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CREDIT OPINION
22 September 2022

Update

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RATINGS

ZF Friedrichshafen AG

Domicile	Friedrichshafen, Germany
Long Term Rating	Ba1
Type	LT Corporate Family Ratings
Outlook	Stable

Please see the ratings section at the end of this report for more information. The ratings and outlook shown reflect information as of the publication date.

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ZF Friedrichshafen AG

Update to credit analysis following rating affirmation and outlook change to stable

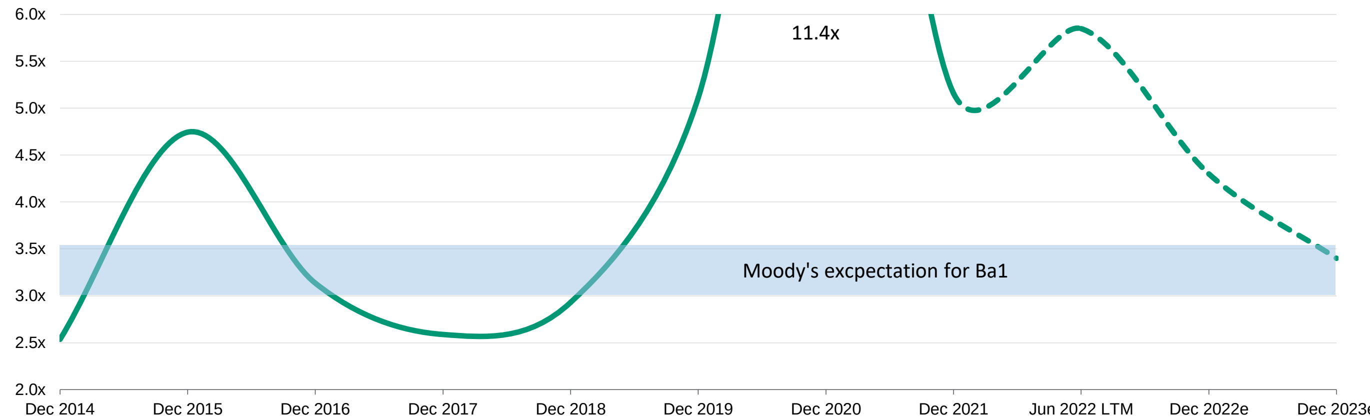
Summary

The affirmation of ZF's Ba1 ratings with a stable outlook in September 2022 reflects Moody's expectations that ZF's operating performance and credit metrics will recover in the next quarters post the weak levels in 2020 caused by the coronavirus pandemic and acquisition-induced leverage increase and meet our expectations for the Ba1 rating by FY 2023 the latest. The improvement will be driven by an expected pick-up in car production volumes in H2 2022 following still soft deliveries in the first half of the year as well as the expected deleveraging in the next 12-18 months supported by improved profitability and free cash flow generation and expected asset disposals. Considering the scale and diversity of ZF's business profile with a significant exposure to new technologies and a robust pricing power, we anticipate that ZF will be able to achieve their deleveraging targets, even in a scenario of a weaker global economy and continued cost inflation.

ZF Friedrichshafen AG's (ZF) Ba1 ratings reflect the company's leading market position as one of the largest tier 1 global automotive suppliers, combined with its sizeable industry-facing operations, and regional and customer diversification; clear focus on innovation and new product development; positive strategic alignment to address the disruptive trends of automotive electrification and autonomous driving; relatively conservative financial policy, reflected in its moderate dividend payments, which emphasises debt reduction and cash flow generation; and good liquidity.

However, ZF's ratings also reflect the company's high leverage, with debt/EBITDA (Moody's adjusted) of 5.8x as of the 12 months that ended June 2022; its modest operating profitability, with an EBITA margin of 4.0% as of the 12 months that ended June 2022, although broadly in line with the industry average; ZF's continued high capital and R&D spending, reflecting the group's focus on innovation; and an increase in its leverage because of the acquisition of Wabco (closed in the second quarter of 2020).

Exhibit 1
ZF's leverage is likely to further decrease, driven by profitability recovery and debt repayments
Gross debt/EBITDA (Moody's-adjusted)



Source: Moody's Investors Service

Credit strengths

» Leading market position as one of the largest tier 1 global automotive suppliers

» ZF's favourable positioning, given the disruptive trends, such as alternative fuels or autonomous driving, affecting the auto sector

» Substantial free cash flow (FCF), leading to decreasing leverage in a healthy sector environment

Credit challenges

» Supply chain disruptions driven by the coronavirus pandemic, semiconductor shortages and geopolitical risks

» Exposure to cyclicality of the automotive industry

» Modest operating profitability

» Ownership structure, which prevents ZF from accessing equity markets if needed

» Leverage reduction following the debt-funded acquisition of Wabco

Rating outlook

The stable outlook reflects Moody's expectations that ZF will return to metrics in line with the Ba1 rating category such as Moody's-adjusted Debt / EBITDA below 3.5x and EBITA margin above 5.0% in the next 12-18 months on the back of operational improvements and further debt reduction supported by assets sales if necessary. We expect cash flow generation to remain robust, evidenced in RCF/ Net debt metrics above 15%. Moody's expects ZF to continue their strong liquidity management and conservative financial policy.

