2023

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01

Jan-Mar 2023

The economy is under intense pressure in 2022: these 3 types of industries are the focus

Chip giants invest to expand production in down cycle

Status and Prospects of Markets in Global Major Regions 2022: Recovery is underway, Challenges are indispensable

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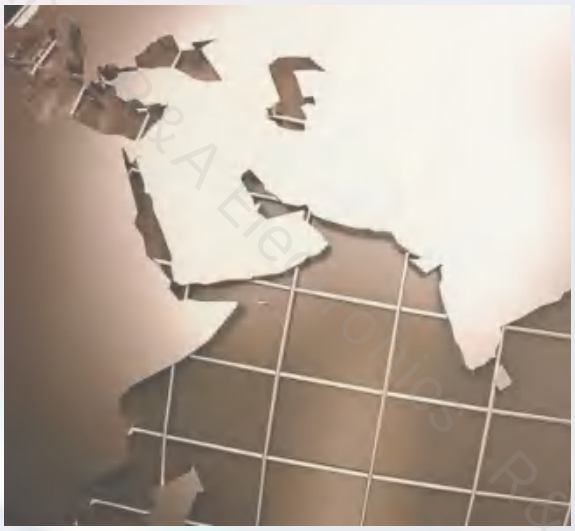

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Global Online

01

Status and Prospects of Markets in Global Major Regions 2022: Recovery is underway, Challenges are indispensable

Jola

In 2022, many regions of the world are facing challenges on the way to economic recovery: high inflation, universal unemployment, gap between the growth of regions...By the analysis of the United States, Europe and the Asia-Pacific region, the article encloses the current situation of the international economy and puts forward the outlook for the future.

Economic Situation and Prospects: GDP growth is low, economic activities expand moderately

The US

For the economic development of the United States, the Organization for Economic Co-operation and Development (hereinafter called "OECD") indicated that the real GDP in the U.S. is projected to grow by 1.8% in 2022, 0.5% in 2023 and 1.0% in 2024 (as shown in Figure 1). According to the Advance Estimate of the U.S. Department of Commerce in the third quarter, the real GDP grew at an annual rate of 2.6% in the third quarter of 2022, ending the previous two consecutive quarters of economic contraction (as shown in Figure 2).

CPI

According to the latest report from the U.S. Bureau of Labor Statistics, the overall CPI index in the United States in September exceeded expectations, rising by 8.2% year-on-year, which was 0.4% higher than that in August (As shown in Figure 3).

Figure 1 Real GDP forecast, Annual growth rate (%), 2013-2023
Source: OECD Economic Outlook: Statistics and Projections

Personal Consumption & Economic activities

In terms of personal consumption, economic activities expanded moderately in most regions in September, while the demand slowed in a few regions.

In the real estate market, home sales in the United States fell for the eighth consecutive month in September, recording 4.71 million units with a year-on-year decrease of 23.8%. However, home prices continued to climb, with the median home price rising 8.4% year-on-year to $384,800 in September. Low inventory keeps home prices high: existing home inventory recorded 1.25 million units in September, down 2.3% month-on-month and 0.8% year-on-year (as shown in Figure 4).

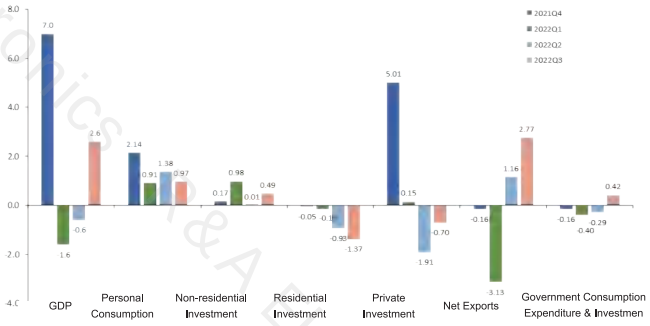
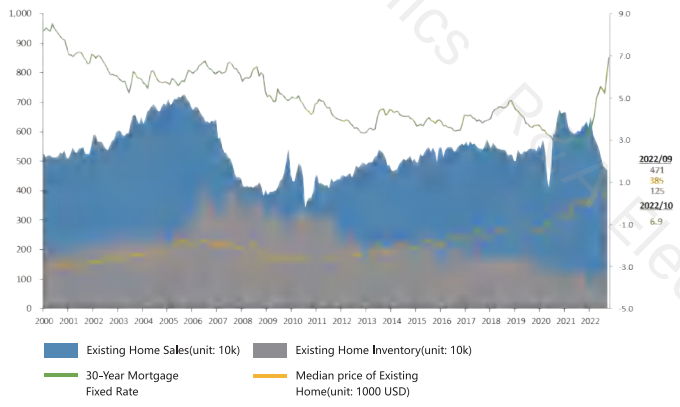


Figure 2 GDP in the third quarter of 2022 - driven by net exports and personal consumption
Source: OECD Economic Outlook: Statistics and Projections

Figure 4 Home sales fall due to the higher mortgage rates and rising home prices
Source: National Association of Realtors, Freddie Mac



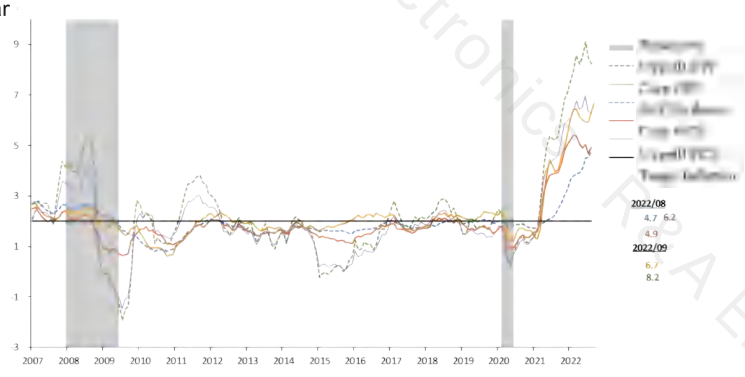


Figure 3 U.S. inflation falls to 8.2% in September 2022
Source: Bureau of Economic Analysis, Federal Reserve Bank of Dallas, U.S. Bureau of Labor Statistics, National Bureau of Economic Research (NBER)

In terms of retail industry, the Department of Commerce indicated that retail sales in the U.S. (excluding food) in September 2022 fell by 0.08% from the previous month. Soaring rent and health care costs are squeezing the budgets of many Americans (As shown in Figure 5).

In terms of auto sales, 13.99 million vehicles were sold in the U.S. in September, up 375,000 from August (As shown in Figure 6).

As for the Consumer Confidence Index(CCI), the University of Michigan Survey of Consumers reported that the CCI rose 1.3% from September to 59.9 in October, which exceeded expectations and reached the highest level since April (As shown in Figure 6).

In terms of economic activity, the latest data from the Institute of Supplier Management (ISM) showed that economic activity in the manufacturing sector increased in October, with the manufacturing index recording 50.2, down 0.7 percentage points from the previous month. Since September 2022, the economic activity in the service industry had increased for 28 consecutive months.The index of service industry was recorded as 56.7, down 0.2% from August (as shown in Figure 8).

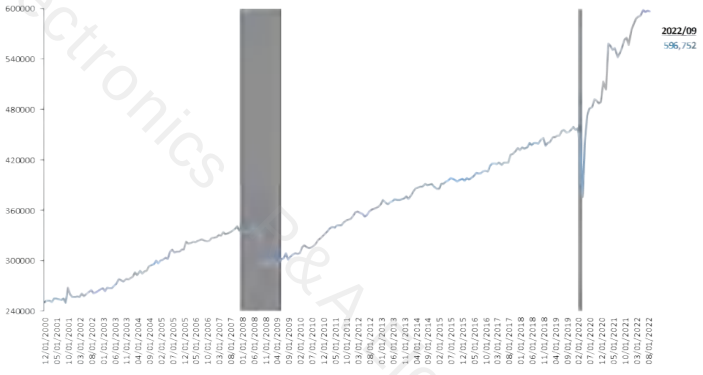


Figure 5 Retail sales month-on-month in September 2022(excluding food)
Source: U.S. Census Bureau

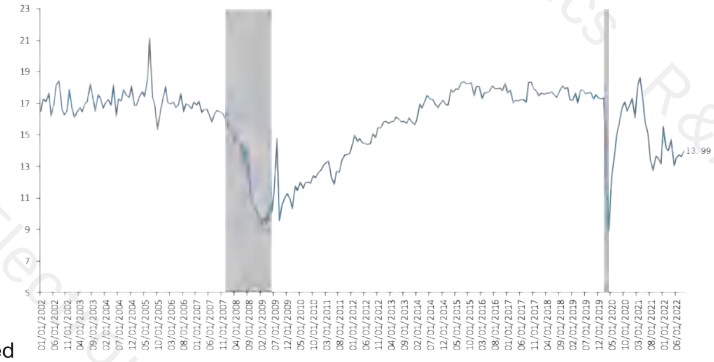


Figure 6 Auto sales rebounded slightly in September
Source: Federal Reserve Economic Data(FRED)

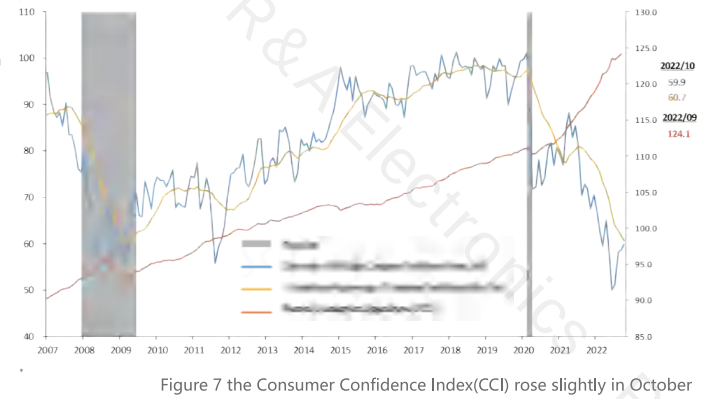
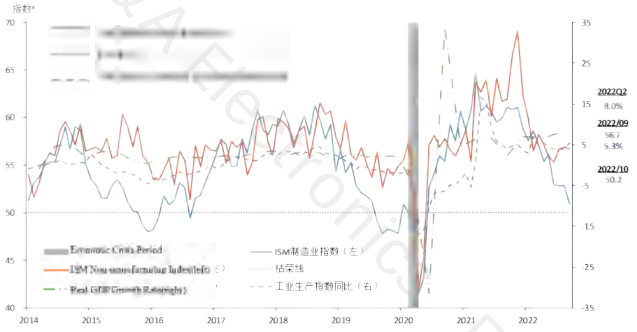


Figure 7 the Consumer Confidence Index(CCI) rose slightly in October
Source:Bureau of Economic Analysis, Surveys of Consumers, University of Michigan, National Bureau of Economic Research

Figure 8 Manufacturing and service industries continued to expand in September
Source: Bureau of Economic Analysis, Institute for Supply Management, Board of Governors of the Federal Reserve System, National Bureau of Economic Research



Market Overview: the recovery road face the twin problems of regional imbalances and high inflation

Imbalanced Recovery

According to the analysis and forecast of the Department of Commerce in the Bureau of Economic Analysis, the U.S. economic

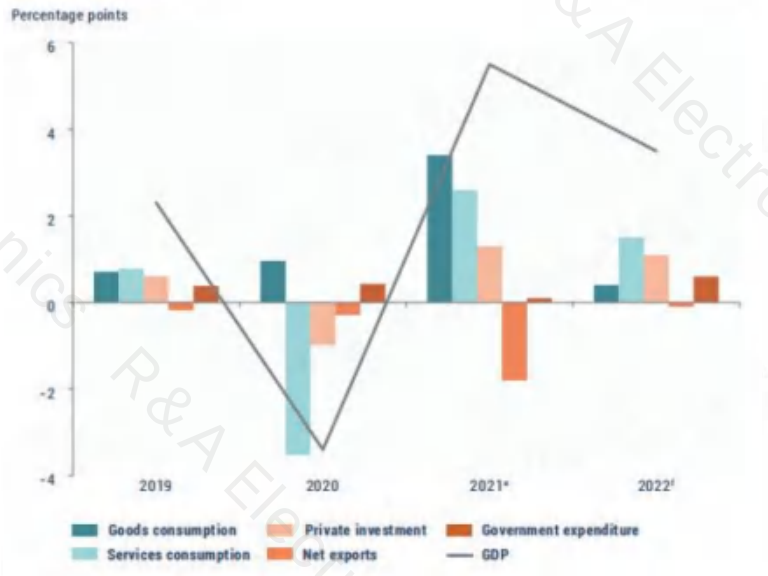


Figure 9 The contribution of demand components to GDP growth in the United States
Source: United States, Bureau of Economic Analysis, Department of Commerce, and UN DESA estimates and forecasts

recovery in 2022 is overly dependent on goods consumption, which is extremely imbalanced.

By the end of 2021, the consumption of goods drove the growth of GDP. The services consumption, as well as investment expenditure, recovered strongly. However, expenditure on non-residential structures remained extremely weak. (as shown in Figure 9)

At the same time, the U.S. economy faces growing supply -side constraints. First of all, a severe shortage of semiconductors has worsened due to continuing production disruptions and rapid draw-down of inventories in East Asian countries. This industrial parts shortage has hit the auto industry hard. Another factor of supply-side constraints has been a growing labor shortage.The labor force participation rates have remained lower than the pre-pandemic level. (as shown in Figure 10)

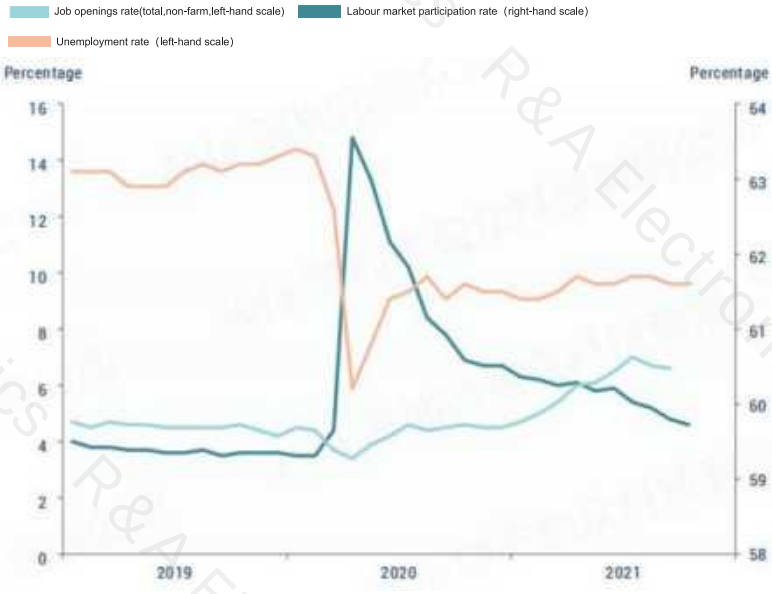


Figure 10 Labour market indicators in the United States
Source: United States, Bureau of Labor Statistics.

High Inflation

High inflation and tight financial conditions will further depress spending plans across the economy. With the slowing in domestic production, labor demand and wage growth will weaken. Price pressures will subside as energy prices stabilize and demand moderates, but core inflation is not expected to return to the Federal Reserve target until late 2024. (as shown in Figure 11)

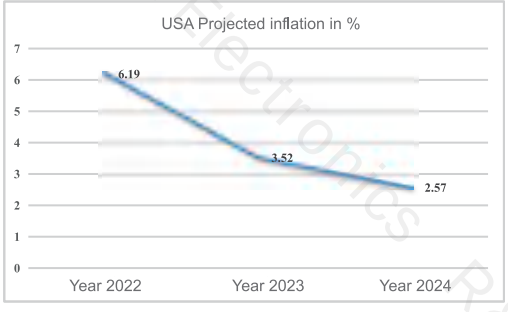


Figure 11 USA Projected inflation in %
Source: OECD Economic Outlook

Figure 12 Food CPI play a main role in driving up prices in September
Source: Bureau of Economic Analysis, Federal Reserve Bank of Dallas, U.S. Bureau of Labor Statistics, National Bureau of Economic Research (NBER)

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Food has been one of the main categories driving inflation in recent months. As shown in Figure 13, food prices rose by 11.37% year-on-year in September, a slight drop from August's 13.5% year-on-year increase, and the year-on-year increase in August was the largest increase in nearly four decades. Energy is another major inflationary factor. As can be seen from Figure 12, energy prices rose by 19.87% year-on-year in September, falling for the second consecutive month.

Electronic products continue to sell well, and semiconductors are the main export products

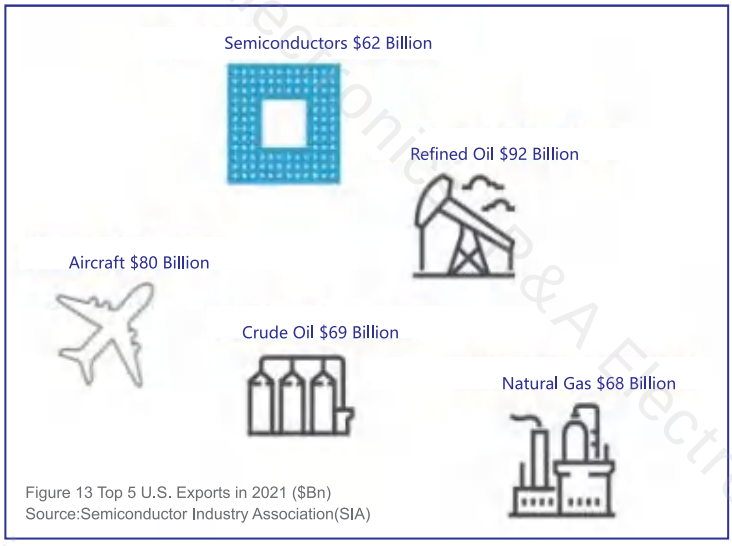


Figure 13 Top 5 U.S. Exports in 2021 ($Bn)
Source:Semiconductor Industry Association(SIA)

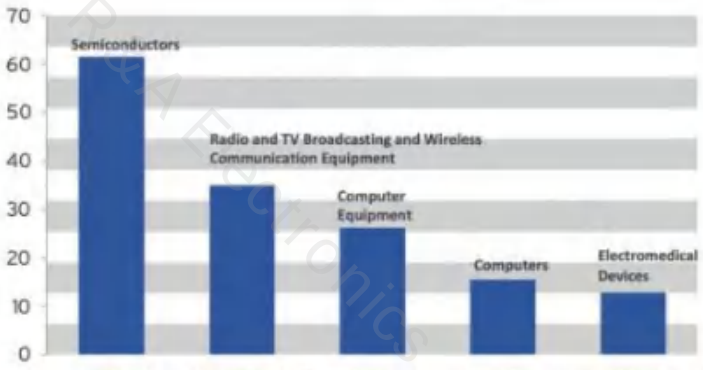


Figure 14 U.S. Electronic Product Export in 2021 ($Bn)
Source:U.S. International Trade Commission

Electronic products continue to sell well, and semiconductors are the main export products Starting in 2021, the e-commerce industry in the U.S. accelerated its growth under COVID-19. According to data from Statista, fashion and electronics are the two categories with the highest online sales in 2021 (around $180 billion and $160 billion, respectively). The online growth rates of beauty care and beverage products are also very significant (both growth rates are in the range of 30%-35%), and daily consumer goods generally maintain a relatively rapid growth momentum.

In 2021, the total value of U.S. semiconductor exports was $62 billion, ranking 5th among U.S. export commodities. The Top 4 exports were refined oil, aircraft, crude oil, and natural gas. (as shown in Figure 13)

For the export of electronic products in the U.S. in 2021, as shown in Figure 15, they are mainly semiconductors, radio and TV broadcasting and wireless communication equipment, computer equipment, computers, and electromedical devices:

Small appliances are more popular in the US market than large appliances

The development of the U.S. home appliance industry is also worthy of attention. Since 2020, the revenue of U.S. home appliances has reached US$52.7 billion, a year-on-year increase of 16%, showing a small and steady growth. According to data from Statista, in 2020, the sales volume of large appliances in the U.S. was only 62.7 million units, while the sales volume of small appliances can reach 514.1 million units. The market revenue of small appliances in the U.S. has exceeded $30 billion, which is the best in the world.

Economic Policy: investing in infrastructure and climate transition to strengthen public welfare

The United States economy rebounded strongly from the depths of the recession, aided by a large and enduring sustained policy response.

The Government is boosting public welfare with plans to invest in infrastructure and the climate transition, but an aging population means fiscal pressures are coming. In the report released by World Economic Situation and Prospects(hereinafter called “WESP”), the U.S. further efforts should focus on expanding the tax base and improving the efficiency of public spending, especially in the areas of health and infrastructure.

