


**Shanghai Huayi (Group)  
Company**

**Credit  
Rating  
Report**

 Shanghai New Century Credit Appraisal &  
Investment Service Co.

Shanghai Brilliance Credit Rating & Investors Service Co.

## Ove

No.: [New Century Enterprise Assessment (2021) 020607]

Rating subject: Shanghai

Huayi (Group) Company

main credit rating: AAA

Rating Outlook: Stable

Rating Date: November 25, 2021

Key FinancialData and  
Indicators

Item	Project	2018	2019	2020	2021
First three quarters					
Amount unit: RMB billion					
<b>Parent company caliber data:</b>					
Monetary Funds		30.96	49.93	40.00	37.52
Rigid debt		119.97	158.32	182.24	201.98
Owner's Equity		132.85	147.21	149.26	137.88
Net cash inflow from operations		11.20	-0.01	-2.67	-4.19
<b>Consolidated caliber data and indicators:</b>					
Total Assets		710.90	788.92	788.41	887.64
Total liabilities		381.70	427.50	423.29	484.75
Rigid debt		227.31	271.17	275.19	320.25
Owner's Equity		329.20	361.42	365.12	402.89
Operating income		605.98	550.94	424.02	445.65
Net Profit		44.64	26.18	16.54	41.61
Net cash inflow from		68.57	29.74	23.56	41.12
Equity capital to rigid debt ratio [%]		144.82	133.28	132.68	125.80
Current ratio [%]		111.16	129.43	106.96	129.32
Cash Ratio [%]		66.25	73.04	61.25	72.80
Ratio of coverage from operations to multiple times		6.26	4.27	3.30	-
Ratio of coverage from operations to current liabilities [%]		23.85	10.28	5.54	-
Net non-financial cash inflows to total debt [%]		10.00	-2.43	-7.54	-
EBITDA/interest expense [times]		8.53	6.68	5.90	-
EBITDA/rigid debt [times]		0.40	0.27	0.20	-

Note: Based on Shanghai Huayi's audited 2018-2020 and unaudited 2021

The financial data for the first three quarters of the year were compiled and calculated.

## Rating

## Opinions

Key

## Strengths:

- **Scale and technology advantages.** As an important large chemical enterprise in China Shanghai Huayi is one of the industry groups, which has formed a comprehensive chemical production technology and equipment capability, with obvious scale and technology advantages.
- **Industrial integration advantage.** In recent years, Shanghai Huayi has continued to increase its internal integration efforts, clearly separated the main and subsidiary industries, concentrated resources to enhance the industrial capacity of the main industry, and continuously improved the industrial chain. The company is vigorously pushing forward the construction of the production base in Qinzhou, Guangxi, and the first phase has been put into operation since June 2021, so the scale advantage can be further expanded.
- **Strong financial resilience.** Shanghai Huayi's financial leverage is maintained at a reasonable level  
Ping. The company has a strong shareholder background and smooth financing channels, and has been working with many  
The bank has maintained good cooperation and obtained large amount of credit support, and the current remaining credit is still sufficient. The company's main business has a strong cash recycling ability, a large scale of stock money capital, and a strong liquidity  
Main risks company's financial assets.

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- **Capital expenditure pressure and capacity release risk.** Shanghai Huayi's production base in Qinzhou, Guangxi still has a certain scale of capital expenditure, so we are concerned about the pressure of capital expenditure and the subsequent release of production capacity.
- **Safety production and environmental protection risks.** At present, the chemical industry is facing severe pressure on resources and safe production and environmental protection, with high energy consumption and the production process of some products having certain impact on the environment, and Shanghai Huayi continues to face pressure on safety and environment.
- **Earnings volatility risk.** The chemical industry is still facing problems such as structural overcapacity and fierce competition. Shanghai Huayi's operating results are susceptible to fluctuations due to changes in the supply and demand of chemicals and cost transmission capacity.

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通过对上海华谊主要信用风险要素的分析，本评级机构给予公司 AAA 主体信用等级，评级展望为稳定。

上海新世纪资信评估投资服务有限公司



Shanghai Huayi (Group)  
Company

# Credit Rating Report

## Overview

Shanghai Huayi (Group) Company ("Shanghai Huayi", the Issuer, the Company or the Company) was formerly known as

Established in April 1957 as the Shanghai Chemical Industry Bureau, the chemical industry in this system covers chemical raw materials, plastics, dyes, pesticides, paints, rubber processing, reagents, fertilizers, chemical equipment, coking and coke, etc., producing more than 6,500 varieties of chemical products in 18 categories every year. Shanghai Chemical Industry Holdings (Group) Company, an asset management entity invested, controlled and operated by state-owned assets, is involved in 10 industries, including chemical raw materials, plastics, dyes, pesticides, paints, rubber products, chemical fertilizers, chemical equipment, chemical preparations and energy chemicals, and can produce more than 6,000 kinds of chemical products and chemical equipment, which is an important chemical production base in China. In October 1996, Shanghai Huayi was established through a joint reorganization based on all the state-owned assets of the former Shanghai Chemical Holding (Group) Company, the former Shanghai Pharmaceutical Administration and its affiliated enterprises, as approved by Shanghai Municipal Government in the document No. 368 [1996]. In the past 5 years

The Company's paid-in capital has not changed and was \$3,476 million as of the end of September 2021.

After more than two decades of development, the company has developed into one of the largest chemical manufacturers in China. Its main business is divided into five major business segments: energy chemicals, green tires, advanced materials, fine chemicals and chemical services, with a high market share of its core products and a number of well-known domestic brands. The company has 3 national-level enterprise technology centers, 5 municipal-level enterprise centers, 15 Shanghai high-tech enterprises, 6 national testing laboratories, and a postdoctoral research station, making it one of the very few

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large chemical companies in China with integrated business capabilities from chemical technology research and development, engineering design to construction. Ltd. ("Shuangqian", stock code, 600623.SH; now renamed as "Shanghai Huayi Group Co. "Ltd. ("Huayi Group", stock code 600618.SH) and Shanghai Sanfu New Materials Technology Co. ("New Material Technology") and other subsidiaries (please refer to Appendix III for details)

As of the end of October 2021, the company had four bonds in existence (as shown in Chart 1)

The outstanding principal balance of RMB bonds is RMB 4 billion and the outstanding principal balance of overseas bonds is USD 350 million. All of the Company's existing bonds pay interest on schedule.

**Figure 1. Overview of the Company's debt financing instruments as of the end of October 2021 (Unit: RMB billion, %)**

Debt Name	Issue amount	Period	Issue Rate	Start time	Registration Amount / Registration Time	Principal and interest payments
18 Huayi 01	10.00	5+2 years	5.10	2018-05-04	4 billion/2018.3	Normal interest payment
21 Shanghai Huayi MTN001	20.00	3 years	3.19	2021-08-16	2 billion / 2021.3	Not yet due for interest payment
21 Shanghai Huayi SCP002	10.00	180 days	2.65	2021-10-15	2 billion / 2021.3	Not yet due for payment
HUAYI FNI 3% N2024	350 million USD	5 years	3.00	2019-10-30	-	Normal interest payment

Source: Shanghai Huayi

## Business

### 1. External Environment

#### (1) Macro Factors

Since the third quarter of 2021, the global economy has continued to recover and performance is divergent, and inflation risks remain high; some emerging economies have accelerated the pace of interest rate hikes, and the Federal Reserve is about to start tapering its bond purchases, so the global economy and finance are facing challenges brought about by the withdrawal of easing policies; factors such as Sino-US relations and geopolitical conflicts in the Middle East and other regions have further increased global economic and financial uncertainty, and China's economic development The external environment faced by China's economic development has become more complex and severe. In the short term, China's economic recovery may continue to weaken, but with the support of macroeconomic policy cross-cycle regulation, economic growth is still expected to remain in a reasonable range, while we need to pay attention to the changes in the overseas epidemic situation, the U.S. strategic containment of China, the global economic repair and other factors; in the medium and long term, under the new development pattern of "double cycle", China's reform and opening up In the medium and long term, under the new development pattern of "double cycle", the continuous improvement of China's reform and opening-up, innovation-driven development and the in-depth implementation of the strategy of expanding domestic demand will further stimulate the potential of the domestic market and promote high-quality economic development.

Since the third quarter of 2021, the new crown epidemic has spread repeatedly and the global economy continues to recover while the pace of repair in developed and emerging economies is still diverging, and inflation risks remain high due to supply and demand imbalances and large-scale liquidity injection. High prices, capital outflows and currency depreciation pressure led to some emerging economies in the case of a fragile economic recovery continued to raise interest rates and the pace has accelerated, the European Central Bank has announced a slowdown in the emergency bond purchase program, the Federal Reserve is about to start reducing the scale of bond purchases, the



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global economy and finance is facing the challenge of easing policy exit. At the same time, Sino-US relations and geopolitical conflicts in the Middle East and other regions have further increased the global economic and financial uncertainty, and the external environment facing China's economic development has become more complex and severe, and proactive promotion of foreign cooperation is conducive to China's response to this unstable external environment.

Real estate regulation, local government hidden debt regulation,"lack of core""production restrictions"" and the epidemic epidemic and other factors overlapping intertwined, China's economic recovery process tends to weaken. The pressure of rising consumer prices is generally controllable and the employment situation is stable. Among the industrial sectors, high-tech manufacturing and extractive industries performed strongly, and the operating efficiency of industrial enterprises was well restored but uneven among industries, while mid- and downstream manufacturing and small and micro enterprises faced higher cost and working capital pressure. Domestic epidemic emanation led to unstable consumption recovery; real estate investment and infrastructure investment in fixed asset investment slowed down, while manufacturing investment steadily recovered; new export order index continued to be low, and export trade continued to be strong while volatility increased. The RMB exchange rate fluctuated steadily and the allocation scale of international investors to RMB assets continued to increase.

China continues to promote structural reform on the supply side, enhance innovation capacity, adhere to the expansion of domestic demand, and promote the construction of a new pattern of ""double-cycle"" development is a long-term policy deployment to deal with the complex situation at home and abroad; macro policy to maintain continuity and stability, enhance the effectiveness, through policy linkage to provide support for the real economy. China's fiscal policy remains active, the pace of issuance of local government special bonds and the use of funds continues to accelerate, fiscal spending effectiveness continues to improve, to protect employment, people's livelihood and market players at the same time drive effective investment; policy

The risk of local government debt is generally under control as new local government hidden debt is strictly prohibited at the local government level, supervision and monitoring are strengthened, and the stock of debt is properly resolved. The central bank implements a flexible and precise prudent monetary policy, strengthens cross-cycle regulation, maintains a reasonable abundance of liquidity, and guides financial resources to serve the entity and support green development through measures such as downgrading, new support for small refinancing, and renewal of direct monetary policy tools for the real economy; under the goal of risk prevention and maintaining the basic stability of macro leverage ratio, the growth rate of real financing is expected to stabilize after experiencing a significant recession. The transition period of the new regulation of capital management is coming to an end, and China's financial supervision continues to be strengthened to deepen the reform of financial institutions, crack down on illegal securities activities, and promote the high-quality development of the bond market and two-way opening, so as to lay a solid foundation for the healthy development of the financial market.

The year 2021 is the first year of China's new journey to build a comprehensive socialist modern country and **the** opening year of **the** 14th Five-Year Plan period. It is particularly important to balance economic growth and risk prevention to create a favorable macroeconomic and financial environment for the in-depth implementation of the new development concept, accelerate the construction of a new development pattern and promote high-quality development. In the short term, the global situation of epidemic prevention and control is still severe, the U.S. strategic containment of China, the world economy to repair the divergence and high inflation, the Fed's easing policy withdrawal, geopolitics and other factors there are many uncertainties, China's economic development is facing increased external pressure, the economic recovery tends to weaken the trend may continue, and in the macro policy cross-cycle regulation support, economic growth is still expected to remain in a reasonable range: it is expected that consumption recovery It still takes a long time for consumption to recover, manufacturing investment in fixed asset investment continues to recover, real estate development investment growth slows, infrastructure investment performance is stable, and the strong performance of export trade may not be sustainable. In the medium and long term, under the new development pattern of domestic circulation as the main body and domestic and international circulation promoting each other, the continuous improvement of China's reform and opening up, innovation-driven development and the deepening of the strategy of expanding domestic demand will further stimulate the potential of the domestic market and promote high-quality economic development, and China's macroeconomic fundamentals are still

expected to be good in the long term.

## (2) Industry Factors

### A. Chemical industry

Driven by the good situation of resuming production and work after the domestic epidemic, the downstream demand for some chemical products in China recovered rapidly in 2020, and the annual output of methanol, acetic acid and fluorine chemicals increased. In terms of price, the prices of methanol, acetic acid, acrylic acid and esters showed a V-shaped reversal in 2020, and prices stabilized and rebounded from the second half of the year driven by the recovery of downstream demand, and the good trend continued into 2021; the demand of caustic soda downstream industries such as alumina, paper printing and dyeing is still low, and the industry is still in an oversupply pattern, which affects the continued weakness of caustic soda prices.

#### a. Industry Overview

According to WIND data, as of the end of 2020, China's chemical raw materials and chemical products manufacturing industry above the scale of 21,722 enterprises, down 223 from the end of the previous year. 2018-2020, chemical raw materials and chemical products manufacturing industry, the number of enterprises above the scale of 21,722 enterprises, down 223 from the end of the previous year.

The operating revenues of the academic products manufacturing industry were 7.21 trillion yuan, 6.58 trillion yuan and 6.31 trillion yuan respectively; the same The total profit for the period was 514.620 billion yuan, 348.100 billion yuan and 425.760 billion yuan, respectively, cumulatively year-on-year.

( In the first three quarters of 2021, the operating revenue and total profit of chemical raw materials and chemical products manufacturing industry were 5.92 trillion yuan and 583.91 billion yuan respectively, up 32.8% and 126.8% year-on-year respectively. In 2019, affected by the slowdown of demand growth in downstream industries and the weakening support of crude oil and coal, the prosperity of China's chemical industry declined, and the revenue and profit of chemical raw materials and chemical products manufacturing industry declined to different degrees; the short-term impact of the new crown epidemic on the chemical industry at the beginning of 2020 was obvious, and the revenue and profit of chemical raw materials and chemical products manufacturing industry declined significantly in the first quarter and the second quarter.

Since the first three quarters of 2021, the chemical industry has shown a high boom with a significant increase in profitability, surpassing the boom high point of the last round (first quarter of 2017) as the downstream industry resumed work one after another and demand was boosted.

### Methanol

Methanol is an important basic organic raw material and a chemical intermediate. China's methanol production process is mainly coal-based methanol, and it is the world's largest methanol producer and consumer. In recent years, the main downstream of methanol in China is MTO

( In recent years, the price of coal/methanol to olefin has weakened due to the low crude oil price and the increase of olefin products from crude oil route, and the commissioning of MTO units has slowed down, which in turn has affected the incremental demand for methanol; from the traditional downstream such as formaldehyde, dimethyl ether, acetic acid and MTBE (methyl tertiary butyl ether), their consumption is affected by safety supervision, environmental protection tightening and the increase of substitutes. The overall consumption of formaldehyde, dimethyl ether, acetic acid, MTBE (methyl tertiary butyl ether) and other traditional downstream is slightly shrinking due to the influence of safety supervision, environmental protection and the increase of substitutes. Overall, the growth rate of methanol downstream demand is slowing down.

On the supply side, in recent years, the new production capacity of methanol exceeds the eliminated capacity, and the growth rate of methanol production capacity continues to be stable. According to data from Zhuo Chuang, China will add 5.93 million tons of methanol capacity and eliminate 2.04 million tons of capacity in 2020; according to the company's annual report, the effective methanol capacity at the end of the year was nearly 91 million tons, with a growth rate of about 6%. new methanol capacity will be released one after another in 2021, such as the company's 1.95 million tons/year methanol project in mid-June.

The production capacity of domestic methanol is expected to exceed 100 million tons by the end of 2021, and the pressure on capacity release is high. In addition, imported methanol has a big impact on the domestic market. In 2020, global demand for methanol shrank significantly due to the epidemic, and a large amount of cargoes chose to sell to China, where the epidemic was relatively well controlled, so the annual methanol import volume hit a record high of 13.091 million tons. 2020 China's methanol output was 70.730 million tons<sup>1</sup>, an increase year-on-year; the average start-up rate in the same period 70.17%. At present, domestic production capacity is mainly concentrated in Northwest China, North China and East China, and demand

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is mainly located in East China and Shandong etc.; in 2020, affected by the new crown epidemic, the elimination of lapsed production capacity is accelerated, and the new large-scale project capacity has obvious advantages, and the concentration and large-scale degree of the industry is further enhanced, with 25 enterprises above one million tons accounting for 46% of all production capacity. The company's methanol production capacity is one of the enterprises above one million tons in China, and its market share ranks first in East China.

In terms of price trends, international crude oil prices continue to fluctuate, and as a substitute for energy chemical products -

-The price of methanol also fluctuated. Due to the impact of the epidemic, the downstream demand for methanol in 2020 suffered further setbacks from the previous year, and coupled with the factor of falling crude oil prices, methanol prices (in the middle price of East China, for example) declined rapidly, with the middle price of methanol in East China, for example, falling to around RMB1,500/ton by mid-June.