Factors that could lead to an upgrade

An upgrade to Baa3 would be conditional to ZF achieving:

» an improvement in its EBITA margin to above 7% (Moody's adjusted),

» a reduction in its leverage, as reflected by debt/EBITDA moving towards 3.0x (Moody's adjusted),

» retained cash flow (RCF)/net debt above 25% on a sustained basis, and

» FCF above €500 million a year.

Factors that could lead to a downgrade

ZF's ratings might be downgraded if :

» EBITA margin remains below 5%,

» debt/EBITDA is above 3.5x on a sustained basis,

» retained cash flow (RCF)/net debt is below mid teen percentage level or

» FCF is less than €500 million a year.

Key indicators

Exhibit 2

Key Indicators for ZF Friedrichshafen AG[1][2][3]

	Dec-17	Dec-18	Dec-19	Dec-20	Dec-21	Jun-22 LTM	2022 (E)	2023 (E)
Revenue (EUR million)	36,444	36,929	36,518	32,611	38,313	40,192	41,600	44,250
EBITA Margin %	7.4%	5.1%	3.9%	0.7%	5.1%	4.0%	4.4%	5.2%
Debt / EBITDA	2.6x	2.9x	5.1x	11.4x	5.2x	5.8x	4.3x	3.4x
EBITA / Interest Expense	5.2x	4.2x	3.3x	0.4x	3.3x	2.5x	2.7x	3.3x
RCF / Net Debt	32.3%	28.3%	22.7%	8.8%	18.3%	13.7%	20.0%	27.0%

[1] All figures and ratios are calculated using Moody's estimates and standard adjustments.
[2]Periods are Financial Year-End unless indicated. LTM = Last Twelve Months.
[3] Moody's Forecasts (f) or Projections (proj.) are Moody's opinion and do not represent the views of the issuer.
Source: Moody's Investors Service

Profile

ZF Friedrichshafen AG (ZF), headquartered in Friedrichshafen, Germany, is a leading global automotive technology company specialised in driveline and chassis technology, and active and passive safety technology. The company generates most of its revenue from the passenger car and commercial vehicle industries but delivers to other markets as well, including the construction, wind-power and agricultural machinery sector. ZF is one of the largest automotive suppliers on a global scale, with revenue of €40.2 billion as of the 12 months that ended June 2022, similar in size to Robert Bosch GmbH, Denso Corporation (A2 stable) and Magna International Inc. (A3 stable). ZF, which is owned by two foundations, employs more than 157,500 people and is represented at about 188 production locations in 31 countries and 18 development locations in 8 countries.

ESG considerations

ZF Friedrichshafen AG's ESG Credit Impact Score is Highly Negative CIS-4

Exhibit 3

ESG Credit Impact Score

CIS-4

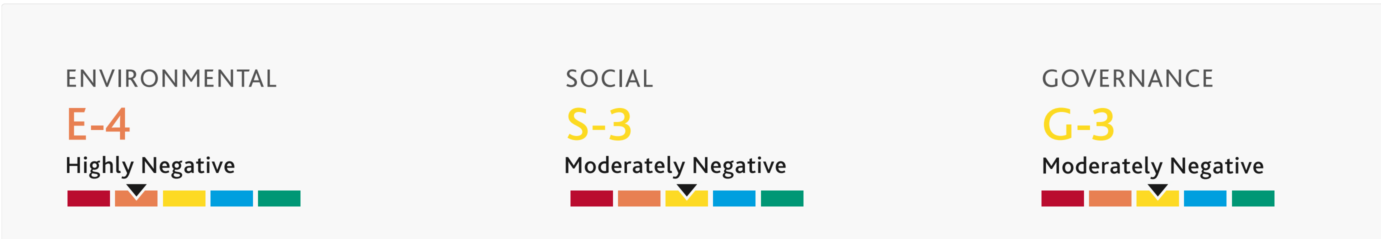
Highly Negative

For an issuer scored CIS-4 (Highly Negative), its ESG attributes are overall considered as having a discernible negative impact on the current rating. The negative influence of the overall ESG attributes on the rating is more pronounced compared to an issuer scored CIS-3.