The new economic policies should address childcare and climate transition. Expanding public investment in childcare can increase affordability for the middle class and benefit female workforce participation. In addition, the impact on the middle class of policies to reach net-zero carbon emissions by 2050 should be considered, ensuring that labor market policies and place-based policies are in place to deal with some mess in the labor market as jobs switch from high-carbon to low-carbon activities. (Economic Survey of the U.S., October 2022)

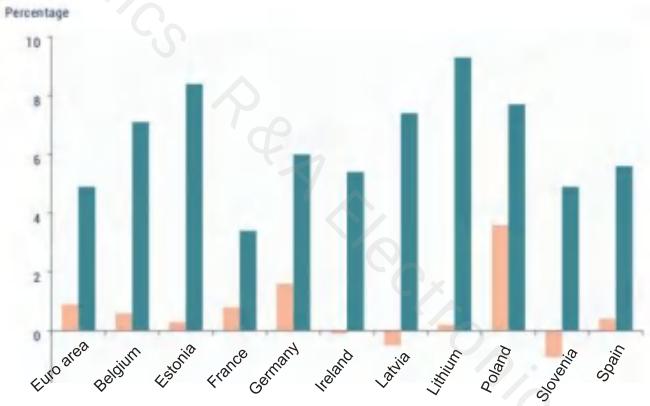
Gross Domestic Product(GDP)

According to data released by Eurostat on October 31, the GDP of the European Union and the Euro Area in the three quarters of this year grew by only 0.2% month-on-month after seasonal adjustment The International Monetary Fund(IMF) predicted that the economic growth rate of the Euro Area will be only 0.5% in 2023, which is the slowest growth among the world's major economies.

Market Overview: there are many difficulties such as high inflation and severe labor issue on the road to recovery

High Inflation

Figure 15 Annual change in the Harmonized Index of Consumer Prices for select European countries Source: Eurostat



Consumer price inflation turned negative in many European countries in 2020. At the beginning of 2021, it remained sluggish, but accelerated markedly in the second half of the year (as shown in Figure 15).

According to data released by Eurostat, the inflation rate in the Euro Area in October 2021 reached 10.6% on an annualized basis, setting a new record high. 11 of the 19 members in the Euro Area have 2-digit inflation rates, and Three Baltic States have inflation rates above 20%.Inflation in Europe is high, with energy prices as the primary factor. By the end of October 2022, the annual increase of energy prices in the Euro Area reached 41.5%, and the annual increase of second-ranked food was 13.1%. If these two factors are removed, the annual core inflation rate in the Euro Area is 5%, 1.3 percentage points lower than that in the US. However, the fact is that the inflation in Europe is 2.9 percentage points higher than that in the US.

According to Eurostat data, the consumer confidence index(CCI) in the Euro Area in September and October is -28.8 and -27.6 respectively, which are close to historical lows. According to the Autumn 2022 Economic Forecast from the European Commission, the economies of the EU, the EA and most member states are projected to fall into recession in the fourth quarter of this year, and economic activity will continue to shrink in the first quarter next year.

Depressed Labor Market

Xinhua News Agency reported in November that many European companies recently announced layoff plans. Industry experts believe that the trend of layoffs will continue, which has put pressure on the European labor market.

The German Employment Index in October released by the Ifo Institute for Economic Research in German showed that the companies' willingness to hire continued to decline, falling to the lowest value since April 2021. In response to the weak business profitability in Europe, a German chemical giant recently announced a cost reduction plan including layoffs, to cut the spending by 500 million euros per year in the next two years. Another German auto and industrial product supplier said it would cut 1,300 jobs by 2026 last month.

Affected by the decline in performance, many semiconductor companies have also announced layoffs worldwide. Many CEOs have stated that companies need to reduce operating expenses and simplify organizational structure, take necessary measures to maintain operation and sustainable development.

Many experts believe that the prospect of European energy supply is bleak, and the trend of layoffs will continue, which will inevitably bring pressure to the European job market.

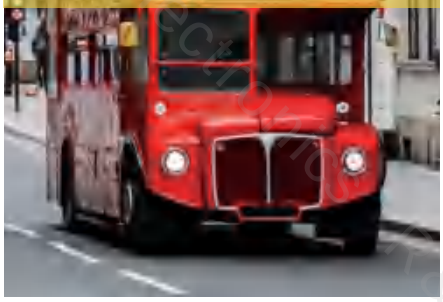
Economic Recovery with challenges

It is shown in Economic Surveys of the European Union and the Euro Area 2021 that The COVID-19 pandemic forced most euro area economies to repeat lockdowns in 2020 and early 2021, causing the euro area into its deepest recession in 2020. This recession has increased the risks of inequalities between regions.

By 2021, with the gradual easing of COVID-19 prevention measures, the economies of Europe will begin to growth. Output in most European economies registered a double-digit year-on-year increase in the second quarter, with the overall performance of the region in the first half of the year exceeding previous expectations. Private consumption surged and consumer sentiment improved after more than a year of restrictions. With the reopening of the service industry and the lifting of travel restrictions within the European Union, tourist arrivals have risen sharply in countries relatively dependent on tourism such as Greece and Italy.

Analysts said that the impact of COVID-19 on economic recovery cannot be underestimated. The report by Oxford Economics suggests that widespread quarantine rules have triggered a slump in consumer confidence and disrupted the labor market, which will weigh on economic activity.

The economy is gradually recovering due to the ease of COVID-19 containment measures, but the reaction force cannot be un derestimated



According to the 2022 Eurozone Economic Outlook Report, due to its larger industrial scale and long supply chain, Germany is the most vulnerable country among the Euro Area to supply chain bottlenecks. The lack of raw materials from abroad means that many business orders cannot be processed.

Since Italy relies on imports for most of its energy, rising energy prices will affect Italy more than many other countries.

The aftermath of UK's "Brexit" continues. The UK's new customs control regulations for EU goods came into effect at the beginning of this year, and the new regulations may exacerbate trade frictions between the UK and the EU. RayBarrell, a professor at Brunel University in the United Kingdom, said that the UK economy continues to be negatively affected by "Brexit", and believed that this is the main reason why the growth in UK lags behind other developed economies in 2022.

Development of Semiconductor-related Industries: supply-chain disruptions & soaring energy prices, hampering the development of many industries

Development of Semiconductor-related Industries: supply-chain disruptions & soaring energy prices, hampering the development of many industries

From the second half of 2021, Europe faced serious headwinds.Manufacturing Industry had recovered to its pre-pandemic levels, but was severely impacted by supply-chain disruptions caused by container shortages and reduced capacity in Asian ports. Some industries, especially the automotive industry, which is crucial to many economies in Europe, have been forced to curtail production due to the global semiconductor shortage. Supply disruptions and rising costs of input material have also brought the construction sector in Europe to a standstill in late 2021.

Additionally, many industries and services have faced massive worker shortages, especially truck drivers.

Soaring energy prices, especially natural gas and liquefied natural gas(LNG), caused a spike in electricity costs, and became another hurdle to economic recovery, disrupting output in energy-intensive businesses.

Maintain accommodative stance, normalize monetary policy gradually

In 2021, macroeconomic policies in Europe have largely maintained their accommodative stance, with ongoing liquidity and wage support schemes. As shown in Figure 16 , as a result of massive stimulus spending, public debt levels in some countries have soared well beyond the limits set by the Stability and Growth Pact.

With the implementation of a large-scale anti-crisis liquidity support program, the ECB is expected to start normalizing monetary policy gradually.

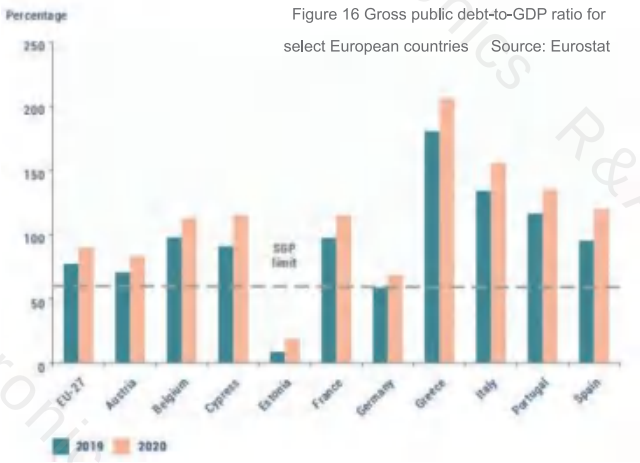


Figure 16 Gross public debt-to-GDP ratio for select European countries Source: Eurostat

Economic Situation and Prospects: strong rebound in early 2022, then gradually slows down

Asia-Pacific Region

According to Regional Economic Outlook for Asia and Pacific 2022 by International Monetary Fund, the economies of the Asia-Pacific showed a strong rebound momentum at the beginning of year 2022.

However, there have been signs of a slowdown since the second quarter. According to the forecast of the International Monetary Fund, the real GDP growth rate of the Asia-Pacific region is expected to drop to 4.0% in 2022 and rise slightly to 4.3% in 2023, which is far lower than the average growth rate of 5.5% in the past 20 years (as shown in Figure 17). These forecasts have been revised down by 0.9 and 0.7 percentage points respectively in the second quarter. Growth in most economies in the region will slow further in 2023.

Figure 17 Economic Forecasts: Asia and the Pacific (real GDP growth, percent) Source: IMF, World Economic Outlook database and IMF staff estimates and projections

Market Overview: unbalanced economic growth among regions

According to the the Regional Economic Outlook for Asia and Pacific 2022, the overall economic growth in the Asia-Pacific region will gradually slow down in the second quarter of 2022, but the economic growth trends of different regions are not completely consistent.

East Asia: increasing uncertainties

According to the analysis of the WESP 2022, the East Asia region has started a new economic recovery, but also faces increasing downside risks and many uncertainties.China's economy barely grew in the second quarter, but the IMF predicts that with the gradual easing of COVID-19 containment measures, the growth rate in China will rebound slightly in the second half of 2022, and the growth rate is expected to reach 3.2 % and will rise to 4.4% next year.

According to the forecast of the IMF, Japan's economic growth rate in 2022 will remain at 1.7%, but the economic growth rate in 2023 will decline. The OECD expects the GDP growth rate of Japan to be 1.8% in 2023 and 0.9% in 2024. After peaking in 2022, inflation will fall back in late 2023 as energy prices stabilize.

Economy in Republic of Korea grew strongly in the second quarter, and the annual growth rate rose to 2.6%. However, affected by external adverse factors, the country's economic growth rate in 2023 was revised down to 2%.

East-South Asia: strong recovery

According to the forecast of the IMF, the economy of Southeast Asia is likely to recover strongly.
Vietnam is increasing its importance in the global supply chain, and its economic growth is expected to reach 7% this year, with a slight decline next year. The Philippines is expected to grow by 6.5% this year, while Indonesia and Malaysia are expected to grow by more than 5%.

Due to the improvement in tourism, the economies of Cambodia and Thailand will accelerate in 2023. However, Myanmar has been affected by the coup and COVID-19, and its economic situation has severely declined. Its economic growth rate this year will remain at a low level.

South Asia: economic development is more challenging

According to the WESP 2022, economic recovery in South Asia is gaining momentum but remains unstable and faces downside risks.

Sri Lanka, one of the island nations, is still in deep economic crisis, but the authorities have reached an agreement with IMF staff on a plan to help stabilize the economy, proposing a new fund support plan. The goal is to restore macroeconomic stability and debt sustainability, while maintaining financial stability and protecting the vulnerable.

In coastal Bangladesh, the Russo-Ukrainian war and high commodity prices have dampened a solid post-pandemic recovery. The authorities have applied for an IMF-backed program to strengthen their economic position externally.

According to the IMF, Economies that rely on tourism are beginning to benefit as travel restrictions are gradually lifted and travel policies eased. Growth in the South Asian island nation will rebound strongly to 4.2% next year from 0.8% this year.

Development of Semiconductor-related Industries:manufacturing and exports are supported, but also face obstacles.

According to the WESP 2022, strong global demand for Asian manufacturing and exports underpins overall economic growth in Asia. China, Republic of Korea, Singapore and Taiwan are benefiting from the boosting demand for electronics, electrical and information technology equipment and cars in developed countries due to a rapid rebound in household spending. These investments were mainly used for machinery and equipment, and to support export manufacturing.The main factor behind Japan's economic recovery since the second half of 2020 has been export growth, but it has lost momentum so far. Disruptions to global supply chains, especially semiconductor shortages, have forced the auto industry to operate at full capacity. In the second half of 2021, the export of automotive products will drop sharply. Supply-chain disruptions have added inflationary pressure to commodity prices, but this has done little to offset persistent deflationary trends, especially in service prices.

For semiconductor industry, the ongoing technical and trade tensions between China and the United States have further hindered the production and export of semiconductors. Rising energy prices and power shortages have also dented exports. For example, power rationing in China has hampered production at many factories, including those supply components to large consumer electronics and automakers. In the future, demand for manufactured goods in Asia is expected to gradually decline as other economies recover from the outbreak and restore local supplies.

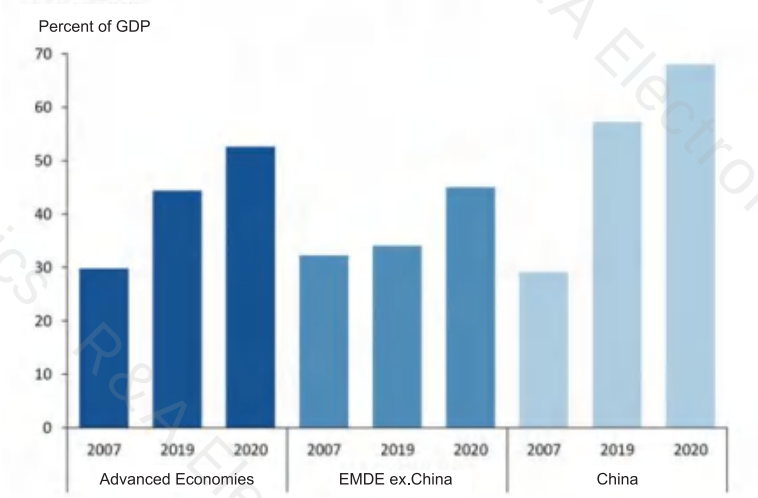


Figure 18 The pandemic further fueled Asia's public debt growth
Source: IMF Global Debt Database and IMF staff calculations

Note: Advanced category includes Australia, Japan, Korea, New Zealand, Singapore and Taiwan Province of China
EMDE = Emerging markets and developing economies

Economic Policy:tightening policy until inflation falls back

According to the IMF forecast: for the Asia-Pacific region, policy makers face complex challenges amid slowing economic growth and must take strong responses.

First, central banks must persist in tightening policy until inflation falls back to target in a sustained manner. Exchange rates should be allowed to adjust to reflect various fundamentals, including terms of trade (a measure of the price of a country's exports relative to its imports), and foreign monetary policies. However, if a global shock leads to a spike in borrowing rates unrelated to domestic policy changes, or if it threatens financial stability or undermines the central bank's ability to stabilize inflation expectations, FX intervention may be a useful part of the reserve policy mix, as well as macro-prudential policy. Countries should urgently consider improving their liquidity buffers, including requiring eligible people to use the IMF's precautionary tool.

Public debt in Asia has risen sharply over the past 15 years and has risen further during the pandemic. Fiscal policy, together with monetary policy, should continue to be gradually consolidated to moderate demand, with a focus on the medium-term goal of stabilizing public debt. (as shown in Figure 18)

Therefore, the authorities should use temporary targeted measures to protect vulnerable groups from rising living costs. In countries with high debt levels, support measures must be budget-neutral to allow fiscal consolidation to continue.

In the long term, the policy must repair the damage done by COVID-19 and the Russia-Ukraine war. COVID-19 and current headwinds are likely to inflict huge long-term trauma in Asia, partly because high corporate leverage weighs on private investment. Meanwhile, the educational losses from school closures could erode manpower capital if they are not remedied soon.

Figure 19 Summary of economic development status in major countries
Source: Trading Economics

Regarding the economic development of major countries in the world, Trading Economics made a summary in Figure 19 below (real-time data as of December 8, 2022). The GDP of most countries increased compared with the same period last year, and the highest GDP year-on-year among these countries is India (6.3%), but the GDP of Russia has decreased by 4% compared with the same period last year.

Summary of economic development

01

Global Economy may stagnate in coming years with a lack of momentum

Jade

The economy across the world was given a violent blow by repeated outbreaks of COVID-19, conflicts between Russia and Ukraine, inflation, rising prices, monetary policy tightening in developed countries, and layoffs. A standstill in global economy is supposedly in the coming years.

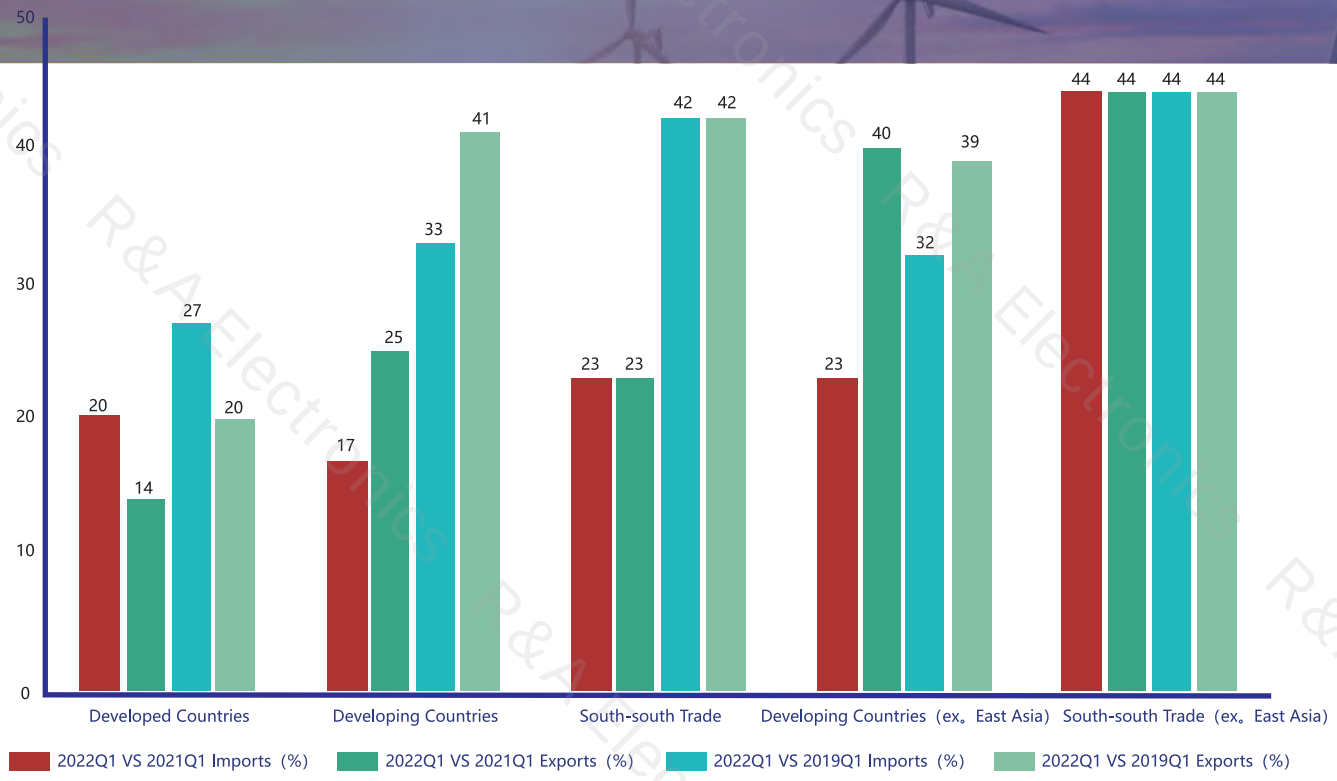


Figure 1 Global Trade volume growth rate

Another Global Trade Update report delivered by UNCTAD in July 2022 unveils that the global trade volume is up to historic $7.7trn in the first quarter this year, an increase of $1trn over the same phrase last year. The remarkable growth is accomplished. Amid them, global trade volume in goods and services of the first quarter in 2022 stays upward and fulfills $6.1trn in goods, up by 25% year-on-year and $1.6trn in services, up 22% year-on-year and with an increment of 1.7% over the fourth quarter in 2021.

