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NOVA – School of Business and Economics.

Continental AG - An Equity Perspective on the
technological shift in the Automotive Industry

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Abstract

The following equity research analyses Continental AG, one of the largest auto parts suppliers worldwide. After assessing its historical performance in light of past events, the mobility trends of the future and upcoming risks were considered to draw an overview of the market targeted by the company and its place in the industry. All factors were included as drivers of Conti's future performance into a DCF model and, using wacc method and SOP approach, a €103.29 share price was obtained for December 2024. Henceforth, the report concludes with a buy recommendation considering a 37.06% shareholder return.

Keywords: Automotive Industry; ADAS; Technology; Sustainable Mobility

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This report is part of the report “An Equity Perspective on the Future of Mobility”, developed by José Carlos Rodrigues Barros and Aleardo Chitto’ and should be read has an integral part of it.

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Introduction

The joint thesis in which this report is inserted aims to assess Continental AG share price adopting a potential investor view. In the joint report, the three main divisions of the company (Automotive, Tires and ContiTech) are deeply analysed and forecasted to reach a final investment recommendation.

This individual report is focused on the Automotive division, also presenting a mention to Contract Manufacturing. After reviewing Automotive historical business performance and organizational structure, highlighting the developments in its business units, a peers' analysis is conducted to compare the company with the main competitors.

Next, a macroeconomic overview is drawn to provide context on the current period of unprecedented inflation and interest rates and how it might affect company's demand and ongoing investments. Given the nature of the current geopolitical turmoil, it is as impactful to the company as any other market trend since it places supply chain networks in peril and threatens new sudden price increases for key commodities. In the joint report, the expectation on the evolution of supply chains and adoption of sustainable raw materials is described.

Regarding this individual report, an overview of the trends in the future of automotive industry (Autonomous Vehicles, Ridesharing) is described as well as a number of technological advancements to which Continental is strongly linked to and which will contribute to enhance its revenues.

Finally, a valuation section is used to present the main forecasts conducted for Conti's Income Statement and Balance Sheet items, leading into a DCF valuation using a wacc sum of parts approach, obtaining a share price of €103.29. Furthermore, to assess potential price variations, a sensitivity and scenario analysis are conducted.

Company Overview

Continental AG (also known as Conti) was founded in 1871 in Hanover, Germany, where it is still headquartered. Initially established as a rubber manufacturer, Continental has always had transformation and change in its core, which turned it not only into one of the largest automotive suppliers but also a leading technology company worldwide. Besides its solid Tires division, Continental develops cutting-edge industrial solutions in the ContiTech segment and, since its creation in 1995, the Automotive division has been developing breakthrough technologies for the automotive industry. On this date, the company employs over 199,000 workers at 519 locations across 5 continents.

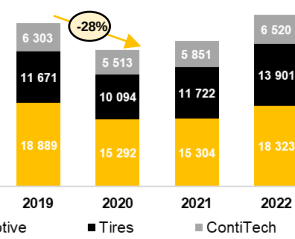
Automotive Division

Even though Conti is more commonly recognized for its tires, the Automotive division is responsible for the highest share of sales (over 45%) and employs almost 50% of the company's workforce. However, its operational margin and ROIC have been declining since 2018, reaching negative values in 2021. This evolution was initially caused by a significant downward trend in vehicles production and enhanced by the unfavourable market and macroeconomic conditions triggered by the pandemic. Moreover, assets turnover declined as well and was roughly 67% of 2017's value last year, mainly driven by growing inventories. On the upside, it is important to highlight the growing share of APAC revenues, which was the only region able to surpass 2019 sales already. Note also that around 94% of Automotive revenues are generated through the sale of original equipment (OE), while the rest comes from the replacement business. Since no meaningful shifts are expected in the latter, its future revenues were estimated by assuming the same share of OE sales going forward.

Business Units

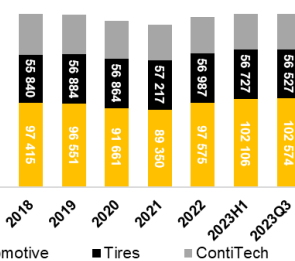
In 2022, Continental merged the Autonomous Mobility & Safety and Vehicle Networking & Information divisions into a unified organizational structure constituted by 6 business units. Firstly, Autonomous Mobility (AM) unit is pioneering advanced automated driving (AD) solutions to shape the future of individual mobility with less mortality and more relaxing commutes to work. With more than 25 years of expertise in assisted and automated driving, Continental has been developing revolutionizing technologies such as the Cruising Chauffeur (advanced cruise control) and Valet Parking (driverless parking). Secondly, to achieve increased safety, comfort, and efficiency (the main goal of AD), the Safety & Motion (SAM) unit is responsible for the creation of active and passive safety enhancing technologies such as Tread Depth Monitoring (TDM) and Intelligent Battery Sensors (IBS, to monitor core battery parameters). Thirdly, as the world moves in a path towards electric mobility, software is beginning to define hardware characteristics, and so the new centralized vehicle E/E (electrical and electronic) architecture paves the road for new system features. To make Continental a top-tier software-oriented mobility provider, the Architecture & Networking (AN) division develops HPCs and ZCUs to improve the performance and reduce the complexity of E/E architectures. This last-generation of computing power makes the vehicle part of the Internet of Things (IoT) and therefore connected to the cloud, enhancing data exchange handling and "over-the-air" updating capabilities. Consequently, the Smart Mobility

Continental Revenues (€ million)



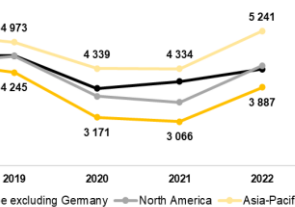
Source: Continental Financial Reports

Number of Employees



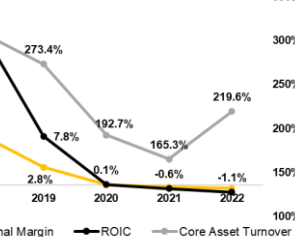
Source: Continental Financial Reports

Automotive Revenues (€ million)



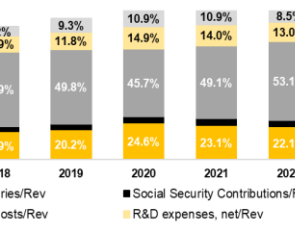
Source: Continental Financial Reports

Automotive Division



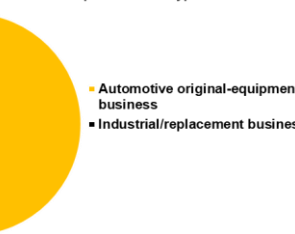
Source: Continental Financial Reports; Own Estimates

Automotive Division - Operational Margin (main) Drivers

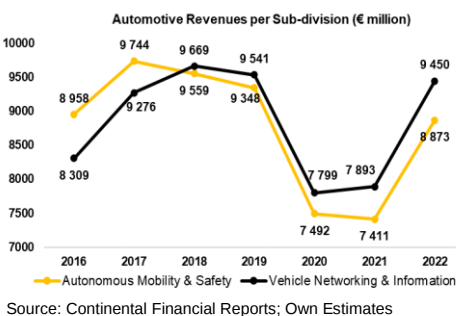


Source: Continental Financial Reports; Own Estimates

Automotive Revenues per Business type - 2022



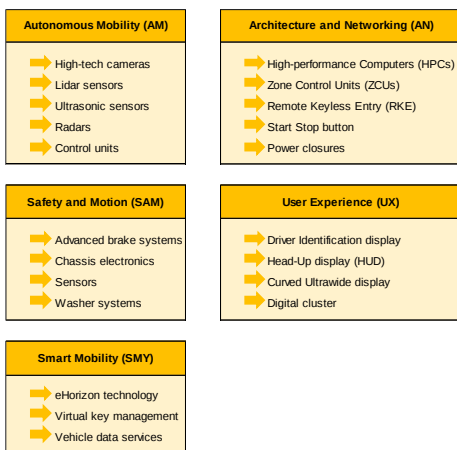
Source: Continental Financial Reports; Own Estimates



Source: Continental Financial Reports; Own Estimates

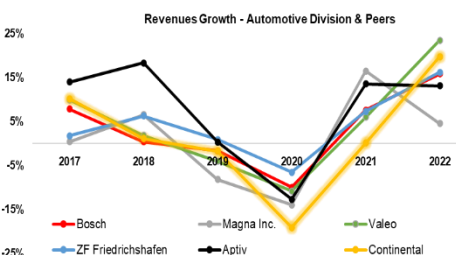
(SMY) division is able to collect data for a better understanding of a vehicle's status, health and driving profile in order to monetize the findings. Lastly, enhanced user experience (UX) will be the differentiator in this market, through innovative display solutions that show all the important driving information to a driver without the need to look down at the instrument cluster. Hence, despite Automotive's apparent mathematical inefficiency, there is no doubt autonomous driving is a booming market and Continental is at the forefront.