Source: Moody's Investors Service

CIS-4: ZF's rating has been highly negatively impacted by ESG considerations. Environmental risks are high, especially in the context of electrification of passenger cars and commercial vehicles. The high governance risks are also negatively reflected in the rating.

Exhibit 4
ESG Issuer Profile Scores



Source: Moody's Investors Service

Environmental

E-4: ZF is highly negatively exposed to environmental risks, which essentially comprise of carbon transition risks (also at the level of its OEM customers). Some of ZF's products, especially in terms of gear boxes, are negatively exposed to stricter regulation of CO2 emissions of passenger cars and commercial vehicles and the trend towards electrification. This results in lower demand and profit margins for existing products.

Social

S-3. Social risks are moderately negative and arise from risks associated with ZF's need to build to the safety and quality requirements of its original equipment manufacturer (OEM) customers. The company has a very diverse global manufacturing network which mitigates issues related to retaining skilled labor and potential localized union disputes. There are moderate level of risks related to upkeep employee safety and thereby resources required to provide protection to its factory workforce.

Governance

G-3: ZF's Governance risks are moderate to high. The company is owned by two foundations, which is a positive from a governance perspective, because it guarantees the company's independence. However, a negative aspect is the lack of access to equity capital markets. In October 2017, ZF's shareholders implemented a dividend policy, which is now based on a payout ratio of 18% on net profit. ZF has a relatively conservative financial policy, including maintenance of good liquidity and the objective to achieve an investment grade rating. Given the strategic importance of the Wabco acquisition for ZF's product portfolio, the company has, however, temporarily compromised this rating objective.

ESG Issuer Profile Scores and Credit Impact Scores for the rated entity/transaction are available on Moodys.com. In order to view the latest scores, please click here to go to the landing page for the entity/transaction on MDC and view the ESG Scores section.

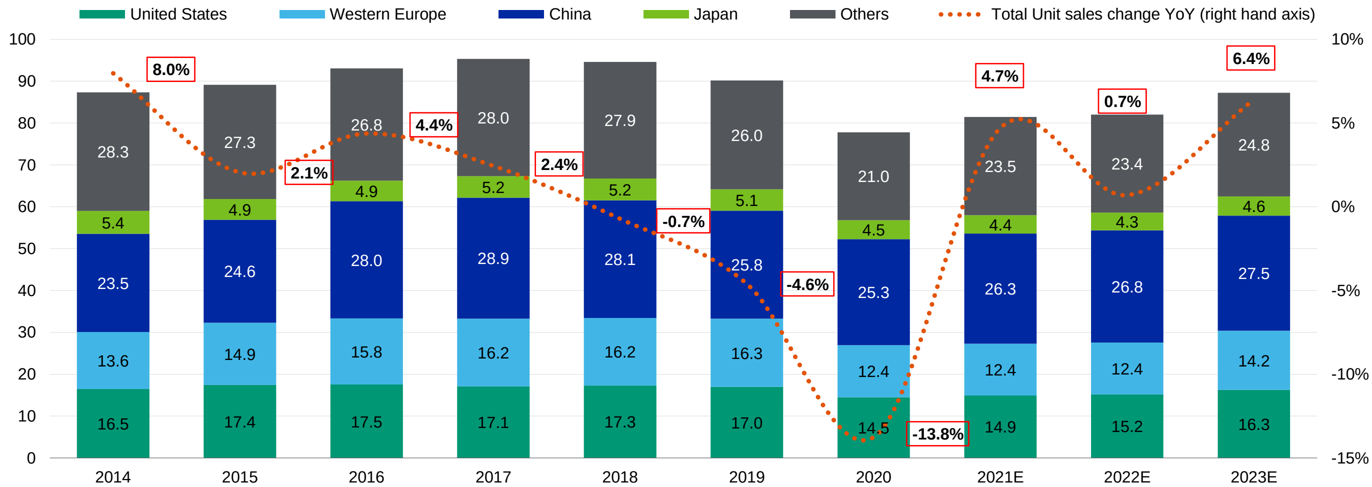
Detailed credit considerations

Cyclicality of automotive production a key driver of credit risk

ZF, like most global auto suppliers, has a strong reliance on the production rates of light vehicles by OEMs and thus is exposed to the high cyclicality of the global automotive industry.