The highest growth of the global trade value in Q1 2022

A report about global trade in 2021 released by the United Nations Conference on Trade and Development (UNCTAD), shows that the global trade sums in 2021 reached $28.5trn, a year-on-year increase of a quarter, which is 13% higher than before the outbreak of the epidemic in 2019. Among them, the global trade in goods and services is $22.4trn and $6.1trn respectively.

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Trade in goods and services is forecast to continue to ascend in the second quarter of 2022, but at a slower pace, the report wrote. The Russia-Ukraine conflict in February this year led to further increases in international prices for energy and primary commodities, which have had an impact on international trade. Meanwhile, decline of partial demands and aggravation of tensions for international trade are likely to be caused by current challenges, including interest rates rise, lower incomes, high prices, geopolitical conflicts, ongoing challenges to global supply chains, regionalization, and policies that support the transition to a green global economy.

Goods	Q1 2022 relative to 2019 average		Q1 2022 relative to Q4 2021	
	Imports	Exports	Imports	Exports
Brazil	↑ 30%	↑ 43%	↓ 3%	↑ 15%
China	↑ 35%	↑ 49%	↑ 2%	↑ 4%
India	↑ 37%	↑ 34%	↑ 4%	↑ 7%
Japan	↑ 20%	↑ 8%	↑ 6%	↑ 2%
Republic of Korea	↑ 39%	↑ 29%	↑ 4%	↑ 3%
Russian Federal	↑ 15%	↑ 38%	↓ 6%	↑ 5%
South Africa	↑ 19%	↑ 46%	↑ 8%	↑ 10%
United States	↑ 30%	↑ 17%	↑ 8%	↑ 4%
European Union	↑ 37%	↑ 12%	↑ 7%	↑ 2%

Figure 2 Goods trade rise rate in Major Economies

The report also looks at the growth of trade in goods among major economies, with both developed and developing countries registering significant year-on-year growth in the first quarter of 2022. South-south trade among developing countries, in particular, increased by 23% year-on-year. Imports of goods in the first quarter of 2022from Brazil and Russia declined by 3.0% and 6.0% respectively, while other economies maintained their relative growth trend, versus the fourth quarter of last year. Brazil and South Africa, for example, saw strong growth in goods exports in the first quarter of 2022, up 15% and 10% respectively. But economies' trade in services is lagging behind. Trade in services in the fourth quarter of 2021 has not yet recovered to its average rate of pre-pandemic in most countries, but with the exception of Brazil, Japan andthe EU the rest of countries showed improvement.

Services	Q4 2021 relative to 2019 average		Q4 2021 relative to Q3 2021	
	Imports	Exports	Imports	Exports
Brazil	↓ 27%	0%	↓ 2%	↓ 1%
China	↓ 8%	↑ 58%	↑ 3%	↑ 9%
India	↑ 16%	↑ 21%	↑ 4%	↑ 4%
Japan	↓ 5%	↓ 19%	0%	↓ 2%
Republic of Korea	0%	↑ 26%	↑ 3%	↑ 1%
Russian Federal	↓ 15%	0%	↑ 7%	↑ 9%
South Africa	↓ 15%	0%	↑ 1%	0%
United States	↓ 1%	↓ 8%	↑ 2%	↑ 3%
European Union	↑ 3%	↑ 10%	↓ 2%	↑ 2%

Figure 3 Services trade rise rate in Major Economies

The conflict between Russia and Ukraine has great influence on the foreign trade of the two countries. The trade activities of them have been clearly affected by the war's direct disruption of national logistics networks, changes in market demand and the imposition of sanctions. Ukraine's imports and exports to all three of its major economic partners, China, US and Europe, fell in the first quarter of 2022, with a sharper decline in imports. Exports to Europe, China and US were down 10%, 31% and 10% year-on-year respectively, while imports from the three parties fell even more sharply, by 90%, 27% and 48% respectively. In contrast, Russia's imports and exports to China, US and Europe show obvious differences. In the first quarter, Russia's exports to China and European Union rose 38% and 75% year on year, respectively, while exports to the United States fell 4%, while imports from China, US and Europe scaled down 18%, 83% and 59%, respectively. Among them, Russia's exports of refined copper to China decreased significantly, its exports of crude oil, platinum and nitrogen fertilizerto the United States decreased significantly, and its major exports

to the European Union all increased (natural gas exports increased 259%). Since the conflict between Russia and Ukraine began in late February, trade figures between the two countries are expected to change more dramatically in the second quarter.

UNCTAD speculates international trade map of the future on the basis of analyzing increase and decrease among a variety of commodities in the first quarter of 2022. The trade volume of most commodities keeps growing significantly, like energy products, metals and chemicals, agricultural products, clothing accessories, machinery and equipment, office equipment, medicine. Trade in transportation was on a downward trend due to a decline in aircraft orders, and trade in communications equipment was also lower than the same period in 2019 and 2021. International trade in road vehicles and precision instruments also underperformed due to short semiconductor inventories and delayed transportation worldwide.

However, the factors impeding trade development are ever-changing, and the international situation is even more volatile. Trade activities in the future suffer from virus mutations and repeated epidemics, the tightening of monetary policy in developed countries, the rising gas prices in Europe, inflation, global supply pressure and other challenges and problems.

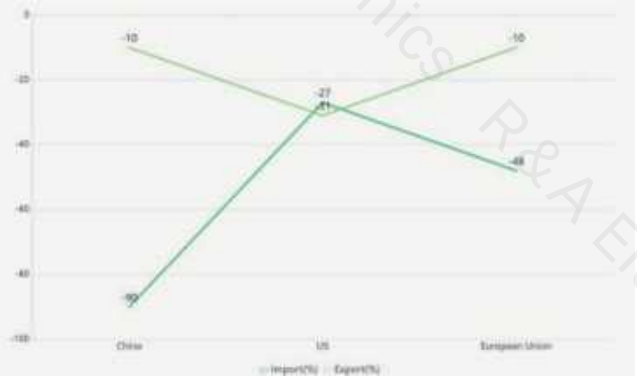


Figure 4 Ukraine's imports and exports from & to China, US and Europe

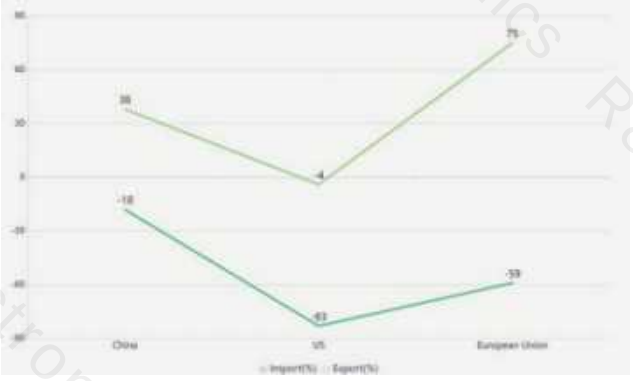


Figure 5 Russia's imports and exports from & to China, US and Europe

Global Trade value surged in 2021

According to WTO statistics, global trade in goods was up 26% year-on-year in 2021. What it had done in 2021 made the price of imports and exports jump by 15% average. There was a 59% increase in the trade volume of fuels and minerals, a 19% growth in agricultural products and a 21 % increase in manufactured goods. The related data showed steady year-on-year growth in products such as steel, chemicals and integrated circuits, while clothing and machinery showed modest growth. The 2021 value of trade in pharmaceuticals, computers and integrated circuits is actually higher than pre-pandemic in the belief of that the demand for COVID -19 vaccines has skyrocketed and that remote working becomes more universal. By contrast, trade in automotive products in 2021 grew 14% year on year, but still contracted 4% from 2019. World merchandise trade gained an increase of 15% year on year in 2021 due to mass needs for transportation services. While tourism export maintains growth, the pace is slow. Financial and business services rose 12% year on year in 2021.

India harvests the first-fastest GDP growth around the world

India's GDP growth rate is ranking NO.1 at present in the world, with 7.7% increment in the first three quarters of this year. India's GDP grew by 7.5% in the third quarter, according to official figures. In the first three quarters, GDP rose 2.5% in the United States, 3% in China, 2.2 percent in Germany, 3.3% in France, 1.4% in Japan, 5.8 percent in the United Kingdom and 4.1% in Canada.

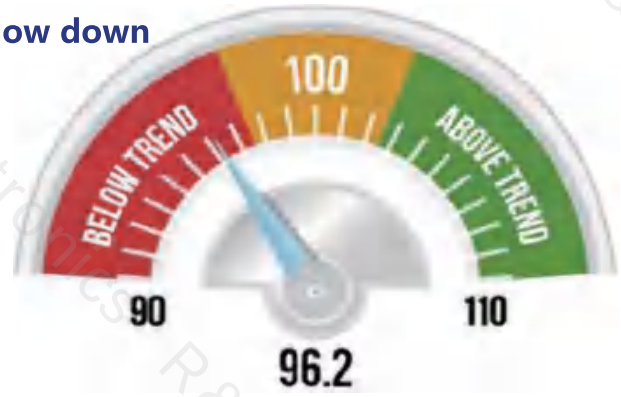
Countries	Billion Dollars	Growth rate year-on-year
United States	187978	2.5
China	131723	3.0
Japan	31420	1.4
Germany	30311	2.2
India	25360	7.7
United Kingdom	23090	5.8
France	20817	3.3
Canada	16125	4.1

Figure 6

There are two reasons for India's relatively high economic growth rate. First, India has attracted a large amount of foreign investment, with the investment increase of over 10% in the third quarter. The manufacturing investment has grown rapidly, and India's manufacturing and industrial chain layout has increasingly caught global capital's eyes. Second, India's jumbo inflation has made a great contribution to its GDP. In the third quarter, India's consumer price index (CPI) increased by more than 7%, including a 7.4% rise in September. The core inflation rate exceeded 6%, indicating a sharp rise in prices.

Global trade growth in 2022 is forecast to slow down

All authoritative organizations have made reasonable forecasts and judgments on the global trade growth this year and the coming years. The World Trade Organization (WTO) released a forecast of global trade value growth in mid-April 2022 . The WTO expects the volume of global goods trade to grow by 3% in 2022 and 3.4% in 2023. In late November, the WTO estimates a 3.5% increase for global trade in goods in 2022, up slightly from its April forecast. But the forecast for 2023 is 1.0%, far away from one in April.



At the end of November, the WTO released its latest Goods Trade Barometer index, with a below-trend reading of 96.2 lower than baseline of 100, reflecting a decline in global needs for trade in goods. (The barometer index shows how the latest data compares with short-run trends in goods trade. A reading of 100 indicates trade expansion in line with recent trends. Readings greater than 100 suggest above-trend growth while readings below 100 indicate below-trend growth. The Goods Trade Barometer is updated on a quarterly basis.)

Figure 7 Goods Trade Barometer index

The index of export orders is reading of 91.7, aeroplane of 93.3, electronic components of 91, container shipping of 99.3, raw material of 97.6, all below the baseline of 100, indicating a gloom and doom in the global trade demands. However, it is noticeable that the automotive products index is 103.8, above the baseline.

The WTO cited strong sales in the United States, promotion of supply chain and an increase in Japanese auto exports due to a devalued yen exchange as reasons behind the out-performance of auto. The expectation of the drop in the barometer of global trade in goods resembles the WTO's trade forecast in early October, as multiple pressures strike the global economy. The WTO estimates that global trade will lose momentum in the second half of 2022 and remain sluggish through 2023.

According to WTO monitoring figures, the good trade barometer is declining, while the barometer of goods trade is on the rise. (The good trade barometer is a leading indicator that shows trends in real time . The commodity trade index shows actual trade data.) The WTO explained that such discrepancies had occurred in 2021 and 2022, possibly due to delays in shipments posed by disruptions in the global supply chain since COVID-19. The organization speculates that the value of trade in goods may fall in line with the barometer as quarterly trade data for the second half of 2022 is released.

The report from WTO manifests that the Middle East is expected to show the highest increase in exporting countries this year, up 14.6% year on year, followed by Africa at 6.0%, North America at 3.4%, Asia at 2.9%, Europe at 1.8%, South America at 1.6%. In addition, imports from the Middle East are predicted to achieve the fastest growth, rising 11.1% year on year, followed by 8.5% from North America, 7.2% from Africa, 5.9% from South America, 5.4% from Europe and 0.9% from Asia.

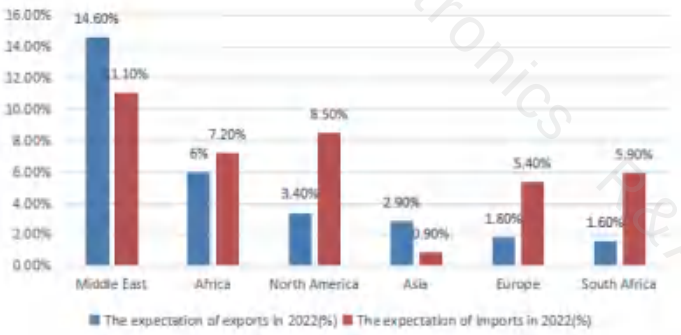


Figure 8

The WTO noted import demand is estimated to scale down as trade volume growth in major economies slows for a variety of reasons. The conflict between Russia and Ukraine has led to higher energy prices in Europe, which will push up household bills and factory costs. Tightening US monetary policy will bang interest-sensitive areas of spending such as housing, cars and fixed assets; Rising import bills for fuel, food and fertilizer tends to accompany with food shortages, food security and debt woes in developing countries.

As specific figures on the economic impact of world conflicts are scarce, WTO economists can only rely on economic simulations to make reasonable projections of global gross domestic product (GDP) in 2022 and 2023, the WTO pointed out in its mid-April 2022 trade forecast report. Under its assumptions, the WTO forecasts that global GDP will move ahead by 2.8% year-on-year in 2022 and 3.2% in 2023. At the end of November, the WTO reissued its global growth forecasts, projecting 2.8% growth in 2022 and 2.3% in 2023. Projections for 2023 are down comparing with the previous.

In its global Economic outlook report released in November, the Organization for Economic Cooperation and Development (OECD) predicted that global economic growth in the next two years would be much lower than before the Russia-Ukraine conflict, as the large-scale and historic energy shock caused by the conflict constantly stimulated inflation, weakened purchasing power and increased global risks. The world economy is projected to grow by 3.1% in 2022. The growth rate will fall to 2.2% in 2023 and 2.7% in 2024.

The OECD expects Asia's major emerging economies to account for nearly three-quarters of global GDP growth in 2023. GDP rise in the US and Europe is trimmed with a astounding speed. The U.S. economy will ascend by 1.8% in 2022, down to 0.5% in 2023; Growth in the euro-zone will be 3.3% in 2022, falling to 0.5% in 2023; The UK economy will be up by 4.4% in 2022, downward by negative growth of 0.4% in 2023.

The World Economic Outlook report issued by the International Monetary Fund (IMF) in October 2022, predicted that global economic growth would cut off from 6.0% in 2021 to 3.2% in 2022 and 2.7% in 2023. Global inflation will predictably jump from 4.7% in 2021 to 8.8% in 2022, but the pace of its increase will slow in 2023 and 2024, supposedly to 6.5% and 4.1%, respectively.

The outlook of international tide for 2022

The Current Affairs Information Manual published by Xinhua News Agency in earlier 2022, analyzing and recording the real-time affairs in the world, provides a reference to generalize the outlook of global trends for 2022. Here are seven global trends for 2022.

First, outbreaks of Covid-19 are fickle. Mutated strains of the virus continue to break out in various places, seriously impeding normal economic activities, international investment and trade.

Second, the recovery of global economy in different regions is unbalance. Vaccines are crucial to epidemic prevention, which is a premise for economic recovery. The uneven distribution of vaccines in the world and the acute shortage of vaccine injections in low-income countries, in large measure caused imbalanced economic development among regions and between developed and developing countries, which severely hinders the pace of global recovery. However, with the withdrawal of quantitative easing policies by major countries including the US across the world, t he economic pace will moderate rather in 2022.

Quantitative easing is often implemented when interest rates hover near zero and economic growth is stalled. Central banks have limited tools, like interest rate reduction, to influence economic growth. Without the ability to lower rates further, central banks must strategically increase the supply of money.

Third, industry supply chain is speeding up for reshaping. Powerful countries and multinational giants focus on industrial security and consider the balance between efficiency and security. Developed countries, such as the US, Europe and Japan, vigorously promoted industrial reflow or return to surrounding stable areas, emphasizing the initiative and controllability of supply chains.

Variation in the flow of production components due to the pandemic have stifled the global industrial chain, leading to supply shortages and soaring inflation in most countries and regions. The EU introduced the carbon border adjustment mechanism (CBAM) in 2021, and plans to impose "carbon tariffs" on imports from countries and regions with relatively loose carbon emissions from January 2023. Some states like the America intend to get into the swing of imposing “carbon taxes”. China has launched national carbon emission trading, and the transformation of the global green economy is moving faster.

Fourth, China-U.S. tension is intensifying. Joe Biden proposed the so-called "competition, confrontation and cooperation" principle for US policy toward China, after he took office. In order to secure its "dominance", the US insists to suppress China in many fields, including economy, trade, military, science and technology, politics and culture. Even so, China and the United States are expected to cooperate in international public goods such as addressing climate change, fighting the epidemic and maintaining global strategic stability. It objectively meets the needs of the situation and the expectations of the international community. In May 2022, US Secretary of State Antony Blinken made a speech in which he mentioned that the Biden administration's new strategy is "investment, alliance and competition", and the competition is directed at China.

Fifth, the burst of the Russia-Ukraine conflict in late February 2022 further intensifies global inflation rise and represses economic growth and the global supply chain, sharply increasing the cost of global industrial raw materials and container transportation.

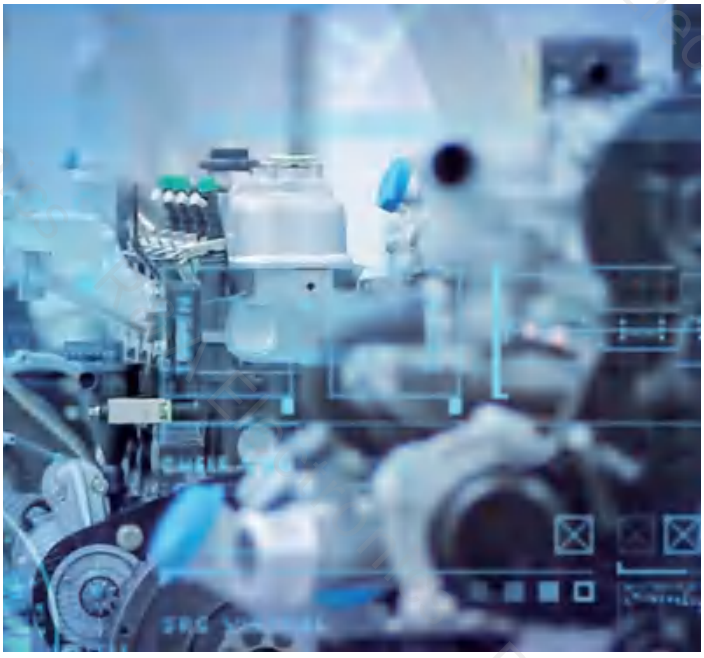
Sixth, major economies adjust their orientation. Relations between the U.S. and Europe have melted since Joe Biden started his tenure, but the two sides are still in arguments over digital taxes, energy and trade. In addition, the America organizes an Anglo-Saxons group together with Britain and Australia, and intercepts a military order from French, so that the leaders of Europe Union, French and Germany firmly convince that international trends generate strategic autonomy. The Brexit United Kingdom mainly through the special relationship with the US, barely maintains its powerful status; With Germany stepping in a "post-Merkel era" and a presidential election in France in April 2022, it is crucial that the two sides work together to inject new impetus into the EU.

Finally, A wave of interest rate rise in developed countries has shocked the global economy. Interest rates have been lifted at central banks around the world, such as the Federal Reserve, the European Central Bank, the Bank of England, the Bank of Canada and the Reserve Bank of Australia and so on, at a pace that has never been seen in 50 years, which is likely to last next year, according to a World Bank study published in September. Therefore, the downturn of the global economy has been greatly exacerbated.

The Global semiconductor will ease growth in the future

Jola Jade

The global semiconductor market is expected to decline by 4.1% to US$557 billion by 2023, driven by the memory market. In the latest WSTS forecast, this category is expected to drop to US$112 billion by 2023, a 17% decline from the previous year. Some other major categories, such as Optoelectronics, Sensors, Discrete and Analog, showed single-digit growth.