Business Reorganization



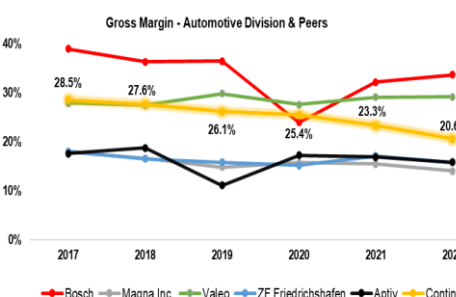
At the recent Capital Market Day, Nikolai Setzer (Conti's CEO) announced plans to carve out User Experience into an independent unit in the short term. This follows company's goal to focus on business areas with strong value growth, achieved by giving higher organizational independence to such units. Note however that, in the following years, the company will be assessing whether the best solution for User Experience is a spin off, due to the significant investment required by this unit and its hardware focus. On top of this, Continental announced that an administrative restructuring will be taking place until 2025 to strengthen the division's competitiveness while streamlining its business and easing annual costs by €400 million. To this end, Smart Mobility will be dissolved, involving roughly 5,500 job cuts. Nevertheless, this is expected to be simply translated into a partial offset of the ongoing growth in hirings, which surpassed 5,000 new employees in 2023 (according to Q3 report).

Competitors

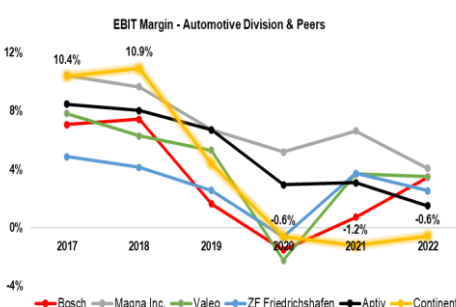


Source: Continental & Peers Financial Reports

Even though there are countless manufacturers of auto parts, only a few are as advanced as Continental in the development of AD technologies and so the list of close competitors is small: Bosch, Magna International Inc., Valeo, ZF Friedrichshafen and Aptiv. Note that these companies develop a wide range of products therefore, only the divisions focused on the same products as Conti were accounted for comparison. As for Continental, the 2018-2020 period was drastic to the entire industry, with sales decreasing YoY. The following years have been (still are) of recovery and, even though Conti gained ground in terms of revenues growth, its efficiency suffered a big hit and is at the bottom of the industry, with gross margin still down mainly due to supply chain shortages. Moreover, while revenues presented a similar evolution across geographies, Conti market share (based on revenues) declined in comparison to 2018. North America share was the most affected after the pandemic and is expected to recover only slightly in the next years, as the USA aim to reduce imports and reliance on foreign companies. Contrarily, APAC market share will certainly improve as Conti is focused on the opportunities emerging in this market and there are no local relevant competitors at this point.



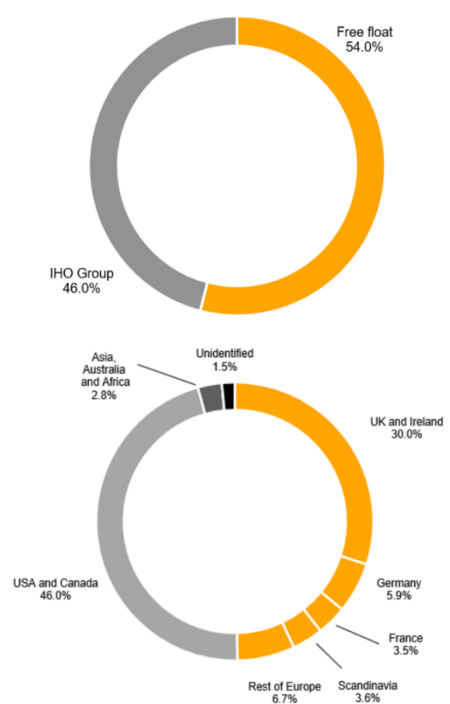
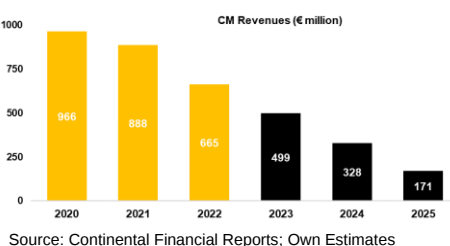
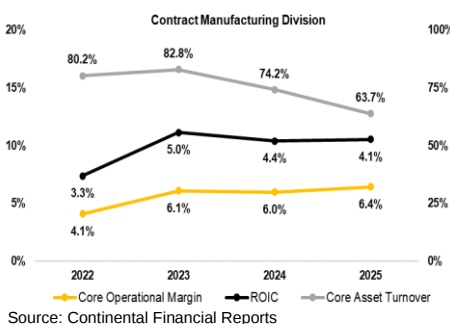
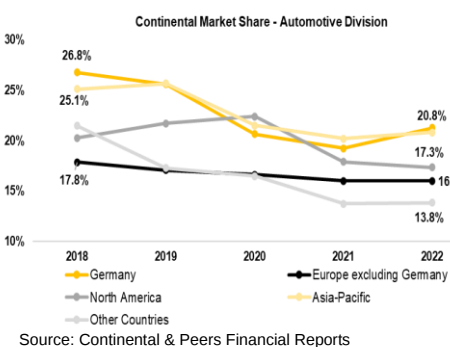
Source: Continental & Peers Financial Reports



Source: Continental & Peers Financial Reports

Powertrain & Contract Manufacturing

With more than €7.0 billion in revenues and employing over 40,000 people, Powertrain division ceased to exist in 2020 and gave place to a new company, Vitesco Technologies. The spin-off had been announced in April 2019 in what was Continental's first move to realign the Group's operations, centralizing resources in the development of breakthrough automotive technologies. Also, this gives Vitesco greater flexibility than Powertrain could have to quickly react to a market that is rapidly changing, as exhaust



emission regulations imposed by governments become more stringent. Moreover, Conti had lost significant ground to Asian competitors which are more advanced in the development of powertrains for EVs (comprise fewer components). Nevertheless, after its closure, Continental started a new temporary division, Contract Manufacturing (CM), to carry out the continuing operations of the former Powertrain Technologies. As part of the spin-off, industrial sites were either transferred to Vitesco Technologies or retained by Continental AG. Hence, the two companies entered a contract manufacturing arrangement “to ensure a time-efficient and cost-optimized exit of formerly shared production plants”¹. According to Vitesco, the phase-out of CM will be substantially complete by 2025 and the relevant agreements terminated or replaced by new ones. On Continental’s side, CM revenues have been steadily decreasing as the volume of operations is expected to continue falling in the next years, until complete phase-out is reached. Therefore, it was forecasted that revenues, expenses and invested capital in the CM division will consistently fall towards 0 in 2026.

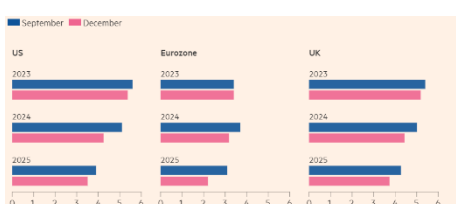
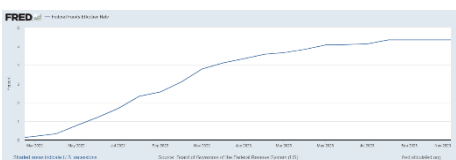
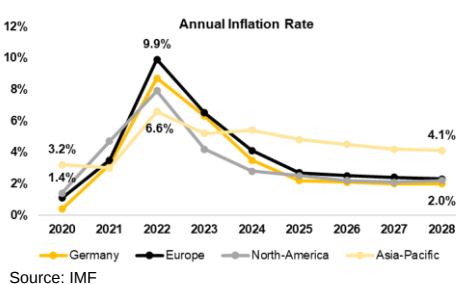
Ownership Structure

Continental AG (Bloomberg ticker: CON) is traded on the German stock exchanges of Frankfurt, Hamburg, Hanover and Stuttgart, and is part of the DAX, Prime Automobile and Prime All Share indexes, among others. As of December 2023, Continental has a market capitalization of €15.20 billion and 200,005,983 shares outstanding. Of these, 46% are held by the IHO Group (indirectly owned by the Schaeffler family), which holds also 100% of the voting rights in Schaeffler AG and approximately 49.9% of Vitesco shares. Regarding the 54% share of public investors, it is noticeable that German and other European investors represent only a minority, while North American and British investors are a majority. Since the latter are recognized by a stronger participation in financial markets, this is perceived as a positive signal of Conti’s value and potential to attract significant demand in Europe, when and if its performance becomes notorious. Finally, the most recent change in the shareholder structure occurred in September 2013, when the IHO Group abandoned the idea of a full merger between Conti and Schaeffler AG, announcing the sale of 7.8 million shares to reduce its shareholding in Continental AG to 46.0%. This happened after a turmoil period between the two competitors triggered by a fierce takeover battle in which Schaeffler AG acquired a 49.9% share of Continental (nearly 90% indirectly) in mid-2008 using low market transparency tactics.

