% of its sales are in Europe and largely served from Asia, so the **Red Sea crisis** raised its freight costs in 2024. Both were hit by US tariffs: about €55m gross for Pirelli in 2025, and a 15% rate for Hankook after the US–Korea deal. However, Hankook's local-for-local hedge is in place, as it is already expanding its Tennessee plant, while Pirelli's Georgia expansion will only add capacity from 2028.

Transition and regulatory risks. Transition and regulatory risk also differs between the two companies. Pirelli's risk is tied to a **tightening EU policy environment**, including carbon pricing, more demanding sustainability disclosure, deforestation compliance and rising customer expectations in the premium automotive segment. Hankook faces a dual regulatory burden: it must comply with Korea's own carbon market and, at the same time, meet EU-equivalent standards in order to maintain competitiveness in export markets. This may make Hankook's transition risk more fragmented and operationally complex.

Opportunities. At the same time, the climate transition creates meaningful opportunities for both firms. These include premium EV tyres, recycled and bio-based materials, smart and connected tyre solutions, and deeper partnerships with automakers seeking lower-carbon supply chains. For Pirelli, these opportunities reinforce premium positioning and brand value. For Hankook, they support a broader competitive proposition built on operational efficiency.

4. INVESTMENT RECOMMENDATION

At first sight, the valuation points to Hankook: at the end of 2024 it traded at 0.42x book value and 1.9x EBITDA, below every value we estimated. Pirelli traded just below its range, close to sector multiples and book value. An investor looking only at the gap between value and price would choose Hankook; however, this reading is superficial. Our analysis explains **why the market discounts Hankook so heavily**, and why Pirelli is the more attractive investment for an investor who considers **financial and sustainability factors together**.

Stability and financial maturity. Pirelli's results are more predictable. On all four ratios we studied, its values move within narrower ranges. Its ROI rose steadily, its ROE stayed within a narrow 8.0–8.8% band and its CAPEX coverage stayed between 3.2x and 3.4x. Hankook's ROI doubled in two years, its net profit stayed flat in 2023 despite an 81% rise in EBIT, and its CAPEX coverage swung from 4.7x to 1.8x. The valuation tells the same story. Pirelli's three methods give a narrower range (€5.8–9.2). Hankook's range is wide (₩91,000–199,000), and 84% of its DCF value lies in the terminal value.

Capital allocation. This is where the two companies differ most. Pirelli reinvests in its premium core. Its Georgia plant earns 4.6 pp above its WACC, has an NPV equal to about 7% of its market capitalisation and keeps creating value until sales fall by a third. Hankook's Tennessee expansion does not cover its cost of capital (IRR 5.3% against a 5.9% WACC) and does not recover its investment within 25 years in discounted terms. The Hanon Systems acquisition¹⁶ lies outside our valuation, but an investor cannot ignore it, and it confirms this pattern. To diversify away from tyres, Hankook paid a large control premium and spent almost all of its net cash. **The market reacted negatively from the start**, with the share price falling about 9% on the announcement. In 2025, consolidation doubled revenue but cut the group operating margin from 18.7% to 8.7%, and turned net cash into about €2.1bn of net debt.

Sustainability. Both companies are credible, with SBTi-validated targets and a CDP A rating,

¹⁶ See Annex 1 for the full analysis of Hankook's acquisition of Hanon Systems.

but Pirelli leads on what matters most in the sector: **faster decarbonisation** (Net Zero by 2040, –80% Scope 1+2 by 2030) and **rubber traceability**, which is key for the EUDR and for carmakers. Its sustainable materials and FSC certification also reinforce the premium positioning behind its higher prices, low working capital and value-creating project. Hankook, by contrast, is held back by governance: its holding chairman’s conviction for embezzlement was a real scandal for the company. Together with low payouts, this feeds the “Korea discount” behind most of Hankook’s valuation gap, which our CAPM cannot capture because Korea’s country premium only reflects sovereign risk.

What speaks for Hankook. Hankook is not a weak company. Its tyre business is still more profitable than Pirelli’s (a 18.7% EBIT margin in 2024 against 13.3%). Its discount also offers a margin of safety: at sector multiples alone, it would be worth almost three times its year-end price. If Hankook delivers its EV synergies and governance and payouts improve, Hankook’s upside could be much larger than Pirelli’s.