Exhibit 5

Recovery of global auto market will pause in 2022; 6% growth forecast for 2023
Global light vehicle sales



European Automobile Manufacturers' Association (ACEA), China Association of Automobile Manufacturers (CAAM), LMC Automotive, Korean Ministry of Trade, Industry and Energy and
Source: Moody's estimates: see [Moody's global automotive sector outlook, published 14 June 2022]

After several years of continuous growth since the beginning of the decade, global light vehicle sales peaked at around 95 million units in 2017-18. In 2019, global light vehicle sales declined by around 5% to around 90 million units, driven mainly by an 8% decline in China. Global light vehicle sales plummeted 14% in 2020 because of the pandemic and recovered by only around 4% in 2021, as production was constrained by a global shortage of semiconductors. We forecast 2.5% global GDP growth for 2022 and 2.1% for 2023, with growth rates suffering from direct and indirect effects of Russia's invasion of Ukraine and tighter financial conditions (see Global Macro Outlook 2022-23 [August 2022 Update]). For the auto sector, this means a more muted recovery path, with global light vehicle sales growing by just below 1% in 2022 and a higher growth in 2023 based on a high order backlog as a result of supply chain issues. (see our Global Automotive Industry Outlook, published in June 2022). As a result, global light vehicle sales will remain well below the 2019 sales level of 90 million units and much less than the peak of 95 million units in 2017. Furthermore, recent macroeconomic data and rising energy costs increase the downside risk for our current base case scenario for light vehicles sales growth in 2023.

Despite this cyclicality, we expect ZF to outperform the market (8% outperformance in H1 2022), reflecting its strong positioning in active and passive safety systems, and powertrain technology. Additionally, the company's industrial and commercial vehicle technology, and aftermarket business together with their high exposure to new technologies in the auto sector, underpinned by €23 billion order backlog for electric drive technologies, mitigates somewhat the cyclicality in the auto OEM market.

Ability to generate substantial FCF and reduce leverage depends on a positive sector environment

ZF's credit metrics are currently still weakly positioned in the Ba1 rating, following the continued deterioration in global light vehicle sales and the debt-funded acquisition of Wabco in Q2 2020. ZF managed to reduce its Moody's-adjusted gross debt/EBITDA to around 2.6x in 2019 from 4.7x in 2015 (immediately after the debt-funded acquisition of TRW). This reduction was driven by ZF's ability to generate substantial positive FCF (€1.5 billion in 2016 and €1.3 billion in 2017), facilitated by a favourable market environment, with growing global light vehicle sales and still-moderate dividend payments to shareholders. Since 2018, when global light vehicle sales started to decline, ZF's FCF has deteriorated but has remained positive even in the difficult 2020 (€0.3 billion on average between 2018-2021). This decline was also because of continued high capital spending and R&D spending.

In 2021, ZF's revenues increased by 17.5% from very low 2020 levels and its Moody's-adjusted EBITA margin towards 5.1% from 0.5% in 2020. In H1 2022 driven by lockdowns in China, the Russian invasion of Ukraine and still difficult supply of semiconductors leading to inefficiencies in the supply chain and stop and gos, the EBITA margin fell to 4%. In the meantime ZF's revenues increased by more than 9% to above €40 billion driven by the ZF's ability to pass on the majority of cost inflation and outperform the global passenger car market by 8%. We expect the margin to increase above 5% following normalization of supply chains and further global automotive production recovery.

We expect ZF's capital spending to remain high, given the company's innovation requirement and the outsourcing trend by auto manufacturers. Because of ZF's limited ability to access equity markets, a conservative dividend payout is necessary to maintain a sufficient equity buffer in the current cyclical downturn and the ongoing investments in new technologies.

Following the closing of the fully debt-funded acquisition of Wabco as of the end of May 2020 coinciding with the start of the covid pandemic, ZF's leverage increased from 5.1x as of year-end 2019 (3.7x without the pre-financing of Wabco) to 11.4x as of year-end 2020. It decresed to 5.8x as of the end of June 2022 with the full year impact of Wabco and post covid recovery. We expect debt/ EBITDA should decrease towards 4.5x in 2022 and below 3.5x in 2023, driven by profitability improvement as well as positive free cash flow generation and assets disposals supporting gross debt reduction. The reduction of pension provision from €5.5 billion as of FY2021 to €3.1 billion as of H1 2022 on the back of increased interest rates further supports the deleveraging.

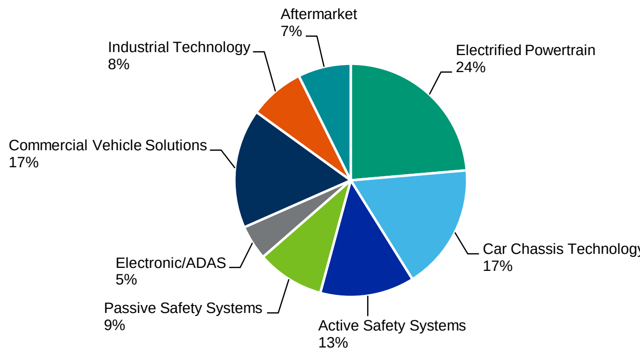
ZF's favourable positioning, given the disruptive trends affecting the auto sector

ZF has positive exposure to the two main disruptive trends affecting the automotive sector: electrification and the rollout of alternative fuel vehicles; and autonomous driving, in both cars and commercial vehicles.