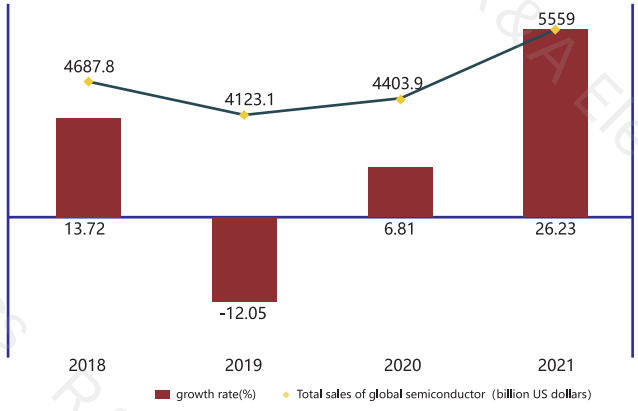


Figure 1

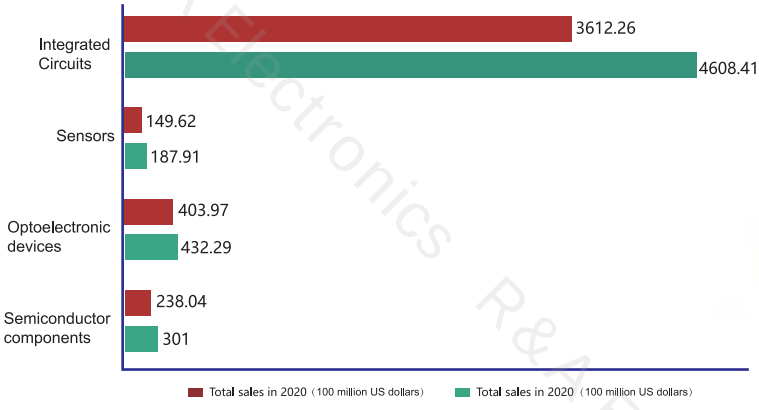


Figure 2

The global semiconductor market soared incredibly in 2021

It promotes a rapid increase of the demands for semi-electronic downstream such as artificial intelligence, big data, cloud computing, Internet of Things, automotive electronics and consumer electronics and further boosts the growth of the market. In 2021, the market scale grows rapidly, with a total of 1.15 trillion chips sold, up 26.23% year-on-year, and the sales volume reaching 555.9 billion US dollars.

the global sales of integrated circuits in 2020-2021 are $ 361.226 billion and $460.841 billion respectively, accounting for about 80% of the total sales of the global semiconductor industry. Integrated circuit can be subdivided into logic circuit, memory, processor and analog circuit. In 2021, the proportion of these four products is 27.85%, 27.67%, 14.43% and 13.33%. In addition, the sales volume of sensors, optoelectronic devices and semiconductor components in 2021 is $18.791 billion, $43.229 billion and $30.1 billion, accounting for 3.4%, 7.8% and 5.4%, respectively.

Semiconductor sales in the Americas grew the most in 2021, up 27.4% year-on-year. China remains the largest single market for semiconductors, with sales totaling $192.5 billion in 2021, up 27.1% year-on-year. Europe's 2021 semiconductor market sales increased by 27.3% and Japan's by 19.8%. Sales in Asia Pacific and other regions rose 25.9%.

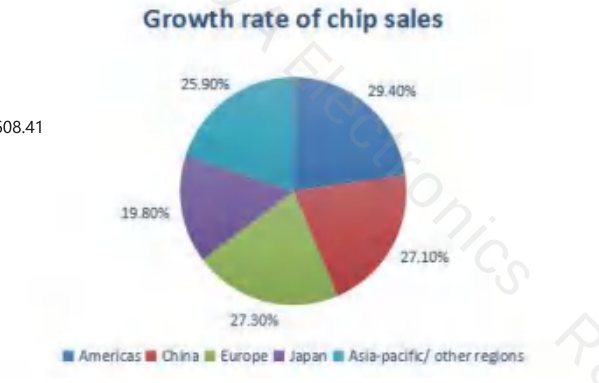


Figure 3

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A report released by Gartner, reveals that the top companies in the global semiconductor industry in 2021 are as follows: Samsung transcended Intel as the chip leading. Samsung's semiconductor revenue surged 31.6% to $75.95 billion in 2021. Intel's revenue fell to $73.1 billion, up just 0.5%

NO.	Brand	Region	Annual income in2021 (billion US dollars)	Market Sales（%）
1	Samsung	Korea	75.95	13.7
2	Intel	US	73.1	13.1
3	SK Hynix	Korea	36.326	6.5
4	Micron	US	28.449	5.1
5	Qualcomm	US	26.856	4.8
6	Broadcom	US	18.749	3.4
7	Media Tek	China	17.452	3.1
8	TI	US	16.902	3.0
9	NVIDIA	US	16.256	2.9
10	AMD	US	15.893	2.9
		Other Regions	230.067	41.4

Figure 4

Global semiconductor market sales reached about 556 billion dollars in 2021, PC and communications markets accounted for 31.5% and 3.7% separately, automotive products accounted for 12.4%, consumer electronics accounted for 12.3%, Industry accounted for 12% and government 1%, according to data released by the United States Semiconductor Industry Association (SIA).

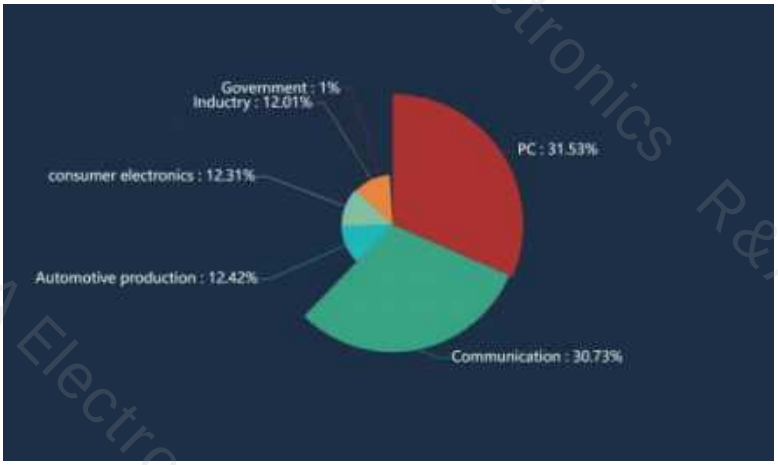


Figure5

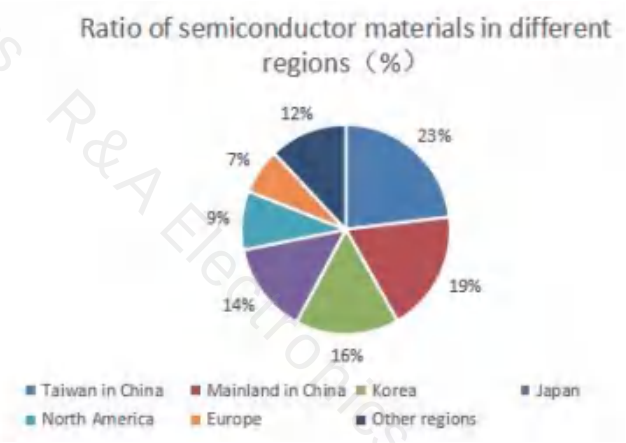


Figure 6

As demand for chips grows, so does the overall scale of global semiconductor materials. Data shows that the size of the global semiconductor market in 2021 reached $64.273 billion, with a year-on-year growth of 16%. Taiwan Province and Mainland in China are the largest markets for semiconductor materials, accounting for 22.9% and 18.6% of the global semiconductor material market respectively. Generally, most products in mainland China are still concentrated in middle and low-end semiconductor materials, with the slow development of high-end photoresist and CMP pad.

IC Insights reported that the global shipments of smart home devices in 2020 and 2021 are 854 million and 896 million for each. Global PC shipments were 304 million and 349 million, respectively. Shipments of PC display across the world gained 137 million and 144 million, the highest since 2012. The increasing maturity of power battery technology has accelerated the penetration rate of electric vehicles. The global sales volume

of electric vehicles achieved 3.12 million in 2022 and 6.5 million in 2021, with a year-on-year rise of 41% and 109%.

The demand for chips was soaring in the second half of 2021, while demand exceeded supply. The 8-inch process is mainly used for the production of analog chips, power devices and sensor chips, etc. The downstream is for automobiles, industries, and smart phones, etc. However, the 8-inch wafer has a low capacity of production expansion, with a compound average growth rate of 3.7% from 2016 to 2019. The gradual closure or conversion of fabs of 6-inch or smaller that were the previous generation production lines resulted in high capacity utilization of 8-inch wafers, which remained above 90%.

The average selling price for MCU in 2021, due to a lack of this type for vehicles, skyrocketed by 10%, the largest rise in 25 years. Sales are $19.6 billion, a year-on-year growth of 23%, and prices are back to normal in the second quarter of 2022.

The consumer electronics market is stranded in a downturn in the third quarter of 2022. It is predicted that the annual shipment of smartphone in the whole world will be 1.26 billion units roughly, down by 6.8%, and PC shipment will decline by 12.8% year-on-year to 305 million units. Given the gradual saturation of the downstream electronics industry, chip inventory will gradually climb.

Global chip market is on the ebb in the third quarter of 2022

The global semi-electronics revenue in the second quarter of 2022 was $158 billion, and the third quarter revenue was $ 147 billion, a decline by 7% from the previous one, Omdia's Semiconductor Total Competitive Analysis Tool (CLT) demonstrated.

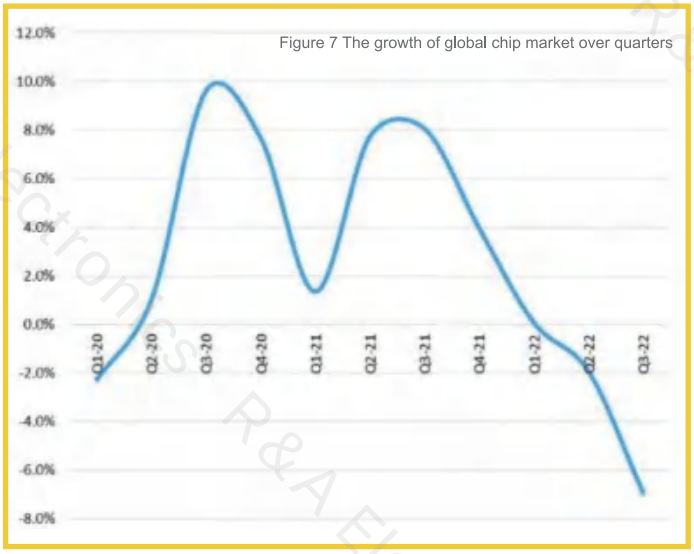
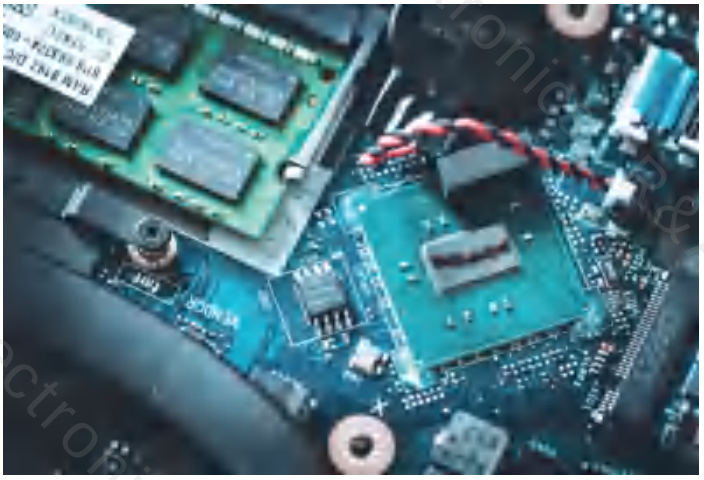


Figure 7 The growth of global chip market over quarters

Cliff Leimbach, senior Research Analyst, explained: "Some market has sparked recession in the whole semiconductor market at some time. For example, the decline of PC sales precipitates the downturn of the whole chip market in Q2 2022, which made Intel's revenue suffer from a drop of 17%. The recent decline of the part market is due to weakness in the memory market. Memory revenue shrinking by 27% versus the same period of last year owes to lower demand for data centers, PCS and mobile devices, combining with customer inventory adjustments."



For the sales growth rate of semiconductor industry in distinguished regions, Americas rise by 11.4%, Europe by 9.3% and Japan by 3.9%. However, sales in the Asia-Pacific region and China have slid down 10.1% and 16.2% respectively. Monthly sales rose 2.2% in the Americas and 0.2% in Europe, slipped 0.1% in Japan, 1.5% in China and 1.6% in Asia-Pacific and the rest of regions.

Semiconductor industry on the earth is going through a downturn, but in the long run, demand for memory and

storage will rebound to grow continually, an industry insider said.

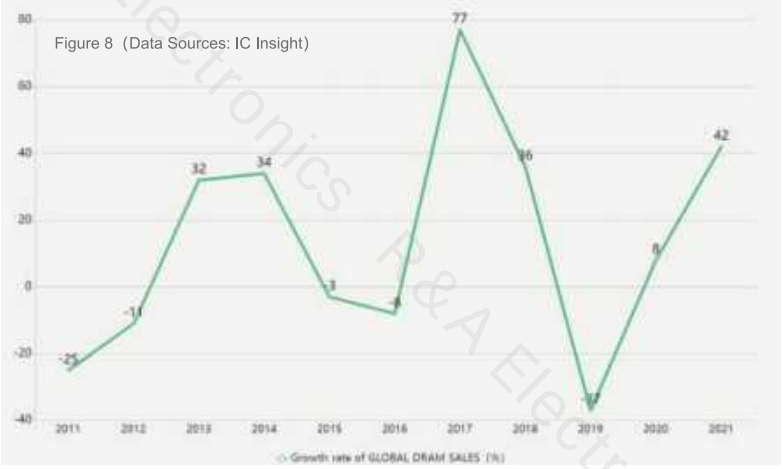


Figure 8 (Data Sources: IC Insight)

"The industry has been hit by the pandemic, the Russia-Ukraine conflict and high global inflation", Micron's CEO disclosed, "adjustment of inventory at customers drives the current depression in the memory industry, reducing needs, and the imbalance between supply and demand is affecting the pricing environment of the industry. It typically takes about six months for customer inventories to return normally, and macroeconomic factors can go a long way to its recovery".

Micron was the first major manufacturer to hoist a red flash on falling demand for personal computers and smartphones, and to reduce chip production by around 20% and suspend hiring. Similarly, chip maker TSMC in Taiwan of China has cut its annual investment budget by at least 10% this year, while South Korea's SK Hynix has halved its investment for next year.

The situation is in sharp contrast to last year's chip supply crunch. Now the semiconductor supply exceeds demand.

Even so, Micron's CEO says the demand for memory and storage will restore to increase constantly throughout the cycle.

Weak economy and high inflation have restricted global demand for personal computers, smartphones and other consumer electronics, according to IC insights.

Micron's actual memory sales tanked 23% in 4Q22. SK Hynix and Samsung also unveiled a steep decline in memory sales in 3Q 22 and evaluate the DRAM market to remain weak until the end of this year, at least until 1Q23. The Big Three memory makers pointed out on earnings calls that inflation has cut into consumer discretionary spending. Coupled with ongoing supply chain disruptions and a boom of inventory, a DRAM market correction is almost inevitable. Over the past 10 years, the DRAM market has been characterized by precipitous growth and devastating decrease.

Memory exports have slipped sharply since the second quarter of 2022, from 5.335 billion in Q2 2022 to 4.484 billion in Q3. The fading consumer electronics market deteriorates the memory market across the world and constrains the demand and prices of DRAM and NAND flash memory, foreign media reported on November 2. Meanwhile, it further has an impact on the performance of memory chip manufacturers such as Samsung Electronics and SK Hynix.

The memory chip market, though, is generally negative, the demand for some sectors like server, is positive. The global demand for DRAM for servers is estimated to reach 68.486 billion GB this year, while mobile devices such as smartphones and tablets will need 66.272 billion GB of DRAM this year, Omdia released. It is suggested that The demand for DRAM applied to servers scales up at an average annual rate of 24% by 2026. The relevant manufacturers will benefit from that, such as Samsung, SK Hynix and Micron.

Automotive market remains booming compared with the fading consumer electronics market currently, TI, ST microelectronics, Infineon and NXP largely or partially offset declines in other sectors with growth in the auto.

Smartphone shipments in Southeast Asia shed 4% in Q3 2022 Shipments in Southeast Asia's smartphone market slashed to 23.5 million units in the third quarter of 2022, down 4% year-on-year and the lowest shipment in the region since 2020, as consumer demand decayed, Canalys said in a report released on Dec 1. Samsung shipped 5.9 million units, accounting for 25% of the Southeast Asian market, with leading the pack. OPPO delivered 4.5 million units, accounting for 19% of the market. Vivo carried out 3.1 million units and realme 2.1 million units.

Brand	Shipments in Q3 2022 (million)	Market shares in Q3 2022	Shipments in Q3 2021 (million)	Market shares in Q3 2022	Annual growth rate
Samsung	5.9	25%	5.9	24%	0%
OPPO	4.5	19%	4.8	20%	-7%
Vivo	3.5	15%	3.9	16%	-9%
Xiaomi	3.1	13%	3.5	14%	-11%
Realme	2.1	9%	2.9	12%	-27%
others	4.4	19%	3.4	14%	29%
sum	23.5	100%	24.4	100%	-4%

Figure 9 (Sources: Canalys)

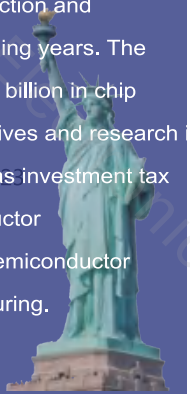
A data released by SNE Research, a market research institution in South Korea, shows the global installed battery volume of electric vehicles accomplishing 48GWh in October 2022, with a year-on-year increase of 73.6%, maintaining a stable growth for 28 consecutive months. Ningde Times (CATL) and BYD who are Chinese manufacturers, become the current leaders around the world, with installed capacity of 18.1GWh and 7.8GWh separately, accounting for 37.6% and 16.2% of the market.

According to CleanTechnica, electric vehicles occupied 17% of total global vehicle sales in September 2022, with battery electric vehicles alone covering 13% of the market. Sales of battery electric vehicles rose 50% from a year earlier, while sales of plug-in hybrids grew highly 54%. It is first time that the sales of plug-in hybrid electric vehicles overwhelmed battery electric vehicles in months. In the first nine months of this year, global cumulative sales of electric vehicles reached 6,815,282 units, accounting for 13% of the global auto market share, of which battery electric vehicles accounted for 9.3%.

Countries launched stimulus policies to push chip business

US

The year 2022 also saw the enactment of landmark bipartisan legislation, the Chip and Science Act, which will significantly strengthen domestic semiconductor production and innovation in the coming years. The Chip Actincludes $52 billion in chip manufacturing incentives and research investments, as well as investment tax credits for semiconductor manufacturing and semiconductor equipment manufacturing.

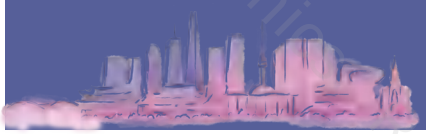


EU

The EU's Chip Act, which was issued on 10 February 2022, will allocate more than 43 billion euros in public and private funding to support chip production, pilot projects and start-ups. Thierry Breton, the EU's executive commissioner, said the main goal of the Chip Act was to attract investment in "large chip projects". The EU wants to promote the region's chip production capacity from 10% of the world's today to 20% by 2030.

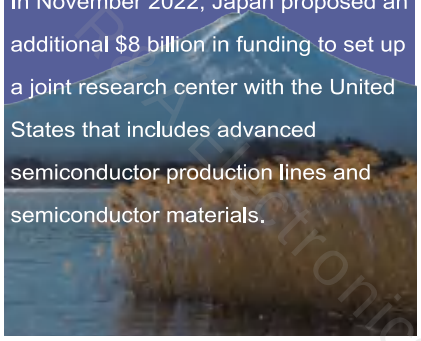
South Korea

In May 2021, South Korea announced its "Korea Semiconductor" strategy, which aims to build the world's largest semiconductor supply chain by 2030. The plan provides an investment tax credit for semiconductor research and development to attract more private sector investment.



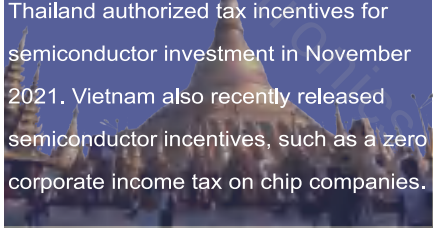
Japan

In November 2021, Japan approved $6.8 billion in domestic semiconductor investment funding as part of its goal to double domestic chip revenue by 2030. In November 2022, Japan proposed an additional $8 billion in funding to set up a joint research center with the United States that includes advanced semiconductor production lines and semiconductor materials.