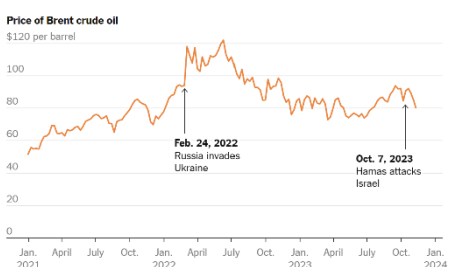
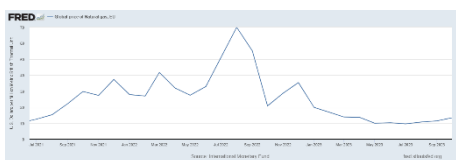
Macroeconomic & Geopolitical Context

The last couple of years will be forever remembered because of the Covid-19 pandemic, a life-changing event that hit every country without notice and led economic activity into a sudden halt. However, the worst scenario for economies came when people started to resume their lives. While demand for goods and services quickly soared, industrial production was rather slow to restart, bringing supply chain shortages and the highest inflation level since last century to the forefront. Due to the crisis unparallel nature, Central Banks (CBs) were forced to intervene and raised interest rates unprecedentedly, with the FED funds rate reaching a 22-year high last November in an attempt to tame inflation. The direct consequence of these rate jumps was an increase in borrowing costs,

¹ Vitesco Annual Reports



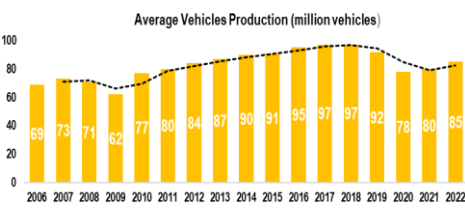
Market expectation of policy rate (%)
 Note: Investors are now more optimistic regarding interest rate cuts than in September
 Source: Financial Times, Atlanta Fed, ECB, BoE, ICE US (December 12, 2023)



leading companies to avoid debt financing and likely postpone investments. Also, such uncertainty caused low consumer confidence and, consequently, a drop in consumers spending, especially non-essential goods such as the ones marketed by Continental. However, it is important to note that Conti revenues still increased in 2022 and will improve further in 2023 (evidence from Q3 report). Even though most CBs have stabilized interest rates, these are expected to remain on the high for the months to come. Particularly in Europe, inflation showed signs of deceleration last month but, as many economists believe this wave of inflation will persist, CBs are being cautious before lowering rates, knowing that taking too long to react will also have adverse effects. Therefore, due to the complexity of controlling inflation, the next years will continue to be haunted by fears of recession and adaption to this new reality.

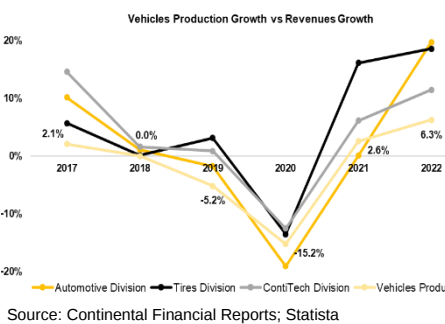
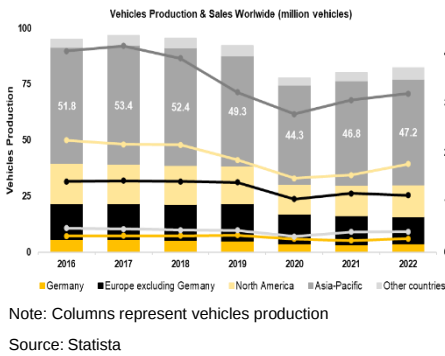
Geopolitical Overview

To make matters worse, the world is also going through the most boiling geopolitical context in decades. Besides the long-lasting conflicts in the Middle East and coups in Africa, the war in Ukraine broke out after Russia's invasion in 2022 marked the closest conflict to European Union (and NATO) borders in decades. On one hand, this situation dragged the attention of several countries which aid Ukraine with significant financial and military (equipment) support, deviating leaders focus from internal affairs. Not long ago, for example, the USA were pointing to resolve conflicts in the Middle East and fell asleep during China's uprisal to become the second largest economy in the world. On the other hand, Ukraine-Russia war caused another wave of supply chain disruptions affecting products exported from these countries, such as wheat, oil, and fertilizers. This exacerbated inflationary pressures on societies and, being Russia the third largest energy exporter worldwide, it created an energy crisis, particularly in Europe. The subsidy schemes put in place last winter involved immense funding from governments and might raise conflicting objectives (ending with people spending more energy). Therefore, Europe might face troubles again to survive its first winter without Russian gas since it still lacks enough storage capacity (full capacity covers less than half of winter consumption) and suitable alternatives. These developments certainly concern Continental since against the backdrop of rising energy prices, many people are concerned that they will no longer be able to afford personal mobility (decreasing demand for vehicles). Furthermore, last October the conflict between Israel and Palestine erupted to the deadliest level since early 2000's, after Hamas attacked Israeli soil. This event is followed with attention since the Middle East is the largest oil supplier in the world. As of now, there is no extraordinary impact on oil price, but this can quickly change if neighbouring countries (mainly Iran) escalate the conflict, with the barrel price potentially soaring to over \$150 in the worst-case scenario. Overall, this negative overview is derived from the downside of globalisation, which makes countries in different spheres of the world dependent on each other. To soften this reality, supply chain networks are expected to adopt measures such as on-shoring or near-shoring production and logistics management to increase resilience (sales in the same region of production). Continental is also expected to adopt these strategies to reduce its vulnerability to price and quantity fluctuations of several components and ensure timely delivery of raw materials. In fact, concerns about interdependence were prevalent even before the pandemic, with countries like the United States establishing tariffs on imports from China already in 2018



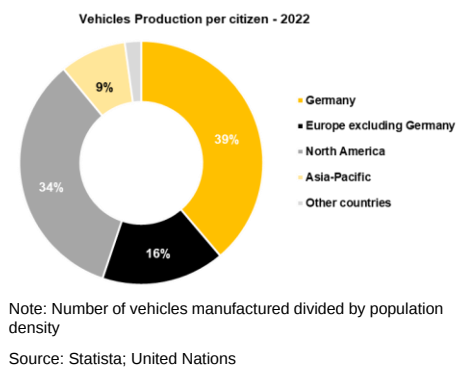
(Trump administration). Similarly, countries are becoming more aware of the importance of internal production for own consumption, especially in Asia. Thus, considering its expansion ambition in Asia-Pacific, Continental has announced that more R&D locations will be opened in the region to strengthen its affinity among consumers.

Automotive Industry

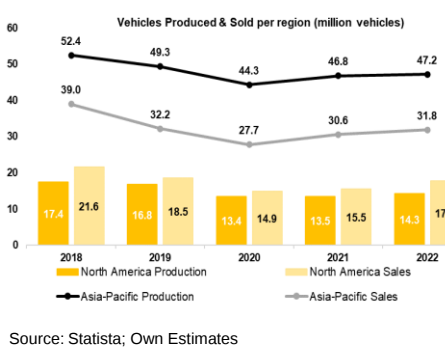


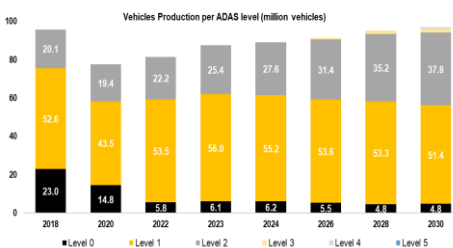
After many years of steep growth in vehicles' production (passenger cars used as proxy), the peak was reached in 2017 with almost 97 million vehicles produced worldwide in a single year. It followed a quick decline to roughly 78 million vehicles manufactured in 2020 before an upward trend restarted, being expected to reach 2017 production levels no sooner than 2029. As highlighted before, the cooldown of the automotive industry was the main responsible for the mild growth of the Group's turnover in 2018 and 2019 and, coupled with Covid-19 effects, it led to an even bigger drop in 2020 sales. Geographically, Asia-Pacific is the region with the highest production and sales of vehicles (followed by far by North America and Europe), to which China gives a major contribution with over 32% of global production in 2022. However, if the population density of each region is accounted for, production and sales in Asia-Pacific fall tremendously shorter than North America and Europe. Moreover, while sales in North America are "slightly" higher than automobiles' production, Asia-Pacific sales represent roughly 65% of the production in the region. Hence, this market saturation in western countries helps explaining the softened demand for vehicles verified since 2018, while pointing out the potential growth in the APAC market. Thus, it is no surprise that expanding into this region is Conti's main goal, which occupies first place in Automotive division sales already.