Recommendation. We recommend **Pirelli as a core long-term holding**. For roughly a sector price, the investor gets a company with **four strengths**: one of the strongest brands in the industry, premium positioning, growth that needs little cash, and a US plant whose NPV equals about 7% of its market capitalisation. Together, these support the margin durability our DCF assumes and the market does not yet price in. The main risk is that pressure on the sector (Asian imports, tariff changes, weak European car demand) erodes the margins our valuation relies on. For **Hankook we recommend a hold**: it is a fundamentally solid company, and for an investor focused purely on financial return, its discount could deliver good results over time. The upside, however, depends on a **catalyst** that brings its market price back in line with its fundamentals, and the conditions for that do not yet seem to be in place.

ANNEXES

Methodology

This section explains how the analysis was carried out, so that the work behind every figure in the report can be checked.

The first step was to transfer the complete consolidated financial statements of Pirelli and Hankook for 2022–2024 into a single Excel file. This covered the balance sheet, the income statement and the cash flow statement. Having every line item in one place from the start gave us a common base for all later calculations, so we never had to retype figures from different documents. To make the two companies comparable, all amounts are expressed in thousands of euro. Hankook's figures were converted from Korean won at the ECB average rate of each year, and the conversion is written inside each cell, so the original amount published by Hankook can still be read.

All computations were then carried out in Excel workbooks submitted with the report, and any figure in the report can be traced back to them. Each external input, such as an accounting item, a market rate, a beta or a credit spread, is entered only once. Every external value and every assumption comes with the source it was taken from or is based on, linked directly in the file. This means each number can be checked against the original document, whether it is an annual report, a Damodaran dataset, a central bank publication or a market data provider. Everything else is calculated with formulas linked to those inputs, so changing an assumption updates every result that depends on it. Values that are our own choices rather than observed data are clearly labelled as assumptions, together with the reasoning or reference that supports them.

Throughout the analysis we applied the methods and assumptions seen in class:

- the CAPM with a country risk premium for the cost of equity;
- the risk-free rate plus a rating spread for the cost of debt;
- relevering of the industry beta at each company's leverage, and the WACC at market-value weights;
- the DCF with a Gordon terminal value, alongside the comparative and patrimonial approaches;
- NPV, IRR, global IRR, profitability index, payback, break-even, security index and neutral point for the investment projects.

The only computational task we delegated to an AI tool was the generation of the random numbers used in the 500-draw simulation of the investment projects. These numbers were pasted into the file as fixed values, so the results stay the same every time the file is opened. Everything that turns them into results is calculated with Excel formulas that can be checked in the same sheet: the ranges of each variable, the resulting shocks, the NPV of each draw and the final statistics.

Annex 1: Hankook's Acquisition of Hanon Systems

Why. Hanon Systems is the world's second-largest maker of automotive thermal management systems, and Hankook first invested in it in 2014, buying 19.49% for about €0.73bn, alongside private equity firm Hahn & Co. In May 2024 Hankook decided to take control of it, with the aim of **diversifying** away from the mature tyre business and becoming a “high-tech mobility” group covering tyres, batteries and thermal management. Management also expected synergies between Hanon's heat-pump technology and Hankook's EV tyre range (iON), and from shared sales networks, procurement and IT.

How. The deal was signed in May 2024, renegotiated, and closed on 3 January 2025. It consisted of **two distinct transactions**. First, Hankook bought 122.8 million existing shares ($\approx 23\%$) from Hahn & Co at about €6.8 per share; second, it subscribed to 145 million newly issued Hanon shares at about €2.8 each, bringing the total stake to 54.77%. The large gap between the two

prices reflects a significant **control premium** paid to Hahn & Co, since the new shares were priced close to Hanon's market value. The total outlay of roughly €1.24bn was paid mostly from Hankook's own cash and absorbed almost all of the net cash it held in Q3 2024. As a result, in February 2025 the company returned to the public bond market for the first time in five years, issuing a bond of about €0.19bn mainly to refinance maturing bonds and to fund working capital.

Risk and Results. Overall, the acquisition was a **risky move** for Hankook. It gained control of a company that remained heavily indebted even after the 2025 transactions, with over €1.8bn of debt and thin margins. The clearest evidence came in December 2025, when Hanon launched a further rights issue of about €0.6bn, mostly to repay debt. The market had anticipated these risks from the start: in fact, **Hankook's share price fell about 9%** on the first trading day after the announcement, and analysts cut their target prices, citing unclear synergies and an estimated return on equity of only about 4% on the investment. In terms of results, consolidating Hanon more than doubled Hankook's revenue, from €6.38bn in 2024 to €13.19bn in 2025. Profitability, however, did not keep pace: since Hanon earns a margin of only 2.5% against 16.3% for tyres, the **group's operating margin halved from 18.7% to 8.7%**. At the same time, the cost of the acquisition and the consolidation of Hanon's debt turned Hankook's net cash position into about €2.1bn of net debt.