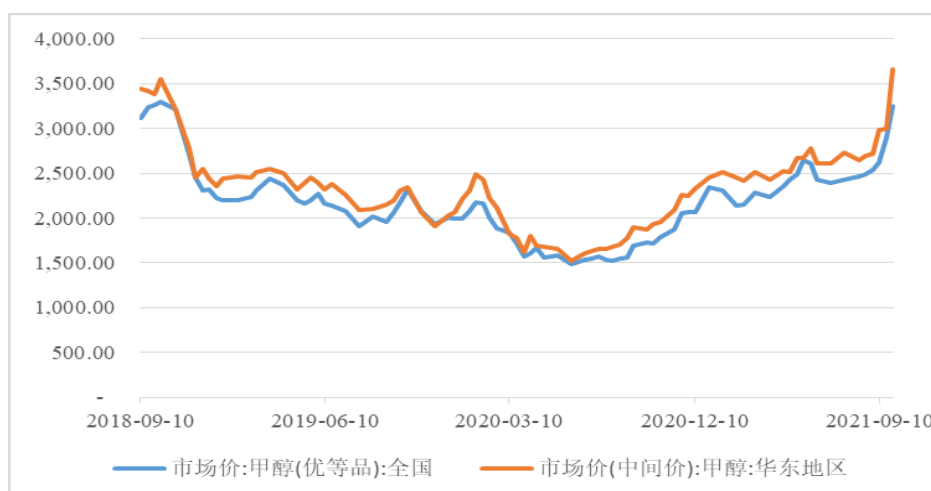
The domestic methanol market has been in a tight supply/demand balance since 2021, with unstable international production start-ups leading to import contraction and domestic double-control control in Inner Mongolia. The supply of methanol is tight due to the tightening of international production start-ups and domestic double control in Inner Mongolia and the effect of spring inspection, while downstream olefins, formaldehyde, dimethyl ether and acetic acid are working well under the stimulation of high profitability, driving up the demand for methanol.

The price is RMB 3,660.00 per ton.

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<sup>1</sup> Data source: Lonza Chemical, weekly data summation

Chart 2. Methanol price trend in China (Unit: Yuan/ton)



Source: Wind Information

### Acetic acid

Acetic acid is widely used in synthetic fiber, coating, pharmaceutical, pesticide, food additive, dyeing and weaving industries, and is one of the important basic chemical products. The development of China's coal and natural gas industries has promoted the development of the methanol industry, which provides raw materials for the acetic acid industry. The overall supply and demand of acetic acid in China is in a tight balance. In the past two years, there have been many new downstream installations of acetic acid and strong growth driven by downstream PTA, acetate and chloroacetic acid, especially PTA starts continue to be high, driving the apparent consumption of acetic acid to grow by 6.1% in 2020. And acetic acid installations in recent years, only Shaanxi extension in 2020 to expand production of 150,000 tons. As for exports, due to the epidemic, foreign prices remain low, and the overall export volume is low in recent years, with only 399,900 tons of glacial acetic acid exported in 2020, down 37.35% year-on-year. From January to September, the average operating rate was 86.56%.

In terms of price, taking the mainstream market price of acetic acid in Jiangsu as an example, the price of acetic acid fluctuated throughout 2020, with the price going down at the beginning of the year due to the epidemic, reaching a low of RMB1,980/mt at the beginning of April, down 19.51% from the beginning of the year; with the gradual release of downstream production capacity and the recovery of exports, the price of acetic acid gradually rose, especially since the fourth quarter when the supply of acetic acid continued to be tight, and the price rose to RMB4,320/mt at the end of the year, up 118.18% from the low point in April. The price of acetic acid rose to 4,320 yuan/ton at the end of the year, up 118.18% from the low point in April. Since 2021, the domestic Shijiazhuang epidemic closed the city, downstream replenishment after the Spring Festival and the

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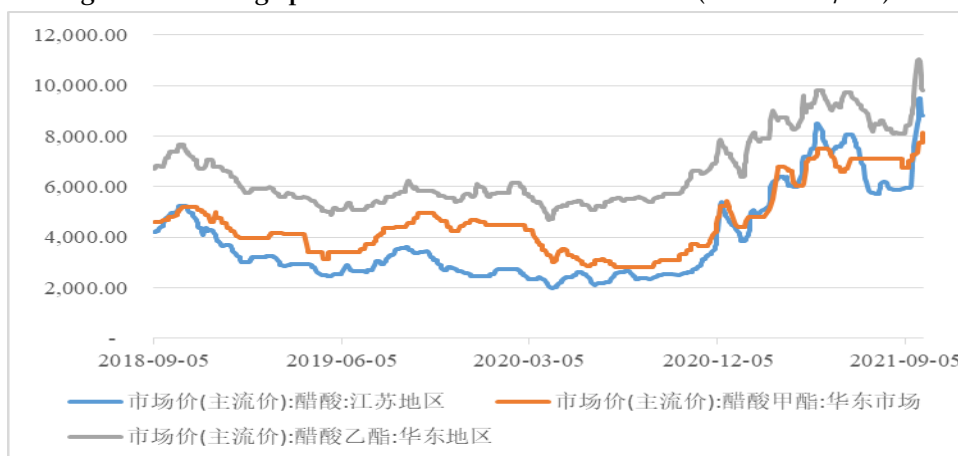
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U.S. cold wave acetic acid plant shutdown.

car and other unexpected events one after another, as well as the increase in overseas long orders, acetic acid price fluctuations rose to the end of September

The price was RMB8,800 per ton, an increase of 103.70% from the end of the previous year.

Figure 3. Average price trend of acetic acid in China (Unit: Yuan/ton)



Source: Wind Information

### Acrylic acid and esters

As an important monomer for synthetic materials, acrylic acid products are facing development difficulties for small enterprises under the influence of macro factors such as environmental protection inspection and supply-side reform, and the industry influence of medium and large enterprises is expanding under the macro background of supply-side reform. The self-sufficiency rate of domestic acrylic acid products has reached over 100%, and export trade has become a key area of competition for domestic acrylic acid producers. At the end of 2020, China's acrylic acid production capacity remained flat compared with the previous year. In terms of exports, acrylic acid and butyl acrylate products have declined; in terms of consumption, the annual apparent consumption has declined, and the situation that the supply of downstream acrylic emulsions exceeds demand has not yet changed, but the application markets of acrylic acid polymers and special acrylic esters have expanded. Overall, China's acrylic acid and ester industry maintains a state of oversupply, and the overall competitive pressure is high, with low-priced raw materials, capacity scale, advanced production technology in the industry related to the competitive advantage of enterprises.

In terms of price, the mainstream market price of acrylic acid in East China market, for example, since 2020, acrylic acid prices first fell and then rose, affected by the new crown epidemic, crude oil and other unfavorable unexpected factors, acrylic acid prices fell to mid-April

The lowest 5,300 yuan/ton in the first half of the month; the downstream start-up rate increased after the resumption of work, coupled with the maintenance of acrylic acid and ester production units, the

Acrylic acid and ester prices strengthened due to shrinking spot supply and reached RMB7,500/mt at the end of May; then after three months of price adjustment, acrylic acid prices started to rise in September, driven by the

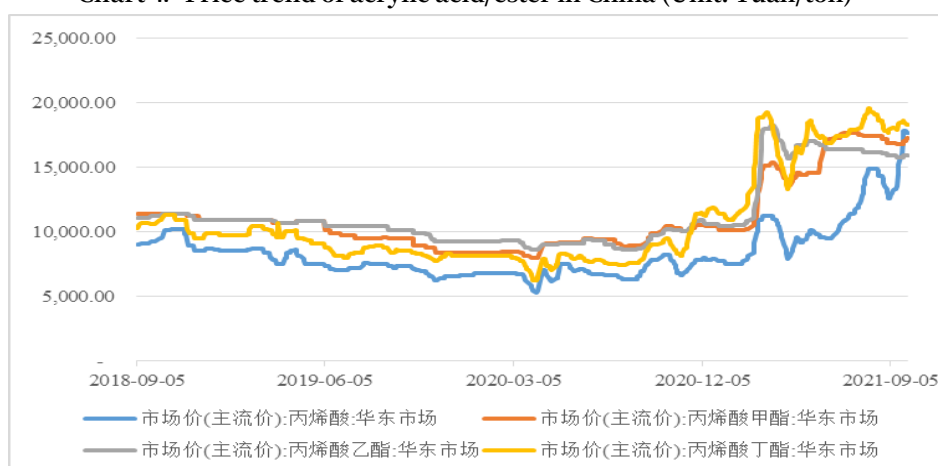


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downstream peak season, and peaked at RMB8,200/mt in mid-October, before falling back to RMB6,800/mt at the end of October due to poor performance of crude oil prices and declining willingness of downstream purchases. Since February 2021, acrylic acid production dropped due to low start-up rate and plant stoppage for maintenance during the Chinese New Year, and some enterprises, in order to maintain export orders, overlapped with factors such as higher prices of raw materials such as propylene, acrylic acid prices rose sharply to a peak of RMB 11,200/mt in early mid-March; as start-up rate increased and raw material prices fell, overlapped with export and energy consumption control factors, acrylic acid prices shocked higher to a peak of RMB 17,200/mt by the end of September. The price of acrylic acid rose to RMB 17,700/mt by the end of September.

Chart 4. Price trend of acrylic acid/ester in China (Unit: Yuan/ton)



Source: Wind Information

### Caustic soda

Caustic soda is widely used in metallurgy, paper making, chemical industry, textile, light industry, medicine and water treatment, etc. The downstream products are mainly alumina, polyvinyl chloride (PVC), etc. The capacity of caustic soda in China is 42.59 million tons, 43.8 million tons and 44.7 million tons from 2018 to 2020, of which 2.05 million tons will be added in 2020.

The net increase in production capacity was 900,000 tons, with 1.15 million tons of production capacity withdrawn; the actual production was 34.202 million tons, and the actual production was 3.5 million tons, respectively,

The demand for caustic soda was relatively weak, with a total of 3,464.4 million tons and 3,642.0 million tons. On the downstream side, the demand for caustic soda was relatively weak, with the apparent demand of 32,677,400 tons, 33,570,700 tons and 35,211,000 tons respectively during the same period, due to the increase of national environmental protection monitoring, the closure of small and medium-sized enterprises, and the improvement of metallurgy, paper making, chemical industry and textile technology, the consumption of caustic soda tended to decline, and the overall oversupply of caustic soda market.

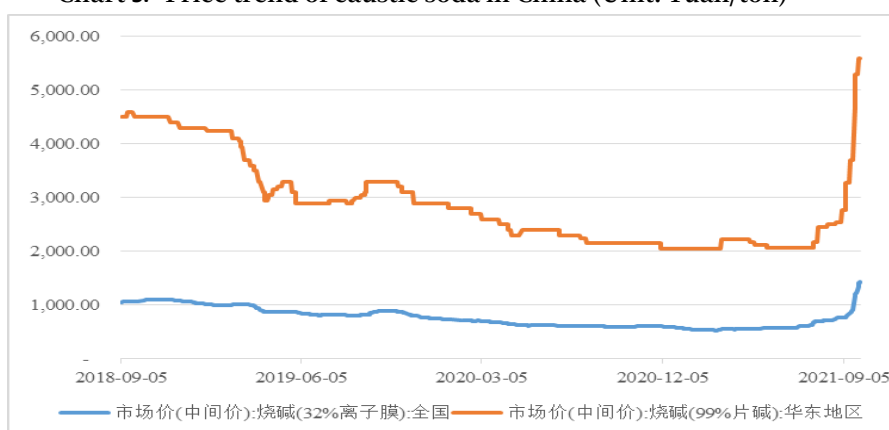
In terms of price, in 2019, affected by the decrease in the volume and price of domestic bauxite and the continuous decline in the alumina market, the profit margin of the downstream alumina industry has narrowed, and there is a certain price suppression on caustic soda procurement. At the same time, the performance of paper making, chemical fiber and printing and dyeing industries were all flat, and the purchasing enthusiasm of caustic soda was not high, so the price of caustic soda was shockingly low, and the annual average price of caustic soda (99%) was 3,086 yuan/ton, down 25.76% year-on-year. From January to July 2021, the price of caustic soda (99%) fluctuated slightly and rose mainly to RMB 2,450/ton at the end of July; then, due to the double control policy on energy consumption, the price

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of caustic soda (99%) rose rapidly to RMB 5,600/ton at the end of September due to the reduction of upstream sources and strong downstream demand.

Chart 5. Price trend of caustic soda in China (Unit: Yuan/ton)



Source: Wind Information

## Fluorochemicals

Fluorine chemical products mainly include inorganic fluoride (hydrogen fluoride, aluminum fluoride, lithium hexafluorophosphate, etc.) fluorocarbon chemicals (refrigerants, polymers (polytetrafluoroethylene (PTFE) polyperfluoropropylene (FEP) polyvinylidene fluoride (PVDF) and fluorine rubber (FKM), etc.) and fluorine fine chemicals. Fluorine polymers have high heat resistance, chemical corrosion, durability and weather resistance, and high added value, which is one of the fast growing and promising industries in the segment. In terms of product applications, PTFE and FEP are mainly used for gaskets, tubes, seals, coatings, diaphragms, protective films, etc. PVDF is mainly used for tubes, pumps, wires, hoses, films, plate linings, etc. FKM is mainly used for O-rings, gaskets, static seals, dynamic seals, etc.

PTFE and PVDF are expected to maintain a demand growth rate of 8-10%, with growth mainly coming from the development of wind power, environmental protection, bridges, semiconductors, new energy and other industries, especially from the boost in demand for communication cables, LAN cables, 5G network base stations and wires for smartphones. In recent years, the PVDF produced by the company has been affected by the rise of Dongyue Chemical, Sinochem Blue Sky and other enterprises in the same industry and its own industrial structure adjustment, the market share has declined, but the company's main fluorine chemicals market share reached more than 40%, still has a strong market competitiveness.

In 2020 by the new crown epidemic, PTFE demand in the first half of the year was poor, inventory backlog, the market supply exceeds demand, prices are difficult to support, profits are meager; the end of August, the impact of extreme weather in North America, the global manufacturers to reduce the work load, the market supply shortage, coupled with the low prices in the early, downstream intentions to stock up, PTFE market was able to slightly push up;

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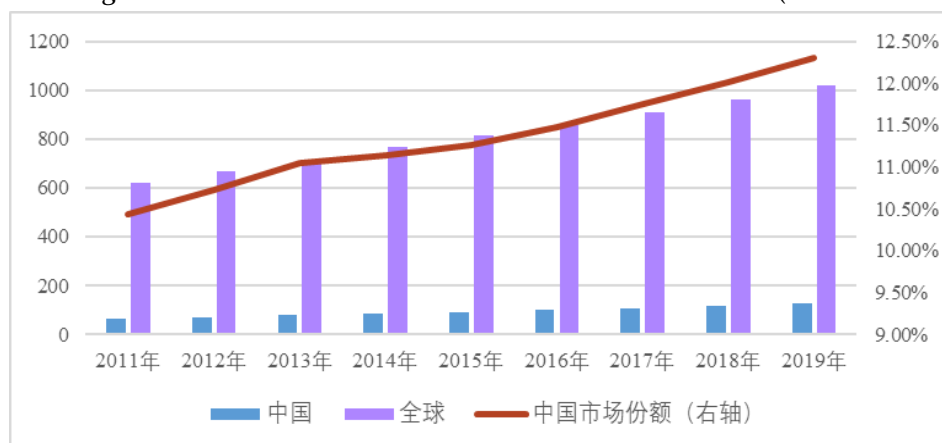
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into the fourth quarter, the downstream manufacturers gradually into the start Peak season, the whole market jumped sharply, transaction prices continue to climb, the market price began to pick up.

### **Industrial Gases**

In industry, products in gaseous state at room temperature and pressure are collectively referred to as industrial gas products. Industrial gases are indispensable production materials in the industrial production process and are used in a wide range of applications, among which the demand for gases in the steel and petrochemical industries is particularly large, accounting for 24% and 13% of the gas consumption in 2019, respectively. The proportion of domestic industrial gas sales revenue in 2017-2019 will be US\$10.69 billion, US\$11.58 billion and US\$12.57 billion respectively, accounting for 11.75%, 12.02% and 12.31% of global gas industry sales revenue.

Figure 6. Industrial Gases Market Sales Revenue Trends (in USD Billion)



Source: SAI report

Large enterprises in steel, metallurgy and chemical industry were basically based on building their own air separation and making their own gas in the early days. With the development of the gas industry, many users began to outsource their gas supply systems, with all air separation equipment inputs, pipeline laying and project management handed over to professional gas suppliers (i.e. outsourcing model). The market share of the outsourcing model has been increasing year by year, with the outsourcing output value of USD 8.75 billion in 2019, up 19.05% year on year, accounting for 68.2% of the domestic industrial gas output value, up slightly from the previous year. The domestic gas outsourcing business mainly includes four business models: on-site gas supply, liquid gas, pipeline gas and cylinder gas. From the structure of gas supply in the outsourcing market, on-site gas supply is still the main distribution method, and its output value is significantly higher than that of distribution methods such as liquid gas and cylinder gas. In 2019, the value of on-site gas supply grew 16.35% year-on-year to \$4.27 billion, accounting for 49.77%, while the output value of liquid gas, pipeline gas and cylinder gas accounted for 23.78% and 12.94% of the outsourcing market respectively and 13.52%.

In addition to the steel industry, coal chemical industry has become one of the main application areas of industrial gases in recent years. Under the situation that China is short of oil and rich in coal, the country actively develops coal chemical industry. In the short and medium term, the country is expected to remain cautious in promoting the new coal chemical industry, and technology demonstration and upgrading will remain the main direction, and energy saving and emission reduction will become the main goal of the coal chemical industry. In the long term, with the increasing maturity of domestic coal chemical technology, the advantage of relatively abundant and cheap coal resources will be highlighted, and the coal chemical industry has a good growth space, which

will drive up the market demand for related products, including gas products.