Autonomous Vehicles

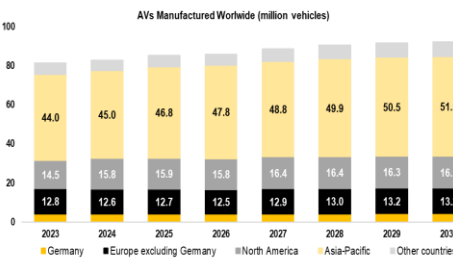


The second major development in the Automotive Industry and to which Continental is strongly linked is vehicles automation, defined by 5 SAE levels. Although it is very unlikely that fully autonomous vehicles in which human beings have no driving interference (level 5 vehicles) will be seen casually driving around any time soon, vehicles with assisted driving are already common these days and are expected to reach a 95% share of annual cars produced by 2028. In fact, vehicles with no automation (level 0) are being phased out and represent a minority of vehicles produced. Geographically, even though Asia-Pacific presents a lower (but fastest growing) share of AVs manufactured, it will still hold the highest amount of vehicles produced worldwide. Level 1 vehicles introduce assistance driving systems such as Lane keeping Assist (LKA) or Adaptive Cruise Control (ACC) and represent most vehicles manufactured this decade (over 65% share in 2022). In Level 2, LKA and ACC are combined into one system able to control the longitudinal and lateral dynamics of the vehicle at the same time. While vehicles of these 2 levels are already frequent, level 3 technology is expected to reach the market very slowly by 2025 and to mark a significant leap in the industry, as it brings conditional automation and allows drivers to occasionally take their eyes off the road. Likewise, level 4 vehicles are not expected to have a significant share in the passenger cars market any time soon. However, robotaxis designed by Cruise and Waymo are already circulating in San Francisco since last summer, while last-stage trials are occurring in other cities in the United States and China. If successful, robotaxis are likely to spread to other

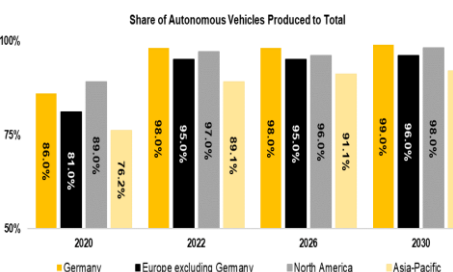




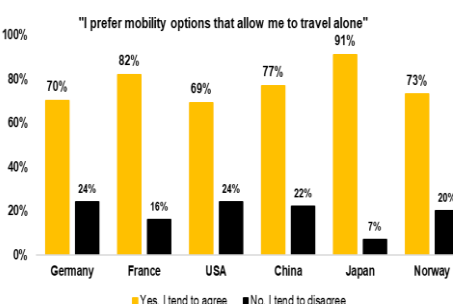
Source: Statista; Own Estimates



Source: Statista; Own Estimates



Source: Statista; Own Estimates



Source: Continental 2022 Mobility Report

countries in the following years and contribute to a new revenue stream to Continental.

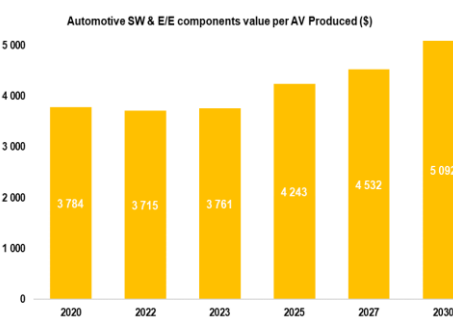
In the medium to long-term, the market penetration of autonomous vehicles above level 1 will also benefit from the intensification of EVs commercialization. Obviously, EVs' electric systems provide an easier integration of autonomous features compared to ICE cars and, since EVs have fewer moving pieces, it is also simpler to control its components. Moreover, both technologies are considered to still be at early development stages thus, there is a large potential to reinforce and accelerate one another.

Ridesharing

Continental should also be aware of a new trend in the industry: Ridesharing. Driven by EVs' low operating costs and rising awareness of the need to reduce pollution, a growing number of people will avoid owning a car. Ride-hailing (one is not really sharing a ride or reducing traffic congestion) with companies like Uber, Lyft, etc or shared micro mobility (electric bicycles or scooters) have been the most popular solutions, but OEMs are developing alternatives such as subscription-based vehicles. Besides finding a new revenue stream, OEMs can attract customers who are completely new to the brand by giving them the right to use a vehicle in exchange for a recurring fee. By now, this business model has only been implemented by a small number of brands (Porsche, Cadillac, BMW, etc) in a few cities, but the greater the level of automatization the faster will be the growth of ridesharing. In the long run, the best fit for ridesharing are robotaxis, which will autonomously drive around a city picking up people. Nevertheless, while the ridesharing trend will benefit from Continental technologies, it is not certain whether Conti will gain from this advancement. In part, replacement businesses such as tire sales benefit from an increased utilization rate per vehicle, since more kilometres will be driven by registered cars, implying a higher frequency for tires substitution. However, this upside is completely offset by the direct consequence of shared mobility: reduced automotive sales, which, as it was already shown, negatively impacts all segments turnover. Even though this trend poses a risk to the company, it is important to note that ridesharing is not expected to gain significant market share in the next two decades (or even more), as it requires a big change of consumers' behaviour, and it is simply not feasible in rural areas and certain locations of the world.

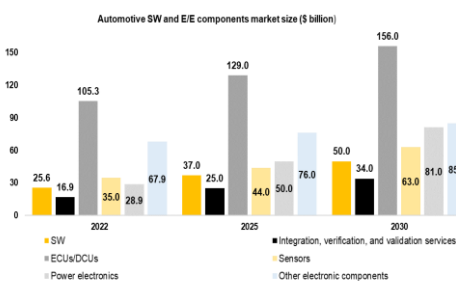
Technological Advancements

Automotive Software and Electronic Components



Source: Burkacky, O., Deichmann, J., Guggenheimer, M., & Kellner, M. (2023, January 3). Outlook on the automotive software and electronics market through 2030. McKinsey & Company

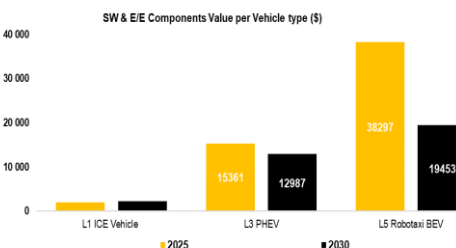
Considering Continental tech products in the Automotive division, the closest market targeted by the company is the "automotive software (SW) and electrical and electronic components (E/E) market", which is expected to grow at a 7% CAGR until 2030 to reach \$469 billion. During the same period, the overall automotive market is predicted to grow only at 3% CAGR. From the core components considered, electronic control units (ECUs)/domain control units (DCUs) present the highest value but decreasing unit costs, followed by electronic components such as harnesses, controls, switches, and displays. Power electronics are expected to present the highest growth, mainly driven by EV adoption, followed by SW and sensors (including Lidar), guided by AD adoption. Moreover, the content of SW and electronics per car is expected to increase in the future



Source: Burkacky, O., Deichmann, J., Guggenheimer, M., & Kellner, M. (2023, January 3). Outlook on the automotive software and electronics market through 2030. McKinsey & Company

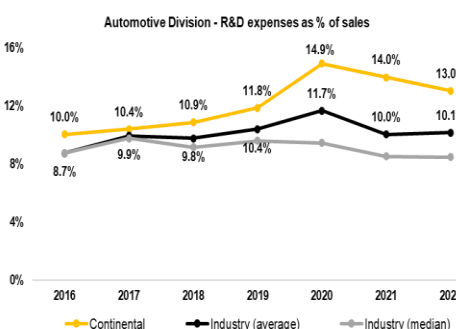
and to differ according to the powertrain type (electric, ICE) and SAE AV level, being expected however a decrease in unit costs due to scale effects, lowering components value over time. Nevertheless, the balance between increased content and lower unit costs will still result in a growing value of SW and E/E components per AV produced, estimated at \$3,760.90 in 2023 and expected to surpass \$5,000 by 2030. The overall growth of the market will also be tied to the increase in labour costs, driven by a dominance of SW. According to McKinsey, salaries in the sector are expected to grow annually between 2 to 6% until 2030, due to the need of more domain specialists and highly skilled SW developers.