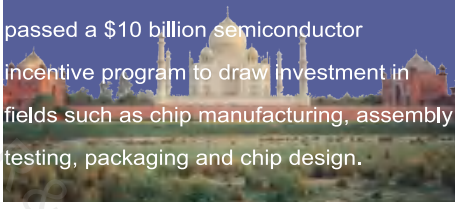
Southeast Asia

Thailand authorized tax incentives for semiconductor investment in November 2021. Vietnam also recently released semiconductor incentives, such as a zero corporate income tax on chip companies.



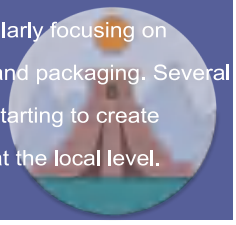
India

In December 2021, the Indian government passed a $10 billion semiconductor incentive program to draw investment in fields such as chip manufacturing, assembly testing, packaging and chip design.



Mexico

In September 2022, the Mexican federal government began drafting new incentives to attract semiconductor investment, particularly focusing on assembly, testing and packaging. Several exican states are starting to create similar incentives at the local level.



Canada

In 2022, Canada announced that it tends to provide incentives for new investment in chip design, manufacturing and related key materials. In addition, Canada aims to enlarge its talent pool through educational partnerships between universities and design or manufacturing companies.

At the same time, all governments on the planet, must ensure that their efforts little harm but improve the health of the global semiconductor ecosystem. It means confirming that their policies and incentives are consistent with their international trade obligations and commitments under the World Trade Organization and the World Semiconductor Council. The promise from every governments would prevent government incentives from creating artificial competition or serious market chaos.

The development of semiconductor market: many research institutions predict that the market will decline in 2023

In November 2022, the WSTS released its new semiconductor market forecast (as shown in Figure 10).

Forecast	Amounts in US$M			Year-on-Year Growth (%)		
	2021	2022	2023	2021	2022	2023
Americas	121,481	142,138	143,278	27.4	17.0	0.8
Europe	47,757	53,774	54,006	27.3	12.6	0.4
Japan	43,687	48,064	48,280	19.8	10.0	0.4
Asia Pacific	342,967	336,151	311,005	26.5	-2.0	-7.5
Total World - $M						
Discrete Semiconductors	30,337	34,098	35,060	27.4	12.4	2.8
Optoelectronics	43,404	43,777	45,381	7.4	0.9	3.7
Sensors	19,149	22,262	23,086	28.0	16.3	3.7
Integrated Circuits	463,002	479,988	453,041	28.2	3.7	-5.6
Analog	74,105	89,554	90,952	33.1	20.8	1.6
Micro	80,221	78,790	75,273	15.1	-1.8	-4.5
Logic	154,837	177,238	175,191	30.8	14.5	-1.2
Memory	153,838	134,407	111,624	30.9	-12.6	-17.0
Total Products - $M						

Figure 10 WSTS Forecast Summary Source: World Semiconductor Trade Statistics (WSTS)

WSTS predicts that the global semiconductor market will slow down to 4.4% in 2022, and in 2023, it will decline by 4.1%.

WSTS forecast lowered its growth forecast due to the rising inflation and weaker end-market demand, especially those exposed to consumer spending. While some major categories of semiconductors are still expected to achieve double-digit year-over-year growth in 2022, with Analog by 20.8%, Sensors by 16.3%, and Logic by 14.5%. The memory market is expected to have negative growth, and decline by 12.6% year-over-year.

The global semiconductor market is expected to decline by 4.1% to US$557 billion by 2023, driven by the memory market. In the latest WSTS forecast, this category is expected to drop to US$112 billion by 2023, a 17% decline from the previous year. Some other major categories, such as Optoelectronics, Sensors, Discrete and Analog, showed single-digit growth.

Overall, WSTS expects the semiconductor market in all major regions of the world to remain flat through 2023, with only the Asia Pacific estimated to decline by 7.5% year-on-year.

IC Insights

According to the latest report released by IC Insights, due to factors such as weak market demand of semiconductor and high inventory, it is expected that total semiconductor sales will decrease by 5% in 2023, and total IC sales are expected to decrease by 6% year-on-year.

After a cyclical decline in 2023, IC Insights predicts a rebound in semiconductor sales and stronger g rowth over the next three years. Semiconductor sales are projected to climb to $843.6 billion by 2026, a CAGR of 6.5%.

Semiconductor Industry Association(SIA)

In November, SIA released the U.S. Semiconductor Industry Report 2022, which focuses on the current development status and challenges of the U.S. semiconductor industry. The report pointed out that the semiconductor industry will continue to face major challenges in 2022. The growth of global semiconductor sales will slow down sharply in the second half of this year, and the industry utilization rate will decline (the Gartner report estimates that it will fall below 85% in the fourth quarter of this year). Meanwhile, the global supply chains are also affected.

TECHCET

Research institute TECHCET recently stated that with the growth of semiconductor manufacturing capacity in Europe, Europe is facing a bottleneck in the supply of chemical materials. TECHCET believes that European fabs need to expand, and their expansion requires additional investment support from chemical suppliers, otherwise semiconductor manufacturers should start preparing to find alternative sources of key chemicals.

The agency believes that 16nm and below processes will be the focus of European production expansion in the next few years. For suppliers, building new facilities will better enable the manufacture of chemicals to a higher level, but there needs to be predictable demand to justify such investments.

Semiconductor Intelligence(SC-IQ)

SC-IQ has compiled the semiconductor market forecast data from 3 institutions for 2022-2023. SC-IQ believes that the semiconductor market fell by 6.3% in 3Q 2022 and the gloomy outlook for 4Q 2022, so only the forecasts made after the 3Q 2022 WSTS data are relevant.

As shown in Figure 2, the November forecasts for 2022 from the Cowan LRA model is 8.1%, and 1.5% from Semiconductor Intelligence. As for 2023, most institutions predict that the semiconductor market will definitely decline. Back in August, Future Horizons predicted that the semiconductor market would decline by 22% in 2023.

SC-IQ is expected to decline 14% in 2023. That would be the largest drop in the semiconductor market since a 32% drop in 2001. Over the past 50 years, the market has seen double-digit declines in only three years: 1975, 1985 and 2001.

Semiconductor Market Forecasts		
	2022	2023
Future Horizons, August 2022	6%	-22%
Cowan LRA Model, November 2022	8.1%	
Semiconductor Intelligence, November 2022	1.5%	-14%

Figure 11 Semiconductor Market Forecasts from 3 research institutes

Source: Future Horizons, Cowan LRA Model,Semiconductor Intelligence

Nomura, J.P. Morgan Chase and other institutions

Institutions such as Nomura and J.P.Morgan Chase indicated that the price of the storage industry will plummet in the first half of 2023, and the rate will exceed 50%. Among all kinds of storage, due to the strong demand for high-density NOR chips in the automotive/industrial field, manufacturers related to encoded flash memory (NOR Flash) will outperform pure DRAM manufacturers. At this stage, storage manufacturers and channel providers are actively cleaning up their inventories, but the results will not gradually appear until the first quarter of next year.

There are many applied technologies relying on advances in semiconductor technology to enable innovation: Artificial intelligence(AI), AR/VR, Internet of Things(IoT), autonomous vehicles, electric vehicles, high-performance computing(HPC), aerospace, satellite communications, 5G/6G, smart cities and so on.

According to the Global Semiconductor Market Developing Trend Report 2022 released at the World Semiconductor Conference&Expo 2022, two main technological trends are indicated:According to the Global Semiconductor Market Developing Trend Report 2022 released at the World Semiconductor Conference&Expo 2022, two main technological trends are indicated:

Disruptive technologies of new materials and new architectures will become the main choice for the semiconductor industry in the post-Moore era

Moore's Law will continue on a global scale. Mao Junfa, academician of Chinese Academy of Sciences and president of Shenzhen University, suggested that Moore's Law is facing challenges in various aspects such as technical means and economic costs.

On the supply side, foundries are developing innovative technologies such as carbon nanotubes, memory computing, 3DIC heterogeneous integration, and composite materials to manufacture chips with smaller footprints, greater computing power, and lower energy consumption. In terms of terminal equipment, if there is some innovation to drive the demand for sub-2nm chips, Moore's Law will continue better. As mentioned in Chip Vision, the law predicts that the number of transistors on a chip will double every 2 years.

Capital Wings predicts that in the next 3-5 years, Moore's Law will still rule the semiconductor industry, and breakthroughs in new energy vehicles, 5G and other industries will provide a large number of new application scenarios.

Advanced packaging technology will become the focus of competition among major manufacturers

Packaging belongs to the post-process of semiconductors, which is to package the semiconductors manufactured in the fab. The packaging technology way closely follows the trend of the semiconductor market, and the current developing trend in the mainstream is to cooperate with the SoC to improve the process of the system integrated chip, and to use the SiP system-in-package to further reduce the chip size. For gallium nitride devices, ceramic packaging is still the first choice, but in order to further reduce supply-chain costs, plastic packaging will be the mainstream in the future. Gallium arsenide is mostly packaged in ceramics or metal when it is used in the military, while in the civilian market, methods such as QFN packaging and multi-chip modules are used to reduce costs.

Mao Junfa, academician of Chinese Academy of Sciences and president of Shenzhen University, reviewed the brief history of the development of integrated circuits, suggesting that for integrated circuits, the boundaries between front-end chip design and back-end packaging are becoming increasingly blurred.

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Foucs China

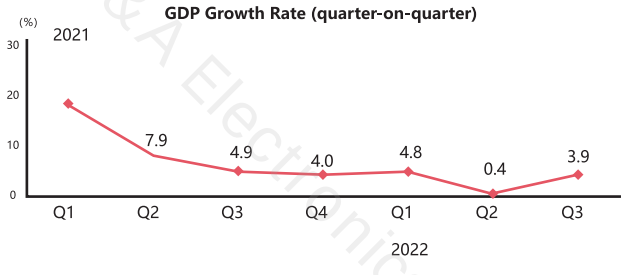
02

The economy is under intense pressure in 2022: these 3 types of industries are the focus

Sarah

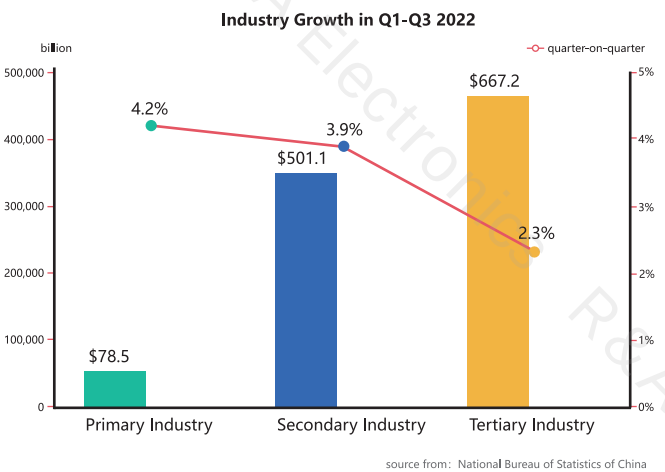
Under the increasingly gloomy economic environment throughout the world, facing the impact of many unfavorable factors such as frequent outbreaks of COVID-19, the economy in China has still withstood pressure in the first three quarters of 2022. According to the report released by BOC Research Institute, the GDP growth rate will reach 3.8% in Q4 2022 in China, and the annual growth rate will be 3.2%.

In the first quarter of 2022, the beginning was generally stable with a year-on-year increase of 4.8% in GDP. In the second quarter, due to the impact of the COVID-19 lockdown in Shanghai, the economic growth fell sharply to only 0.4%. In the third quarter, the epidemic was generally under control. The economy recovered gradually and was significantly better than that in the second quarter, achieving a growth of 3.9%, and the overall situation is recovering.



The first three quarters of the primary industry increased by 4.2% year-on-year, with an increasing value of $78.5 billion. The secondary industry increased by 3.9% year-on-year, an increase of $501.1 billion. The increasing value of the tertiary industry was $667.2 billion, an increase of 2.3% year-on-year.

In the first three quarters, the production and development of the primary industry, secondary industry, and tertiary industry in China remained in a reasonable range, especially the secondary industry. With the continuous improvement of industrial production demand, the rapid recovery of industrial development has



boosted the economic growth by 1.2 percentage points in China. At the time when economic growth is sluggish, the industrial economy in China still demonstrates the resilience of development and maintains a stable developing trend.

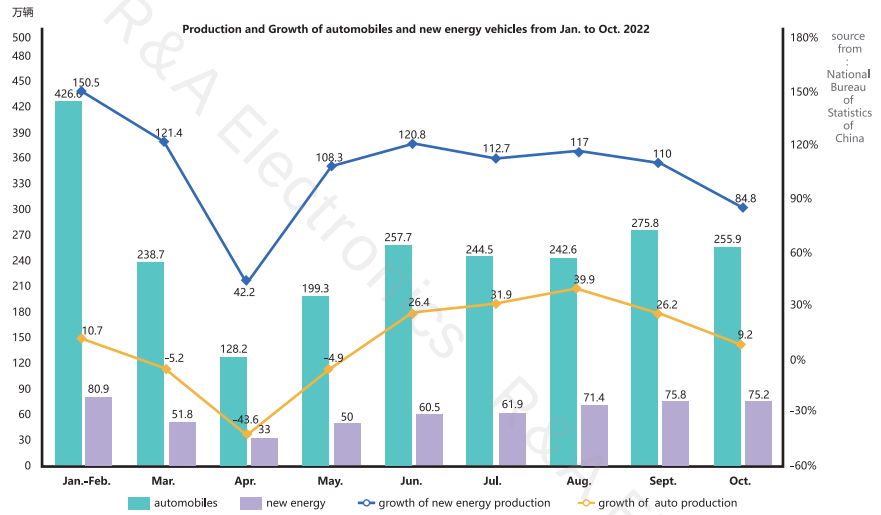
With the industrial upgrading and the steady structural adjustment, industrial informatization, intelligent transformation and green transition have become the current hot direction of industrial investment in China, and related investments are showing a trend of rapid growth. According to China national bureau of statistics, investment in high-tech industries increased by 20.5% year-on-year in the first 10 months, of which investment in equipment manufacturing of electronic communication increased by 28.7%, and investment in R&D and design services increased by 22.5%.

In terms of the growth value, the value of high-tech manufact-uring increased by 10.6% year-on-year in October 2022, becoming an important driving force for the growth of industries.

First, the manufacturing industry of electronic communi-cation equipment, which has the fastest investment gro-wth, is still leading the production trend, and the growth value in October increased by 16.6% year-on-year. With the continuous deepening of 5G commercial deployment and scale in the past three years, the development of the manufacturing industry of electronic communication pr-oducts has also been stimulated. In the future, the coverage and depth of China's 5G network will be further improved. By then, the market demand for electronic communica-tion devices will be further expanded.

Second, the aviation, spacecraft and equipment manufacturing industry increased by 13.9% year-on-year. According to the published “Aerospace White Paper”, a series of tasks have been released, including the comprehensive constructionand operation of the space station, the 4th China Lunar Exploration Project, Manned lunar exploration project, Mars sam-ple-return mission,etc. As of November 2022, China Space has completed 6 launch missions. In the next five years, China Space will be in a period of comprehensive construction and development.Meanwhile, aerospace involves a wide range of fields, which can form a huge pulling and radiation effect, thereby driving the development of energy, information, control and other related high-tech industries.

Third, with the rebound of the global CIVID-19 and the spread of the epidemic in China, there is a huge demand for medical and epidemic prevention materials. In October, the manufacturing industry of medical equipment and instruments increased by 8.4%. At present, the epidemic prevention and control in China has entered a new stage. In 2023, facing the new situation of COVID-19, the construction and investment in medical health and medical equipment will become the focus. In addition, the construction of mobile cabins and hospitals in many places will also push a large number of equipment and facilities to be updated and upgraded.



In October, the equipment manufactu-ring industry in China took the top spot in performance, and its value increased by 9.2% year-on-year, which was significantly faster than all indust-ries in other designated sizes. Among them, the automobile and the electric-al machinery industry closely related to automobiles performed outstandin-gly, with year-on-year growth of 18% and 16.3% respectively. The electronics and instrumentation industries followed, with year-on-year growth of 9.4% and 8.9% respectively.

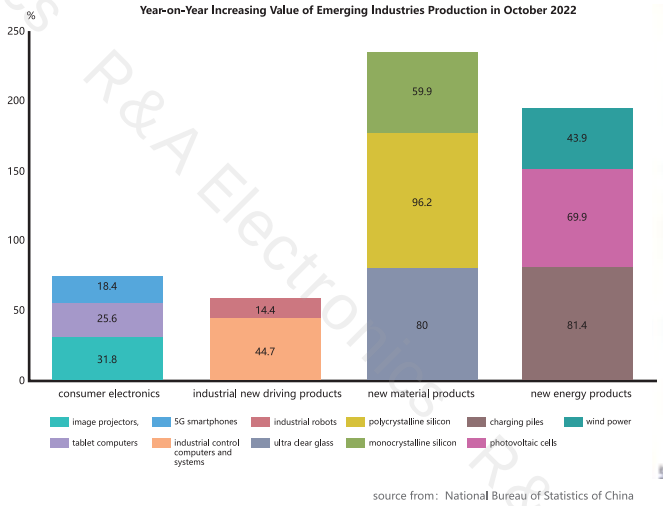
The rapid growth of the equipment manufacturing industry reflects the resilience of the industrial economy

As a pillar industry of the national economy, even though it was hit by a relatively serious epidemic in the first half of the year and the problem of chip shortage still exists, the automobile industry still performed well in 2022, especially the performance of new energy vehicles. According to data from China national bureau of statistics, by October 2022, the automobile production in China has reached 25.252 million units, a year-on-year increase of 20.8%. Among them, growth momentum of new energy vehicles is still strong. From January to October, the production exceeded 5 million, a year-on-year increase of 109.3%, accounting for 22.2% of the total vehicle production.

Entering 2023, although the problem of chip shortage for vehicles is expected to be alleviated, the auto industry may be affected by the uncertainty of the COVID-19 situation and the prevention and control policies in China, as well as the adj-ustment of the purchase-tax halving policy, but the overall demand for passenger cars is still in an up cycle. In particular, new energy is the general trend, and new energy vehicles are still expected to maintain rapid growth. It is estimated that by 2023, the potential growth momentum of domestic new energy vehicles will remain strong.

Emerging products and new growth driver products continue to lead and create new demands

In recent years, the reform of supply-side structure has achieved remarkable results, and a large number of emerging ind-ustries have become an important thrust to promote the transformation and upgrading of the manufacturing industry, constantly leading and creating new demand.According to the industrial production data released by the National Bureau of Statistics in November, the production of consumer electronics such as image projectors, tablet computers, and 5G smartphones increased by 31.8%, 25.6%, and 18.4% year-on-year respectively. The production of industrial new driving products such as industrial control computers and



source from: National Bureau of Statistics of China

Source: IDC China, 2022

Against the backdrop of an escalating energy crisis in Europe, new energy products from China such as photovoltaic and lithium-cell energy storage are selling well overseas. By Q3 2022, photovoltaic module exports have reached 121.5 gigaw-atts (GW), with a year-on-year increase of 89%.

According to relevant data, in the first half of this year, 15 of the 20 companies with largest installed capacity of global power battery are Chinese companies. Among the 12 power battery manufacturers with a growth rate of more than 100%, 11 companies were opened by China. It is foreseeable that the Russia-Ukrainian war has reached a stalemate, and the energy crisis in Europe will continue. The European market is still in urgent need of energy-saving products and new energy products such as photovoltaic, and the transformation of energy structure has become a global consensus. Therefore, it is worthwhile to expect the potential of new energy products such as photovoltaic and power batteries.

Although there were some fluctuations in China's economy in 2022, especially in the second quarter. In Q2 2022, the economic growth rate fell below 1%, showing a significant decline. However, in Q3 2022, GDP is gradually recovering, and the major economic indicators continue to improve.

According to the report released by BOC Research Institute, the GDP growth rate will reach 3.8% in Q4 2022 in China, and the annual growth rate will be 3.2%. Overall, the economy will be relatively stable in 2022. China's GDP growth in 2023 will be revised up to 5.2%, showing strong growth prospects.

Global economic growth will lag in 2023 with the highest global economic growth at only 2.2%. the economic growth of developed countries stays in recession, which means the export demand will further recede next year. The contribution of exports to China's economic growth is predicted to precipitously slash, and the growth of China's imports has a good chance of recovery.