#### **b. Policy Environment**

In 2020, national, local and industry planning proposals and guidelines were released one after another to point out the direction for the high quality of the chemical industry, and relevant ministries and commissions have launched a series of policies to support and promote the chemical industry to overcome the difficulties caused by the global economic downturn, deepen the supply-side structural reform and promote the high-end upgrading of industrial structure around the strategic deployment of the CPC Central Committee and the State Council. The relevant policies mainly include: (1) Proposal of the Central Committee of the Communist Party of China on Formulating the 14th Five-Year Plan for National Economic and Social Development and the 2035 Vision", which points out that the theme is to promote high-quality development, enhance the modernization of the industrial chain supply chain, and accelerate the development of new energy, new materials, green environmental protection and other strategic emerging industries (2) Petroleum and Chemical Industry (2) "The 14th Five-Year Plan Guide" clearly takes the theme of promoting high-quality development of the industry, accelerating the construction of a modern petroleum and chemical industry system, accelerating the development of new chemical materials industry, building a number of internationally competitive and influential enterprise groups and industrial clusters, and promoting China's progress from a petrochemical power to a petrochemical power.

In terms of promoting low-carbon development and strengthening environmental protection, in 2020, at the 75th session of the UN General Assembly, China pledged to strive to achieve carbon peaking by 2030 and carbon neutrality by 2060, and the government work report of the National People's Congress in 2021 explicitly proposed to do a good job in achieving carbon peaking and carbon neutrality. The commitment to achieve peak carbon and carbon neutrality has far-reaching implications for the implementation of low-carbon development in related industries, including the chemical industry. The Measures for the Administration of National Carbon Emission Registration and Trading Settlement (Trial Implementation) (announced in December 2020) and the Measures for the Administration of National Carbon Emission Registration and Trading Settlement (Trial Implementation) (announced in May 2021) promote the national market of carbon emission rights; the Law of the People's Republic of China on the Protection of Yangtze River (announced in December 2020) prohibits the construction and expansion of new chemical parks and chemical projects within one kilometer of the shoreline of the main tributaries of Yangtze River to promote the optimization of the layout of the chemical industry; The Opinions on Comprehensively Strengthening Safe Production of Dangerous Chemicals (February 2020) and the National Three-Year Action Plan for Special Rectification of Safe Production (2020-2022) promote the industry to comprehensively identify existing risks, effectively enhance preventive and control measures, and promote comprehensive assessment and certification of chemical parks to meet standards.

### c. Competitive landscape/stance

Although China is a large producer and consumer of basic chemicals, the industry as a whole is "large but not strong"; most enterprises are small in scale, the industry competition pattern is more fragmented, and the problem of homogeneous product competition is more serious. In recent years, with the increase of industry concentration and the strengthening of leading enterprises, large enterprises have gradually increased the development strategy of industry chain integration. At present, China's seven petrochemical industry bases are: Dalian Changxing Island (West China Island) Hebei Caofeidian, Jiangsu Lianyungang, Shanghai Caojing, Zhejiang Ningbo, Guangdong Huizhou, Fujian Gulai and other seven major petrochemical bases. In addition, Guangxi Qinzhou Petrochemical Park is one of the key 100 billion industrial parks in Guangxi Province, with a total planning area of about 52 square kilometers, and has initially formed a nationally unique diversified petrochemical industry system of "oil, coal and gas". The "oil head" is PetroChina's 10-million-ton oil refinery and the 1.2-million-ton naphtha ethylene plant project being promoted, and Tongkun's 2.8-million-ton aromatics refinery and chemical integration project.

The "coal head" is the company's Guangxi new materials integration base project.



“gas head” is Guangtou Group's 1.25 million tons

The Company's 1.35 million tons of propane dehydrogenation to propylene project will be put into operation in mid-June 2021. The 1.8 million tons of methanol integration project at the company's Guangxi New Materials Base, with 1.2 (500+700) million tons/year of acetic acid and 200,000 tons/year of ethylene glycol, will be put into operation in mid-June 2021, which will change the regional supply and demand pattern of domestic chemical products to a certain extent.

The company's chemical business has formed a series of advantageous products after years of development and has a strong industry influence. Its main products, such as methanol, acetic acid, acrylic acid and esters, have certain scale advantages, among which methanol is the largest producer in East China, acetic acid capacity ranks among the top three in the domestic industry, and acrylic acid and ester capacity ranks third in the industry with Yangzi BASF and Formosa Ningbo.

#### **d. Industry Focus**

**Industry cyclical risk.** The basic chemical industry is a cyclical and volatile industry, which continues to be affected by the general international economic environment and domestic macroeconomic environment and policy changes, and also continues to suffer from the adverse effects of industry cycle fluctuations.

**The risk of imbalance between supply and demand.** China's production of some products ranked among the world's top, most products self-sufficiency rate of more than 90%, most products face more serious homogeneous competition problems. At the same time, the international trade environment has not yet seen a comprehensive improvement, the downstream export-oriented industries will still face pressure.

**Risk of increased pressure on environmental protection investment.** The industry continues to face pressure on energy conservation, emission reduction and environmental protection. Standing and

Institutionalized environmental inspections, will affect the operation of highly polluting chemical companies pressure on environmental protection inputs will continue to increase.

## **B. Tire Industry**

China's tire supply and demand is also in a state of oversupply, the United States, the European Union and other countries "double reverse" ruling on the tire export negative impact is obvious, the domestic introduction of a number of policies to expand auto consumption, tire production areas in Shandong to speed up the tire backward production capacity out, to a certain extent to help improve the tire supply and demand relationship.

### **a. Industry Overview**

Tire industry is one of the main supporting industries of the automotive industry, the current mainstream structure for radial tires, radial tires can be divided into all-steel tires, semi-steel tires, all-steel tires (also known as load tires) are mainly used for medium-sized load above the truck and bus, engineering vehicles, etc., semi-steel tires (also known as passenger tires) are mainly applicable to cars, light trucks. According to Wind data<sup>2</sup>, 2017-2019 China's tire production is 827 million and, 881 million and 838 million, the market situation is supply exceeds demand. China's tire export dependence of about 40%, the frequent occurrence of trade friction on the development of the tire industry to form a greater impact. According to the General Administration of Customs data, China's exports to the United States in 2018-2020 were 57,229,300 tires, 39,890,000 and 41,708,700 tires, of which 2019

In November 2018, the European Commission officially announced the final ruling of the EU's countervailing case against China's truck tires, after which Chinese tire enterprises will have to pay a fixed tax of 42.73~61.76 euros (333.7~482.3 RMB) for each truck tire exported to the EU for five years. In May 2021, the Executive Committee of the Foreign Trade Commission of the Ministry of Economy of Brazil (GECEX) issued Resolution No. 198 of 2021, making a second decision on passenger truck tires for buses and trucks originating from China.

The final ruling of the affirmative anti-dumping review for the second time continues to impose anti-dumping duties on the Chinese products involved in the case for a period of five years.

The amount of the project was US\$1.05-2.59/kg.

According to the design and technical characteristics, vehicles are roughly divided into two categories: passenger cars and cars with less than 9 seats, including SUVs, MPVs, racing cars and family pickups, etc.; commercial

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vehicles refer to all trucks, special vehicles, military vehicles, engineering vehicles, all buses with more than 9 seats, as well as tractors, agricultural vehicles, mining vehicles, etc. In terms of tire demand, passenger cars are mainly semi-steel tires and commercial vehicles are mainly all-steel tires. According to the data of the China Automobile Association, the sales of passenger cars in China in 2018-2020 are 23,709,800, 21,440,000 and 20,177,000, which is a downward trend. The transformation and upgrading of the automobile industry, the economic and trade friction between China and the United States, the switch of environmental protection standards and the retreat of new energy subsidies have put the industry under greater pressure, and 2020 is also affected by the reduced demand for travel of the people during the epidemic . The total sales of commercial vehicles in China in the past three years are 4,370,800 units, 4,324,500 units and 5,133,300 units, of which 18.69% year-on-year growth in 2020, mainly benefited from the increase in market demand for logistics transportation during the epidemic, truck sales increased by 835,000 units year-on-year, which supported the demand for all-steel tires.

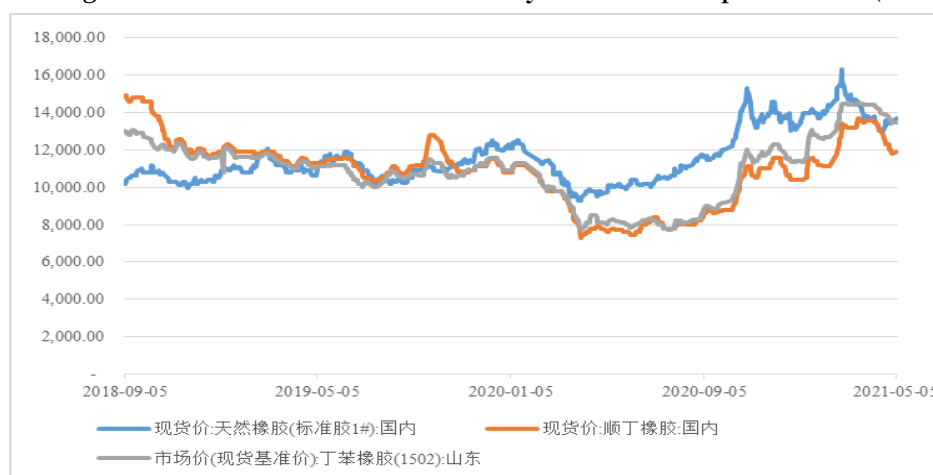
The main raw materials for tires are natural rubber, synthetic rubber, carbon black and cord fabric, of which natural rubber and synthetic rubber account for approximately 30% and 20%. Therefore, changes in the prices of natural rubber and synthetic rubber pose a significant impact on the production and operation of the tire industry. According to data from the General Administration of Customs, the 2018-2020 natural and synthetic rubber (including

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<sup>2</sup> As of the date of this report, Wind has not disclosed the tire production data of China in 2020.

The imports of natural rubber (atex) were 7.008 million tons, 6.576 million tons and 7.470 million tons respectively, with an import dependency of about 50%, which is vulnerable to overseas supply. In 2020, due to the impact of the new crown epidemic, the market investment level was bearish, coupled with the drop in crude oil prices, natural rubber prices fell rapidly, domestic natural rubber 1# fell rapidly from 12,300 yuan/ton at the beginning of the year to a low of 9,300 yuan/ton at the end of March, with the recovery of demand and inflation expectations, rubber prices fluctuated and rose to 13,300 yuan/ton at the end of the year. With the recovery of demand and inflationary expectations, rubber prices fluctuated up to about 13,000 yuan/ton at the end of the year; since 2021, negative factors over-digested, highest domestic natural rubber 1# rushed to 16,300 yuan/ton at the end of February and then fell back to 13,200 yuan/ton at the end of May, back to the level at the beginning of the year. As for synthetic rubber, synthetic rubber for tires mainly refers to butadiene rubber and styrene-butadiene rubber, whose raw materials are petrochemical products, so the price is highly correlated with the price of crude oil, while the price trend of synthetic rubber is strongly isotropic with natural rubber. China's synthetic rubber is mainly supplied by Sinopec and PetroChina affiliated companies.

Figure 7. China's natural rubber and synthetic rubber price trends (unit:



yuan/ton)

Source: Wind

## b. Industry Policies

Since the Ministry of Industry and Information Technology issued the "Tire Industry Policy" in 2010, several policy documents have made provisions for the tire industry to adjust the industrial structure, improve the concentration of the industry and eliminate backward production capacity. In April 2021, the Leading Group of the New Old Power Conversion Comprehensive Experimental Zone issued a notice on the implementation of

the "Three Resolute" Action Plan (2021-2022) which involves the withdrawal of backward tire production capacity, and the integration and withdrawal of all-steel radial tire enterprises with an annual output of less than 1.2 million tons and semi-steel radial tire enterprises with an annual output of less than 5 million tons by 2022. Shandong Province all-steel / semi-steel tire production capacity accounted for more than half of the country, the impact of the round of capacity retirement, exit time is fast, help improve the tire supply-side structure.

In October 2018, the Ministry of Finance issued the Notice on the Adjustment of Export Tax Refund Rate for Some Products, which 22 tire products after the adjustment of the tax rebate rate unified 13%, which helps reduce the cost of tire enterprises, and ease the impact of the United States, the European Union and other countries and regions on the tax increase on domestic tires, and alleviate the financial pressure of some enterprises.

On the demand side, in April 2020, the Ministry of Finance, the Ministry of Industry and Information Technology, the Ministry of Science and Technology and the Development and Reform Commission jointly issued the Notice on Improving the Financial Subsidy Policy for the Promotion and Application of New Energy Vehicles, which extended the implementation period of the financial subsidy policy for the promotion and application of new energy vehicles to the end of 2022, taking into account factors such as technological progress and scale effect. Smoothing

In principle, the subsidies in 2020-2022 will be reduced by 10%, 20% and 30% respectively from the previous year. In the same period, the Development and Reform Commission and other 11 ministries issued the Notice on Several Measures to Stabilize and Expand Auto Consumption, proposing to speed up the elimination and scrapping of old diesel trucks, and support key regions to complete the task of eliminating 1 million vehicles through "subsidies in lieu of prizes" -

**In December 2020, the Ministry of Commerce and 12 other ministries and commissions issued the "Notice on Several Measures to Boost Bulk Consumption and Promote the Release of Rural Consumption Potential", encouraging cities to optimize purchase restrictions and increase the number plate indexes; carry out a new round of automobile going to the countryside and exchange old cars for new ones, encouraging rural residents to purchase trucks of 3.5 tons or less, passenger cars of 1.6 liters or less displacement, and subsidizing residents to phase out cars with national emission standards of three or less and purchase new cars. Relevant policies will help stabilize and expand auto consumption and boost demand for the tire industry to a certain extent.**

#### c. Competitive landscape/stance

At present, the concentration of China's tire industry is lower than the global level. At present, most of the enterprises in China production scale is small, the overall technical level is low, product homogeneity, and product competition is mainly concentrated in the low-end products, only load radial tires and bias tire market share is high. And large multinational enterprises, such as the global tire industry "three giants" Michelin, Bridgestone (Japan) and the United States Goodyear, mainly in the high-end market (high-end cars, light trucks and other radial tire market) dominant position. However, with the improvement of the comprehensive strength of China's leading tire enterprises, the relevant enterprises began to enter the import supporting market, to participate in the performance tests organized by foreign media, has gained more and more market recognition. At present, the industry's leading domestic enterprises include Zhongce Rubber, Linglong Tire, Sai Lun Jin Yu, Jiatong Tire and Delta Tire. The company ranks third in terms of production capacity of all-steel tires.

#### d. Industry Focus

China's tire industry has a product structure overcapacity problem, high-performance tires, green special tires are scarce, low-end products surplus, the industry has been operating under greater pressure in recent years. The industry needs to pay attention to (1) supply-side adjustment and industry policy

changes and implementation effects(2) industry mergers and acquisitions and their impact on the industry landscape;

( 3 ) Product structure upgrade pressure and tire differentiation competitiveness;

(4) trade friction on industry demand(5) increased pressure on safety and environmental protection, etc.

## 2. Business Operations

The company is one of the largest integrated chemical enterprise groups in China. The company's business covers a number of chemical sub-industries and has strong competitive advantages in terms of production scale, market brand and industrial integration. In 2020, affected by the epidemic, the prices of methanol, acetic acid, caustic soda and other products fell, the market was relatively weak, the production and sales volume of the company's main chemical products declined, coupled with the compression of the trading business, the company's revenue and main business profit scale declined in that year; in the first three quarters of 2021, benefiting from the improvement of the chemical market environment, the new production capacity of methanol and acetic acid in Guangxi base came into operation, methanol, acetic acid, chlor-alkali, acrylic acid and esters, etc. In the first three quarters of 2021, benefiting from the improvement of the chemical market environment, the new production capacity of methanol and acetic acid in Guangxi base, the price of methanol, acetic acid, chlor-alkali, acrylic acid and esters and other major chemical products increased significantly, coupled with the low base during the epidemic in the previous year, the overall revenue and earnings increased significantly year-on-year. The company is vigorously pushing forward the construction of the integrated production base of new chemical materials in Qinzhou, Guangxi, and the first phase of the industrial gas island project will be put into operation in June 2021, so we are concerned about the pressure of capital expenditure and the release of production capacity.

The company is one of the largest manufacturers of chemicals in China and has the largest variety of production in China's chemical industry and

It is the most comprehensive chemical production base and has an important influence on the development of Shanghai petrochemical and fine chemical manufacturing industries, as well as the entire East China region and even the national manufacturing industry. The headquarters of the company mainly assumes the management function of the headquarters, and the specific industries are operated by the core member enterprises. The company's main business focuses on five major areas: manufacturing of energy chemical products and clean energy products ("energy chemical"), manufacturing of polymer materials products ("Advanced Materials"), manufacturing of tire and rubber products ("Green Tire"), manufacturing of fine chemicals ("Fine Chemicals") and chemical logistics, chemical engineering ("Chemical Services") which mainly support the first four businesses. After the listing of core assets in 2015, the main operating entities of energy chemicals, green tires, fine chemicals and chemical services have all become subsidiaries of Huayi Group; the advanced materials business is mainly operated by chlor-alkali chemicals, new materials technology and Changshu Sanfu Fluorine Source New Materials Co.

**Figure 8. Basic information about the company's main business**

Main business/products or services	Market coverage/core customers	Core drivers of business
Energy & Chemical Business	Domestic / East China	Scale/technology/brand
Green Tire Business	Global / Domestic	Scale/Capital/Regional Layout
Advanced Materials Business	Domestic / East China	Industry chain integration / cost / safety and environmental protection
Fine Chemicals Business	Domestic	Size / Capital
Chemical Services	Domestic / East China	Capital / Customers

Source: Shanghai Huayi

After years of development, the company has basically formed a business pattern of national development, with several internationally advanced and comprehensive chemical production bases in Shanghai, Anhui, Jiangsu, Chongqing, Xinjiang, Zhejiang and other regions, as well as a large intelligent tire production plant in Thailand and an integrated production base of new chemical materials in Qinzhou, Guangxi. Through the reasonable layout of bases and the construction of overseas bases, the company is effectively close to the market and implements the mode of origin sales, which enhances the company's ability to participate in market competition. Relying on the advantages of wide coverage of upstream and downstream products, the company continues to build an integrated industrial chain to reduce logistics and storage costs in production operations and enhance production operations, logistics and safety.