The growing adoption of alternative fuel vehicles with hybrid or all-electric powertrains reflects a combination of tougher carbon emissions regulations applied to automotive OEMs and the falling cost of key technologies, most notably batteries. ZF, along with Valeo S.A. (Baa3 stable), Continental AG (Continental, Baa2 stable) and GKN Holdings (Ba1 stable), stands to benefit from electrification for two key reasons. Firstly, the internal combustion engine is one of the few parts within a car that is not subject to outsourcing. Although some OEMs may opt to manufacture the key equipment themselves, powertrain-focused suppliers such as ZF will play a much bigger role in the future. Secondly, the integration of hybridisation equipment with the transmission system (including the control units) will be critical in optimising the powertrain. Therefore, ZF is well positioned because of its long pedigree in transmission systems. Arguably, ZF is able to accommodate all technology pathways for hybrids and fully electric vehicles, depending on the requirements of its OEM customers. For mild hybrids, the group offers a modular motor unit, which connects the engine and gearbox. For full hybrids, ZF integrates a high-powered motor into its standard 8-speed automatic gearbox. Finally, for fully electric vehicles, the group manufactures axle drives, with the motor integrated directly into the axle.

Following the acquisition of TRW, ZF also gained access to a number of key technologies, which will likely underpin the transition to fully autonomous driving. The time horizon for this development is somewhat longer than that for fully electric vehicles. Nevertheless, the trend has already started, with new executive saloons having increased the number of sensors and driver assistance functions than was previously the case. This provides an opportunity for suppliers such as ZF. In terms of these technologies, ZF has an emerging product portfolio, which includes front-facing cameras and a 77-gigahertz radar, both of which will likely be employed on autonomous vehicles. In addition, ZF (along with many other auto suppliers) is forming partnerships to address gaps in its product portfolio. In June 2017, the group announced new strategic relationships with HELLA GmbH & Co. KGaA (Hella, Baa3 negative), which will contribute its expertise in software solutions, and NVIDIA Corporation (A2 stable), a semiconductor manufacturer and provider of artificial intelligence technologies. Following the full consolidation of Wabco since June 2020, ZF increased its share of commercial revenue to 17% as of the 12 months that ended June 2022 from 9% in 2019.

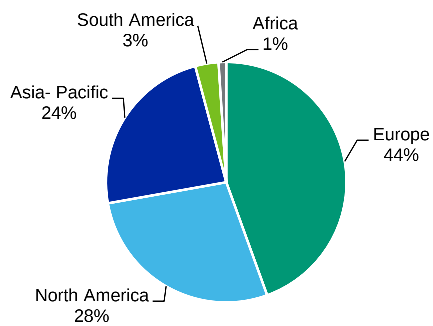
Exhibit 6
ZF's product diversification
As of the 12 months that ended June 2022



External revenue, excluding corporate functions and consolidation effects.
Source: Company information, Moody's calculation

ZF has improved its geographical diversification with the acquisition of TRW, which has a strong position in North America and the Asia-Pacific region. Wabco has a similar regional revenue profile as that of ZF, with most sales in 2019 generated in Europe (48%), 24% in North America and 20% in APAC.

Exhibit 7
ZF's geographical diversification
As of the 12 months that ended June 2022



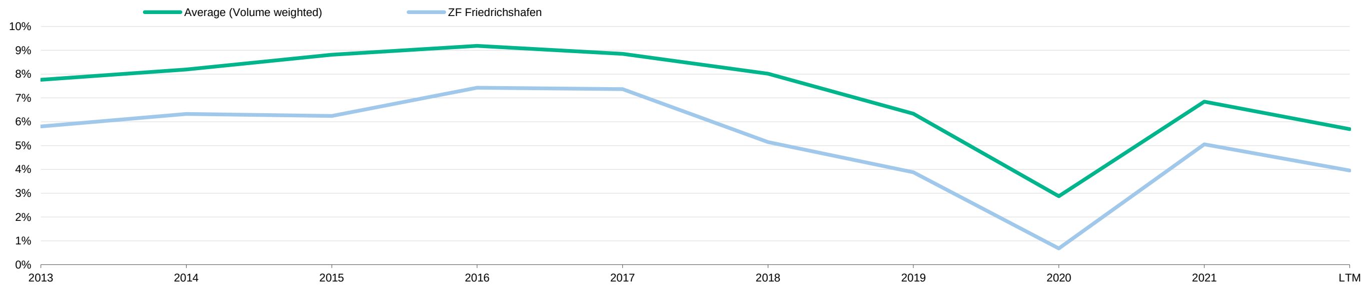
Sources: Company information, 2021 annual report and H2 2022 report

