ADAS and Autonomous Driving Tier 1 Suppliers Report, 2020-2021

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STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

Autonomous Driving Tier1 Supplier Research: centralized implementation of L2+, middleware layout of Tier 1 suppliers

1. The ADAS revenue of foreign Tier 1 suppliers declines amid the pandemic

The outbreak of COVID-19 has led to the declining demand for automobiles and the temporary suspension of production in the automobile industry. In this case, the overall revenue of most Tier1 suppliers has fallen sharply as they have difficulties in business development. For example, more than 40% of Continental's 249 production bases around the world decided in April 2020 to temporarily suspend production for several days or several weeks in order to protect employees and respond to lower demand.

ADAS Revenue of International Tier 1 Suppliers (Part), 2020

Tier1 Suppliers	ADAS-related Business	ADAS-related Revenue	YoY
Continental	Autonomous Driving and Safety Division	2020Q1-Q3: EUR5.3 billion	-24.60%
Aptiv	Advanced Security and User Experience Division	2020Q3: USD1.02 billion	3.00%
Valeo	Comfort and Driving Assistance System Division	2020Q1-Q3: EUR2.253 billion	-38.30%
ZF	Advanced Driving Assistance System Business	2020H1: EUR629 million	-31.00%
Veoneer	Active Safety Business	2020Q1-Q3: USD421 million	-24.00%

2. Tier 1 suppliers actively promote the mass implementation of L2 autonomous driving, and L3 autonomous driving enters the market

While Tier 1 suppliers' normal production is hindered, the technology of L2/L3 autonomous driving is advancing in an orderly manner.
From January to November 2020, 57 domestic auto brands launched 208 L2 models, and sold 2.60 million vehicles with a year-on-year upsurge of 118.9% thanks to the efforts of Tier 1 suppliers. For example, Bosch helped 40 local models achieve L2 autonomous driving in 2019, and focused on the implementation of L2+ autonomous driving in 2020.

Benefiting from the effective control over the domestic epidemic, Chinese Tier1 suppliers have constantly launched new products. Among them, Huawei and Baidu have attracted the most attention from the market. Huawei has successively unveiled perception layer products such as radar and LiDAR, as well as decision layer products like intelligent driving computing platform MDC and intelligent driving operating system AOS. Baidu APOLLO has released the autonomous driving computing platform ACU (1.0/2.0/3.0) and the L2 intelligent driving solution ANP, and also has successively landed in Changsha, Cangzhou, and Beijing with Robotaxi which is fully open to the society for operation.

With the introduction of HD maps, Tier 1 suppliers have assisted OEMs to head towards L3 autonomous driving. Xpeng P7, GAC Aion LX and other models with L3 autonomous driving have debuted successively.

Market Situation of Models with L3 Autonomous Driving (Part)

OEMs	L3 Models	Launch Time
Xpeng	P7	April 2020
Changan	UNI-T	June 2020
GAC Aion	Aion V	June 2020
Cadillac	CT6	July 2020
Benz	Mercedes-Benz S-Class	September 2020
GAC Aion	Aion LX	November 2020
Lexus	LS	November 2020
Leapmotor	C11	December 2020
Honda	Legend	March 2021
SAIC	MARVEL R	February 2021
Great Wall	WEY Mocha	2021Q1
Changan	UNI-K	March 2021

3. Foreign Tier 1 suppliers dabble in middleware, while domestic Tier 1 suppliers are deeply tied up with OEMs

From the perspective of autonomous driving products and scenarios, Bosch, Continental and ZF have the most comprehensive layout among foreign Tier1 suppliers. Both Bosch and ZF launched middleware designed for autonomous driving in 2020. As for the domestic Tier 1 suppliers, Huawei and Desay SV take the lead in the perception layout; however, all the domestic Tier1 suppliers are absent in the field of actuation.

In July 2020, Bosch launched Iceoryx, a middleware for advanced autonomous driving, compatible with ROS2 and Adaptive AutoSAR interfaces to meet the requirements of different development periods (pre-ROS, mass production of Autosar).

In December 2020, ZF released ZF Middleware, providing a modular solution that can be integrated into automakers' software platforms. At the same time, the middleware will be installed on mass-produced vehicles in 2024.