Note on exchange rates: amounts were originally reported in Korean won (₩) and converted at average annual rates. Figures for 2024 and for the acquisition use 1 € = ₩1,475 (6.778E-07 thousand € per ₩). Figures for 2025 onwards (the February 2025 bond, Hanon's debt, the December 2025 rights issue, FY2025 results and net debt) use 1 € = ₩1,607 (6.221E-07 thousand € per ₩).

Annex 2: Cost of Debt and Cost of Equity Computation

We use the CAPM, $R_e = R_f + \beta_e \times PR_m$. The risk-free rate is the 10-year German Bund yield at year-end (2.36%). The market risk premium combines Damodaran's mature-market premium (4.33%) with the country risk premium of each company's domicile: 2.93% for Italy and 0.66% for South Korea. For beta we start from Damodaran's global Rubber & Tires industry beta, unlevered and cash-adjusted (0.76), and relever it at each company's market leverage with a debt beta of zero as a simplifying assumption. This gives an equity beta of 1.18 for Pirelli and 1.03 for Hankook, and a cost of equity of 10.90% and 7.48%.

R_d is the risk-free rate plus the default spread matching each company's credit rating: BBB- for Pirelli (lower of Fitch BBB and S&P BBB-, spread 1.40%) and Baa2 for Hankook (Moody's, spread 1.20%). We do not add a country spread because the rating already reflects country risk. After tax at the 2024 effective rates (22.64% and 28.13%), R_d is 2.91% for Pirelli and 2.56% for Hankook.

Weights use the market value of equity at 30 December 2024 and gross interest-bearing financial debt, which includes IFRS 16 lease liabilities for both companies. We use gross debt because the course material retains only interest-bearing debt in the WACC; relevering on net debt instead would give 7.70% for Pirelli and 6.24% for Hankook.

Annex 3: Limits of the Assumptions (Cost of Capital and Valuation)

Our results rest on choices that a different analyst could reasonably make differently.

Cost of capital. Country risk is measured by domicile. Weighting it by where revenue is earned would lower Pirelli's WACC to about 6.6% and cut its gap with Hankook from 1.7 pp to about 0.7 pp. Both companies share the same global industry beta, so they are assumed to have identical

operating risk. The debt beta is set to zero, and the weights use gross rather than net debt; net debt would give a WACC of 7.70% and 6.24%. We relever the beta with taxes, consistently with Damodaran's unlevered beta; relevering without taxes changes the WACC by only 0.08 pp for Pirelli and 0.05 pp for Hankook.

Cash flows. Revenue grows at a uniform 3% for both companies. Pirelli's 2024 margin is held constant, and Hankook's fades to 14% by 2029. These are judgement calls rather than forecasts, and they matter a great deal, because the terminal value accounts for 70% and 84% of enterprise value.

Terminal value. The simplest Gordon terminal value grows the last free cash flow at g . Our model instead deducts the reinvestment needed to grow ($NOPAT \times (1 + g) \times (1 - g/ROIC)$), because growth without investment is not realistic: for Pirelli, capex and D&A are equal by 2029. Growing the 2029 free cash flow at g would give €11.54 per share for Pirelli (+25%) and ₩208,040 for Hankook (+4.6%). Our choice is the more prudent one and only strengthens the conclusions.

Hankook's ROIC. The reinvestment rate uses the 2024 ROIC (14.0%), computed on an exceptional 18.7% EBIT margin, while the terminal year assumes a 14% margin. At that margin ROIC would be about 10.5%, and Hankook's value per share about 4% lower (about ₩190,000), still far above the market price.

Currency. Hankook's won flows are converted at a single 2024 average rate and in effect discounted at a euro rate, ignoring the inflation gap between Korea and the euro area; the effect is small.

Base year. FY2024 predates the consolidation of Hanon Systems, so our model describes a group that no longer exists in that form, while the share price already reflects the deal.

Comparative approach. It uses Damodaran's global sector averages rather than a hand-picked peer group, so the benchmark mixes premium and budget producers from very different markets.

Minority interests. The equity bridge of the DCF deducts financial debt but not minority interests (about €156m for Pirelli and €64m for Hankook). Deducting them would lower the DCF value per share by about 1.7% and 0.4%, without changing any conclusion. The patrimonial values, on the other hand, already exclude them.