## (1) Main business operation status/competitive position

Figure 9. Company's core business revenue and changes (billion yuan, %)

Dominant product or service	2018	2019	2020	2021 First three quarters	2020 First three quarters
Total operating income	605.98	550.94	424.02	445.65	302.35
Of which: core business operating income (billion yuan)	583.60	500.91	380.84	402.87	270.65
Share of operating income (%)	96.31	90.92	89.82	90.40	89.51
Among them: (1) energy and chemical	99.04	72.47	67.55	108.10	45.46
Share of core business revenue (%)	16.97	14.47	17.74	26.83	16.80
(2) Green tires	74.62	80.33	80.41	75.34	59.59
Share of core business revenue (%)	12.79	16.04	21.12	18.70	22.02
(3) Advanced materials	112.69	102.89	77.46	85.43	55.93
Share of core business revenue (%)	19.31	20.54	20.34	21.20	20.67
(4) Fine Chemicals	54.94	56.36	65.09	76.05	47.01
Share of core business revenue (%)	9.41	11.25	17.09	18.88	17.37

Dominant product or service	2018	2019	2020	2021 First three quarters	2020 First three quarters
(5) Chemical service industry	242.30	188.86	90.32	57.95	62.66
Share of core business revenue (%)	41.52	37.70	23.72	14.39	23.15
<b>Gross margin (%)</b>	<b>12.54</b>	<b>11.73</b>	<b>11.55</b>	<b>18.47</b>	<b>12.30</b>
Of which: (1) Energy Chemicals (%)	28.81	14.84	9.76	18.72	3.63
(2) Green tires (%)	11.48	12.33	5.57	11.19	12.82
(3) Advanced materials (%)	19.48	18.63	17.59	28.29	15.88
(4) Fine chemicals (%)	11.53	9.03	14.17	23.45	13.09
(5) Chemical service industry (%)	2.02	4.56	6.85	6.05	9.62

Source: Shanghai Huayi

For 2018-2020 and the first three quarters of 2021, the company's revenue will be \$60.598 billion, \$60.598 billion, and

55.094 billion yuan, 42.402 billion yuan and 44.565 billion yuan; of which, the core business revenue accounts for about 90%. The scale of the company's revenue declined in 2019 due to the decline in prices of major products such as methanol, acetic acid, acrylic acid and esters and caustic soda and the reduction of trading business, etc. In 2020, due to the epidemic and the decline in sales and prices of chemicals such as methanol, acetic acid, caustic soda and chlorine products, as well as the reduction of the scale of trading business with low relevance to the main business, the company's operating revenue declined by 23.04% year-on-year in that year; in the first three quarters of 2021 In the first three quarters of 2021, the prices of the Company's major chemical products increased significantly, leading to a year-on-year increase of 47.40% in operating income. In the first three quarters of 2021, the prices of the company's main chemical products increased significantly, leading to a 47.40% year-on-year increase in revenue.

In addition, the Company's total operating income includes a small amount of interest income, which is mainly from Shanghai Huayi Group Finance Co. The interest income for the first three quarters of 2018-2020 and 2021 is RMB 243 million, RMB 228 million, RMB 199 million and RMB 151 million respectively.

#### A. Energy & Chemical Business

The energy chemical business is one of the company's major business segments and its traditional business segment, which has been developed for more than 50 years and has strong technology, brand and scale advantages. The company's energy chemical business mainly produces and sells clean energy and new generation basic chemical raw materials based on coal-based chemicals, with the main products being methanol, acetic acid and ethyl acetate, and industrial gases. The business is operated by Shanghai Huayi Energy and Chemical Co. The Company's original energy chemical production bases are mainly located in Shanghai Wujing Base and Anhui Wuwei Base. In June

2021, when the Guangxi Base comes into operation, the production capacity of methanol and acetic acid will be increased by 1.95 million tons and 500,000 tons respectively. As of the end of September 2021, the main

The capacity of methanol for energy chemicals is 3.55 million tons/year (including 900,000 tons in the headquarters, Anhui and Guangxi respectively).

The company has a production capacity of 1.75 million tons/year (including 700,000 tons, 1.95 million tons and 700,000 tons in the headquarters, Anhui and Guangxi, respectively), acetic acid production capacity of 1.75 million tons/year (including 700,000 tons, 550,000 tons and 500,000 tons in the headquarters, Anhui and Guangxi, respectively). The company's methanol capacity is one of the enterprises with more than one million tons in China, ranking fifth in the country in terms of capacity; its acetic acid capacity ranks first in China.

**Figure 10. Operation status of important products of the company's energy chemical business (unit: million tons/year, million tons, billion cubic meters)**

Species	2018 (end)			2019 (end)			2020 (end)			2021 First three quarters (end)		
	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales
Methanol	161	149.79	82.41	161	150.73	86.12	161	146.29	83.74	355	146.64	87.62
Acetic acid	130	122.53	113.11	130	121.21	115.27	130	115.17	107.04	175	105.23	99.08
Ethyl acetate	30	12.09	12.10	30	9.02	11.27	30	10.42	10.31	30	7.28	7.28

Species	2018 (end)			2019 (end)			2020 (end)			2021 First three quarters (end)		
	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales
Phthalic anhydride	5	4.15	4.11	5	4.18	4.20	5	4.29	4.31	5	3.09	3.10
Industrial Gases	-	10.08	10.08	-	10.45	10.45	-	10.11	10.11	-	7.99	7.99

Source: Shanghai Huayi

Note: Some of the company's methanol is consumed internally to produce acetic acid, so its production and sales rate is low

In 2018-2020 and the first three quarters of 2021, the company's energy chemical business revenue was RMB9,904 million, RMB7,247 million, RMB6,755 million and RMB10,810 million, respectively, with gross margins of 28.81%, 14.84%, 9.76% and 18.72%, respectively. Among them, the market boom of methanol and acetic acid products was high in 2018, and the prices were in the upward period, and the revenue and gross margin of energy chemical business were at a high level; due to the market conditions, the average sales price of methanol and acetic acid dropped significantly in 2019 compared with the previous year, and the revenue and gross margin of energy chemical business declined significantly; in 2020, due to the epidemic, the sales volume and average sales price of methanol and acetic acid declined. Therefore, both revenue and gross margin of energy chemical segment continue to decline; in the first three quarters of 2021, the price and production and sales volume of methanol and acetic acid increase, leading to a significant increase in revenue of energy chemical segment, while the increase in price of acetic acid exceeds the increase in price of raw materials, leading to an increase in gross margin of energy chemical segment.

Figure 11. Revenue and Gross Margin of Huayi Group's Major Products of Energy and Chemical Industry (Unit: RMB billion, %)

Products	2018		2019		2020		First three quarters of 2021	
	Revenue	Gross margin	Revenue	Gross margin	Revenue	Gross margin	Revenue	Gross margin
Methanol	22.30	16.11	16.84	-4.77	13.73	-8.94	19.77	-11.34
Acetic acid	43.82	45.03	28.54	20.78	24.15	14.02	52.37	42.44
Industrial Gases	11.01	7.21	11.84	22.91	11.33	22.03	10.13	16.28

Source: Huayi Group Annual Report

Note: The caliber of industrial gases in 2020 differs from the annual report, and the caliber of data remains consistent compared to 2018 and 2019

## B. Green Tire Business

The main operating entity of the company's green tire business is Shuangqian Tire Group Company Limited ("Shuangqian Tire"), subsidiary of Huayi Group. The production bases of this business are mainly located in Jiangsu, Chongqing, Anhui, Xinjiang and Thailand. The main products of the company's tire business include all-steel radial tires (load tires) and semi-steel radial tires (passenger tires) which are widely used in trucks, buses, passenger cars, mining and agricultural vehicles. Shuangqian has a national technical center and testing center, and has "Shuangqian", "back to the force" and other domestic famous brands, brand awareness is very high. 2018 onwards Xinjiang base expansion of annual production capacity of high-performance all-steel radial tire project batch on line and put into production, the same year the Xinjiang base added 300,000 capacity of all-steel radial tires. The Xinjiang base added 300,000 pieces of production capacity / year, in addition to the Thailand base and Chongqing base put into operation, respectively, to bring an incremental capacity of 120,000 pieces of radial tires.

The new capacity of 650,000 strips/year in 2019 will come from the continued investment in the Xinjiang production line.

Production. As of the end of September 2021, the Company's tire production capacity was 15.25 million tires per year.

**Figure 12. regional distribution of the company's tire production capacity and capacity utilization rate (unit: 10,000 pieces/year, %)**

Item	2018 (end)		2019 (end)		2020 (end)		2021 First three quarters (end)	
	Design Production capacity	Capacity Profit Usage rate	Design Production capacity	Capacity Profit Usage rate	Design Production capacity	Capacity Profit Usage rate	Design Production capacity	Capacity Profit Usage rate
Double money Jiangsu all steel tires	360	80	360	82	360	84	360	95
Double money Chongqing all-steel tires	250	78	250	72	250	93	250	103

Item	2018 (end)		2019 (end)		2020 (end)		2021 First three quarters (end)	
	Design Production capacity	Capacity Profit Usage rate	Design Production capacity	Capacity Profit Usage rate	Design Production capacity	Capacity Profit Usage rate	Design Production capacity	Capacity Profit Usage rate
Double money Xinjiang all-steel tires	130	95	195	79	195	88	195	105
Shuangqian Anhui passenger tires	600	59	600	59	600	63	600	79
Huayi Thailand All Steel Tire	120	27	120	76	120	66	120	104
Total	1,460	68	1,525	70	1,525	76	1,525	95

Source: Huayi Group Annual Report and Shanghai Huayi

In 2020, the company's total tire production and sales volume were 11,164.40 million and 11,629.1 million respectively, representing year-on-year growth of 8.77% and 11.36% respectively. Among them, the production of all-steel radial tires was 7.84 million, up 9.16% year-on-year, mainly due to the commissioning of the new 650,000 tons/year capacity in Xinjiang in 2019 and the 1.2 million tons/year capacity in Thailand.

In the first three quarters of 2021, total production and sales of radial tires were 10,896,500, benefiting from the growth of downstream demand. In the first three quarters of 2021, total tire production and sales volume were 10,896,500 and 10,797,100, respectively.

Figure 13. Business overview of the main products of the company's green tire business (unit: million tires/year, million tires)

Species	2018 (end)			2019 (end)			2020 (end)			2021 First three quarters (end)		
	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales
All steel radial tires	860	597	588.00	925	718.20	702.56	925	784	775	925	733.29	726.91
Semi-steel radial tires	600	354	335.00	600	352.40	341.71	600	381	388	600	356.36	352.8
Total	1,460	951	923	1,525	1,070.60	1,044.27	1,525	1,164.40	1,162.91	1,525	1,089.65	1,079.71

Source: Shanghai Huayi

The company's tires are sold to nearly 100 countries and regions at home and abroad, providing original equipment for many automobile manufacturers. Benefiting from the new tire production capacity climbing, the company's green tire business revenue is on an upward trend, 7.462 billion yuan, 8.033 billion yuan, 8.041 billion yuan and 7.534 billion yuan in 2018-2020 and the first three quarters of 2021,

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respectively, with gross margins of 11.48%, 12.33%, 5.57% and 11.19%, of which the low 2020 is mainly due to the The lower gross margin in 2020 is mainly due to the adjustment of some freight costs from sales expenses to operating costs and some sales service fees from sales expenses to operating income as required by accounting standards, excluding the difference in this caliber, the gross margin of the business is 9.04%, which is still downward due to the market environment; in the first three quarters of 2021, the caliber has not been audited and adjusted, and the gross margin is significantly higher.

**C. Advanced Materials Business**

The company's advanced materials business is a business segment based on polymer materials, which is also one of the traditional business segments of the company. The main products of this business include chlor-alkali products and fluorine chemical products, the former is mainly produced and operated by the company's subsidiary chlor-alkali chemical, while the latter is mainly operated by New Materials Technology and Fluorine Source New Materials. From 2018 to 2020 and the first three quarters of 2021, the company's advanced materials business achieved revenues of RMB 11.269 billion, RMB 10.289 billion, RMB 7.746 billion and RMB 8.543 billion, respectively, of which the revenue of the segment declined significantly in 2020, mainly due to the impact of the epidemic and the weakness of the chlor-alkali industry boom, and the decline in sales volume and average sales price of caustic soda and chlorine products; in the first three quarters of 2021, it was affected by the improvement of the market. In the first three quarters of 2021, the revenue of the segment increased significantly due to the improvement of the market. Gross profit margin for the same period was 19.48%, 18.63%, 17.59% and 28.29% respectively, with fluctuations greatly influenced by the boom of related products.

### a. Chlor-alkali products

Chlor-alkali Chemical is one of the major producers of PVC and caustic soda in China. It is classified as a national mega enterprise and a technologically advanced enterprise, and is one of the 520 key enterprises in China, and is listed on both A and B shares. The production base of chlor-alkali chemical is currently concentrated in Shanghai Chemical Industry Zone. Chlor-alkali Chemical is the only supplier of chlorine resources in the Shanghai Chemical Industry Zone and implements an integrated business model with the following industrial chain structure: supplying raw material chlorine and caustic soda to MDI/TDI/PC units in the main part of the zone, and using ethylene raw material for secondary use of chlorine, digesting hydrogen chloride gas as a by-product and manufacturing dichloroethane. As of the end of September 2021, the annual production capacity of caustic soda of chlor-alkali chemical was

The company is one of the largest suppliers of caustic soda, liquid chlorine and specialty resins in East China. The company is one of the largest suppliers of caustic soda, liquid chlorine and special resins in East China. In order to enlarge and strengthen the industrial chain and improve its core competitiveness, the company is currently investing in the construction of 200,000 tons/year of vinyl chloride and 60,000 tons/year of special resin in Shanghai Chemical Industry Zone.

At the same time, we invested in the construction of 300,000 tons/year caustic soda and 400,000 tons/year polyvinyl chloride projects in Qinzhou, Guangxi.

In 2020, the production of chlorine products, caustic soda and PVC of chlor-alkali chemicals will be 1.3980 million tons, 70.70 million tons, respectively.

In the first three quarters of 2021, benefiting from the rebound in the boom, the output of major chlor-alkali chemical products increased, with the output of chlorine products, caustic soda and PVC amounting to 1,103,100 tons, 559,150 tons and 2.60 million tons respectively.

**Figure 14. Business Overview of the Company's Chlor-alkali Products (Unit: 10,000 tons/year, 10,000 tons)**

Species	2018 (end)			2019 (end)			2020 (end)			2021 First three quarters (end)		
	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales
Chlorine Products	-	151.68	145.15	-	151.56	141.49	-	139.80	130.30	-	110.31	99.85
Caustic soda	72	71.14	67.94	72	74.42	71.18	72	70.70	67.12	72	55.915	53.575



#### Century Ratings

Polyvinyl chloride	8	4.85	4.97	4	3.60	3.67	3	3.26	3.21	9	2.60	2.51
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Source: Chlor-alkali Chemicals

Note: Some of the company's chlorine products and caustic soda are used for internal production, so the output is greater than the sales volume

In 2018-2020 and the first three quarters of 2021, Chlor-Alkali Chemical will achieve operating revenues of RMB 7.171 billion and RMB 3.5 billion, respectively,

The revenue of chlorine products, caustic soda and polyvinyl chloride was RMB4,082 million, RMB4,882 million, RMB3,305 million and RMB4,666 million, respectively, which fluctuated with market conditions. The revenues of chlorine products, caustic soda and PVC were NT\$4,082 million, NT\$3,882 million, NT\$3,305 million and NT\$4,060 million, respectively.

3.485 billion yuan. The gross margin of chlor-alkali chemicals in the past three years were 17.83%, 17.48%, 17.00% and 27.62%. 2021 Revenue and gross margin improved significantly in the first three quarters, mainly benefiting from the significant increase in product prices and a small increase in production and sales volume.

**Chart 15. Revenue and Gross Margin of Major Products of Chlor-alkali Chemicals (Unit: RMB billion, %)**

Products	2018		2019		2020		First three quarters of 2021	
	Revenue	Gross margin	Revenue	Gross margin	Revenue	Gross margin	Revenue	Gross margin
Chlorine Products	20.83	10.07	21.53	19.78	18.79	19.62	22.64	42.96
Caustic soda	16.61	51.12	14.62	37.87	11.81	27.35	9.85	34.09
Polyvinyl chloride	3.38	-1.18	2.67	1.03	2.45	16.75	2.37	33.09

Source: Chlor-alkali Chemical Annual Report

#### b. Fluorochemicals

The company's fluorine chemical products mainly include fluorine polymers, fluorine refrigerants and fluorine fine chemicals.

Major categories. The company's fluorine chemical business revenue is mainly contributed by PTFE, PVDF and FKM products. The company has the largest research and development base of fluorine chemical industry in China, and most of the products have independent intellectual property rights, and some of the process technologies have passed national appraisal, and the technology level and product quality are at the leading level in China. As of the end of September 2021, the annual production capacity of PTFE, PVDF and FKM were 0.98 million tons, 0.80 million tons and 0.43 million tons respectively, of which PTFE has a low capacity utilization rate of about 50-60% and PVDF has a relatively high capacity utilization rate of over 90%. In recent years, the Company has increased the sales of fluorine chemical products, and the production and sales rate of the above products has remained high.

4,089 million yuan, 3,575 million yuan, 2,562 million yuan and 3,926 million yuan, with gross margins of 24.14%, 23.51% and 20.84% and 29.05%, of which revenue and gross margin declined in 2020 due to the decline in product prices; revenue and gross margin increased in the first three quarters of 2021 due to the growth in demand and prices.