Foucs China

02

2022
The time of rapid rise ends up in international trade demand fading

Sarah

In recent years, China generally has accomplished increasing expansion of foreign trade scale, promotion of the total imports and exports and steady improvement of trade quality. The figures of China's trade present that China has overcome heavy pressure and gained a good grade on trade with a growing international market share, particularly in the cumulatively complex and severe international environment.

图1：中国贸易进出口总值 新华社发　数据来源：海关总署

China achieves a jump of international market share and foreign trade

A data released by the General Administration of Customs, states that China's import and export volume of goods summed 5.509 trillion USD between January to November of 2022, up 8.6% year on year, in which exports reached 21.84 trillion RMB(3.13 trillion USD), a rise of 11.9% year on year, imports at about US$2.37 trillion, up 4.6% year on year.

On the whole, China's import and export volume maintained stable growth from January to November this year. For instances, the trade moved smoothly in the first quarter. The imports and exports were attacked by geopolitical conflicts, COVID-19 and high inflation in major western countries, slowing their growth in the second quarter. Especially in April, the import trade recorded negative growth. As epidemic prevention and control in China has generally improved, the growth rate of foreign trade has bounced significantly in May and June. However, the growth of China's import and export shrunk largely in the second half of the year, owing to the domestic epidemic, interruption of the operation of industrial and supply chains, the severe inflation in Europe and the United States, the tightened monetary policy, the external demand decline constant.

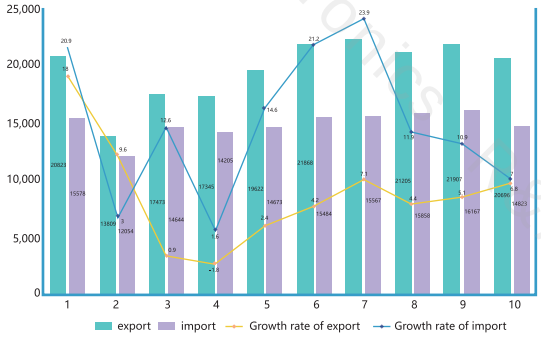
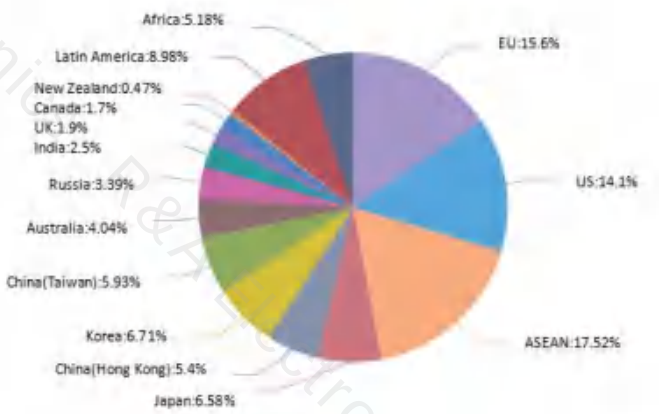


Figure 2 Monthly trade scale and growth rate year-on-year in China amid January and October of 2022

ASEAN still is the largest trading partner of China while the US and Europe decelerate on the trade with China

In the first ten months, ASEAN, the European Union, the United States, Latin America and South Korea were China's top five trading partners in terms of

Figure 3: The ratio of China's exports to the China's trading partners in January to October of 2022



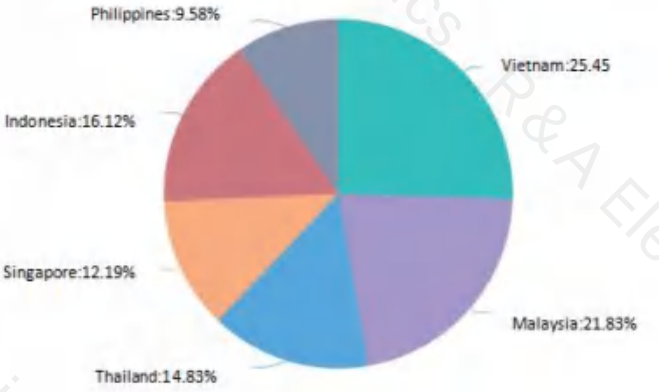


Figure 4: The rate of China's exports to the members of ASEAN in January to October of 2022

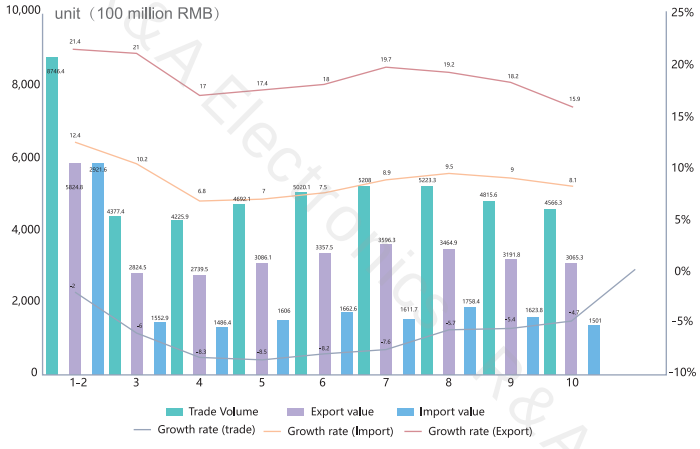


Figure 5: China's imports and exports to the EU amid January and October of 2022

total trade volume, accounting for 17.52%, 15.6%, 14.1%, 8.98% and 6.71% of the total trade volume, respectively.

Regional economic integration has been boosted by the entry into force of the Regional Comprehensive Economic Partnership (RCEP) and the Belt and Road Initiative. According to the General Administration of Customs, in the first 10 months of 2022, the total value of trade between ASEAN and China reached about 0.753 trillion USD , up 15.8% year on year, remaining ASEAN as China's largest trading partner. Three members of ASEAN, Vietnam, Malaysia and Thailand, are China's top three trading partners.

The European Union is the second largest trading partner of China following ASEAN. The trade between the EU and China is about 0.67 trillion USD, acceleration of 8.1% year on year. However, since the beginning of 2022, the year-on-year growth of China's imports to Europe has been negative for 10 consecutive months. The import volume in the first 10 months was about 0.225 trillion USD, with a year-on-year negative growth of 4.7%. China's exports to Europe in the January-October period were about 0.446 trillion USD, an increase of 15% from a year earlier, and overall the growth rate of China-Europe trade is decreasing.

Trade between China and the US attained a historic 0.603 trillion USD during January to October in 2022, an increase of 6.8% year on year. Exports are at 0.446 trillion USD and imports at 0.95 trillion RMB(0.136 trillion USD), with year-on-year growth rates of 8.4% and 1.7%, separately. The growth rate of China's import and export to the US in 2022 decreased visually, compared with the rapid growth in 2021.

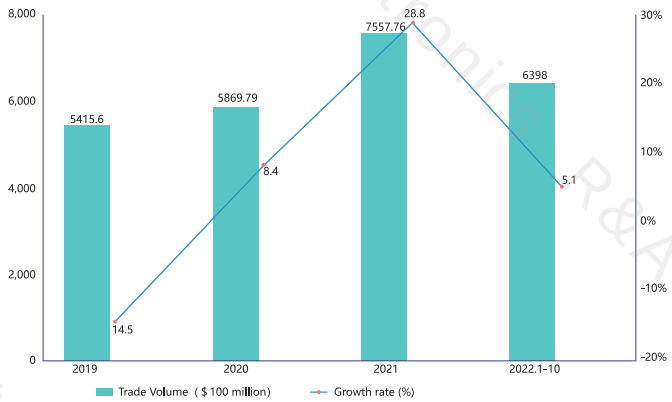


Figure 6: The trade value between China and the US among 2019 and 2022

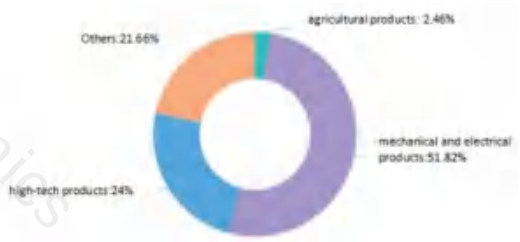


Figure 7：The ratio of the main categories of export products in the first 11 months of 2022 in China

In general, under global economic stagnation, overseas demand has been further contracted. The growth rate of China's import and export has reduced in the European Union, the United States, Latin America and South Korea, while the growth rate of China's export to ASEAN is still remarkably higher than that of other countries due to the RCEP coming into effect at the beginning of this year.

The export of mechanical and electrical products in China held more than half of China's whole export scale from January to November 2022, followed by high-tech products covering 24.06% and agricultural products only 2.46%, the data from the General Administration of Customs of China represented.

The exports of automotive products soar steadily versus the steep decline of consumer products

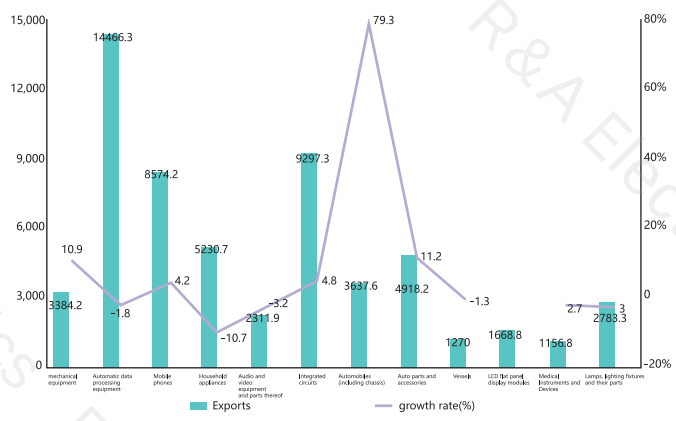


Figure 8:Mechanical and electrical export products in the first 11 months of 2022 in China

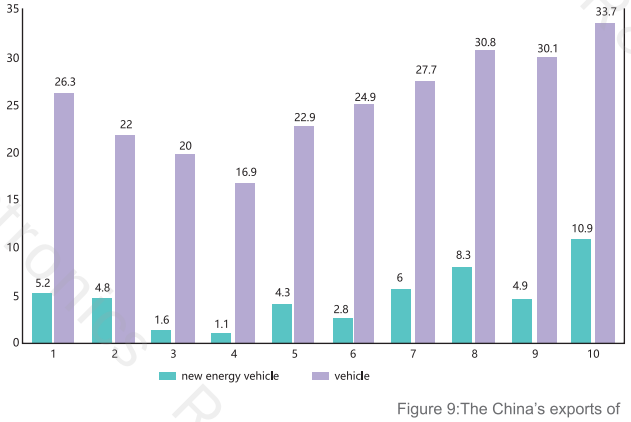


Figure 9:The China's exports of vehicles and new energy vehicles amid January and November of 2022

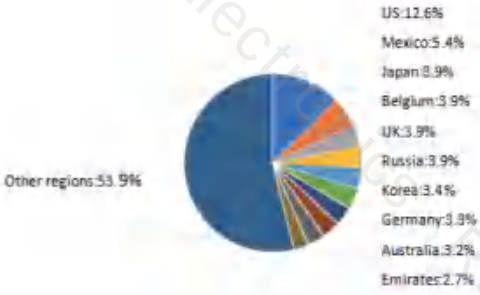


Figure 10：The top 10 countries of automotive products exports in January to October of 2022

China's automatic data processing equipment and its parts owned the biggest total exports amid mechanical and electrical export products in the first 11 months, with exports value of 207.16 trillion USD, but with a negative increase of -1.8%. In contrast, automobile products (including chassis) is extraordinarily successful at it with the fastest growth rate of 79.3%, from January to November the cumulative export value of 52.05 trillion USD; The growth rate of household appliances was cutting extremely by minus 10.7%, with cumulative exports of 74.96 trillion USD; The export value of medical instruments was at the bottom of the pile, only 16.58 trillion USD as well as raising rate by minus 2.7%;The cumulative exports of mobile phones and integrated circuits were 122.95 trillion USD and 133.23 trillion USD, with rise rates of 4.2% and 4.8% for each.

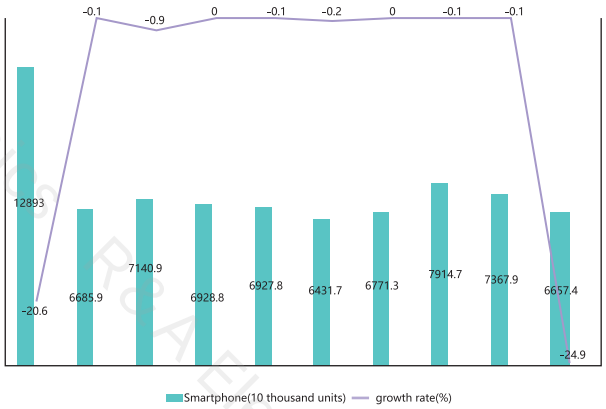


Figure11: China's smartphone exports amid January and November of 2022

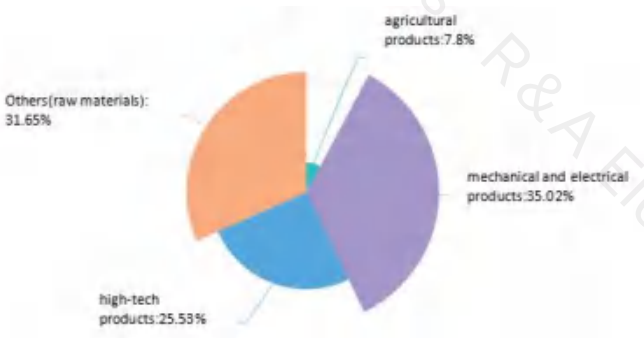


Figure 12: The rate of import products of China in the first 11 months of 2022

The continuous surge of China's automobile export is not only beneficial from the rapid development of Chinese new energy vehicles, but also from the consistent upgrading of the "globalization" strategy at its automobile enterprises to optimize the layout of the automotive industry in developed regions like Europe and the United States who have become the main exporters of domestic vehicles.

China exported 2.984 million vehicles during January to and November this year, growing by 54.9% year on year, ranking the world's second-largest exporter after Japan, the General Administration of Customs disclosed. Among the export vehicles of China, 499,000 new energy vehicles were exported in the first 10 months, up by 96.7% year on year, seizing about 20% of the total exports.

By contrast, the Exports of consumer electronics are slashing, such as laptops, computers and mobile phones. Statistics manifest that China presented exports of 143.68 million notebooks, 109.02 million tablets and 757.194 million mobile phones during the first 11 months, a rise rate of -20.8%, -5.6% and -11.7% separately.

In the final quarter of 2022, the promotion created by cycles for smartphone is fading because of the renewal of cell phones. The growth rate of its export has furiously slid at negative to 24.9% year-on-year in November.

Integrated circuit imports in China plunges significantly, raising its average price and the shortage of upscale IC.

The related figures show that besides mechanical and electrical products still occupy the first place in China's import products from January to November 2022, the import quota of other (raw materials) products has been greatly raised, with the import amount reaching 57,504.7 in the first 11 months and an 11.4% increase comparing with the same periods in 2021. It mainly includes iron ore (concentrate), crude oil, natural gas, rubber and other industrial raw materials, which reflects the gradual growth of China's industrial production scale.

The import scale presents a great contrast with the export between integrated circuits and automatic data processing equipment and their parts.

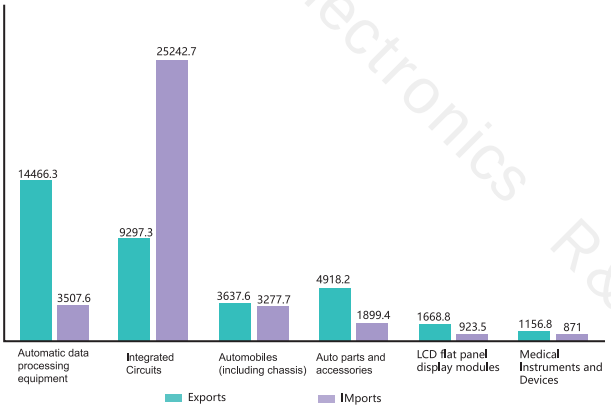


Figure 13:The imports of mechanical and electrical products in China in 2022

Chips have long been one of China's top imports, but their imports have faltered this year. The General Administration of Customs released, among January and November 2022, China's cumulative import value of integrated circuits harvested 365.1 trillion USD, up 0.6% year on year, with importing 498.51 billion units, a negative increase of 14.4% year on year.

In recent years, China strive to work on the expansion of scale and improvement of technical level on independent integrated circuit industry, which can better meet the development needs of the new generation of information technology and the demand of the mid -low-end industry applications. However, a solid shortage of supply in the high-end chips also raises the average price of imported IC in China from 2020 to 20223. The average import price from January to October of 2022 was $76,672,300 per 0.1 billion.

Figure 14

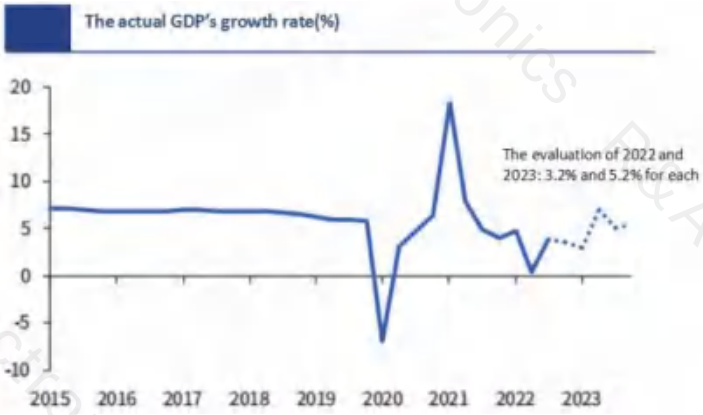


Figure 15 Sources: Wind, KPMG Analytics

In term of the "2023 Macroeconomic Outlook" and "2023 Investment Strategy Outlook" recently published by Morgan Stanley, the global economic growth will lag in 2023 with the highest global economic growth by only 2.2%. the economic growth of developed countries stay in recession, which means the export demand will further recede next year. In contrast to the rapid export growth in 2020 and 2022, the contribution of exports to China's economic growth is predicted to precipitously slash in 2023.

Still, Morgan Stanley expects that seeds of growth will sprout in Asia, particularly a modest recovery in emerging markets such as Southeast Asia and Latin America. ASEAN and Latin America, as the first and fourth largest trading partners of China's foreign trade in 2022, have certain support for China's export.

Contrary to export expectations, as China's "dynamic zero clearance" policy becomes a thing of the past, "maintaining the economy, stabilizing growth and promoting employment" will become mainstream in 2023. Relevant institutions forecast that China's GDP growth will be revised up to 5.2% in 2023, with a promising growth prospect and a high odd of gradual rebound of China's imports in 2023.

As economy gradually recovers, opportunities and challenges coexist

Tom

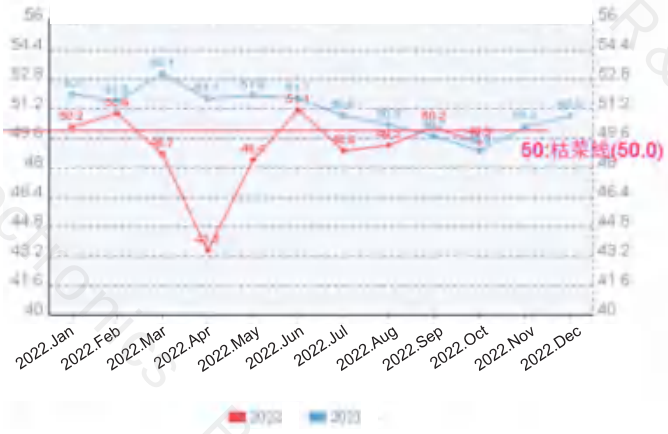
Given a withdrawal from zero-Covid19 plan in China and the consumption with a strong bounce from shock, China's GDP growth will achieve a jump of around 5.5% in 2023 from 3.0% in 2022, according to the anticipation of various financial institutions and analysis reports. Eight essential industries will usher in potential opportunities following the issue of the 20th CPC National Congress report.

IC EYES THE WORLD

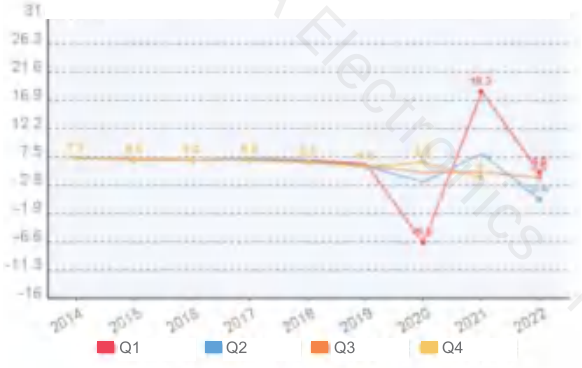
At present, the international environment gets uncertain due to geopolitical tensions, energy and food crises and other multiple risks. Combined with the persistent high inflation and tightening monetary policy in developed economies, the world economic growth is further drop, which will undoubtedly bring many external challenges to China's economic growth.