Partnerships

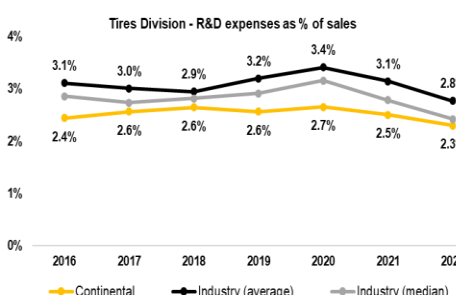


Source: Burkacky, O., Deichmann, J., Guggenheimer, M., & Kellner, M. (2023, January 3). Outlook on the automotive software and electronics market through 2030. McKinsey & Company

The sourcing of hardware (HW) and SW components is expected to become separate, making it easier for tech-native companies to enter the industry. As established value pools are broken, entry barriers are reduced putting Continental market share at risk. With the redesign of production processes, co-development between OEMs and suppliers will become necessary and so partnerships will be key to maintaining a relevant place in the market. Continental has been following this strategy and established several partnerships with tech companies in the last years. Among these, one can highlight the partnerships with Aurora to develop and manufacture AD trucking system kits for Aurora Driver (starts production in 2027), with Volkswagen to produce the first HPC for the entire network of its ID. models (30 vehicle models from different manufacturers will be equipped with this technology by 2024-end), and with Amazon Web Services/Google Cloud to develop a Smart Cockpit High-Performance Computer (ready for production in 18 months) that will allow drivers to have a natural dialogue with their car. Moreover, Conti and Ambarella Inc. are since this year jointly developing AI based hardware and software solutions for ADAS. Regarding the Tires segment, Continental recently secured the status of preferred partner of Mercedes-Benz in the Asia Pacific Region, and it will be supplying the manufacturer's whole car portfolio, from A- to GLS-Class, until 2025. Besides Mercedes, Stellantis, Ford, and the Volkswagen and Renault groups stand as the division's largest customers. Finally, it is important to note Conti's increasing preference for multi-year customer trials of its digital solutions portfolio, which are set up on short notice with haulage companies, like Gor Oz and Venneker Trusts, operating small fleets in unique environments.



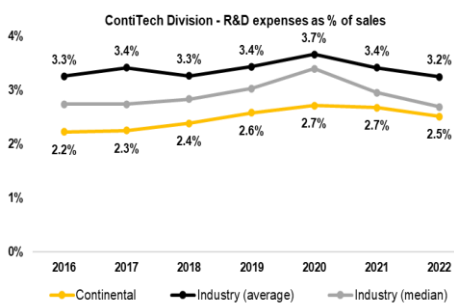
Source: Continental & Peers Financial Reports; Own Estimates



Source: Continental & Peers Financial Reports; Own Estimates

Research & Development

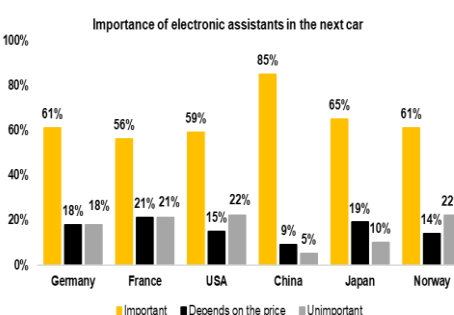
Proving that Continental is also investing in in-house expertise, in 2017 the company inaugurated a new R&D centre in Silicon Valley that houses some of the strongest experts in the industry and, in 2020, it established its own supercomputer for Artificial Intelligence (AI), which is unrivalled in the automotive industry and grants notable computing power for developers worldwide. Nevertheless, developing cutting-edge technologies in the Automotive division implied a large expenditure in R&D in the last years. However, the high ratio of R&D expenses (net of income received) compared to its main peers was not translated into bigger margins (as seen before). Therefore, the Board plans to "consolidating its 82 development locations worldwide" in order to improve costs management. As such, R&D expenses were forecasted to represent 9.5% of Automotive sales by 2028. Conversely, reflecting the higher maturity of its services, the



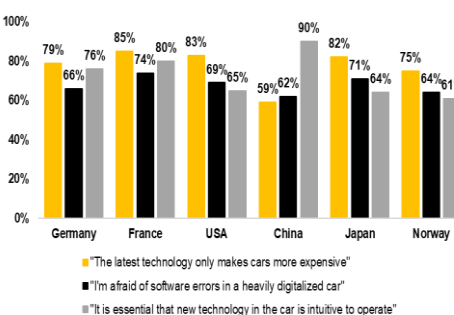
Source: Continental & Peers Financial Reports; Own Estimates

R&D expenses (% of sales)	2023	2024	2026	2028
Automotive	12.4%	11.8%	10.7%	9.5%
Tires	2.4%	2.7%	3.1%	3.1%
ContiTech	2.6%	2.9%	3.2%	3.2%

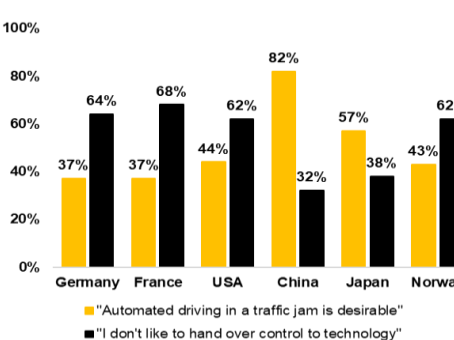
Source: Own Estimates



Source: Continental 2022 Mobility Report



Source: Continental 2022 Mobility Report



Source: Continental 2022 Mobility Report



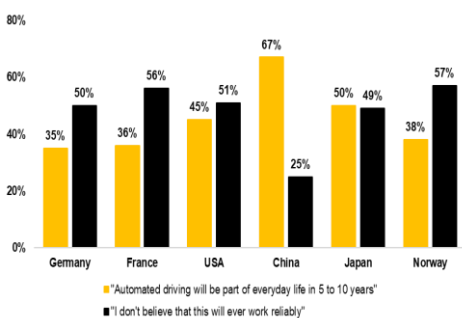
Source: Continental 2022 Mobility Report

Tires division has been underspending in R&D in comparison to its main competitors. However, addressing this gap, the company has adopted new techniques at the Contidrom, its main research facility in Germany. These include an Automated Indoor Braking Analyzer (AIBA) system to monitor the friction properties of tires on dry and wet road, and a driver-in-the-loop simulator that allows virtual testing of new prototypes, thus shortening development times. Moreover, sustainability commitments and labelling initiatives on rolling resistance, wet performance, and noise cancelling will further contribute to stronger research efforts, reinforcing the expectation of a higher R&D share of sales in the future (converging to industry level). Similarly, ContiTech has been below its peers' level, but a growing trend is perceived with the shift of focus towards industrial replacement. Given that its products are (still) less tech heavy compared to the remaining segments, Conti will likely redirect investments to upgrade its offer and improve competitiveness, using R&D as main tool. As such, it is expected to overtake Tires as the second division with high share of R&D in terms of sales.

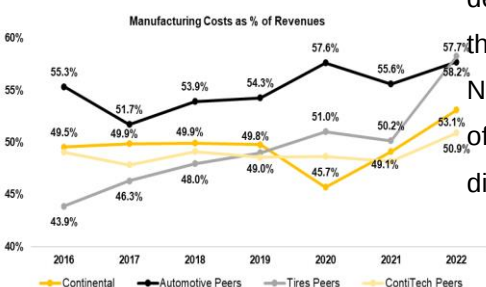
ADAS Demand

Despite the advancements made in the Automotive industry and the progress in the commercialization regulations for AVs, it will all be in vain if there is no significant demand for autonomous vehicles. Even though most of the respondents to Continental 2022 Mobility Report² stated that having electronic assistants in their next car is important, many feared that it would contribute further to rise car prices. On top of that, over 60% of the people surveyed would be afraid of software errors in a heavy digitalized car and believed operational intuitiveness is essential. According to the respondents' answers, it can be inferred that people in Asia are significantly more open towards automated driving compared to Western citizens, who are not keen on handing over a car's control to technology and do not believe automated driving will ever work reliably. Therefore, even though the primary goal of autonomous driving is to maximize safety, it will take some time until drivers fully trust such advancements, delaying the market penetration of certain Conti technologies. Moreover, owners of non-electric cars remain sceptical of acquiring one over concerns on the availability of sufficient charging infrastructures and its real environmental impact – 44% of German and American respondents are not willing to pay more for an environmentally-friendly car. Overall, customers' acceptance is indeed a risk Continental faces by developing high-tech products. This does not apply to vehicles with SAE levels 1 or 2 technologies since drivers still have full control over their cars however, level 3 vehicles only require the driver to intervene after a warning period (conditional automation), even enabling the legal use of cell phones for short intervals. Right now, Conti's biggest investment is on the development of innovative technologies for cars of this level (and above), which might struggle to conquer the market. However, these vehicles will only be available in marketplaces in the long run, giving people time to adjust to a new reality. Moreover, once released, their price tag will be significantly more expensive compared to cars of lower autonomous levels. Hence, they can be perceived as a premium good which only the wealthiest can afford, balancing the low quantity demanded with high prices.