**Figure 16. Business overview of the company's main fluorine chemical products**  
(Unit: 10,000 tons/year, 10,000 tons)

Species	2018 (end)			2019 (end)			2020 (end)			2021 First three quarters (end)		
	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales
Polytetrafluoroethylene (PTFE)	0.98	0.58	0.54	0.98	0.52	0.55	0.98	0.59	0.61	0.98	0.63	0.56
Polyvinylidene Fluoride (PVDF)	0.80	0.77	0.74	0.80	0.72	0.76	0.80	0.91	0.88	0.80	0.75	0.84
Fluorine Rubber (FKM)	0.20	0.19	0.15	0.30	0.20	0.20	0.43	0.35	0.34	0.43	0.28	0.35

Source: Shanghai Huayi

#### D. Fine Chemicals Business

The main products of the company's fine chemical business are acrylic acid and esters, coatings and intermediates, of which the main operating entity of acrylic acid and esters is Shanghai Huayi New Materials Co. Ltd. ("Fine Chemical Company" formerly Shanghai Paint Co., Ltd.). The production of this segment is mainly concentrated in Shanghai Chemical Industry Zone, Jinshan Second Industrial Zone, Pudong Gaoqiao and other areas, with "Flying Tiger", "Eye", "Bright" etc. In 2018-2020 and the first three quarters of 2021, the company's fine chemical business revenue will be RMB 5.494 billion, RMB 5.636 billion, and

RMB 1.3 billion, respectively,

The gross margins were 11.53%, 9.03%, 14.17% and 23.45%, respectively, of which the decrease in gross margin in 2019 was mainly due to the large drop in prices of acrylic acid and ester products; the increase in gross margin in 2020 and the first three quarters of 2021 was mainly due to the rebound in market boom, the increase in prices of acrylic acid and ester products and the increase in capacity utilization. The increase in gross margin in 2020 and the first three quarters of 2021 is mainly due to the rebound in market sentiment, the increase in prices of acrylic acid and ester products and the increase in capacity utilization.

**a. Acrylic and ester products**

The company is one of the largest manufacturers specializing in the production of acrylic acid and ester products in China. The production base of New Materials is located in Shanghai Chemical Industry Zone, with the main production capacity of acrylic acid as of the end of September 2021.

In 2019, the Company will expand its acrylic acid and acrylic esters production capacity by 224,000 tons per year and 340,000 tons per year, respectively. As for new production capacity, the Company will expand acrylic acid and acrylic ester production capacity by 220,000 tons/year and 340,000 tons/year respectively in 2019, and there will be no new production capacity for acrylic acid and esters in 2020. Benefiting from the gradual release of new production capacity in 2019, the production and sales volume of acrylic acid and acrylate esters will continue to grow.

From 2018 to 2020, the company's acrylic acid and ester revenue is 1.793 billion yuan, 2.351 billion yuan and 3.190 billion yuan respectively, gross margin is 2.90%, 1.55% and 5.68% respectively, affected by the industry surplus, the business shows a slight profit, in 2020 benefit from the rise in capacity utilization, gross margin has improved.

**Figure 17. Business Overview of the Company's Acrylic Acid and Esters Products (Unit: 10,000 tons/year, 10,000 tons)**

Species	2018 (end)			2019 (end)			2020 (end)			2021 First three quarters (end)		
	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales	Production capacity	Capacity	Sales
Acrylic acid <sup>3</sup>	27.4	16.58	3.78	49.40	25.36	5.39	49.40	39.05	8.28	49.40	28.61	5.84
Acrylates	16	17.00	17.26	50.00	26.16	25.23	50.00	38.37	37.85	50.00	30.13	30.87

Source: Shanghai Huayi

Note: Some of the company's acrylic acid is used to produce acrylic esters, so its production and sales rate is low

### Coating Products

In 2020, due to the impact of the epidemic, the production and sales volume of the paint market decreased further. In the first three quarters of 2021, the production and sales volume of paints and colorants increased year-on-year.

**Figure 18. Business overview of the company's paint products (in tons)**

Species	2018		2019		2020		First three quarters of 2021	
	Capacity	Sales	Capacity	Sales	Capacity	Sales	Capacity	Sales
Paint	4.57	4.65	3.91	3.95	3.41	3.43	3.11	3.18
Colorants	6.93	6.96	6.42	7.65	6.12	5.98	4.81	5.07

Source: Shanghai Huayi

### E. Chemical Services

The chemical service business mainly includes chemical logistics and trading, general engineering contracting and real estate development and leasing business, etc. From 2018 to 2020 and in the first three quarters of 2021, the company's chemical service revenue will be 24.230 billion yuan, 18.886 billion yuan, 9.032 billion yuan and 5.795 billion yuan, respectively, with gross margins of 2.02%, 4.56%, 6.85% and 6.05%, respectively. Since 2019, the company has significantly compressed its chemical trading business, which has seen a decline in revenue and an increase in gross margin benchmarks.

**Figure 19. 2020 Chemical Service Industry Revenue and Earnings (in billions)**

Projects	Revenue	Revenue Segment Share	Major	Gross margin
Chemical Services	90.32	100.00%	6.19	6.85%
Among them: chemical logistics and trade	67.40	74.62%	2.22	3.30%

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General Engineering Contracting	2.96	3.27%	0.24	8.20%
Real Estate Development and Leasing	10.88	12.04%	5.64	51.83%

Source: Shanghai Huayi

The company has developed chemical logistics and trading business based on the advantage of wide coverage of upstream and downstream products, which forms a better synergy with the company's main business of chemical products production. In order to ensure the safety of business capital, the company's trading method is mainly to select downstream customers first, determine the sales intention according to their quantity and price demand, and then purchase from upstream suppliers at appropriate prices, and the settlement method is mainly by cash on delivery. Logistics trading business gross

<sup>3</sup> The acrylic acid<sup>3</sup> caliber in the 2020 tracking rating report contains only crude acid, this year's rating report also includes commercial acid and refined acrylic acid, so The 2018-2019 acrylic acid capacity varies from the 2020 trailing rating report.

The interest rate is low, and the company has also gradually reduced the scale of trade in recent years. Overall, the company's trading business risk is controllable.

Ltd. and Shanghai Huayi Group Equipment Engineering Co., Ltd. under the company, which provide engineering design, engineering supervision, complete sets of equipment manufacturing and complete sets of technology transfer, etc. From 2018 to 2020, the revenue of the general contracting business of the above companies will be RMB830 million, RMB1,168 million and RMB296 million, respectively. The revenue of general contracting business will decline in 2020 due to the impact of the epidemic on the contracting of general contracting business.

The main business entities of the Company's real estate development and housing leasing business include Shanghai Huayi Group Chemical Industry Company Limited ("Chemical Industry Company") and Shanghai Huayi Group Real Estate Company Limited ("Huayi Real Estate"). The latter (Huayi Real Estate) is mainly engaged in leasing out idle buildings under the company's name, providing property management services and carrying out comprehensive development of former factory lots. As of the end of September 2021, the Company's main real estate projects under development are listed below. Among them, the land acquisition cost of Jiading Phase II project is relatively low and the project is expected to be more profitable. The projects under construction include Dye 8 project and Huai'an Phase III, which have not yet been sold. The Huai'an Phase III project is a commercial plaza project, and the Company initially plans to combine leasing and sales upon completion.

**Figure 20. Major real estate projects under development as of the end of September 2021 (Unit: RMB billion, m3)**

Project Name	Location	Industry	Total Investment	Invested	Saleable area	Sold area
Jiading II	Shanghai Jiading District	Residential, Commercial	9.49	9.29	51,719.00	45,234.45
Dye Eight Project	Putuo District, Shanghai	Commercial, Office	73.35	26.85	139,916.00	-
Huaian III	Huai'an	Business	1.79	1.43	17,648.00	-
Zhayin Project	Yangpu District, Shanghai	Leasing	4.22	1.78	-	-
<b>Total</b>	-	-	<b>88.85</b>	<b>39.35</b>	<b>209,283.00</b>	<b>45,234.45</b>

Source: Shanghai Huayi

## F. Safety and Environmental Protection

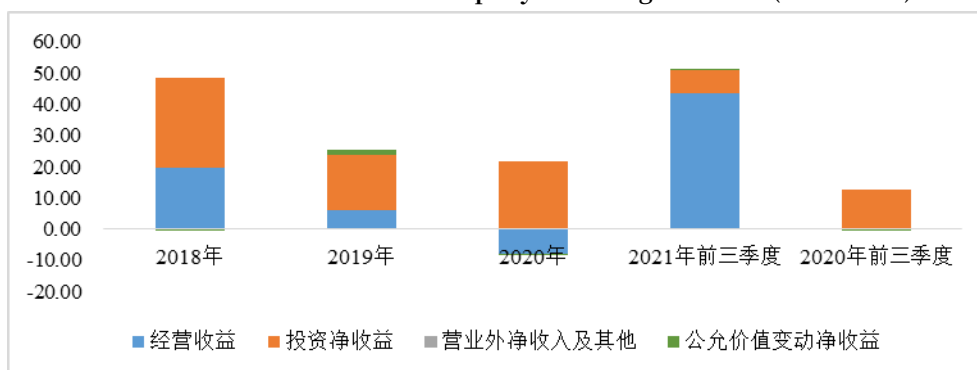
The company's main business involves various chemical products, and there is a possibility that safety and environmental protection accidents may occur

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during the manufacturing, transportation and storage of chemical products, which may pose certain risks to the company's normal production and operation. In terms of safety production, the company has not had any major or particularly major production safety responsibility accidents or had any major production safety responsibility accidents since 2020. In terms of environmental protection, the company has clarified the allocation of responsibilities of each secondary unit and department, formulated and implemented environmental management documents and environmental protection standards, including air, wastewater, solid waste, noise, radiation pollution prevention and control, operation of environmental protection facilities, classification and management of environmental protection facilities, environmental cost management, environmental monitoring, plant appearance management, "three simultaneous" management of construction projects, etc. Management standards. At the beginning of each year, the company formulates an annual environmental monitoring plan to track and monitor pollutant emissions.

## (2) Profitability

Chart 21. Structure of the company's earnings sources (in billions)



Source: Based on data provided by

Shanghai Huayi Note: Operating income

= operating profit - other operating

income

From 2018 to 2020 and the first three quarters of 2021, the company achieved gross profit of RMB7.601 billion, RMB6.461 billion, RMB4.898 billion and RMB8.231 billion. In 2020, the energy chemical and advanced materials segments were affected by the decline in prices of major products and production and sales volume, and the comprehensive gross profit declined, and only the gross profit of the fine chemical segment increased in that year; in the first three quarters of 2021 In the first three quarters of 2021, the gross profit of the current period increased significantly due to the increase in prices of major chemicals and the low base affected by the epidemic in the previous year. In the past three years, the company's period expenses were 4.594 billion yuan, 4.594 billion yuan, 4.595 billion yuan and 3.5 billion yuan, respectively,

The significant decrease in selling expenses in 2020 is mainly due to the adjustment of some freight costs from selling expenses to operating costs in accordance with the new accounting standards; the company's administrative expenses (including research and development expenses) were RMB2,537 million, RMB3,005 million, RMB3,418 million and RMB2,267 million respectively. The company's administrative expenses (including R&D expenses) were RMB2,537 million, RMB3,005 million, RMB3,418 million and RMB2,267 million, respectively, with an increase of RMB347 million in 2020 mainly due to downtime losses incurred during the epidemic; financial expenses were RMB655 million, RMB751 million, RMB2,571 million and RMB2,567 million, respectively,

In 2020, interest expense decreased, but interest income decreased.

The Company also saw a significant decrease in foreign exchange gains and losses from a net gain of RMB71 million to a net loss of RMB49 million in the previous year, resulting in an increase in finance costs year-over-year. During the same period, the company's expense ratio was 7.58%, 9.35%,



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11.91% and 8.21%, respectively. During the same period, the Company's asset impairment losses and credit impairment losses totaled NT\$897 million, NT\$437 million, NT\$340 million and NT\$142 million, respectively. During the same period, the Company's operating income amounted to NT\$1.956 billion, NT\$620 million, and NT\$1.7 billion, respectively,

-The Company was affected by the fluctuations of the chemical industry boom, with RMB 794 million and RMB 4,339 million.

**Figure 22: Analysis of the company's operating profit structure**

Company operating profit structure	2018	2019	2020	2021 First three quarters	2020 First three quarters
Total operating income (billion yuan)	605.98	550.94	424.02	445.65	302.35
Gross profit (billion yuan)	76.01	64.61	48.98	82.31	37.19
Of which: energy and chemical business (billion yuan)	28.53	10.75	6.60	20.24	1.65
Green tire business (billion yuan)	8.57	9.91	4.48	8.43	7.64
Advanced materials business (billion yuan)	21.95	19.17	13.62	24.17	8.88
Fine chemical business (billion yuan)	6.33	5.09	9.23	17.84	6.15
Chemical service industry (billion yuan)	4.90	8.61	6.19	3.51	6.03
Period expense (billion yuan)	45.94	51.74	50.74	36.73	36.24
Period expense ratio (%)	7.58	9.39	11.91	8.21	11.93

Company operating profit structure	2018	2019	2020	2021 First three quarters	2020 First three quarters
Of which: Finance cost ratio (%)	1.08	1.36	1.97	1.43	2.04
<b>Total interest expense for the year (billion yuan)</b>	<b>10.39</b>	<b>9.93</b>	<b>9.07</b>	-	-
<b>Of which: amount of capitalized interest (in billions)</b>	<b>1.10</b>	<b>0.34</b>	<b>0.67</b>	-	-

Source: Based on data provided by Shanghai Huayi

In 2018-2020 and the first three quarters of 2021, the company recognized investment income of \$2,896 million and 1,776 million, \$2,166 million and \$743 million, of which long-term equity accounted for under the equity method was recognized in the last three years. Investment income amounted to RMB1,146 million, RMB1,093 million and RMB1,021 million, respectively, mainly contributed by joint ventures and associates, including Shanghai Hualin Industrial Gas Co. Since the business of the companies in which the Company has equity participation is related to the Company's main business, the income from long-term equity investments accounted for under the equity method shows certain homogeneous fluctuations with the profitability of the Company's main business. In addition, in 2020, the Company generated investment income of RMB913 million from the disposal of part of the equity interest in Shanghai Hua Enterprise Management Co. In the past three years, the Company's non-operating net income and other income were RMB 679 million, RMB 678 million, RMB 132 million and RMB 186 million, respectively, of which government subsidies were RMB 676 million, RMB 549 million and RMB 275 million in the past three years, with a decreasing trend as some subsidies are no longer due. In addition, the company's plant land in Yangpu District was put into storage, forming a gain of 653 million yuan from the disposal of intangible assets in 2020, which complements the business earnings. Overall, the company's investment income has a positive correlation with the main business earnings, and the government subsidies can form a good supplement to the company's earnings.

**Figure 23. Analysis of other factors affecting the company's earnings (in billions of dollars)**

Other factors affecting the company's earnings	2018	2019	2020	2021 First three quarters
Net investment income	28.96	17.76	21.66	7.43
Including: Income from long-term equity investments accounted for under the equity method	11.46	10.93	10.21	-
Among them: Shanghai Hualin Industrial Gas Co.	1.04	1.07	0.98	-
Shanghai Huntsman Polyurethane Co.	3.60	2.00	1.75	-

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Inner Mongolia Yili Chemical Industry Co.	1.03	1.03	0.47	-
Shanghai Chemical Industry Zone Development Co.	1.78	2.28	1.32	-
Investment income from disposal of long-term equity investments	11.40	1.11	9.13	-
Investment income on available-for-sale financial assets during the holding period	5.96	4.72	1.48	-
Non-operating net income and other gains	6.79	6.78	1.32	1.86
Of which: government subsidies	6.76	5.49	2.75	-
Gains or losses from changes in fair value	-0.09	1.37	-0.05	0.17
Gain on disposal of assets	0.56	0.67	6.60	0.59

Source: Based on data provided by Shanghai Huayi

In 2018-2020 and the first three quarters of 2021, the company will achieve total profit of 5.578 billion yuan, 5.578 billion yuan

After deducting income tax, the net profit of the company was RMB 4.464 billion, RMB 2.618 billion, RMB 1.654 billion and RMB 4.161 billion, respectively. In the past three years, the company's return on total assets was 9.28%, 5.65% and 3.80%, and return on net assets was 13.88%, 7.58% and 4.55% respectively, which were affected by the decline of the main business profit.

### (3) Operation Planning / Business Strategy

During the 14th Five-Year Plan period, the company adheres to the "four chains" synergistic orientation of "supply chain, industrial chain, innovation chain and value chain", enhances the integrated development level of "energy chemical, green tire, advanced material, fine chemical and chemical service". "The company will also adhere to the "four new" industrial directions of new energy, new materials, new environmental protection and new biology", form an integrated industrial chain, and continuously optimize the three-dimensional business development model, namely Maintain the leading position in the advantageous business, consolidate the top three in the industry, and make breakthroughs in the emerging business; accelerate the development of overseas business, and strengthen the layout of overseas bases and sales.

As of the end of September 2021, the company's key projects under construction were focused on basic chemicals, industrial gases, acrylic acid and esters, chlor-alkali products and other fields. At present, the company is vigorously promoting the construction of Guangxi Qinzhou Chemical New Materials Integration Base, which mainly includes the industrial gas island project, 750,000 tons of propylene project, 200,000 tons of bisphenol A project, 300,000 tons/year of caustic soda, and 400,000 tons/year of PVC project. The first phase of the industrial gas island project started trial production in June 2021, and the production line includes 1.95 million tons/year of methanol, 500,000 tons/year of acetic acid and 200,000 tons/year of ethylene glycol.<sup>4</sup>. The total investment of the Company's key investment projects is RMB 30.519 billion, and as of the end of September 2021, the total investment of the Company's key investment projects is RMB 30.519 billion. The investment is \$12.576 billion, with \$4.639 billion, \$8.597 billion and \$1.267 billion planned for October-December 2021, 2022 and 2023, respectively.