It is worth noting that foreign Tier 1 suppliers dabble in underlying system R&D and build a bridge between system and software applications while accomplishing functions. Bosch and ZF have successively released middleware products, hoping to centrally configure autonomous driving solutions for OEMs through a comprehensive sensor layout so as to simplify system integration, lower development costs and accelerate product launch.

Enterprises	Product layout								Scenario layout		
	Perception layer					Decision Layer	Middleware	Actuation Layer	Expressway	City	Parking
	Front view camera	radar	LiDAR	Map positioning	V2X						
Bosch	√	√	√	√	√	√	√	√	√	√	√
Continental	√	√	√	√	√	√		√	√	√	√
Aptiv	√	√	√	√		√			√	√	
Valeo	√	√	√	√	√	√			√	√	√
ZF	√	√	√	√	√	√	√	√	√	√	√
Mobis	√	√	√					√	√		
Veoneer	√	√	√	√	√	√		√	√	√	
Visteon						√			√	√	√
Magna	√	√	√		√	√		√	√	√	√
Denso	√	√	√	√	√	√			√	√	√
Baidu				√	√	√			√	√	√
Tencent				√	√				√	√	
Alibaba				√	√				√		
Huawei		√	√	√	√	√			√	√	
ADAYO		√		√							
Desay SV		√		√		√			√	√	√
Neusoft Reach	√			√	√	√	√		√	√	√
NavInfo				√					√		
TUS International		√		√	√						
HiRain Technologies	√		√	√		√					

The domestic Tier 1 suppliers (Huawei, Alibaba and Baidu) have teamed up with OEMs to launch autonomous driving and other technologies by in-depth cooperation or establishment of joint ventures to jointly help automakers build high-end brands or accelerate transformation to electrification, connectivity, intelligence and sharing.

- **Changan and Huawei.** On November 14, 2020, Changan, Huawei and CATL established a new high-end smart car brand together. They will jointly develop the CHN smart electric vehicle platform, which will be equipped with Huawei's smart cockpit platform CDC, autonomous driving domain controller ADC, and some components of electric drive, batteries and electric control.

- **SAIC and Alibaba.** On November 26, 2020, SAIC and Alibaba jointly founded a high-end battery-electric vehicle brand "IM", which will adopt Alibaba's Banma Telematics system and SAIC's electric drive, battery, electric control and intelligent driving technologies.

- **Geely and Baidu.** On January 11, 2020, Geely and Baidu erected a smart electric vehicle company. Baidu will fully empower the joint venture with technologies such as artificial intelligence, autonomous driving, Apollo, and Baidu Map.