² 6000 people surveyed from Germany (1,001), France (1,000), the USA (1,000), China (1,009), Japan (1,000) and Norway (1,001)

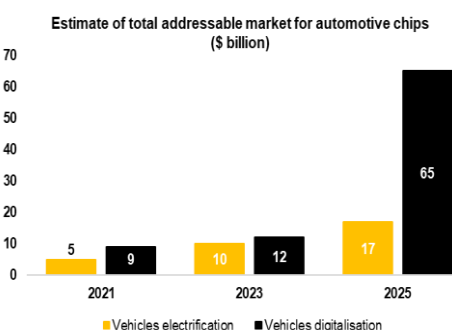


Source: Continental 2022 Mobility Report

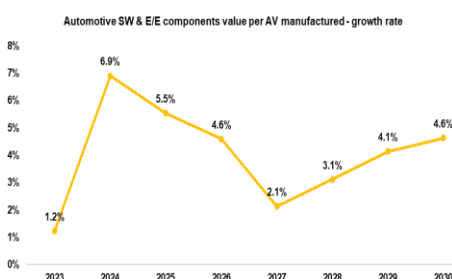


Note: Historical manufacturing costs allocated to each division according to share of revenues

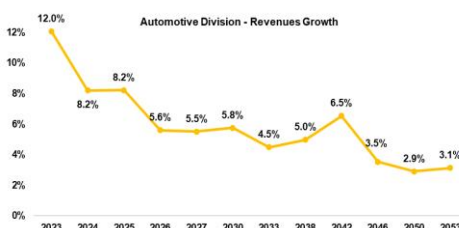
Source: Own Estimates



Source: Financial Times; HIS Markit; STMicroelectronics



Source: Burkacky, O., Deichmann, J., Guggenheimer, M., & Kellner, M. (2023, January 3). Outlook on the automotive software and electronics market through 2030. McKinsey & Company



Note: Growth rate from Automotive SW and E/E components value per AV was adjusted up and downwards according to market, macroeconomic & geopolitical drivers

Finally, according to the same survey, ridesharing does not seem to be gaining a significant share either, as the vast majority of respondents is uninformed about car-sharing models (China being an exception).

Raw Materials & Manufacturing Costs

In the recent past, the main cause for the declining operational margin across the whole company was a surge in manufacturing costs, caused by events that provoked scarcity of raw materials and consequent rising prices. By analysing Conti peers, it is clear that ContiTech suffered the least from this phenomenon due to its diverse nature and low dependence on products that were affected by such events. As for Automotive and Tires, they were highly impacted by semiconductors and rubber shortages, respectively. Nevertheless, it is important to highlight the stability of the company, with a constant ratio of manufacturing costs to revenues until 2020. This is especially relevant to the Tires division, which saw its competitors costs skyrocket due to natural rubber shortages.

Supply Chain Disruptions

In 2022, 35% of the Group's €28.4 billion purchasing volume referred to electronics and electromechanical components. These raw materials are primarily used in the Automotive and Contract Manufacturing divisions, whose products are fundamentally technological, and so, they suffered the biggest impact from disruptions in the semiconductors industry. Even though global chipmakers recovered from the shortage caused by the Covid-19 pandemic to a point of oversupply, the current supply gut is not expected to persist and does not encompass more sophisticated chips such as generative AI related, which have been on the rise since OpenAI's ChatGPT was launched. On its 2022 annual report, Continental states that delivery backlogs for semiconductors hit records in this year and the company does not expect substantial improvements before 2025. Also, while the USA tries to recover market share through the CHIPS Act, China keeps a close target on Taiwan, the largest manufacturer of semiconductors worldwide, putting the market in peril once again. Furthermore, to cope with the enhancing infotainment systems, modern cars require a bigger number and more expensive chips, with the average value of semiconductors per car forecasted to reach \$1,138 by 2028 (from \$700 in 2020), according to S&P Global Mobility. Therefore, prices for Conti breakthrough technologies, especially in the Automotive segment, are expected to continue increasing in the medium-term as electric mobility becomes more advanced and semiconductors availability remains fragile. Hence, this is posed as a risk to Continental not only in terms of manufacturing costs but also in terms of demand, since vehicles price will also remain high, implying that the next generation of AVs will not be at reach of an average individual.

Automotive Market Share	2022	2026	2030
Germany	21.3%	22.6%	24.0%
Europe excluding Germany	16.0%	17.0%	17.0%
North America	17.3%	17.7%	18.0%
Asia-Pacific	20.8%	22.4%	24.0%
Other countries	13.8%	14.0%	14.0%

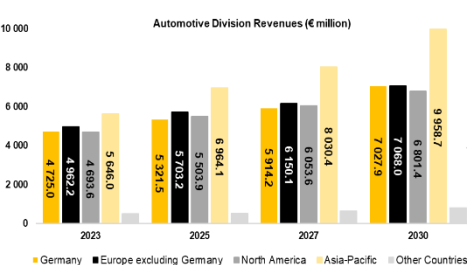
Source: Own Estimates

Valuation

Revenues Forecast

Automotive Division

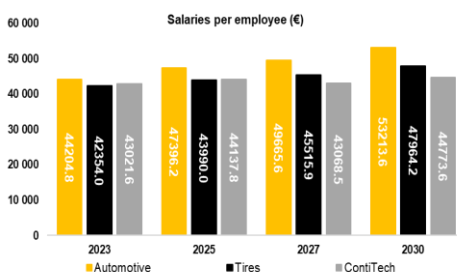
Building upon the geographical projections of AVs manufactured, revenues per AV targeted by Continental were forecasted to grow at the same pace of the global



Source: Own Estimates

automotive SW and E/E components market. Note that a growing market share (especially in APAC region) was assumed, since the company is expected to benefit from its early investments in ADAS to recover ground lost in the last few years. Also, even though tech firms are expected to join the industry, Continental and its main peers not only enjoy a mature business and solid reputation but are also the only companies in such a fast-growing industry to integrate both hardware and software in its value chain.

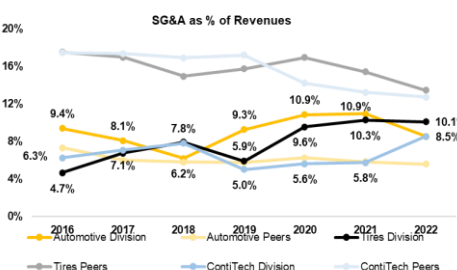
Therefore, partnerships are very likely to be formed to secure progress, but no new entrants will be able to gain significant market share in the medium-term. Overall, the Automotive division is expected to present a fast growth during the next two decades, with revenues increasing on average 6% a year. This trend is sustained by the highly promising developments unearthed, to which Continental will contribute greatly. Geographically, Asia-Pacific will solidify its position as sales leader with a 32% share by 2030, while North America's drop to roughly 21% (from 24% in 2022). In the (very) long-term, more general drivers were adopted to conclude that Continental will reach a smaller and steady growth level by 2053 (3.14%). By then, the industry will have attained a mature state, represented by a major share of EVs and high-level AVs, whose price will have become more standardised. Moreover, Continental is also expected to lose some of its current potential due to an increase in competition, as it becomes easier to replicate its products. Contributing to the higher industry maturation, the shift in mobility habits will be intensified and connectivity and infrastructure issues will prevent the most advanced technologies from reaching some parts of the globe.



Source: Own Estimates

Wages & SG&A

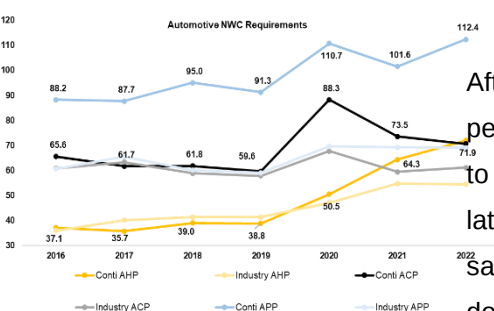
On top of growing in line with inflation, individual salaries and SS contributions were also adjusted to reflect the growing number of hirings and share of sales. In fact, as Continental advances in the development of innovative technologies, a great number of SW developers and highly skilled personnel will be hired, especially in the Automotive division where individual wages were projected to grow 3.17% YoY until 2030. As for SG&A as % of revenues (net of income received), the reforms imposed by the administrative restructuring in the Automotive segment will imply its decline towards industry level (7.09%). Conversely, SG&A share of sales will increase in the Tires and ContiTech divisions towards peers' level (12.70% and 9%, respectively), as the company attempts not to lose market share and expand its customer/market reach.