Guangxi Qinzhou chemical production base investment scale, long construction period, some products (such as caustic soda) domestic has been in a state of oversupply, and the involved sub-products may face industry boom decline when put into production, there is a risk of capacity release.

**Figure 24. Investment arrangement of key projects of the Company as of the end of September 2021 (Unit: RMB billion)**

Project Name	Estimated total investment	January-September 2021		Planned investment amount			Expected production time
		Current Period Input	Cumulative Investment	2021 October - December	2022 Year	2023 Year	

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Industrial gas island of Guangxi Huayi Energy Chemical Co. Projects	121.20	14.54	75.66	8.47	3.57	2.38	Phase I in 2021 Put into production in June
Guangxi Huayi Energy Chemical Co. Utilization Projects	22.17	6.02	8.11	0.65	1.16	0.30	March 2022
Guangxi Huayi New Material 750,000 tons propylene project	87.26	16.52	23.58	21.12	44.94	4.71	December 2022
Guangxi Huayi New Material 200,000 tons of bisphenol A project	32.01	5.93	8.47	7.59	16.15	1.69	December 2022
Huayi Qinzhou Chemical New Material Integration Base 300,000 Caustic soda/year, 400,000 tons/year PVC project	42.55	7.31	9.94	8.56	20.15	3.59	December 2022
<b>Total Projects</b>	<b>305.19</b>	<b>50.32</b>	<b>125.76</b>	<b>46.39</b>	<b>85.97</b>	<b>12.67</b>	

Source: Shanghai Huayi

Note 1: The estimated total investment in the above table is the project feasibility study data, and there are differences with the actual investment.

Note 2: Guangxi Huayi Industrial Gas Island Project and Syngas Comprehensive Utilization Project will adopt BOO mode for the construction of air separation, water treatment and finished product tank area at a later stage, as well as the reserve cost, which are not included in the measurement of investment amount in the next three years, so the accumulated investment + investment amount in the next three years is less than the estimated total investment amount.

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<sup>4</sup> Phased start-up of methanol and acetic acid in June 2021 and ethylene glycol in August, with production capacity of about 80% by November.

## Management

### 1. Property relations and corporate governance

The company is a wholly-owned enterprise of Shanghai State-owned Assets Supervision and Administration Commission, with a clear and stable shareholding structure. The corporate governance structure and organizational structure of the company are sound and can meet the needs of daily operation and management.

#### (1) Property Relations

The Company is a wholly state-owned enterprise and the Shanghai State-owned Assets Supervision and Administration Commission ("SASAC") is the sole financier of the Company and there has been no change in the shareholding structure of the Company in the past three years. The Shanghai SASAC is an ad hoc body directly under the Shanghai Municipal People's Government and is authorized to perform the duties of a financier on behalf of the Shanghai Municipal People's Government.

#### (2) Major Related Parties and Related Transactions

In terms of connected transactions, the company has formulated a better connected transaction system, which specifies the scope of connected parties as well as the decision-making procedures of connected transactions and the approval authority of connected transactions. since 2018, the connected transactions of the company are mainly financial transactions with its participating subsidiaries in the process of production and operation, and the transaction volume is relatively small compared with the overall production and sales volume of the company, which has a small impact on the overall financial position and operating results of the company. The impact on the overall financial position and operating results of the company is small.

#### (3) Corporate Governance

The company exercises the authority of the shareholders' meeting by the Shanghai SASAC. The Company has established the Board of Directors, the Supervisory Board and the management team in accordance with the requirements of the Company Law and the Articles of Association and its own characteristics, and has made clear provisions on the rights and obligations, composition, duties and authority and rules of procedure of the Board of Directors, the Supervisory Board and the management team. The Company

implements the general manager responsibility system under the leadership of the Board of Directors, and the decisions on major operation issues are made by the Board of Directors of the Company, while accepting the leadership and supervision of Shanghai SASAC.

## 2. Operations Management

### (1) Management structure/model

In recent years, the company has initially built a "matrix" management structure with a horizontal business platform and a vertical professional line management as support, which is conducive to the systemic, intensive and synergistic effects of the group. In April 2020, the general manager of the company was changed from Mr. Huang Dai Li to Mr. Gu Lili, who is also the deputy secretary of the Party Committee of Huayi Group and the chairman of the board of directors of chlor-alkali chemical. Mr. Gu was also the Deputy Secretary of the Party Committee of Huayi Group and Chairman of the Board of Directors of Chlor-alkali Chemical. After the listing of the core assets, only two core functional departments, namely the Asset and Finance Department and the General Office, were retained in the Company's headquarters (the organizational structure of the Company's headquarters is shown in Appendix II)

## (2) Business decision making mechanism and risk control

The company attaches great importance to risk management and internal control construction, and has established a perfect control system in production and operation, investment management, capital management, risk control and audit supervision, etc., creating a good control environment. The company has formulated the "Internal Control Code of Shanghai Huayi (Group) Company" and other systems, which provide institutional guarantee to ensure the financing, investment, operation and other economic activities of the company and its subordinate enterprises.

In terms of production and operation risk control, the company signs the "Asset Management Responsibility" and "Safety and Environmental Protection Responsibility" with the heads of its subordinate enterprises every year, linking the responsibility of safety and efficiency and consumption reduction and environmental protection with the performance assessment of the person in charge of the company to ensure asset operation and production efficiency. In recent years, the company's "three wastes" emissions and energy consumption have been reduced year by year. Comprehensive utilization rate of the "three wastes" **has** been steadily increasing, with more significant environmental achievements. The company has set up a special safety and environmental protection department to implement strict environmental protection and safety control supervision for the research and production of its subsidiaries.

In terms of financial risk control, the company takes the value preservation and appreciation of state-owned assets as its core objective, strengthens the supervision and control of the company's and its subsidiaries' budgets, external investment and financing, and external guarantees, and implements centralized and unified decision-making and graded and classified management of long-term investments; it also implements a combination of internal and external audit control and supervision of its subsidiaries. In terms of investment management, the Company issues evaluation opinions on major investment projects of the Company and its subsidiaries through the Board of Directors' Strategic Investment Committee, and strengthens real-time management and supervision of projects and production and construction work by carrying out online control of project management to prevent project investment risks. As for the management of external guarantees, the Company has established a strict system and arranged special personnel to be responsible for dynamic tracking during the guarantee period, so as to warn the possible risks in a timely manner and take corresponding measures to resolve them, thus enabling the Company to effectively control the risks of external guarantees.

In terms of industry risk control, the company has strengthened the



collection and monitoring of market information of the company's main business varieties through the mode of setting up an intelligence office to provide a decision basis for the board of directors' decision making and enhance the timeliness and flexibility of the company's decision making.

The senior management of the company have all served in the chemical industry for many years and have rich experience in operation and management. The company has formulated certain regulations on the management of shareholding of operators as well as the Staff Appraisal Measures, which serve as the basis for appraisal and reward of the company's middle and senior management and provide the necessary institutional guarantee for them to perform their duties. Overall, except for individual executive changes due to retirement or position transfer, the Company's senior management team is basically stable, which is conducive to the consistency of the Company's development planning and the effectiveness of its strategy execution.

### **(3) Investment and financing and daily fund management**

In terms of fund management, the finance company under the company can provide a unified platform for the company to coordinate fund management, while the cost of fund raising of the company is significantly reduced and the efficiency of fund flow is significantly improved.

In terms of fixed asset investment, the company implements the principle of classification and hierarchical management. Investment projects are divided into four categories according to the total investment size: general projects, key projects, major projects and mega projects, with key projects, major projects and mega projects (collectively referred to as projects above the authority) implementing the approval system and general projects implementing the filing system.

#### (4) Misconduct record

The company provided the Corporate Credit Report checked by the Ministry on November 8, 2021, and for the past three years

No credit default record. As of the end of October 2021, the Company has not been subject to any significant administrative penalties and has not been included in the list of enterprises with abnormal operation and serious violations of the law as of the end of October 2021, according to the National Enterprise Credit Information Publicity System.

## Finance

In recent years, the company's rigid debt has generally shown an increasing trend. With the increase in long-term borrowings, the term structure of debt has improved and the gearing ratio has maintained a more reasonable level. The company maintains a net cash inflow from operations and has an ample stock of monetary funds on its books, which can provide support for debt repayment. The company will still have a certain scale of capital expenditure in the next 1-2 years, and the rigid debt and leverage level may further increase.

### 1. Data and Adjustment

Lixin CPA (Special General Partnership) has audited the Company's 2018-2020 financial statements and issued a standard unqualified audit report. The company implemented enterprise accounting standards (2006 Edition) and its supplementary provisions. Huayi Group and Chlor-alkali Chemical will implement the revised Enterprise Accounting Standard No. 14 - Revenue by the Ministry of Finance in 2017 for the first time starting from 2020, and the Company will implement

Enterprise Accounting Standard No. 13, Interim Provisions on Accounting Treatment for Carbon Emissions Trading (Future Application)

(Law) In addition, in 2020, the company implemented the "New Crown Pneumonia Epidemic" issued by the Ministry of Finance on June 19, 2020.

Accounting Treatment of Rent Reduction Related to the Situation (Caihui [2020] No. 10) allows enterprises to make the following adjustments for the January 2020

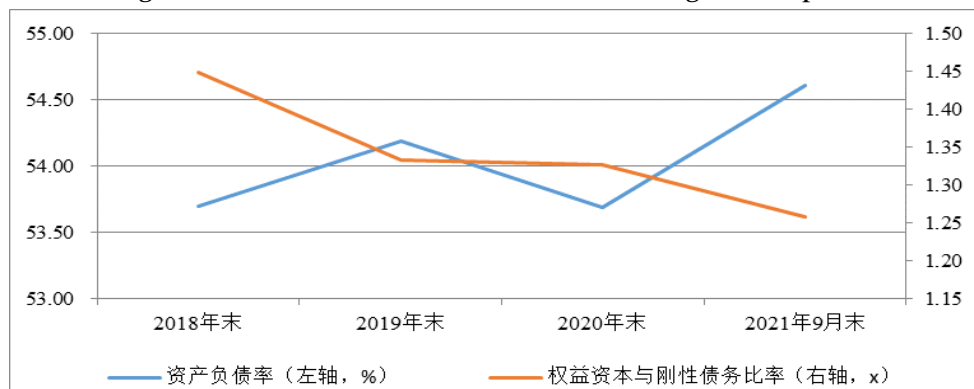
Adjustments to the related rent concessions that occurred between the date of the first day of the year and the date of implementation of this regulation may be accounted for using the simplified method.

In 2020, the scope of consolidation of the company will be reduced by one secondary subsidiary,  
namely Shanghai Huaxiang Rubber Products Co.  
The company ceased to be a subsidiary due to bankruptcy liquidation. As of the end of September  
2021, the scope of consolidation of the Company  
The total number of second-tier subsidiaries (starting from the head office) is 28.

## 2. Capital Structure

### (1) Financial leverage

Figure 25: Trends in the level of financial leverage of companies



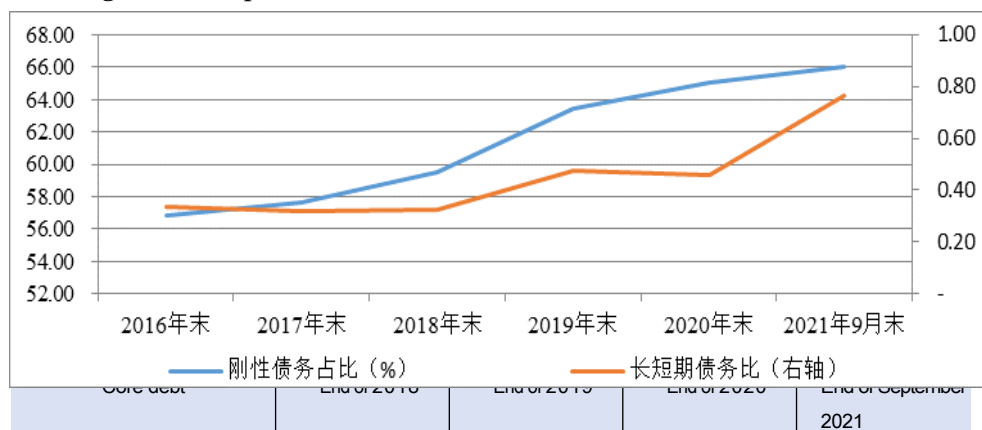
Source: Drawn from data provided by Shanghai Huayi Institute

At the end of 2018-2020 and September 2021, the company's total liabilities will be \$38,170 million and \$42,750 million, respectively.

At the end of September 2021, the growth was mainly due to the increase in rigid debt and accounts payable. At the end of the same period, owner's equity amounted to NT\$32.920 billion, NT\$36.142 billion, NT\$36.512 billion and NT\$40.289 billion, respectively, and minority interests accounted for a higher percentage; the growth of owner's equity was mainly due to Operating accumulation, undistributed profit at the end of September 2021 was RMB8,952 million. As of the end of the last three years, the company's gearing ratio was 53.69%, 54.19%, 53.69% and 54.61%, respectively, with small fluctuations in financial leverage, which is still at a reasonable level. At the end of the same period, the ratio of equity capital to rigid debt was 1.45 times, 1.33 times, 1.33 times and 1.26 times, respectively, and the coverage capacity of equity capital to rigid debt was strong.

### (2) Debt Structure

Figure 26: Corporate Debt Structure and Core Debt



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Rigid debt (billion yuan)	227.31	271.17	275.19	320.25
Accounts payable (billion yuan)	42.90	47.31	52.54	68.14
Pre-receivables (billion yuan)	33.23	28.86	11.88	18.66
Other payables (in billions)	43.96	46.20	43.59	33.72
Percentage of rigid debt (%)	59.55	63.43	65.01	66.07
Percentage of accounts payable (%)	11.24	11.07	12.41	14.06

Core debt	End of 2018	End of 2019	End of 2020	End of September 2021
Percentage of pre-receivables (%)	8.71	6.75	2.81	3.85
Percentage of other payables (%)	11.52	10.81	10.30	6.96

Source: Drawn from data provided by Shanghai Huayi Institute

In terms of composition, the company's rigid debts account for more than 60% of total liabilities and the proportion is on the rise. In addition to rigid debts, liabilities mainly include accounts payable, accounts receivable and other payables. The accounts payable of the company is large in scale, with a book value of RMB5.254 billion at the end of 2020, mainly for unsettled payments for materials, equipment and construction, etc., with the ageing concentrated within one year; accounts receivable in advance (including contract liabilities, the same below) was RMB1.188 billion, a decrease of 58.82% compared with the end of the previous year, mainly due to the carry-over of the pre-receipt from Jiading Phase II; other payables mainly include third-party current accounts, corporate loans, deposits and guarantees, etc. Other payables mainly include third-party transactions, loans, deposits and security deposits, etc. The third-party transactions at the end of 2020 amounted to RMB2,415 million (including RMB 1,195 million for the transfer of equity in Inner Mongolia Haosheng of Yanzhou Coal Industry).

(and interest, the ageing of which is more than 1 year because the prospecting right certificate of Shilawusu well field has not yet been obtained and has not yet been settled) the

At the end of September 2021, the scale of liabilities increased by 14.52% compared with the end of the previous year, mainly due to the increase in rigid debts and accounts payable, of which accounts payable increased by RMB1.560 billion to RMB6.139 billion compared with the beginning of the year, mainly due to the increase in raw material prices; other payables

The decrease of \$987 million to \$3,372 million from the beginning of the year was mainly due to the decrease in operating suspense.

In terms of maturity structure, the company's debt maturity structure has been optimized but is still dominated by current liabilities.

The ratio of long- and short-term debt is 0.32/0.47/0.46 and 0.77 at the end of 2018-2020 and September 2021, respectively.

The maturity structure of debt improved at the end of September 2021, benefiting from an increase in long-term borrowings.

### (3) Rigid debt

Chart 27. Composition of the company's rigid debt (in billions of dollars)

Types of Rigid Debt	End of 2018	End of 2019	End of 2020	End of September 2021
Total short-term rigid debt	150.61	154.22	163.47	133.07
Of which: short-term borrowings	108.12	112.95	131.25	104.49
Notes Payable	15.13	16.84	14.58	15.28
Short-term financing bills payable	-	20.00	-	10.00
Long-term loans due within one year	2.95	4.20	12.21	1.71
Other short-term rigid debt	24.41	0.22	5.44	1.58
Total medium- and long-term rigid debt	76.70	116.95	111.72	187.18
Of which: long-term loans	41.28	57.36	78.72	134.05
Bonds Payable	35.42	59.59	33.00	53.13
Consolidated financing costs (annualized, %)	4.67	3.99	3.32	-

Source: Based on the data provided by Shanghai Huayi, the comprehensive financing cost is estimated based on the financial statement data

At the end of 2018-2020 and September 2021, the company's rigid debt will be \$22,731 million, \$22,731 million, and

27.117 billion yuan, 27.519 billion yuan and 32.025 billion yuan, of which the increase in long-term borrowings and short-term financing bonds payable at the end of 2019 and the increase in long-term borrowings mainly project loans and working capital borrowings at the end of September 2021. As for financing methods, the balance of bank borrowings of the Company at the end of 2018-2020 and September 2021 will be RMB 15.235 billion, RMB 17.451 billion, RMB 22.218 billion and RMB 24.026 billion, respectively, accounting for rigid

The proportion of debt exceeds 60%. The company has strong shareholders' background and good credit quality, and its bank borrowings are mainly credit borrowings. In addition, the company issued several bonds one after another, and the amount of bonds payable as of the end of 2018-2020 and September 2021 is over 60%.

The balance of bonds (including bonds payable and short-term financing bills due within one year) was NT\$5,849 million, NT\$7,959 million, NT\$3,817 million and NT\$6,313 million, respectively. As for the maturity structure, the short-term rigid debts of the Company were RMB 15.061 billion, RMB 15.422 billion, RMB 16.374 billion and RMB 13.307 billion at the end of the last three years and one year respectively, accounting for a fluctuating downward trend of total rigid debts; the long-term borrowings of the Company increased at the end of September 2021, mainly for working capital loans and project loans, and the maturity structure was optimized.