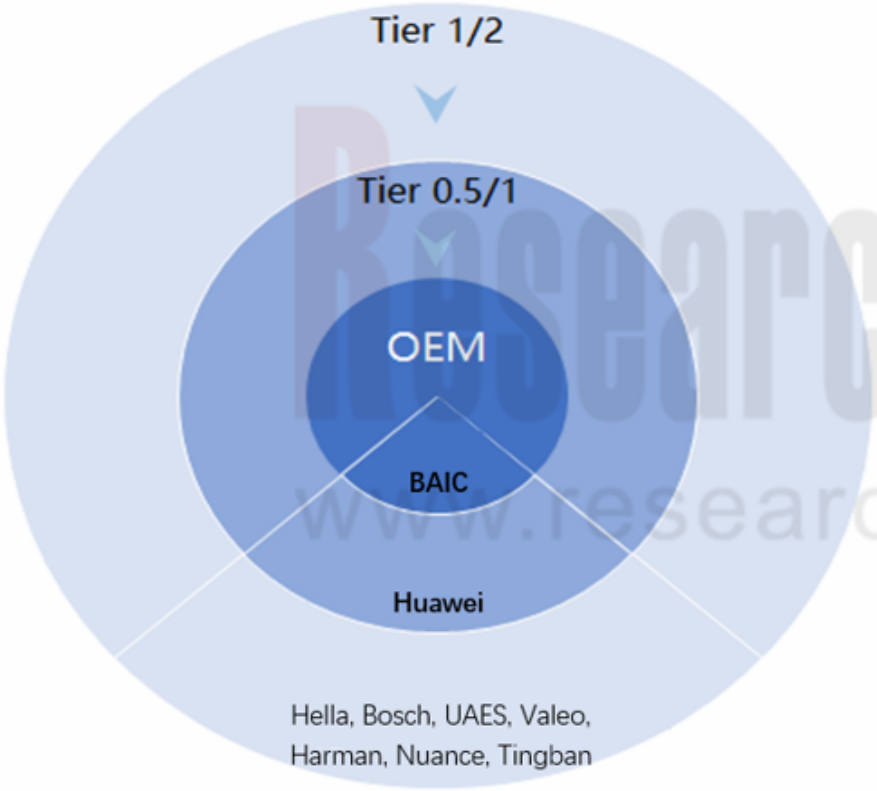
4. Summary

Comparing the development models of Tier 1 suppliers at home and abroad, emerging Tier 1 suppliers represented by Huawei and Mobileye directly penetrate into OEMs, deeply participate in product R&D, and position themselves as Tier 0.5 suppliers. For example, at the beginning of BAIC ARCFOX R&D, Huawei directly took part in R&D of many system functions of the vehicle, including smart driving, smart cockpit and smart electronics. Similarly, Mobileye acted as a Tier 0.5 supplier amid the cooperation with Geely Lynk & Co. Previously, Mobileye only supplied semi-finished components to Tier 1 suppliers, but now it is responsible for the complete solution stack for the first time, including hardware, software, drive strategy and control. Mobileye will also provide a multi-domain controller and provide software OTA updates after the system is deployed.

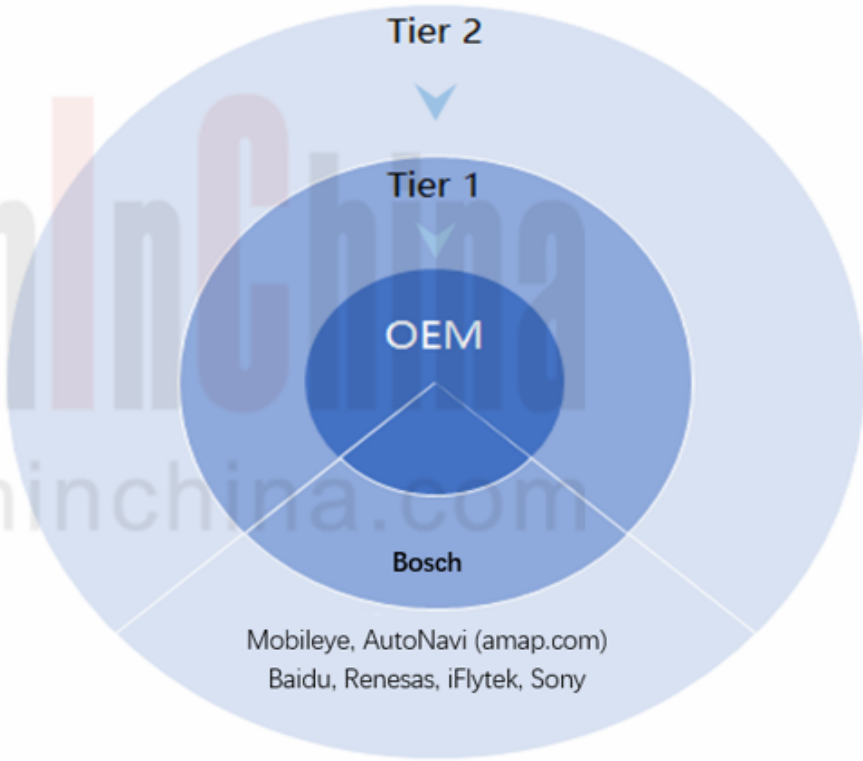
The emergence of the Tier 0.5 cooperation model will reshape the cooperation pattern of the traditional automobile industry chain.

Comparison of Emerging Tier 1 Suppliers and Traditional Tier 1 Suppliers in Cooperation Models

Emerging Tier 1 Suppliers (take Huawei as an example)



Traditional Tier 1 Suppliers (take Bosch as an example)



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