Source: Own Estimates

Net Working Capital Requirements

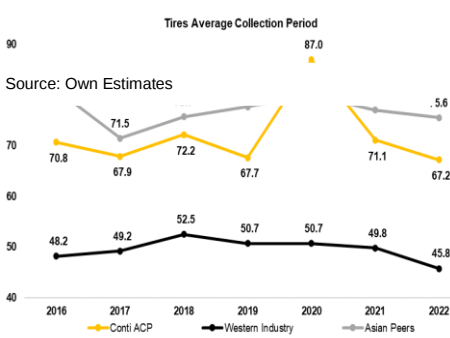
After widening a gap to the industry average since the pandemic, the average holding period (AHP) in the Automotive division is expected to fall towards the level verified prior to supply chain disruptions, which had caused a surge in the value of raw materials and, later, led to higher storage of inventories to soften the impact of sudden disruptions. The same evolution is visible for the average collection period (ACP), which has started a downward trend already as customers (OEM mostly) businesses recover full pace and so are able to pay faster, diminishing their bargain power. Similarly, Conti will also be quicker to meet its debt with suppliers, reducing the average payable period. In the past, a big gap existed to main competitors' level however, due to the growing maturity of Automotive products, the payable period is expected to become shorter than pre-pandemic level, being still at industry's maximum.



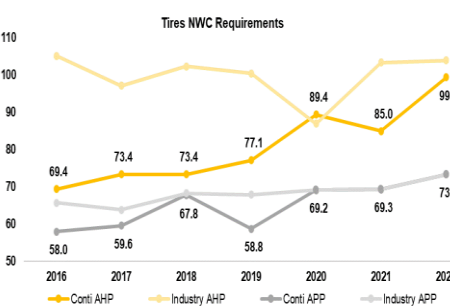
Source: Continental & Peers Financial Reports

Automotive Division	2022	2024	2027	2030
A. Holding Period	71.9	56.6	41.2	41.2
A. Collection Period	70.7	65.8	61.0	61.0
A. Payable Period	112.4	99.2	75.8	75.8

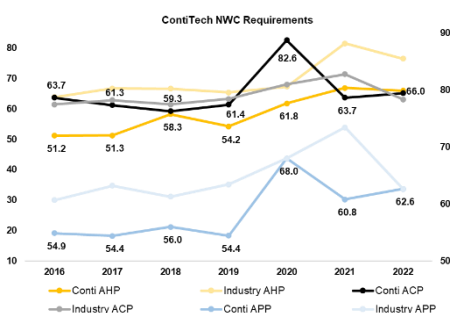
Tires Division	2022	2024	2027	2030
A. Holding Period	99.4	103.7	101.3	101.3
A. Collection Period	67.2	66.1	65.0	65.0
A. Payable Period	73.3	69.6	66.5	66.5



Source: Continental & Peers Financial Reports



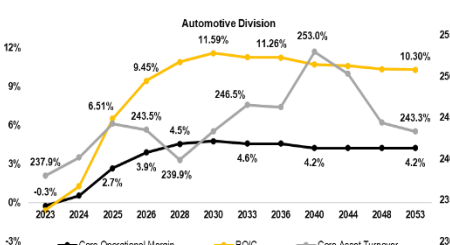
Source: Own Estimates



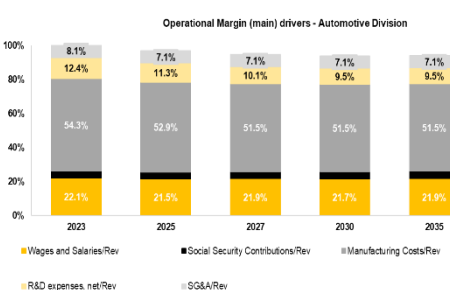
Source: Own Estimates

ContiTech Division	2022	2024	2027	2030
A. Holding Period	66.0	64.9	63.9	62.9
A. Collection Period	65.2	63.2	62.3	62.3
A. Payable Period	62.6	62.1	62.1	62.1

Source: Own Estimates



Source: Own Estimates



Source: Own Estimates

Even though ContiTech presents intrinsic differences to Automotive segment, highlighted by a longer period during which inventories remain in the company before being sold, the same evolutionary trends are applied. Overall, the three indicators evolved closely to the industry and are expected to converge to its pre-pandemic level in the short-run.

For the Tires division, the holding period is expected to persist above historical values, continuing the convergence to competitors' level, and reflecting the longer time needed to implement new materials and technological features in its products. While the payable period will continue to evolve in line with the industry towards pre-pandemic average, the collection period is expected to vary just slightly. In fact, the ACP reflects Conti's ambition to fit into the APAC market, characterized by longer payment periods. This development has been visible in the big gap driven to Conti's main competitors, mainly European and American, which receive faster from customers.

Value Drivers

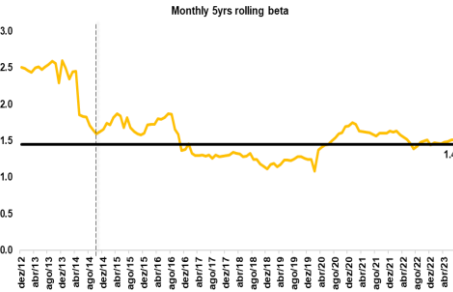
After presenting an exceptional 25% ROIC in 2017 and 2018, Automotive division efficiency quickly became ordinary as assisted driving turned to be regular too, with returns dropping to less than 8% still in 2019. In the future, the operational margin will slowly recover as manufacturing costs and personnel expenses are adjusted, however, it is projected to stabilize at roughly 4.20% in the long run, slightly above half of pre-pandemic level. This can indeed be perceived as a conservative projection but, the truth is that 2016 scenario looks a like a golden age compared to what the future has reserved. If on one hand annual vehicles production will not reach 2016 values any time soon and shared mobility will gain supporters, on the other hand raw materials scarcity and unionized groups syndicating higher wages will become rule, mitigating the likelihood of seeing an exceptional margin once again. In this sense, manufacturing costs will continue representing a huge burden on Conti's production processes, accounting for around 50% of revenues earned for the three segments. Regarding assets turnover, a faster recovery is expected towards stabilization at over 240%, meaning that each million of invested capital would generate around €2.40M in revenues. Overall, in the long run the Automotive division is expected to reach a 10.30% ROIC. The remaining segments are expected to follow similar conservative recovery trends.

Cost of Capital

Over the last years, Continental has been increasing its gearing ratio from merely 15.27% in 2018 to over 31% in 2022, due to a sharp increase in (long-term) debt. At the same time, retained earnings have also been falling (reducing equity value) with the payout rate dropping as well (turned negative in 2019 and 2020). This is explained by the intense investment Conti has been carrying out to solidify its leadership role in the automotive industry, resorting to different sources of funding for that. Moving forward, Continental is targeting a 40% debt-to-equity ratio, translated into a 28.57% gearing ratio. According to the latest quarterly report, despite the current environment of high interest rates, Conti has increased its debt level for the second consecutive year, especially short-term debt (counterintuitively), reflecting the importance of the ongoing advancements. Nevertheless, debt financing is expected to slightly decrease in the following years towards stabilization at target level.

FY	Gearing ratio
2016	22.4%
2017	18.3%
2018	15.3%
2019	26.8%
2020	30.6%
2021	29.5%
2022	31.0%

Source: Continental Financial Reports



Source: Bloomberg, Own Calculations

Automotive Division	Tires Division
1st tier Peers	1st tier Peers
MAGNA INTERNATIONAL INC	MICHELIN (CGDE)
VALEO	GOODYEAR TIRE & RUBBER CO
APTIV	BRIDGESTONE CORP
FORVIA	PIRELLI & C SPA
HYUNDAI MOBIS CO LTD	HANKOOK TIRE & TECHNOLOGY CO
LEAR CORP	
HL MANDO	2nd tier Peers
2nd tier Peers	YOKOHAMA RUBBER CO LTD
AISIN CORP	TOYO TIRE CORP
DENSO CORP	SUMITOMO RUBBER INDUSTRIES
SCHAEFFLER AG - PREF	
VISTEON	

ContiTech Division	Contract Manufacturing Division
1st tier Peers	VITESCO
GATES INDUSTRIAL CORPORATION	
TRELLEBORG	
TI FLUID SYSTEMS	
SUMITOMO RIKO	
2nd tier Peers	
PLASTIC OMNIUM	
NOK CORPORATION	
PARKER HANNIFIN	
INTERROL GROUP	

Regression-based WACC	
Equity Beta	1.44
Cost of Equity	12.2%
5-years Historical D/EV	25.7%
Unlevered Cost of Equity	10.1%
Unlevered Equity Beta	1.14
Beta debt	0.10
Target capital structure	40.00%
Target D/EV	28.57%
MRP	6.90%
Risk-free rate	2.29%
Cost of Debt	4.18%
Unlevered Cost of Equity	10.15%
Relevered Equity Beta	1.55
Cost of Equity (CAPM)	13.01%
WACC	10.12%

Cost of Debt

Due to the unavailability of meaningful long term outstanding bonds, the 10-year yield from Bloomberg’s European BBB Corporate Bonds curve was used instead, as per Continental’s credit rating. Moreover, an annualized probability of default of 0.3% and a ten-year average loss given default rate of 41.01% were factored in the estimation, based on Moody’s 2022 Global Default Study. Consequently, the implied cost of debt obtained was 4.18%, or 2.90% in after tax terms, considering Germany’s 30.7% standard domestic tax duty (15% Corporate Tax, 14.8% Trade Tax and 5.50% Solidarity Surcharge).