As for financing cost, based on the data of the company's financial statements, it is estimated that the consolidated financing cost will be 4.67%, 3.99% and 3.32% from 2018 to 2020, respectively, benefiting from the downward market interest rate, and the company's financing cost will further decrease in 2020. As of the end of September 2021, the company's bank borrowing rate is mainly below 4%, which has the advantage of capital cost.

**Figure 28. Distribution of the Company's bank borrowing terms and interest rates as of the end of September 2021 (unit: billion yuan)**

Consolidated financing cost or interest rate range \ Year to maturity	Within 1 year	1~2 years (Excluding 2 years)	2~3 years (Excluding 3 years)	3~5 years (Excluding 5 years)	5 years and above	Total
Within 3%	1.18	4.15	0.20	-	2.24	<b>7.77</b>
3%~4% (excluding 4%)	101.74	29.00	28.98	-	22.04	<b>181.76</b>
4%~5% (not including 5%)	1.88	1.54	1.25	4.76	18.13	<b>27.56</b>
More than 5%	-	-	0.40	-	0.11	<b>0.51</b>
<b>Total</b>	<b>104.80</b>	<b>34.69</b>	<b>30.83</b>	<b>4.76</b>	<b>42.52</b>	<b>217.60</b>

Source: Based on data provided by

Shanghai Huayi Note: The above table

does not include the part of floating rate

bank borrowing

### 3. Cash Flow

#### (1) Business segment



Figure 29: Cash flow from operations

Main Data and Indicators	2018	2019	2020	First three quarters of 2021
Business cycle (days)	60.43	71.39	88.77	-
Operating income cash ratio (%)	119.58	112.41	96.04	93.50
Net cash receipts and disbursements from operations (in billions)	71.59	38.48	31.33	56.00
Net cash receipts and disbursements from other factors (in billions)	-3.02	-8.74	-7.77	-14.88
Net cash flow generated from operating segments (in billions)	68.57	29.74	23.56	41.12
EBITDA (billion yuan)	88.60	66.34	53.52	-
EBITDA/rigid debt (times)	0.40	0.27	0.20	-
EBITDA/all interest expenses (times)	8.53	6.68	5.90	-

Source: Based on data provided by Shanghai Huayi

Note: Net cash from operations refers to the net amount after excluding the impact of "other" factors on operating cash flows; net cash from other factors refers to the net income and expenses resulting from "other" factors in operating cash flows

From 2018 to 2020, the company's business cycle will be 60.43 days, 71.39 days and 88.77 days, respectively, with

The operating income cash ratio was 119.58%, 112.41%, 96.04% and 93.50% in 2018-2020 and the first three quarters of 2021, respectively, of which the decrease in operating income cash ratio in 2020 was mainly due to the weakening of the chemical market and the extended sales period of some products. The decrease in cash flow from operating income in 2020 is mainly due to the weakness of the chemical market and the extended sales period of some products. The cash flow from other factors mainly includes government subsidies, issuance and recovery of finance lease payments, and related party transactions, with a net outflow of RMB302 million, RMB874 million, RMB777 million and RMB1,488 million respectively in the past three years. During the same period, the net operating cash inflow of the Company was RMB6,857 million, RMB2,974 million, RMB2,356 million and RMB4,112 million, respectively. Overall, the Company's net cash flows from operations were all net inflows.

From 2018 to 2020, the company's EBITDA will be RMB8,860 million, RMB6,634 million and RMB5,352 million, respectively, decreasing mainly due to the decline in total profit; due to the characteristics of chemical companies with heavy assets, the company's depreciation and amortization are large and stable overall. EBITDA also decreases to the extent of interest expense and rigid debt coverage, which will be 5.90 and 0.20 in 2020, respectively. In 2020, EBITDA will be 5.90 and 0.20, respectively.

## (2) Investment links

**Figure 30. Cash Flow Position of the Company's Investment Segment (in billions)**

Main data and indicators	2018	2019	2020	First three quarters of 2021
Net inflow of recovered investments and investment payments	-12.40	-6.27	-5.59	-1.16
Cash received from obtaining investment income	10.96	12.20	9.59	8.10
Net inflows from the acquisition and disposal of fixed assets, intangible assets and other long-term assets	-26.91	-38.14	-59.94	-66.41
Net cash inflow from disposals and acquisitions of subsidiaries and other operating units	0.00	1.48	-2.75	0.00
Net effect of other factors on cash flows from investment segments	-2.24	-7.36	0.29	-0.63
Net cash flows generated from the investment segment	-30.59	-39.58	-55.65	-60.10

Source: Based on data provided by Shanghai Huayi

From 2018 to 2020 and in the first three quarters of 2021, the company's net inflows of recovered investments and investment payments were -RMB 1,240 million, -RMB 627 million, -RMB 559 million and -RMB 116 million,

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respectively, mainly due to additional investments in participating companies, of which 2020 was mainly due to additional investments in Changshu Sanfu Zhenfu New Materials Co. In 2020, the additional investments were mainly in Changshu San'aifu Zhenhua New Material Co. The cash received from investment income was RMB1,096 million, RMB1,220 million, RMB959 million, and RMB1,090 million, respectively.

and RMB810 million, mainly cash dividends paid by participating companies, fluctuated. As a result of product restructuring and tightening of environmental protection policies, the Company has relocated its production capacity, shut down and disposed of backward production units in recent years, generating certain cash inflows from the disposal of fixed assets, intangible assets and other long-term assets, and the scale of cash paid for the purchase and disposal of fixed assets, intangible assets and other long-term assets due to the continuous investment in the Company's green tires, acrylic acid and esters, Guangxi Qinzhou integrated production base and other projects under construction. The net cash outflow from the purchase and disposal of long-term assets was RMB2,691 million, RMB3,814 million, RMB5,994 million and RMB6,641 million, respectively. In the past three years, the net cash flows from investment were

-The cash flow from investment is expected to remain net in the next 1-2 years. According to the company's investment plan for projects under construction, there will still be a certain scale of capital investment in the next 1-2 years, and the cash flow from investment is expected to maintain a net outflow trend.

### (3) Funding links

Figure 31. Cash flow position of the company's financing segment (in billions)

Main data and indicators	2018	2019	2020	First three quarters of 2021
Equity net financing	-1.33	-11.26	-5.68	-9.40
Of which: Cash dividends	-4.51	-13.31	-8.83	-
Net financing of debt type	-13.85	26.57	6.06	31.13
Of which: cash interest	-9.14	-10.00	-7.82	-
Net effect of other factors on cash flows from financing segments	-5.64	-0.33	-0.04	-0.34
Net cash flows from financing segments	-20.83	14.99	0.34	21.38

Source: Compiled from data provided by Shanghai Huayi Institute.

The company's listed companies, Huayi Group and Chlor-Alkali Chemical, have annual cash dividend payments, with dividends of RMB 211 million and RMB 116 million in 2020, respectively, so net equity financing is dominated by net outflows. The company's financing cash inflow is dominated by debt financing, and the net financing amount of debt category is -RMB 1,385 million, RMB 2,657 million, RMB 606 million and RMB 3,113 million in 2018-2020 and the first three quarters of 2021, respectively, and the cash interest expense grows with the expansion of debt scale. Other factors had less impact on the cash flow from financing. During the same period, the net cash flow from financing was -\$2,083 million, \$1,499 million, \$34 million and \$2,138 million, respectively.

### 4. Asset Quality

Figure 32. Distribution of the company's main assets

Main data and indicators		End of 2018	2019	2020	End of September 2021
Current assets	Amount (billion yuan)	320.74	375.53	310.50	354.76
	Share of total assets (%)	45.12	47.60	39.38	39.97
Of which: monetary funds (billion yuan)		157.96	163.10	125.40	121.38
Trading financial assets (billion yuan) <sup>5</sup>		3.33	17.19	17.49	17.67
Notes receivable (including receivables financing) (Billions of dollars)		29.88	7.89	7.21	5.14
Receivables financing (billion yuan)		-	23.81	28.64	29.46
Accounts receivable (billion yuan)		32.66	31.28	30.33	40.65
Inventory (billion yuan)		66.05	67.75	60.19	63.07
Assets held for sale (billion yuan)		-	22.31	-	-

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yuan)					
Non-current assets	Amount (billion yuan)	390.15	413.39	477.91	532.89
	Share of total assets (%)	54.88	52.40	60.62	60.03
Of which: available-for-sale financial assets + investments in other equity instruments + other non-current financial assets (billion yuan)		42.13	35.98	37.62	35.43
Long-term equity investments (in billions of yuan)		65.70	76.78	97.87	102.30
Fixed assets (billion yuan)		184.18	188.10	182.95	234.36
Construction in progress (billion yuan)		37.98	28.46	76.73	62.05
Intangible assets (billion yuan)		40.27	41.58	42.04	40.92

<sup>5</sup> Including financial assets held for trading and financial assets at fair value through profit or loss from the end of 2019.

Main data and indicators	End of 2018	2019	2020	End of September 2021
Carrying value of all restricted assets at the end of the period (in billions)	30.14	23.60	14.68	-
Book balance of restricted assets/total assets (%)	4.24	2.99	1.86	-

Source: Compiled from data provided by Shanghai Huayi. Note: Restricted assets data not available as of September 2021

At the end of 2018-2020 and September 2021, the company's total assets will be RMB 71.090 billion, RMB 78.892 billion, RMB 78.841 billion and RMB 88.764 billion, respectively. The company has the characteristics of asset-heavy operation, with non-current assets accounting for slightly more than current assets in terms of asset pattern, coupled with the investment and construction of key projects such as the Guangxi Qinzhou integration base in recent years, non-current assets accounted for approximately 60% of total assets at the end of September 2021.

The company's current assets mainly include monetary funds, financial assets held for trading, notes receivable, receivables financing, accounts receivable and inventories, etc. The company's monetary funds amounted to RMB12,540 million (including restricted funds of RMB1,198 million) at the end of 2020, which were reduced by the investment in new associates and investment in projects under construction, such as Guangxi Qinzhou. The Company adopted the new financial instruments standard in 2019, reclassifying notes receivable and accounts receivable measured at fair value and recognized in other comprehensive income to receivables financing, with notes receivable (including receivables financing) amounting to RMB2,864 million at the end of 2020. The notes receivable (including receivables financing) amounted to RMB2,864 million at the end of 2020, which was increased by the industry environment. Accounts receivable amounted to RMB3,033 million at the end of 2020, basically unchanged from the end of the previous year. Inventories were mainly within 1 year. Inventories amounted to RMB6,019 million (cumulative provision of RMB287 million) representing a decrease of 11.16% compared with the end of the previous year, mainly due to the decrease in raw material prices and the carry-over of real estate projects; of which RMB1,868 million was for raw materials (cumulative provision of RMB127 million) and RMB3,351 million was for inventories (cumulative provision of RMB1,507 million). At the end of 2019, the Company's assets held for sale amounted to RMB2,231 million, representing part of the equity interest in Shanghai Hua, which was transferred from a consolidated subsidiary to long-term equity

investment after the Company sold part of its equity interest in 2020, and therefore there was no balance in this account at the end of 2020.

The company's non-current assets mainly include available-for-sale financial assets, long-term equity investments, fixed assets, construction in progress and intangible assets, etc. Available-for-sale financial assets + investments in other equity instruments + other non-current financial assets amounted to RMB3,762 million at the end of 2020, most of which are measured at fair value and are vulnerable to market price fluctuations. Long-term equity investments amounted to RMB9,787 million at the end of the same period, representing an increase of 27.47% compared with the end of the previous year, mainly due to additional investments in participating companies and investment income recognized under the equity method; the ending balances of equity interests in Shanghai Chemical Industry Zone Development Co, 573 million and

The above-mentioned companies enhanced their earnings and contributed a large amount of investment income during the year. Public

The Company's fixed assets amounted to NT\$18.295 billion, and the transfer of construction in progress and current depreciation were basically the same, with changes from the previous year.

The main investment projects include Guangxi Qinzhou Industrial Gas Island Project and Synthetic Gas Comprehensive Utilization Project, etc. In 2020, the above two projects will add RMB 3.748 billion and RMB 203 million respectively. Intangible assets amounted to RMB4,204 million, mainly consisting of land use rights.

At the end of September 2021, the company's total assets increased by 12.59% compared with the previous year-end, of which notes receivable increased by 55.94% compared with the previous year-end to RMB5,590 million and accounts receivable increased by 30.29% compared with the previous year-end to RMB3,951 million

Prepayments increased by 117.78% to RMB2,499 million as compared with the end of the previous year, mainly due to the increase in prepayments for equipment and other projects in Guangxi; fixed assets increased by 28.11% to RMB23,436 million as compared with the end of the previous year, mainly due to the partial consolidation of the industrial gas island project in Qinzhou, Guangxi; construction in progress decreased by 19.13% to RMB6,205 million as compared with the end of the previous year. Construction in progress decreased by 19.13% to RMB6,205 million compared with the end of last year, mainly due to the fact that the amount invested in projects such as Guangxi Qinzhou integrated production base was less than the amount transferred.

At the end of 2020, the carrying value of the company's restricted assets was NT\$1,468 million, accounting for 1.86% of total assets. In addition to the aforementioned restricted monetary funds of NT\$1,198 million, restricted assets also mainly include fixed assets (NT\$114 million) and notes receivable (NT\$132 million) both of which are restricted as collateral for borrowings.

## 5. Liquidity/short-term factors

Figure 33: Company's asset liquidity indicators

Main data and indicators	End of 2018	End of 2019	End of 2020	End of September 2021
Current ratio (%)	111.16	129.43	106.96	129.32
Quick Ratio (%)	83.86	101.94	82.27	98.17
Cash ratio (%)	66.25	73.04	61.25	72.80

Source: Based on data provided by Shanghai Huayi

In terms of asset liquidity indicators, the company's current ratio was 111.16%, 129.43%, 106.96% and 129.32% at the end of 2018-2020 and September 2021, respectively, and the quick ratio was 83.86%, 101.94%, 82.27% and 98.17%, respectively, which fluctuated due to the market environment. The cash ratio at the end of the same period was 66.25%, 73.04%, 61.25% and 72.80%, respectively, and the company had sufficient monetary funds to provide good protection for debt repayment. In addition, the Company's non-current assets, including available-for-sale financial assets and other non-current financial assets, include shares of listed companies, which have strong liquidity. Long-term equity investments and intangible assets also have a certain degree of liquidity, which can serve as a supplementary source of liquidity for the Company.

## 6. Off-balance sheet matters



According to the auditor's report, as of the end of 2020, the company's total assets and liabilities for contractual disputes, equity transfer disputes, etc. were as follows

There is one pending lawsuit or arbitration matter, involving a small amount of litigation, involving the U.S. Department of Commerce

In 2014, an anti-dumping investigation was conducted against China North America Tire Joint Sales Company, a subsidiary of Huayi Group, and the accrual of

The projected liability of \$2.0 million is not expected to have a material impact on the Company's operations and finances. As of September 2021

As of the end of January, the company had 17 external guarantees with a total amount of RMB 1.354 billion and a guarantee ratio of 3.36%, the guarantee scale is relatively small and the risk of repayment is manageable.

**Figure 34. Major external guarantees of the Company as of the end of September 2021 (Unit: RMB million)**

Guarantee Company	Name of the guaranteed company	Guarantee Method	Type of guarantee	Guarantee amount
Shanghai Huayi (Group) Company	Inner Mongolia Yili Chemical Industry Co.	Joint and several liability guarantee	Loan Guarantee	42,478.85
Shanghai Huayi Group Co.	Zhejiang Huahong New Material Co.	Joint and several liability guarantee	Loan Guarantee	37,275.00
Shanghai Huayi Group Investment Co.	Plexus (Guangxi) Gases Co.	Joint and several liability guarantee	Loan Guarantee	30,921.90
Shanghai Huayi Group Investment Co.	Guangxi Tianyi Environmental Technology Co.	Joint and several liability guarantee	Loan Guarantee	18,200.80
Shanghai Huayi Group Co.	Dalian New Sunshine Material Technology Co.	Joint and several liability guarantee	Loan Guarantee	3,870.60
Shanghai Huayi Fine Chemical Co.	Shanghai International Paint Co.	Joint and several liability guarantee	Loan Guarantee	2,880.00

Source: Compiled from data provided by Shanghai Huayi Institute.

## 7. Financial quality of the parent company/group headquarters

At the end of 2020, the total assets of the Company's headquarters will be RMB 36,155 million, of which current assets will be RMB 8,679 million

The Company's financial statements consisted of \$4,000 million of monetary funds and \$4,625 million of other receivables (mainly from subsidiaries).

The Group's non-current assets amounted to RMB27,475 million, of which long-term equity investments amounted to RMB23,171 million (mainly equity investments in subsidiaries, of which the book value of equity interests in Huayi Group, a listed company, amounted to RMB4,775 million and the book value of equity interests in Chlor-alkali Chemical amounted to RMB537 million, both of which were unpledged)

Intangible assets amounted to NT\$742 million. The total liabilities of the Company's headquarters were RMB 21.229 billion, of which rigid debts were 18,224 million (including short-term rigid debt of \$13,980 million) and other payables of \$2,551 million.

In 2020, the Company will achieve operating income of \$61 million, recognize investment income of \$772 million and net income of

At the end of September 2021, the total capital of the Company's head office was RMB 0.621 billion; net cash flow from operations was RMB 0.267 billion.

The total liabilities were \$23,215 million, of which \$20,198 was rigid debt (short-term rigid debt).

In the first three quarters of 2021, the Company reported operating income of RMB 39 million, net income of RMB -72 million and net cash inflow from operations of RMB -419 million.