In the face of sporadic outbreaks, "zero clearance" policies and consecutive depression in the housing market in 2022, China's economy still achieved an increase by 3.9% in the third quarter of 2022. China's official purchasing managers' index fell to 49.4 in November (a reading above 50 indicates expansion, while a reading below 50 reflects contraction), as conditions deteriorated in all sectors except construction. China's goods exports dropped by 10.4% in the July-October period, which points out the ongoing recession in the economy of China in the future. Meanwhile, China needs to pay emphasis on the underlying risk of external demand in receding.

After going through the economy downturn of the second quarter in 2022, China's economy has stabilized and rebounded. The GDP growth rate in the third quarter attained 3.9% year-on-year, and the cumulative increase rate in the first three quarters was 3.0%. But there was a broad slowdown in Chinese economy in October. New restrictions triggered by a rise in new COVID-19 cases in November, weighed on the recovery in household demand and services. Because of that, the consumer confidence index consistently fall below 90 (it will be around 120 on average before 2020). And It is going to take longer time for consumer confidence to further recover. Consumption is most essential for GDP, but nowadays it only drives GDP



Pic 1 2PMI of Chinese manufacturing during 2021 and 2022



Pic 2 The Chinese GDP's growth amid November in 2014 and November in 2022

growth by 1.2 percentage points under the pressure of repeated COVID-19. Looking ahead, the housing market has not yet stabilized, eventually being a drag on the recovery, with recent supportive prescriptions spending time to taking effect. To shore up growth, the government approved additional infrastructure funding in the third quarter of 2022. In addition, fiscal spending is likely to increase further in the fourth quarter of 2022.

Hong Kong's economy deeply contracted to 4.5% year on year in the third quarter. Tightening financial conditions accumulated the stress of national demand, with the contraction in fixed investment to 14.3% in the quarter and the lag of private consumption. External demand was hit hard by the deteriorating external environment and persistent disruptions in the flow of goods through China's overland transportation, subsequent exports of goods plunging 15.6% and exports of services dipping 3.8%. The real GDP of Hong Kong was 3.3% in the first three quarters of 2022.

Hong Kong's exports will constantly encounter the attack from the acute deterioration in the global economy. Besides, fixed investment is about to be restrained by tightening financial conditions, waning economic activity and higher borrowing costs. On the plus side, exports of services is going to be pushed by the relaxation of testing and quarantine for tourists, while national consumption will be encouraged by favourable Labour market conditions and a spending voucher scheme. Providing the pandemic can be contained without palindromia and restrictions from it are further eased, economic activity is anticipated to gradually revive. Taking into account element effects, the growth forecast for Hong Kong is down to 3.3% in 2022 and 2.9% in 2023.

Taiwan’s imports climbed 1.2%, but its net exports only increased 0.3 percentage points. This brings the year-on-year growth rate for the first three quarters of 2022 to 3.6%. However, its exports are evaluated to remain downturn. Private consumption in Taiwan province is likely to fade gradually in light of the end of government incentive policies in June 2023. Recent developments are broadly in line with the market's outlook, so growth predictions for Taiwan province are maintained at 3.4% in 2022 and 3.0% in 2023.

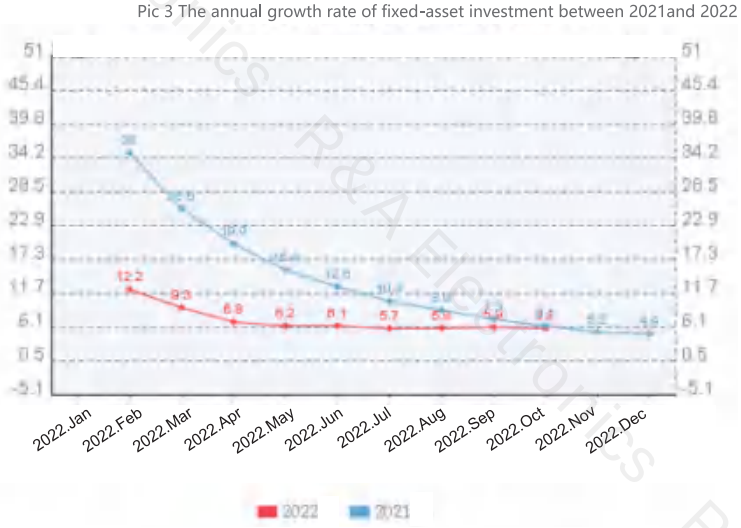
Stabilizing economic growth is to be endowed higher importance following the 20th National People’s Congress of China. With the weakening of the pathogenicity of the Omicronon virus, the popularization of vaccination and sophisticated prevention and control experience, China still strives to optimize and improve the prevention and control measures on the ground of the time and situation. For instances, most cities of the country accelerate the deregulation of epidemic control in December of 2022. The economic aggregate policy loosens enough followed by the incoming recovery of China's economy in 2023, according to the anticipation of various financial institutions and analysis reports. China's GDP growth will arrive around 5.5% in 2023. It would also boost investor and consumer confidence.

However, for the years outside the forecast range (2025-2027), growth is expected to resume roughly 4% in that structural headwinds are expected to significantly reduce China's potential growth rate.

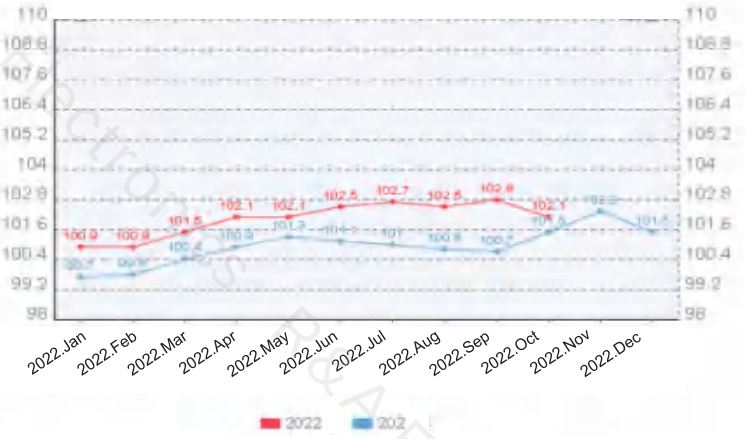
Investment in China

China's Infrastructure manufacturing maintains speedy growth. Real estate stayin adjustment. In 2023, fixed asset investment is still foundation of stable economic growth and an important lever to promote the Chinese domestic large circulation. Under the current situation, the growth rate of fixed asset investment is much possible to be faster than that of nominal GDP to make up for the lack of social demand. It is predicted that in 2023, in fixed-asset investment, infrastructure construction will take the lead, manufacturing booming, and real estate at the stage of adjusting, with the expectation of an annual growth rate by about 7% at fixed-asset investment.

Pic 3 The annual growth rate of fixed-asset investment between 2021and 2022



Pic 4 CPI of China in 2021 and 2022



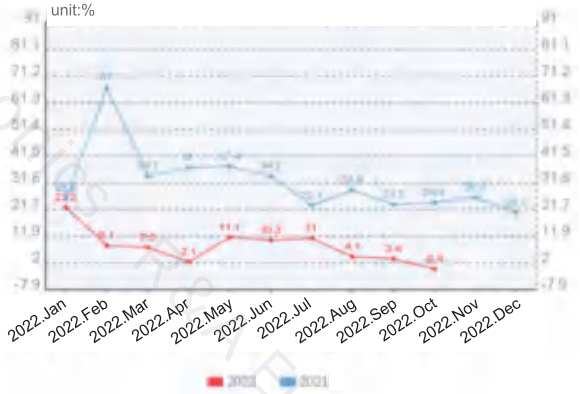
Consum-ption

Consumption could be the highlight for growth in 2023. Household consumption growth has a good chance to rebound potently in the second half of the year as much of the population adapt to life with the virus. In the year-to-date, household consumption has risen by only 3.5% year-on-year in nominal terms. With growth rates of household consumption extremely dull amid the multiple waves of COVID-19 outbreaks and restrictions, many categories of spending, particularly on entertainment and medical services, have fallen well below average. Consumption is supposedly subdued in the initial phase of the reopening, but is forecast to bounce back typically in the second quarter. Employment is speculated to increase in 2023, labor incomes to improve, and consumer confidence to recover somewhat. A direct reading of consumption growth next year is evaluated to be about 5.7%. Thanks to a lower base, the direct reading of consumption growth will be higher than GDP growth.

Import and Export

Looking at the export trend in 2023, it is estimated that China's export growth will decline to a certain extent, but the downward speed is controllable. The decrease of overseas demand will exert a major pressure on China's exports in 2023. ASEAN has become China's largest trading partner and the RCEP agreement has come into force, which certainly encourages China's exports. Furthermore, commodity exports have been buoyed by the ongoing energy problems overseas. With the continuous improvement of China's manufacturing capacity, the structure of China's export

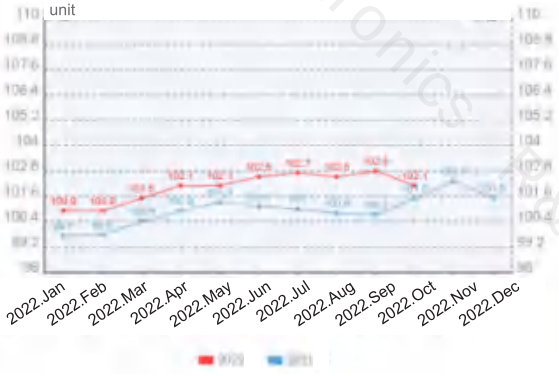
products is also constantly upgrading, transforming into high-end manufacturing and equipment manufacturing. And Automobile export is typical. Driven by the speedy growth in the export of new energy vehicles, China's auto export volume has gotten breakthrough since 2021, and surpassed Germany to become the world's second largest auto exporter. Exports now account for more than 12% of China's car production, up from less than 4% previously. China's breakthrough in automobile export can not be done without new energy vehicles. Recently, many European auto companies have augmented their investment in China. China's auto exports, especially the export of new energy vehicles, will remain conspicuous next year.



Pic 5 The growth rate of China's total export value in 2021 and 2022

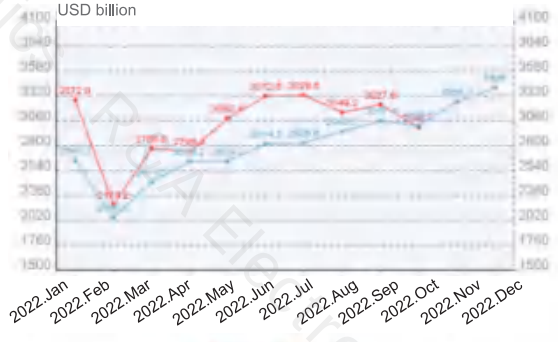
Prices

There is no sign of prices rise. It is predicted that the year -on-year growth rate of core CPI next year may tend to steadily go up with some limit, and the median expectation of around 1% to 1.2%. “Pig cycle” in China has run nearly half a year, pushing the CPI of food. The prices pressure will be mitigated after the first quarter of next year. The need for bulk commodity is stifled by the recession of oversea demand, thus PPI of China perhaps gains an increase of nearly negative 0.2% next year.



Pic 6 CPI of China in 2021 and 2022

The "pig cycle" typically follows a cycle: Inflation meat prices lead to pig supply surging. When the supply of pig exceeds the demand, the meat prices are cut off. Lower prices trigger the shrinkage of pig supply. That is a circle.



Pic 7 The export amount of China in 2021 and 2022

Monetary Policy

The Chinese government will persistently maintain the relaxation of monetary policy reportedly.Global economy slows down, so does monetary policy in major economies, which could facilitate the mitigation of external constraints on China's monetary policy. Subsequently, China will set out to loosen monetary policy. It is anticipated to unlock another lower required reserve ratio and a rate cut in the second half of 2023.

The real estate potentially restores from the downturn step by step after 2023. By that time, Chinese economy basically accomplishes the transition to the new from the old economic engines with the prosperity of new emerging economy. At the beginning of 2024, the economy of China is looking forward to boosting GDP of th new emerging economy as the economy completes the better shifting from old economic drivers to new ones.

Consumer goods and retail

In general, the future opportunities of consumer goods and retail industry mainly deploy in green consumption, cross-border e-commerce, rural and urban markets, digital technology to promote new retail consumption, consumer privacy protection.

Automotive products

Balancing innovation, security and opening-up. The automotive sector will focus on strengthening independent and leading innovation in key technologies. To ensure supply chain be safe and controllable rather than 100% autonomy, localizes core technology and establishes a diversified supply chain ecology. carbon peaking and carbon neutrality goals will accelerate new energy vehicle industry. In the future, the government will make great efforts to optimize the environment for foreign investment and improve the financing ability of manufacturers.

Technology, Media and Telecom

China is going to work hard to push modern infrastructure such as 5G, the industrial Internet, the Internet of Things to lay a solid foundation for the information industry. The digital economy is expected to be applied to diverse scenarios like agriculture, industry, transportation and education, so as to achieve integrated development of the digital economy and the real economy, and foster new drivers of economic development.

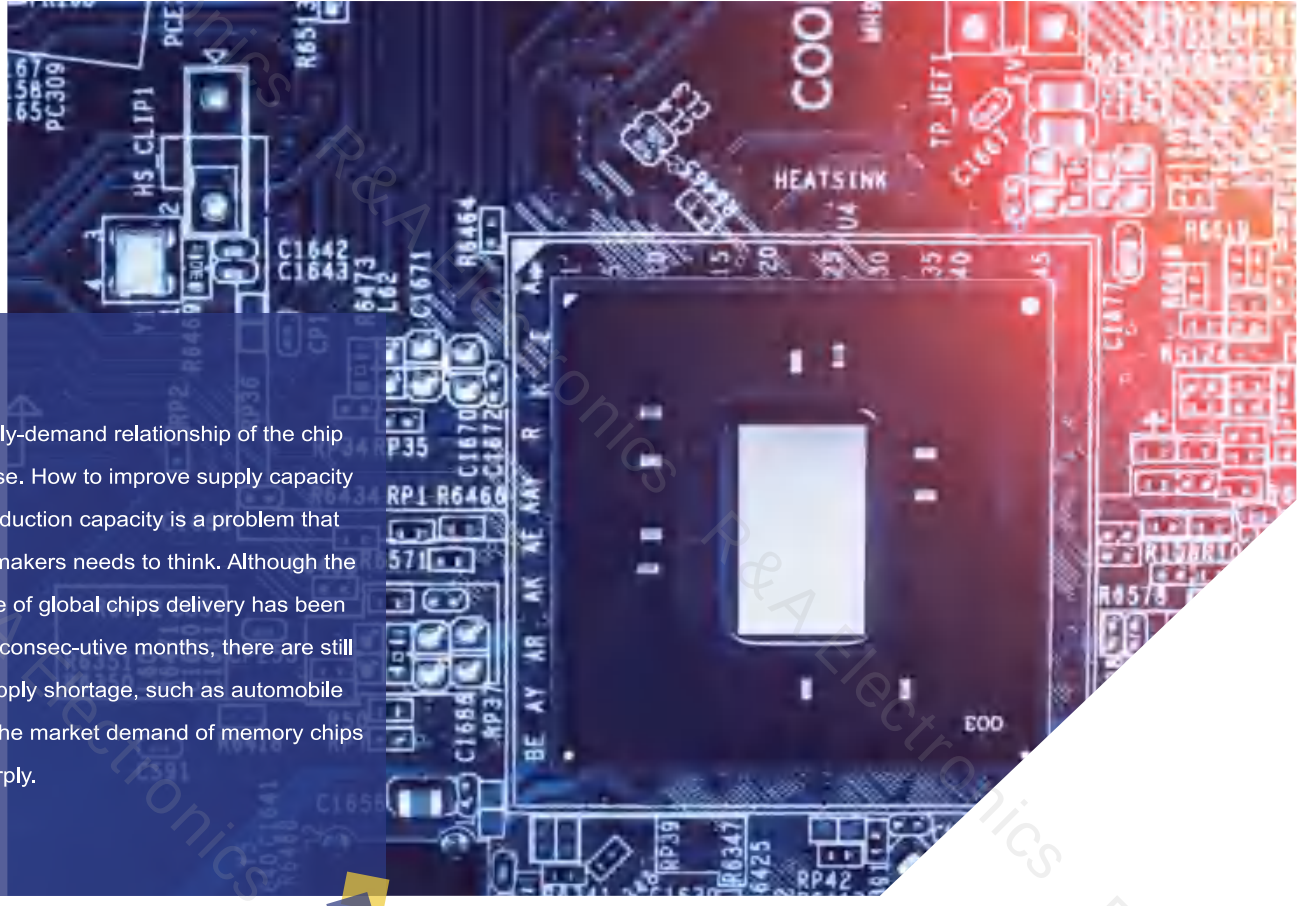
Industry News

03

Chip giants invest to expand production in down cycle: is it a follow-on action or a contrarian?

Grace

In the ever-changing global semiconductor market, the global chip industry shows excess capacity and capacity utilization decrease while it has not extinguished the passion for capacity expansion of semiconductor enterprises.



In 2022, the supply-demand relationship of the chip market is still tense. How to improve supply capacity by expanding production capacity is a problem that the original chip-makers needs to think. Although the average lead-time of global chips delivery has been shortened for six consec-utive months, there are still some chips of supply shortage, such as automobile chips. However, the market demand of memory chips has declined sharply.

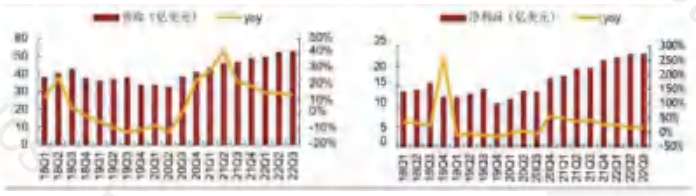
Affected by factors such as weak global economic growth, inten-sified inflation and rising interest rates, the demand for consumer electronics and memory devices such as smartphones, laptops, and other consumer electronics decreased sharply. The falling chip prices have hammered the profits of chip makers. The finan-cial report shows that as the largest maker of memory chips, Sam-sung's revenue was 76 trillion won (about 53.8 billion dollars) in Q3 2022, with an increase of 2.73% year-on-year. The operating profit was 10.8 trillion won (about 7.7 billion dollars), with a year-on-year decrease of 31.7%. SK Hynix's operating profit decreased by more than 60% year-on-year. However, Texas instru-ments(TI), a global chip maker of analog IC and embedded IC, can produce a wide range of products covering consumer, industrial, automobile, aerospace and other fields. Therefore, TI still remains an increasing revenue of automobile chips and communication device chips when the demand of consumer electronics is weak.

Facing the double downturn in market demand of consumer electronics and chip prices, many chip-makers have begun to cut investment and production capacity. Of course, there are also chip-makers choosing to go against the trend and expand production capacity. For example, Samsung plans to develop other markets besides memory chips. Foreign media reported that Samsung revealed at a technical forum attended by its customers and partners that it will strengthen the automobile semiconductor business. With the development of smart cars, the demand for automobile chips has increased.

According to data from market research institutions, the automobile semiconductor market was valued at US$45 billion last year and is expected to reach US$74 billion by 2026 and more than US$110 billion in 2030. Under the environment of intelligence, the demand for automobile chips has been still strong due to the development of new energy vehicles.

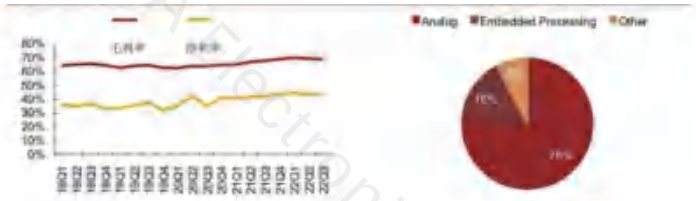
source：Texas Instruments, China Merchants Securities

The Revenue of Texas Instruments by Quarter(US$100 million)



The Net Profit of Texas Instruments by Quarter(US$100 million)

The Gross Profit and Net Profit of Texas Instruments by quarter(US$100 million)



The Revenue Structure of Texas Instruments in Q3 2022

Taking Texas Instruments as an example, although the company's average lead-time decreased by 25 days in October, some chips used in automobiles are still in supply shortage.