Modest operating profitability

ZF's EBITA margin improved over the past few years until 2017, but it has eroded since then. The company's margin is still below the average of EMEA-based auto suppliers. ZF's peers, such as Hella or Continental, which had to cope with the same industrial environment, were able to generate stronger margins during the period. To some extent, this is a result of ZF's product mix, which comprises products with very high technological content and high profitability, especially in its commercial vehicles segment, and products with lower market entry barriers such as axle systems. Margins in these segments are also rather low because of the high outsourcing of production, which, however, would provide for a rather high return on the capital employed. As of the 12 months that ended June 2022, ZF's Moody's-adjusted EBITA margin improved to 4.0%, above the levels in 2019.

Exhibit 8

ZF's EBITA margin has historically been below the EMEA automotive supplier sector average



EBITA margin reflects Moody's adjustments. Average numbers relate to those of similar companies we rate.
For issuers whose financials as of the 12 months that ended June 2022 were unavailable, those as of the 12 months that ended March 2022 or December 2021 were taken into consideration.
Source: Moody's Financial Metrics™

Despite the pandemic, ZF managed to generate a positive EBITA margin of 0.5% in 2020, following a negative margin of 5.7% in H1 2020. ZF generated a 4.0% EBITA margin as of the 12 months that ended June 2022, despite the ongoing sector headwinds explained above. ZF confirmed their guidance for 2022 and we expect the company to manage to gradually recover its margins above 5% in 2023. In light of ZF's history of high R&D spending, around 7% historically (6.8% in 2021), we recognise the company's above-sector-average flexibility to manage its cost base.

Acquisition of Wabco strengthend ZF's business profile but increased leverage

In May 2020, ZF closed the acquisition of automotive supplier Wabco for $7.0 billion in cash, based on a price of $136.5 per share. Wabco is a global automotive supplier in the areas of advanced driver assistance, braking, stability control, suspension, transmission automation and aerodynamics for trucks, buses, trailers, cars and off-highway vehicles. Wabco generated sales of $3.8 billion in 2018. Including Wabco's debt and acquisition-related cost, this results in an enterprise value of $8.5 billion or €7.4 billion.

The acquisition of Wabco strengthened ZF's business profile as a leading global automotive supplier, added around 10% to the company's revenue, and strengthened its product portfolio in the area of autonomous driving systems, where brake systems form an essential part. However, because the acquisition was fully debt funded, the enterprise value increased ZF's financial debt accordingly. We note that ZF reduced its leverage very quickly after its last major acquisition of TRW in 2015 from more than 4x in 2015 to 2.6x as of year-end 2017, supported by its high FCF, asset disposals and commitment to debt reduction. The deleveraging post the Wabco acquisition was delayed by the corona crisis, however we expect similar actions from ZF to delever in a normalized market environment.

The current challenges of the softening macroeconomic environment and consumer sentiment especially in Europe (44% of ZF's revenues) together with further cost inflation driven by increased energy prices or potential gas disruptions might delay ZF's deleveraging. However, we expect ZF to be resilient also in a more challenging environment due to ZF's exposure to new technologies, their diversified production footprint together with the ability to protect free cash flow generation and liquidity.

Liquidity analysis

ZF has good liquidity over the next 12 months. As of 30 June 2022, the company had €1.97 billion in cash and cash equivalents, and €3.5 billion available under its revolving credit facility agreements. We expect ZF to generate operating cash flow of around €3.5 billion over the next 12 months, which will bring its total liquidity sources to €9 billion.

This expected liquidity will be sufficient to cover cash uses of around €6.7 billion, comprising debt repayments of €2.6 billion; estimated capital spending of €2.5 billion; an estimated dividend payout of around €100 million-€150 million; an estimated €300 million working capital build-up; and working cash of €1.2 billion.

Structural considerations

The Ba1 ratings of ZF's senior unsecured notes is in line with the corporate family rating. Most of the group's industrial financial debt (around €13 billion as of June 2022, including the bonds and the bank facilities) and the committed credit lines are sitting at the parent company level or at financing subsidiaries, which are guaranteed by ZF. There is some structural subordination compared with liabilities sitting at the operating subsidiaries. These are, however, predominantly operating liabilities in the form of trade payables (€6.4 billion).