On the whole, the Company's head office mainly assumes the management function of the head office, and its operating business and assets are mainly distributed in Huayi Group and other subordinate companies, and its core assets are mainly equity investments in subsidiaries. The rigid debt of the headquarters is large, and the funds raised are mainly used for the operation and development of subordinate companies, which is manifested by the large amount of internal loans to subordinate companies. The company uses the finance company as a platform for daily position balancing, fund dispatching and fund settlement. In the case of debt repayment, the headquarters can coordinate the resources of non-listed segments within the group (listed subsidiaries have strong financial independence) and make arrangements for debt repayment according to the overall financial situation.

## External Support Factors

### 1. Government Support

The company is a wholly state-owned enterprise group, and the Shanghai Municipal State-owned Assets Supervision and Administration Commission is the sole financier of the company. The company enjoys ongoing financial subsidies and other forms of subsidy income such as scientific research and tax rebates in response to the government's call for energy-saving and emission reduction industrial restructuring. 2018-2020, the company receives subsidy income of RMB 676 million, RMB 549 million and RMB 275 million, respectively.

### 2. Large state-owned financial institutions support

The company has maintained good cooperative relationships with a number of banks. As of the end of September 2021, the company was

Major cooperative banks<sup>6</sup> Total credit line of \$114.363 billion, \$28.546 billion used, unused

The amount of credit facilities used is 85.817 billion yuan, with sufficient financing space.

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<sup>6</sup> Including: Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of Communications, Bank of China, China Development Bank, Pudong Development Bank, China Merchants Bank

Industrial Bank, Export-Import Bank and Bank of Shanghai are among the 10 banks.

Figure 35: Credit support from large state-owned financial institutions

Institution Type	Total amount of credit granted	Used amount	Unused credit
All (billion yuan)	1,143.63	285.46	858.17
Of which: national policy financial institutions (billion yuan)	286.50	96.75	189.75
The five largest commercial banks of ICBC (billion yuan)	481.13	146.44	334.69
Of which: the proportion of large state-owned financial institutions (%)	67.12	85.19	61.11

Source: Based on data provided by Shanghai Huayi (as of the end of September 2021)

## Rating Conclusion

The company is a wholly-owned enterprise of Shanghai State-owned Assets Supervision and Administration Commission, with a clear and stable shareholding structure. The corporate governance structure and organizational structure of the company are sound and can meet the needs of daily operation and management.

The company is one of the largest integrated chemical enterprise groups in China. The company's business covers several chemical sub-industries and has strong competitive advantages in terms of production scale, market brand and industrial integration. 2020 was affected by the epidemic, the prices of methanol, acetic acid, caustic soda and other products fell, the market was relatively weak, the production and sales volume of the company's main chemical products declined, coupled with the compression of trading business, the company's revenue and main business profit scale declined in that year; in the first three quarters of 2021 Benefiting from the improving chemical market environment, the new production capacity of methanol and acetic acid in Guangxi base came into operation, and the prices of major chemical products such as methanol, acetic acid, chlor-alkali, acrylic acid and esters increased significantly, coupled with the low base during the epidemic in the previous year, the overall revenue and earnings increased significantly year-on-year. The company is vigorously promoting the construction of the integrated production base of new chemical materials in Qin Zhou, Guangxi, and the first phase of the industrial gas island project will be put into operation in June 2021, so we are concerned about the pressure of capital expenditure and the release of production capacity.

In recent years, the company's rigid debt has generally shown an increasing trend. With the increase in long-term borrowings, the term

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**Century Ratings**

structure of debt has improved and the gearing ratio has maintained a more reasonable level. The company maintains a net cash inflow from operations and has an ample stock of monetary funds on its books, which can provide support for debt repayment. The company will still have a certain scale of capital expenditure in the next 1-2 years, and the rigid debt and leverage level may further increase.

## Follow-up rating arrangement

In accordance with the regulatory requirements of the relevant authorities and the business practices of this rating agency, during the validity period of this credit rating report (from the date of issuance of this credit rating report to November 25, 2022), this rating agency will continue to pay attention to the changes in the issuer's external business environment, significant events affecting the issuer's operation or financial condition, the issuer's performance of its debts and other factors.

In the event of significant matters that may affect the issuer's credit quality, the rating agency will initiate an irregular follow-up rating procedure, and the issuer shall promptly inform the rating agency of the corresponding matters and provide the corresponding information in accordance with the written commitment already made.

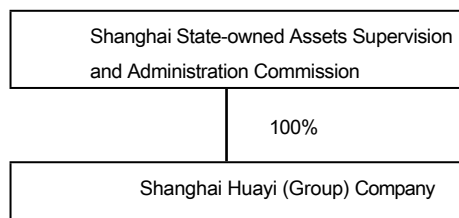
The tracking rating report and rating results of this rating agency will be disclosed to the issuer, the supervisory department and the disclosure targets required by the supervisory department.

The rating agency will publish the continuous tracking rating results in the media designated by the regulatory authority and on the website of the rating agency.

If the issuer fails to provide the required information for the follow-up rating in a timely manner, the rating agency will take rating actions such as announcing delayed disclosure of the follow-up rating report, or suspending the rating or terminating the rating in accordance with the regulatory requirements of the relevant competent authorities and the business operation specification of the rating agency.

## Appendix I:

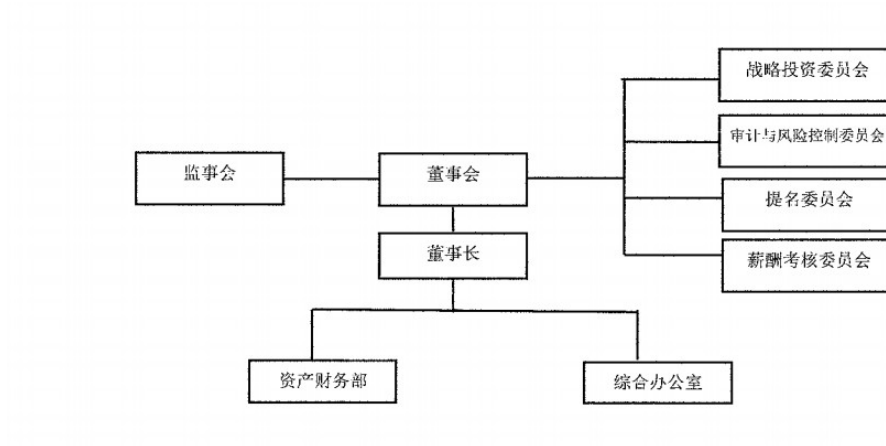
### Relationship between the company and the actual controller



Note: Drawn from information provided by Shanghai Huayi (as of the end of September 2021)

## Appendix II:

### Company Organization Chart



Note: Drawn from information provided by Shanghai Huayi (as of the end of September 2021)

### Appendix III:

## Overview of key data of related entities

Full Name	Abbreviations	Relationship with the company	Shareholding of the parent company (%)	Main Business	Key financial data for 2020 (end) (in billions)						Remarks
					Rigid debt balance (Billions of dollars)	Owner's Equity (Billions of dollars)	Operating income (Billions of dollars)	Net Profit (Billions of dollars)	Net cash inflow from operations (Billions of dollars)	EBITDA (Billions of dollars)	
<b>Shanghai Huayi (Group) Company</b>	<b>Shanghai Huayi</b>	<b>This level</b>	-	<b>Investment management-based</b>	<b>182.24</b>	<b>149.26</b>	<b>0.61</b>	<b>6.21</b>	<b>-2.67</b>	<b>12.71</b>	<b>Monomer caliber</b>
Shanghai Huayi Group Co.	Huayi Group	Subsidiaries	42.01	Chemical production and operation and chemical services, etc.	79.45	211.15	284.19	4.07	11.11	29.79	Secondary subsidiaries, consolidated data
Shanghai Chlor-Alkali Chemical Co.	Chlor-alkali Chemicals	Subsidiaries	46.59	Chlor-alkali products	0.63	52.76	48.89	6.01	4.09	8.61	Secondary subsidiaries, consolidated data
Shuangqian Tire Group Co.	Shuangqian Tire	Subsidiaries	100.00	Tire Products	25.81	22.64	79.35	-1.92	5.55	3.18	Huayi Group secondary subsidiaries, consolidated data
Shanghai San Aifu New Material Technology Co.	New Material Technology	Subsidiaries	100.00	Fluorinated chemical products	14.63	24.19	27.37	-0.73	4.91	1.91	Secondary subsidiaries, consolidated data



Shanghai Tianyuan (Group) Co.	Tianyuan Group	Subsidiaries	100.00	Chemical logistics and trade, etc.	1.84	10.08	20.62	0.52	0.53	1.23	Huayi Group secondary subsidiaries, consolidated data
Shanghai Huayi Fine Chemical Co.	Fine Chemical Company	Subsidiaries	100.00	Paint, etc.	0.33	25.43	25.77	2.23	2.79	3.42	Huayi Group secondary subsidiaries, consolidated data
Shanghai Huayi Energy Chemical Co.	Huayi Energy Chemical	Subsidiaries	100.00	Energy Chemicals	21.09	72.70	97.11	2.34	5.41	9.02	Huayi Group secondary subsidiaries, consolidated data
Shanghai Huayi New Material Co.	New Material Company	Subsidiaries	100.00	Acrylic acid and esters, etc.	0.72	19.88	39.81	0.09	6.62	2.37	Huayi Group secondary subsidiaries, consolidated data
Shanghai Huayi Group Real Estate Co.	Huayi Real Estate	Subsidiaries	100.00	Real Estate	0.00	28.42	10.91	9.91	-4.06	12.44	Secondary subsidiaries, consolidated data

Note 1: Based on the notes to the annual audit report of Shanghai Huayi for 2020 and other information provided;

Note 2: The shareholding ratio of the Company's headquarters in unlisted subsidiaries is as of the end of 2020, and that of listed subsidiaries is as of the end of September 2021.

## Appendi

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## Main data and indicators

Key Financial Data and Indicators [Consolidated Caliber]	2018	2019	2020	2021 First three quarters
Total Assets [Billion]	710.90	788.92	788.41	887.64
Monetary Funds [Billions of Dollars]	157.96	163.10	125.40	127.82
Rigid debt [billion]	227.31	271.17	275.19	320.25
Owner's Equity [Billion]	329.20	361.42	365.12	402.89
Operating income [billion yuan]	605.98	550.94	424.02	445.65
Net Income [Billion]	44.64	26.18	16.54	41.61
EBITDA [Billion]	88.60	66.34	53.52	-
Net cash inflow from operations [NT\$ billion]	68.57	29.74	23.56	41.12
Net investment cash inflow [NT\$ billion]	-30.59	-39.58	-55.65	-60.10
Gearing ratio [%]	53.69	54.19	53.69	54.61
Equity capital to rigid debt ratio [%]	144.82	133.28	132.68	125.80
Current ratio	111.16	129.43	106.96	129.32
[%] Cash	66.25	73.04	61.25	72.80
ratio [%]	6.26	4.27	3.30	-
Interest coverage multiple [times]	2.45	1.78	3.74	-
Guarantee ratio [%]	-	-	-	-
Business cycle [days]	60.43	71.39	71.39	-
Gross margin [%]	12.54	11.73	11.55	18.47
Operating profit margin [%]	9.03	5.54	5.39	11.83
Total Return on Assets [%]	9.28	5.65	3.80	-
Return on net assets [%]	13.88	7.58	4.55	-
Return on net assets*[%]	15.75	8.77	4.97	-
Operating income cash ratio [%]	119.58	112.41	96.04	93.50
Ratio of net cash inflow from operations to current liabilities [%]	23.85	10.28	8.12	-
Ratio of net non-financial cash inflows to total liabilities [%]	10.00	-2.43	-7.54	-
EBITDA/Interest expense [times]	8.53	6.68	5.90	-
EBITDA/rigid debt [times]	0.40	0.27	0.20	-

Note: The data in the table are compiled and calculated based on the audited financial data of Shanghai Huayi for 2018-2020 and the unaudited first three quarters of 2021.

## Indicator calculation formula

Gearing ratio (%) = Total liabilities at the end of the period / Total assets at the end of the period × 100%

Equity capital to rigid debt ratio (%) = Total owner's equity at the end of the

period / Balance of rigid debt at the end of the period × 100% Current ratio (%)

= Total current assets at the end of the period / Total current liabilities at the end of the period × 100%

Quick Ratio (%) = (Total Current Assets - Inventory - Prepaid Accounts - Amortization) / Total Current Liabilities × 100%

Cash ratio (%) = [ending balance of monetary funds + ending balance of financial assets held for trading + ending balance of bank acceptances receivable] / total current liabilities at the end of the period × 100%

Interest coverage multiple (times) = (total profit for the reporting period + interest expense included in finance costs for the reporting period) / (interest expense included in finance costs for the reporting period + capitalized interest expense for the reporting period)

Guarantee ratio (%) = outstanding guarantee balance at the end of the period / total owner's equity at the end of the period × 100%

Operating cycle (days) = 365 / { Operating revenue for the reporting period / [(opening receivable balance + closing receivable balance) / 2] } + 365 / { Operating cost for the reporting period / [(opening inventory balance + closing inventory balance) / 2] }

Gross profit margin (%) = 1 - operating cost for the reporting period / operating revenue for the reporting period × 100% Operating profit margin (%) = operating profit for the reporting period / operating revenue for the reporting period × 100%

Return on total assets (%) = (total profit for the reporting period + interest expense included in finance costs for the reporting period) / [(total

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assets at the beginning of the period + total assets at the end of the period)/2] × 100%

Return on net assets (%) = Net income for the reporting period / [(Total owner's equity at the beginning of the period + Total owner's equity at the end of the period)/2] × 100%

Return on net assets\* (%) = Net income attributable to owners of the parent company for the reporting period / [(Total equity attributable to owners of the parent company at the beginning of the period + Total equity attributable to owners of the parent company at the end of the period)/2] × 100%

Operating income cash ratio (%) = Cash received from sales of goods and services for the reporting period / Operating income for the reporting period × 100%

Net cash inflow from operations to current liabilities ratio (%) = Net cash flow from operating activities for the reporting period / [(Total current liabilities at the beginning of the period + Total current liabilities at the end of the period)/2] × 100%

Ratio of net non-financial cash inflow to total liabilities (%) = (net cash flow from operating activities + net cash flow from investing activities for the reporting period) / [(total liabilities at the beginning of the period + total liabilities at the end of the period)/2] × 100%

EBITDA/Interest expense [times] = Reporting EBITDA / (Interest expense included in finance costs for the reporting period + capitalized interest for the reporting period) EBITDA/Rigid debt [times] =

EBITDA / [(Opening rigid debt balance + Closing rigid debt balance) / 2]

Note 1. The calculation of the above indicators is based on the data in the Company's consolidated financial statements.

Note 2. Rigid debt = short-term borrowings + notes payable + long-term borrowings due within one year + short-term

financing bills payable + interest payable + long-term borrowings + bonds payable + other term debt Note 3. EBITDA = total profit + interest expense included in finance costs + depreciation of fixed assets + amortization of intangible assets and other assets

## Appendix V:

### Interpretation of rating results

The main credit rating of this rating agency is classified and interpreted as follows:

Level		Meaning
Investment Grade	Grade AAA	The issuer is highly capable of repaying its debt and is largely unaffected by adverse economic conditions, with minimal risk of default
	Grade AA	The issuer has a strong ability to repay its debt, is not significantly affected by the adverse economic environment, and the risk of default is very low
	Class A	Issuers are more capable of repaying their debts, more vulnerable to adverse economic environment and have lower risk of default
	BBB level	The issuer's ability to repay debt is average, subject to the adverse economic environment, and the risk of default is average
Speculative grade	BB level	The issuer's ability to repay its debts is weak and is greatly affected by the adverse economic environment, with a high risk of default
	Level B	The issuer's ability to repay its debt is heavily dependent on a favorable economic environment and the risk of default is high
	CCC level	The issuer's ability to repay its debt is extremely dependent on a favorable economic environment and the risk of default is extremely high
	CC level	Issuers have less protection in bankruptcy or reorganization and are largely unable to guarantee repayment of debt
	Grade C	The issuer is unable to pay its debts

Note: Except for the grades below AAA and CCC, each credit grade can be fine-tuned with "+" and "-" symbols, indicating slightly higher or lower than this grade.

## Ratings Statement

Except for the entrusted relationship between the rating agency and the rating subject as a result of this rating matter, the rating agency, the rating personnel and the rating subject do not have any affiliation that affects the independence, objectivity and impartiality of the rating behavior.

The rating agency and the rating personnel have fulfilled their due diligence and integrity obligations and have sufficient reasons to ensure that the rating report issued follows the principles of truthfulness, objectivity and impartiality.

The rating conclusion of this credit rating report is the independent judgment of this rating agency based on reasonable internal credit rating standards and procedures, and the rating opinion has not been changed due to undue influence of the rating subject and any other organizations or individuals.

The credit rating and subsequent follow-up rating of the rating agency are based on the information provided by the rating subject, who is responsible for the legality, authenticity, completeness and correctness of the information provided by the rating subject.

This credit rating report is used for reference of relevant decisions and is not a conclusion or recommendation for a certain decision.

The credit rating of this rating is valid until November 25, 2022. New Century Ratings will, in accordance with the "Follow-up Rating Arrangement", implement follow-up ratings on the rating targets from time to time and form conclusions to decide to maintain, change, suspend or discontinue the credit rating of the rating targets.

The relevant content and numerical analysis covered in this rating report are sensitive commercial information, the copyright of which belongs to this rating agency and may not be modified, copied, reproduced, distributed, sold or in any way transmitted outside without authorization.

## The rating technical documents on which this rating is based

- General Introduction to Rating Methods for the New Century (published in June 2014)
- Credit Rating Methodology for Basic Chemical Industry (2018 Edition)

(published in April 2018) The above rating technical documents are  
available on the official website of New Century Ratings.