Cost of Equity & WACC

To estimate Continental’s cost of equity, a CAPM model was employed, adopting the perspective of a globally diversified marginal investor. Thus, the MSCI World Index (in EUR) was selected as the market portfolio, against which the company’s historical monthly returns were regressed to assess Conti’s levered and rolling betas. After organizing the peers per division and across different tiers, the respective equity betas and capital structures were used to calculate an unlevered beta for each segment. However, while rolling betas averaged roughly 1.45 and going no under than 1.08 in the last 8 years, only Automotive beta alone could get near to these values. Therefore, it was concluded that a regression-based beta represents best the systematic risk faced by Continental compared to aggregating or averaging the risks of each segment. Using betas from comparable companies would have been proved inaccurate since each peer is only focused on one of Conti’s products (e.g. only tires, or only auto components) and not on the whole portfolio. For example, rubber companies typically exhibited lower return volatilities to the overall stock market, a trend which persisted even after adjusting for the tendency of tire competitors to be headquartered in Asia. Conversely, automotive suppliers tended to demonstrate higher correlation with economic activity, thus mirroring the market. Regarding the risk-free rate, a 2.29% yield of a 10-year German bond was assumed as a proxy. Furthermore, according to the range recently recommended by the German Institute of Public Auditors (IDW³), a 6.90% market risk premium (MRP) was singled out, which resembles the historical values applied by German companies and is in line with statements by Continental itself. In fact, in its most recent annual report, the company hints to a 7.50% MRP and a 10% WACC for its cost of capital determination. For this analysis, after unlevering and relevering the regression beta at historical and target gearing ratios, respectively, an equity beta of 1.55 was obtained. Taking all into consideration, a 13.01% cost of equity (Re) and 10.12% WACC were estimated. For comparison, note that each division’s WACC ranged from 8.18% to 9.53%.

Discounted Cash-Flow Model

To complete the discounted cash-flow model, using a sum of parts (SOP) approach, the unlevered operating cash flows for each division were calculated until the respective steady states were reached (2053 for Automotive, 2040 for Tires and ContiTech). As mentioned before, Contract Manufacturing cash flows converged to 0 in 2027, as it is expected to cease existence by 2026. Next, free cash flows were discounted at the 10.12% WACC, and the non-core value was added to obtain EV. Finally, net debt was subtracted to reach an equity value of €20,658.4 as of December 31st, 2024, and,

³ Source: Cost of Capital Study 2023, KPMG

Total Value of Operations	28 830.2
Non-core Value	(1 711.3)
Enterprise Value	27 118.9
Net Debt	(6 460.5)
Equity	20 658.4
# shares outstanding	200.01
Price per share	103.29

Source: Own Estimates.

Automotive Division		WACC		
		8.12%	10.12%	12.12%
g	1.54%	123.7	100.9	88.0
	3.14%	130.9	103.3	88.9
	3.49%	133.2	104.0	89.2

Tires Division		WACC		
		8.12%	10.12%	12.12%
g	1.41%	121.3	98.0	83.5
	3.01%	134.0	103.3	86.1
	3.36%	137.9	104.8	86.8

ContiTech Division		WACC		
		8.12%	10.12%	12.12%
g	1.50%	107.0	102.9	100.3
	2.30%	108.0	103.3	100.5
	2.85%	108.8	103.6	100.7

Source: Own Estimates.

Automotive Division - Mkt Share		Asia-Pacific				
		-5.0%	-2.5%	0.0%	2.5%	5.0%
North America	-5.0%	78.5	85.5	91.9	98.9	103.8
	-2.5%	85.9	92.4	98.4	102.8	110.0
	0.0%	92.8	98.8	103.3	110.5	117.3
	2.5%	99.3	103.7	111.0	117.8	124.6
	5.0%	104.1	111.4	118.2	125.0	131.8

Tires Division - Mkt Share		Asia-Pacific				
		-5.0%	-2.5%	0.0%	2.5%	5.0%
Europe (excl Germany)	-2.5%	88.8	92.9	96.0	99.3	103.7
	0.0%	96.9	100.1	103.3	107.8	114.0
	2.5%	102.4	105.6	110.1	116.3	122.0
	5.0%	107.8	112.4	118.6	124.4	130.1

Source: Own Estimates.

Automotive Replacement Business - Share of OE Sales		1.0%	5.0%	10.0%
		96.9	103.3	112.9

Source: Own Estimates.

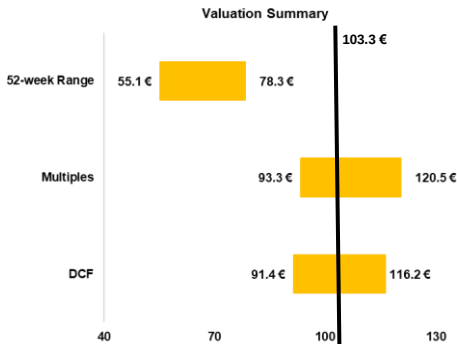
assuming the number of outstanding shares remains constant, a €103.29 share price was estimated.

Sensitivity & Scenario Analysis

To examine to what extent key inputs such as the WACC and steady-state growth rates affect the share price obtained, these values were varied together within each division. In a nutshell, it is important to highlight that a percentage change in WACC has a significantly bigger impact in the final price than the same variation in steady-state growth. Moreover, due to its higher share on Conti’s operations, a variation in Automotive’s inputs creates the strongest effect on share price, while shifts in ContiTech barely affect the valuation. Regarding the Automotive and Tires divisions, it was deemed important to study how the success or failure of Continental strategies might translate into the share price. Therefore, for Automotive, it was assumed that the future market share in each geography could range 5% up or down from the estimated/baseline values. Consequently, studying the impact on Asia-Pacific and Europe except Germany (North America) yields a share price ranging from €77.4 to €133 (€78.5 to €131.84), proving that the company is highly dependent on its own efforts to improve value. The same scenario was tested in the Tires division, differing the fact that a smaller market share loss was assumed in Europe and North America (no more than -2.5%). As such, share price ranges from €88.8 to €130.1 (€84 to €137.1) for Asia-Pacific and Europe except Germany (North America). Returning to the Automotive division, it was assessed how a bigger role of the replacement business could change results, compared to the 5% share of OE business assumed. In fact, stock price estimated would increase 9.33% if the share of this business would double, while a reduction to simply 1% of OE sales would yield a 6.21% drop in Conti’s price. Finally, the upward trajectory in adoption of tires with rim sizes above 18”inches was broken down by geography, to better capture the division’s local offering. Accordingly, the current 57% share of UHP tires was increased in more mature markets like Germany and Europe (yearly at 1.25% intervals) and at first kept constant in other regions. Under this more optimistic scenario, the company’s stock was now estimated at €106.45 (up 3.06%), as both inflation and product mix developments are accounted for in future replacement tires price. Next, Latin America and Asia’s initial UHP proportion were lowered 5%, and projected to remain at such level until 2025, before marginally growing each year. This resulted in a price drop of 2.64%, reaffirming the sensitivity of the division’s outlook to revenues outside Europe.

Final Recommendation

According to the DCF valuation, a stock of Continental AG will be traded at €103.29, being this considered the most appropriate method to assess the company’s fair value. Nevertheless, note that the share price obtained with the multiples approach is almost identical, reinforcing the validity of the DCF result. Hence, as of December 20th, 2023, a 35.87% price appreciation is expected, to which is summed a 1.19% dividend yield over the next year. All in all, a total 37.06% shareholder return entail a **buy** recommendation to investors. As a final remark, note that this valuation was considered conservative in light of Conti’s own projections and yet, the lowest range of the DCF model computed would still entail a buy recommendation to investors (over 20% shareholder return).



Source: Own Estimates, Bloomberg.