Methodology and scorecard

The principal methodology used to arrive at ZF's ratings is our global Automotive Suppliers rating methodology, published in May 2022. The scorecard-indicated outcome based on a 12-18-month forward-looking view is Baa3 one notch above the assigned rating of Ba1. The difference is driven by the historical high gross leverage still exceeding our expected range of 3.0x - 3.5x and low profitability.

Exhibit 9

Automotive Supplier Industry Scorecard [1][2]	Current LTM 6/30/2022		Moody's 12-18 Month Forward View As of 9/13/2022 [3]	
Factor 1 : Scale (10%)	**Measure**	**Score**	**Measure**	**Score**
a) Revenue (USD Billion)	$45.3	Aa	$45 - $48	Aa
Factor 2 : Business Profile (15%)				
a) Business Profile	A	A	A	A
Factor 3 : Profitability and Efficiency (25%)				
a) EBITA Margin	4.0%	Caa	5% - 5.5%	B
b) Expected Free Cash Flow Stability	Baa	Baa	Baa	Baa
Factor 4 : Leverage and Coverage (30%)				
a) Debt / EBITDA	5.8x	Caa	3x - 3.5x	Ba
b) EBITA / Interest Expense	2.5x	B	2.5x - 3.5x	Ba
c) Retained Cash Flow / Net Debt	13.7%	B	20% - 25%	Ba
Factor 5 : Financial Policy (20%)				
a) Financial Policy	Baa	Baa	Baa	Baa
Rating:				
a) Scorecard-Indicated Outcome		Ba1		Baa3
b) Actual Rating Assigned				Ba1

(1) All ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
(2) As of 6/30/2022.
(3) This represents Moody's forward view; not the view of the issuer, unless noted in the text, does not incorporate significant acquisitions or divestitures.
Source: Moody's Financial Metrics™

Ratings

Exhibit 10

Category	Moody's Rating
ZF FRIEDRICHSHAFEN AG	
Outlook	Stable
Corporate Family Rating	Ba1
Senior Unsecured MTN -Dom Curr	(P)Ba1/LGD4
ZF FINANCE GMBH	
Outlook	Stable
Bkd Senior Unsecured -Dom Curr	Ba1/LGD4
ZF EUROPE FINANCE B.V.	
Outlook	Stable
Bkd Senior Unsecured -Dom Curr	Ba1/LGD4
ZF NORTH AMERICA CAPITAL, INC.	
Outlook	Stable
Bkd Senior Unsecured	Ba1/LGD4
TRW AUTOMOTIVE INC.	
Outlook	Stable
Bkd Senior Unsecured	Ba1/LGD4

Source: Moody's Investors Service

Appendix

Exhibit 11
Peer comparison

(in USD million)	ZF Friedrichshafen AG Ba1 Stable FYE Dec-20	FYE Dec-21	LTM Jun-22	Continental AG Baa2 Stable FYE Dec-20	FYE Dec-21	LTM Jun-22	Lear Corporation Baa2 Stable FYE Dec-20	FYE Dec-21	LTM Jun-22	Valeo S.A. Baa3 Stable FYE Dec-20	FYE Dec-21	LTM Jun-22	Schaeffler AG Ba1 Positive FYE Dec-20	FYE Dec-21	LTM Jun-22
Revenue	37,220	45,330	45,331	36,368	39,950	40,105	17,046	19,263	19,427	18,759	20,424	19,949	14,368	16,389	16,226
EBITDA	1,987	4,139	3,628	3,501	4,650	3,662	1,020	1,314	1,000	1,037	2,191	2,009	1,159	2,679	2,227
Total Debt	24,283	20,521	19,670	15,739	11,994	12,391	3,287	3,555	3,503	9,309	8,097	8,295	8,789	7,429	6,286
Cash & Cash Equivalents	2,864	2,652	2,063	3,230	2,272	1,469	1,307	1,318	828	3,611	2,746	3,234	1,841	1,821	461
EBITA Margin %	0.7%	5.1%	4.0%	2.0%	5.4%	3.6%	2.4%	3.5%	1.8%	-1.2%	4.4%	3.6%	0.3%	9.6%	7.1%
EBITA / Interest Expense	0.4x	3.3x	2.5x	2.1x	8.3x	4.9x	3.3x	5.7x	2.8x	-1.2x	4.9x	3.4x	0.2x	6.3x	4.4x
Debt / EBITDA	11.4x	5.2x	5.8x	4.2x	2.7x	3.7x	3.2x	2.7x	3.5x	8.4x	3.8x	4.5x	7.1x	2.9x	3.0x
RCF / Debt	7.7%	16.0%	12.3%	20.5%	36.2%	20.5%	19.6%	27.9%	19.2%	8.5%	16.6%	12.7%	6.5%	25.0%	18.4%