Annex 4: Method and Assumptions (Investment Projects)

Cash flow computation follows the course method: operating cash flow (EBIT minus taxes on EBIT plus D&A), minus expansion and maintenance capex and the change in working capital requirement, with no financial charges. The horizon is 25 years; the last year adds the residual value of the plant (its net book value) and the recovery of working capital. Losses in the start-up years are offset against group profits.

The main assumptions are:

Prices: \$165 per car tyre for Pirelli and \$95 for Hankook (\$300 per truck tyre), growing at 2% a year, the same long-term growth as in the DCF. As a cross-check, Goodyear's Americas segment earned about \$135 per tyre in 2024: Pirelli's price implies a 22% premium for its High Value mix, Hankook's a 30% discount, consistent with a player characterised by a broader mix.

Volumes: added capacity as announced, at 90% utilisation, in line with Pirelli's 2024 plant saturation (86% overall, 95% in High Value).

Margins and costs: EBITDA margin equal to each company's 2022–24 average (21.1% and 19.8%), maintenance capex at 2% of revenue, straight-line depreciation over 15 years and the 2024 effective tax rates.

Working capital: each company's 2024 ratio to revenue, as in the DCF: almost zero for Pirelli and 31.5% for Hankook.

Annex 5: Limits of the Assumptions (Investment Projects)

The valuation of the two projects rests on simplifying assumptions; the main ones are listed below, together with their likely effect on the results.

Discount rate. Both projects are discounted at the company WACC, which is built on the Bund and on the Italian or Korean country premium, while the flows are in dollars and the plants are in the United States. The course's first condition, same risk, is reasonable for a tyre plant. The second, unchanged financing, is weaker for Hankook, whose \$1.6bn project equals almost half of its market capitalisation. A project rate built on the US Treasury (4.58%) without country premium gives 7.59% for Pirelli and 7.44% for Hankook, with NPVs of \$407m and -\$299m: the conclusions hold and Hankook's becomes clearer.

Timing. Each project is valued at its own decision date, but with 2022–24 average margins and 2024 tax rates and WACC. For Hankook, a strictly *ex ante* view would use 2022 data.

Operating assumptions. Prices, utilisation and margins come from company averages and industry benchmarks, not from project data. The price per tyre drives most of the comparison: Pirelli earns about 50% more revenue per dollar of capex.

What is left out. US state incentives, tariff changes and the fact that part of Hankook's US output replaces exports it would have made from Korea are not modelled. The 25-year horizon with a residual value is favourable to both projects, since a longer horizon raises profitability.

Simulation. Each variable is drawn from a uniform distribution within set ranges, and project-specific variables are independent of each other. Real shocks are likely to be correlated, for example lower prices and lower utilisation in the same downturn.

Annex 6: Assumptions Sensitivity (Investment Projects)

Each scenario moves price, utilisation, margin and capex at the same time, relative to the base case.

Variable	Downside	Upside
Price	–10% (tariff roll-back and import competition)	+5%
Utilisation	–10 pp	+5 pp
Margin	–3 pp	+3 pp
Capex	+15% overrun	unchanged

Table 9: Scenario assumptions

Annex 7: Assumptions Simulation (Investment Projects)

NPV is recalculated 500 times, each time drawing random values within the following ranges:

Variable	Range	Distribution	Drawn
Price	$\pm 10\%$	Symmetric	Once for both projects (market-driven)
Margin	± 4 pp	Symmetric	Once for both projects (market-driven)
Utilisation	$-15 / +5$ pp	Skewed to the downside	Separately for each plant
Capex overrun	$-5\% / +20\%$	Skewed to the downside	Separately for each plant

Table 10: Simulation assumptions

Price and margin depend on the market, so the same draw applies to both plants. Utilisation and capex depend on how each plant is run, so they are drawn independently. Their ranges are skewed to the downside because lower volumes and cost overruns are more likely than the opposite.

REFERENCES

Excel Files

Financial Statements

Valuation & Investment Projects

Sources

Annual Financial Statements of Pirelli 2022

Annual Financial Statements of Pirelli 2023

Annual Financial Statements of Pirelli 2024

Annual Financial Statements of Hankook 2022

Annual Financial Statements of Hankook 2023

Annual Financial Statements of Hankook 2024

Pirelli Website

Hankook Website

All other references used for the computations and assumptions in the Valuation and Investment Projects analysis can be found directly in the Excel file “Valuation & Investment Projects”.