All figures and ratios calculated using Moody's estimates and standard adjustments.
FYE = Financial year-end. LTM = Last 12 months. RUR* = Ratings under Review, where UPG = for upgrade and DNG = for downgrade.
Source: Moody's Financial Metrics™

Exhibit 12
Moody's-adjusted debt
ZF Friedrichshafen AG

(in EUR million)	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-21	LTM Jun-22
As Reported Total Debt	**6,391**	**5,020**	**9,647**	**13,283**	**12,531**	**13,301**
Pensions	3,595	4,161	5,140	6,563	5,514	5,514
Operating Leases	633	741	0	0	0	0
Non-Standard Adjustments	24	27	59	0	0	0
Moody's Adjusted Total Debt	**10,643**	**9,949**	**14,846**	**19,846**	**18,045**	**18,815**

Adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Source: Moody's Financial Metrics™

Exhibit 13
Moody's-adjusted EBITDA
ZF Friedrichshafen AG

(in EUR million)	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-21	LTM Jun-22
As Reported EBITDA	**3,909**	**3,333**	**2,888**	**1,779**	**3,728**	**3,235**
Pensions	6	8	(14)	(210)	(9)	(9)
Operating Leases	211	247	0	0	0	0
Interest Expense - Discounting	0	0	0	0	0	(26)
Unusual	35	(46)	72	48	4	138
Non-Standard Adjustments	(48)	(147)	(43)	124	(225)	(121)
Moody's Adjusted EBITDA	**4,113**	**3,395**	**2,903**	**1,741**	**3,498**	**3,217**

Adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Source: Moody's Financial Metrics™

Exhibit 14

Summary financials

ZF Friedrichshafen AG

(in EUR million)	FYE Dec-17	FYE Dec-18	FYE Dec-19	FYE Dec-20	FYE Dec-21	LTM Jun-22
INCOME STATEMENT						
Revenue	36,444	36,929	36,518	32,611	38,313	40,192
EBIT	1,844	1,374	864	(399)	1,272	925
EBITA	2,686	1,902	1,415	222	1,935	1,588
EBITDA	4,113	3,395	2,903	1,741	3,498	3,217
BALANCE SHEET						
Cash & Cash Equivalents	1,315	922	4,878	2,341	2,332	1,973
Total Debt	10,643	9,949	14,846	19,846	18,045	18,815
CASH FLOW						
Capital Expenditures	(1,892)	(1,857)	(1,869)	(1,497)	(1,688)	(1,805)
Dividends	122	235	199	118	59	157
Retained Cash Flow (RCF)	3,016	2,556	2,265	1,535	2,880	2,312
RCF / Debt	28.3%	25.7%	15.3%	7.7%	16.0%	12.3%
Free Cash Flow (FCF)	1,274	343	122	299	344	(164)
FCF / Debt	12.0%	3.4%	0.8%	1.5%	1.9%	-0.9%
PROFITABILITY						
% Change in Sales (YoY)	3.6%	1.3%	-1.1%	-10.7%	17.5%	4.5%
SG&A % of Sales	12.1%	11.7%	11.9%	12.9%	12.6%	12.5%
EBIT margin %	5.1%	3.7%	2.4%	-1.2%	3.3%	2.3%
EBITA margin %	7.4%	5.1%	3.9%	0.7%	5.1%	4.0%
EBITDA margin %	11.3%	9.2%	7.9%	5.3%	9.1%	8.0%
INTEREST COVERAGE						
EBIT / Interest Expense	3.5x	3.0x	2.0x	-0.7x	2.1x	1.5x
EBITA / Interest Expense	5.2x	4.2x	3.3x	0.4x	3.3x	2.5x
EBITDA / Interest Expense	7.9x	7.5x	6.8x	3.0x	5.9x	5.1x
(EBITDA - CAPEX) / Interest Expense	4.3x	3.4x	2.4x	0.4x	3.0x	2.2x
LEVERAGE						
Debt / EBITDA	2.6x	2.9x	5.1x	11.4x	5.2x	5.8x
Debt / (EBITDA - CAPEX)	4.8x	6.5x	14.4x	81.3x	10.0x	13.3x
LIQUIDITY						
(Cash + Marketable Securities) / Debt	12.5%	9.2%	33.1%	12.2%	13.1%	11.3%

All ratios are based on adjusted financial data and incorporate Moody's Global Standard Adjustments for Non-Financial Corporations.
Source: Moody's Financial Metrics™

REPORT NUMBER 1339301

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