After two consecutive quarters of market shrinking in the global semiconductor industry, there are still some chip-makers with improving revenue. On October 25, 2022, Texas Instruments released its performance report for the third quarter of 2022. TI's revenue was US$5.2 billion in Q3 2022, a quarter-on-quarter increase of 1% and a year-on-year increase of 13%. The revenue of Analog-chip business increased by 13% year-on-year, the revenue of embedded processors increased by 11% year-on-year, and revenue of other business increased by 20% year-on-year. The revenue of consumer electronics declined by double digits, continuing the weak status from last quarter. In application fields, the revenue of industrial chips is comparable to that of the second quarter, as the weak demand for consumer electronics tends to spill over into this field. The business of automobile chip continues to be strong, with revenue increasing by about 10% quarter-on-quarter.

TI recently released a discussion with Kyle Flessner, head of its technology

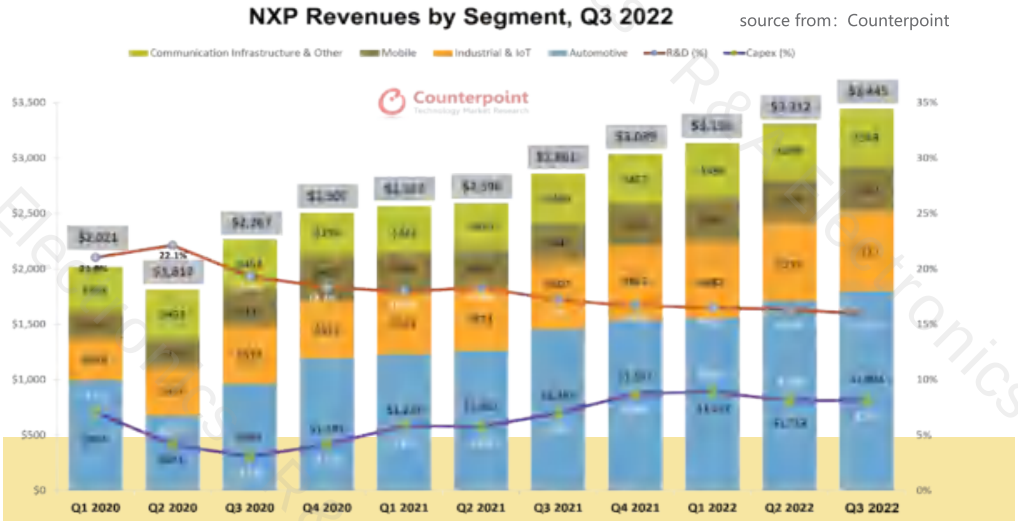
Texas Instruments(TI) recently released a discussion with Kyle Flessner, head of its technology and manufacturing group, about TI's plan to expand its own production capacity in the long term. TI is investing vigorously in expanding production capacity to meet the future growth of semiconductor demand for electronic products. TI will build 6 new 12-inch wafer fabs to make a portfolio of diversified analog and embedded processing semiconductor devices. These new fabs will expand the global range of TI's own manufacturing business, including wafer fabrication and packaging & testing factories.

The 12-inch silicon wafer is an essential material for all leading semiconductor manufacturing plants, and the demand for high-quality material silicon wafers in the global semiconductor industry chain has grown significantly. According to SEMI, the shipment area in global regions of semiconductor wafer reached 14.16 billion square inches in 2021, and the wafer market size reached a record high of $12.62 billion. According to the SEMI report, the shipment area of semiconductor wafer around the world is expected to climb to a higher level in 2023.

In terms of size, terminal markets such as mobile communications and computers continue to develop rapidly, and 12-inch silicon wafer is gradually becoming the mainstream products in the semiconductor wafers market. The shipment area has expanded from 94 million square inches in 2000 to 9.598 billion square inches in 2021, and market share has increased significantly from 1.69% to 68.47%, which is expected to approach 70% by 2022. Meanwhile, shipments of 12-inch silicon wafers have also grown simultaneously with the growth of downstream demand. According to the forecast data of global 12-inch wafer demand released by SUMCO, the global demand for 12-inch wafers will reach 7.5 million pieces per month by the end of 2021 and 9.1 million pieces per month in 2025. 12-inches is the most advanced silicon wafer diameter size. The larger the wafer, the more semiconductor chips can be produced from each wafer. It is a strategic decision for TI to expand its own capacity by investing in new 12-inch fabs. TI's strategic focus has always been 12-inch wafer manufacturing, which can produce more chips per wafer. 12-inch wafer manufacturing also uses more advanced equipment and fully automated manufacturing processes, which greatly improve chip production, quality and efficiency, thereby reducing costs and ensuring product supply.

On December 6, 2022, the production of analog and embedded products has begun to be produced at TI's new 12-inch fab LFAB in Lehi, Utah, which purchased by TI in 2021. Texas Instruments has two 12-inch fabs in operation this year, and the other is RFAB2 fab in Richardson, Texas, which was started initial production in September.

LFAB has more than 25,548 square meters of clean rooms, and the highly advanced facility including approximately 11,265 meters of automated overhead conveyor systems that can quickly transport wafers throughout the fab. TI's total investment in the Lehi fab will be approximately $3 billion to $4 billion. LFAB has the capability to support 65-nm and 45-nm technologies, the ability to transcend these nodes as needed, and the superior process technology to produce complex devices such as embedded processing chips. After full operation, LFAB will manufacture tens of millions of chips per day that will be used in every field from renewable energy to electric vehicles, and to electronics in space telescopes. LFAB will further expand its internal manufacturing capabilities and help TI face the supply and demand challenges of the semiconductor industry in the future.



Third-quarter revenue of NXP enclosed better performance of automotive, mobile and communication than expected

The revenue of NXP Semiconductors in Q3 2022 was US$3.445 billion, a year-on-year increase of 20.4%. The net profit attributable to shareholders was US$738 million, a year-on-year increase of 42.2%.

Divided by business, the automobile revenue was US$1.804 billion, a year-on-year increase of 24%; the industrial and Internet of Things revenue was US$713 million, a year-on-year increase of 17%; the mobile revenue was US$410 million, a year-on-year increase of 19%; communication infrastructure and other revenue was US$518 million, a year-on-year increase of 14%. The automobile, mobile and communications infrastructure business performed better than expected. However, the consumer-facing IoT and Android mobile market were weak. NCNR orders will continue to exceed NXP's supply capacity in 2023. For the fourth quarter, the company expects revenue to be approximately $3.3 billion (± $100 million), which would imply a 9% year-over-year increase and a 4% decline quarter-over-quarter. Non-GAAP gross margin is expected to be 57.8% (± 50 basis points), and operating expenses are expected to be close to $720 million (± $10 million).

NXP's strong point is its automobile business, which accounted for 52.4% of total third-quarter revenue to $1.8billion, up 24% year-over-year and 5% quarter-over-quarter. As the popularity rate of electric vehicles increases, the demand for silicon content in automobiles continues to be strong. The growth in advanced analog, automobile processing and radar solutions can be seen obviously in thethird quarter. However, there is a shortage of microcontrollers and analog products in vehicles due to supply constraints. The NCNR orders in this area continue to exceed the supply capacity in NXP, and this status will maintain next year.

The company also announced its collaborations and product launches in the third quarter. NXP's S32 family of domain and area automotive processors is increasingly favored by automakers as the preferred scalable platform for software-defined vehicles. A leading global automaker has selected the S32 MCU/processor for its upcoming 2025 fleet. NXP has released its second-generation RFCMOS radar transceiver TEF82xx, which replaces the market-proven TEF810xx. This high-performance single-chip solution supports short-, medium- and long-range radar applications, including cascaded high-resolution imaging radars. In addition, NXP has partnered with ChargePoint for charging solutions in the US, also including its proprietary payment solution, providing customers with a seamless process.

Significantly raising long-term financial targets, Infineon set a new record in 2022

Recently, Infineon Technologies AG has upgraded its target operating model and announced the results for the fourth quarter and full year in 2022 (both ending on September 30, 2022). After setting a new record in fiscal year 2022, Infineon has significantly raised its long-term financial goals and plans to invest in a new plant in Dresden.

In fourth quarter of fiscal year 2022, Infineon's revenue reached 4.143 billion euros, the profit reached 1.058 billion euros, the profit margin was 25.5%, and the free cash flow reached 709 million euros.

In fiscal year 2022, Infineon's revenue reached 14.218 billion euros, up 29% year-on-year.The profit reached 3.378 billion euros, up 63% year-on-year. The profit margin reached 23.8%, compared with 18.7% last year. The free cash flow reached 1.648 billion euros, compared with 1.574 billion euros last year.

For the first quarter of fiscal year 2023, assuming a EUR/USD exchange rate of 1:1.00, Infineon's revenue is expected to be 4 billion euros, on which basis the profit margin is expected to be around 25%.

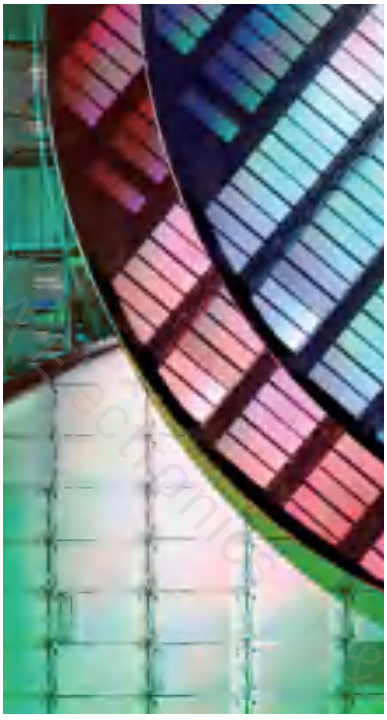
For the fiscal year 2023, assuming a EUR/USD exchange rate of 1:1.00, Infineon's revenue in FY 2023 is expected to reach EUR 15.5 billion ± EUR 500 million. If the revenue is at the midpoint of the forecast range, then the adjusted gross margin is expected to be around 45% and margin is around 24%.

The planned investment is about 3 billion euros. Taking into account the planned expansion of the front-end plant, the free cash flow is expected to be around 800 million euros, and the adjusted free cash flow should be around 1.5 billion euros. Infineon plans to continue expanding its 12-inch wafer manufacturing capabilities to meet the expected accelerated growth in demand for analog or mixed-signal and power semiconductors. The new plant invested by Infineon is planned to be located in Dresden, Germany, which requires sufficient public funding.

With a planned investment of 5 billion euros in total for the plant, it is also the largest single investment in Infineon's history. Infineon's consistent investment strategy includes innovating technology globally, investing in research and development in existing technology fields, creating solutions for customers, realizing product transformation and delivering them to customers.

Infineon started investing in automotive-related R&D projects in the secondquarter of 2019, such as the development of I2S solutions for automotive system-on-chip (SoC). With its outstanding layout of investment and innovative technologies in the Internet of Things (IoT), 5G connectivity, datacenters and microcontrollers for automobile applications, as well as wearable devices and smartphone applications, Infineon has always occupied a dominant position in the highly competitive semiconductor market. In the second quarter of 2022, the revenue of global semiconductorwas US$158 billion, down 1.9% from US$161.2 billion in the first quarter.

The decline continued in the third quarter, with revenue of $147 billion, down 7% from the second quarter. Before this, the global semiconductor market had grown for eight consecutive quarters.Companies such as TexasInstruments, NXP Semiconductors, and Infineon Technologies AG have good sales performance and maintained stable revenue growth during the down cycle of the global semiconductor market due to their investment in the automobile semiconductor field. The semiconductor market has always been cyclical, and the current supply-demand relationship is also leading to a new round of excess and recession. The automobile industry is one of the important markets that will drive the development of semiconductors in the future. Memory chip manufacturers accelerate investment and expand production capacity to explore the automobile semiconductor market, which help them to get through the downturn in the market and can be regarded as a flow-on move.



Source: Samsung, SK Hynix, Texas Instruments, NXP, Infineon, China Business Website, China Merchants Securities, AVIC Securities

Industry News

03

The latest news about the relevant industries of 2022

- Automotive industry
- PV(photovoltaic) Industry
- Intelligent Industrial Control Market

Grace

Automotive industry:

Toyota said its global production rose 23% in October this year, beating its production target for the third month in a row, on Nov. 29 2022. Auto industry struggles to overcome a persistent shortage of chips that is related to the automotive production. Toyota produced 771,382 vehicles worldwide in October, above a gaol of 750,000 and up 23% year on year. In terms of regional outputs, Japan manufactures 203,149 Toyota vehicles, an increase of 33.7% year on year; 568,233 vehicles were produced outside Japan, growing 19.5% from October in a year earlier. Toyota remains facing supply chain disruptions in that the coronavirus spreads. As a result, Toyota's global production growth relatively eased in October from a breakthrough output of more than 887,000 vehicles in September. Toyota's cumulative global production for the January-October period climbed 7.7% year-on-year to 7,494,062 vehicles. Toyota's cumulative output in Japan fell 7.4% year on year while its overseas production was a jump of 15.3%.

Xpeng Motor, Chinese automotive corporate, recently disclosed its earnings report for the third quarter of 2022. According to its earnings, the company's revenue in the third quarter was 6.82 billion RMB($97.8 million), ascending nearly 20% year-on-year and dropping 8.2% quarter-on-quarter, net loss of $34.1 million, an increase of 49% year on year and a decrease of 12% month on month. Deliveries in the third quarter were 29,600 vehicles, surging 15% year on year and falling more than 10% quarter on quarter. By the end of the third quarter, Xpeng Motor's cash reserves reached $575.3 million.

The subsidiary of Honda office in China released sales data for November. The subsidiary sold 78,126 vehicles in November, down 42.8% from a year earlier. Cumulative sales of Honda in China from January to November were 1234,600 vehicles, sliding 11.3% year-on-year.

VinFast, a Vietnamese electric car maker, announced on Dec. 6 that it had filed for an initial public offering (IPO) in the United States and planned to publicly trade its common stock on Nasdaq under the ticker symbol "VFS." VinFast said that in order to complete the IPO, the company will be converted into a Singapore -listed limited company called VinFast Auto Ltd. The number of shares to be offered and the price have not yet been decided. VinFast, which is founded in 2019, has a strong focus on the U.S. market, where it hopes to compete with traditional automakers and other electric car start-ups with its two all-electric SUVs and a battery-leasing business model that lowers vehicle prices. In April, VinFast's Singapore-based holding company submitted a confidential IPO to US securities regulators, even as it prepared to plunge $4bn in a US factory. In late November, VinFast shipped its first 999 vehicles to the United States, a move that marked the realization of its five-year plan to build electric cars in Vietnam and sell them in North America and Europe.

Not long ago, Thomas, chief executive of Volkswagen told the press, by early 2025, Volkswagen will in Wolfsburg, Germany factory input 460 million euros (about $482 million). And most of these funds will be used in the production of ID. 3 the first electric model based on Volkswagen MEB platform. The plant is supposed to set out partial production of ID.3 to begin in 2023 and run full-scale production in 2024. After that, the plant will produce another all-electric SUV model based on the MEB platform. Vw has been using the MEB electric platform since 2019, and it is now reforming it into a new version, the MEB+, which allows for faster charging and longer range.

GWM released its production and sales data for November 2022 in early December. The sales for November came to 87,560 new vehicles. Among them, 20,088 vehicles were sold overseas, up 33.87% year on year. The number of new energy vehicles reached 12,863 in sales. During the first 11 months, 990,081 new vehicles were in sales, including 120,733 NEVs, with a rise of 5.22%; the sales volume overseas attained 152,884 vehicles, growing by 20.36%, hitting a record high.

A production and sales express issued by Changan Automobile in November manifested that the company completed sales of 184,800 new cars in November, but decreasing 1.72% compared to the same period last year. Its own brand gained a better score overall, while the joint venture brand remained depressed. From January to November, Changan Automobile sold 2,090,357 new vehicles, slightly down by 1.51% year-on-year. In detail, Changan carried out sales of 148,534 new cars under its own brands in November, with a year-on-year growth of 9.78%, among which 119,269 passenger vehicles were sold, up by 26.12% year-on-year. The cumulative sales volume of self-owned brands was 1,656,078, increasing 1.51% amid January and November, in which passenger cars were sold at 1,217,933 units, up 8.16% year-on-year.

According to the earnings report of the third quarter of this year Li auto unfolded, the automotive production in China, Li Auto achieved revenue of $133.9 million in the third quarter, an increase of 20.2% year on year, gross profit of 1.18 billion RMB($16.9 million), slashing 34.8% year on year; gross margin of 12.7%, compared to 23.3% in the third quarter of 2021 and 21.5% in the second quarter of 2022. The net loss further widened to $23.66 million from only 0.215 million RMB($30.8 thousand) in the third quarter of 2021, an increase of 156.7% quarter-on-quarter. As of September 30, 2022, the company's cash reserves amounted to $800.6 million.

IC EYES THE WORLD

Tesla's Gigafactory Shanghai hit an all-time record number of deliveries in November, shipping 100,291 electric vehicles to customers in China and overseas markets. Tesla posted a 40% increase from October 2022 and 89.7% increase from Nov.2021. Tesla's deliveries in China during the month of November were made up of 69,098 Model Y units, setting a new monthly sales record and the sales of Model Y as the highest among all passengers in China. Reportedly the Norwegian electric vehicle EV - Stats data platform statistics presented that in November this year Norway electric car sales climbed by 33%, of which the Tesla Model Y is Norway's best-selling car, with 3225 units sales accounted for 18.9% of Norway's electric car sales during November.

BMW Group has officially announced the launch of the new BMW 7 Series led by the innovative all-electric BMW i7. The new BMW7 Series embraced six models, with a price range of $13 thousand to $18 thousand. There were 2 models in BMW i7 while it was priced 1.459 million RMB($21 thousand). At the same time, two types of i7 xDrive50L have been on advance-sale, the price of $ 14 thousand, $17 thousand separately. With the sales of the all-electric i7, BMW now sells five all-electric models in China. By 2023, the amount of pure electric products from BMW will arrive 11 in China.

Mercedes-Benz signed a deal to import its electric cars for the Thai market and has committed to producing electric cars in the country, Bloomberg said. Mercedes-benz will receive a series of preferential measures, including lower import duties and excise taxes on pure electric vehicles inlet by its subsidiary in Thailand by 2023, Ekniti Nitithanprapas, director general of Thailand's tax authority, said in a statement on Dec 9. In the light of the terms of the deal, Mercedes will possibly manufacture electric vehicles in Samut Prakan province, Thailand, although Nitithanprapas unveiled which models would be made or when production would begin.

NIO officially announced that its 300,000th production car is going to launch on the market at NIO's second advanced manufacturing base on December 12.

Compared with the previous two of 100,000 production, which took 3 years and 1 year respectively, NIO's third 100,000 units production only spent more than 7 months to put on the market, with the fastest speed among China's high-end brand. On Feb. 1, NIO reported deliveries of 14,178 units in November, up 30.3% year on year and 40.9% month on month, a new record for new car deliveries. Among them, deliveries of three new models, ET7, ES7 and ET5, based on the second-generation technology platform NT2, rose steadily to a total of 11,072 units. From January to November this year, NIO sold a total of 106,671 new cars, with annual deliveries exceeding 100,000 units for the first time, surging by 31.8% year-on-year. Up to now, NIO has delivered 273,741 new cars in total.

Jinko Solar's N-type TOPCon module Tiger Neo successfully made the bid in a large-scale PV project in Brazil, and will provide about 522MW of PV modules for the first phase of the Santa Luzia Complex in Paraíba, Brazil. Equipped with high-efficiency TOPCon cell

technology, Tiger Neo is an N-type module product released by JinkoSolar at the end of 2021. After its launch, it has become very popular in the global market, and the annual shipment is expected to exceed 10GW in 2022. To this end, JinkoSolar rapidly expanded the production capacity of TOPCon cells to meet market demand.

EU internal market specialist Thierry Breton waved polysilicon crystals at the launch of the European Solar Energy Industries Alliance (ESIA) in Brussels. The new alliance will facilitate investment in large factories with the aim of producing 30GW of solar modules per year by 2025. This target equates to more than six times the current annual production of about 4.5GW. Thierry Breton said that through this alliance, they want to create a complete solar PV value chain in Europe to reduce our dependence and create value in the EU. He believes that Europe still has a lot of work to do. Of the 450GW of PV modules produced globally in 2021, t he EU-controlled supply chain produced less than 9GW. This year, the new solar installations in 27 EU countries are expected to be around 40GW this year, setting a European record compared with 28.7GW last year.

Shangji Automation stated in an announcement that the total amount of daily related procurement transactions that the company expects to occur with Inner Mongolia Xin Yuan Silicon Material Technology Co., Ltd (hereinafter referred to as "Inner Mongolia Xinyuan") is approximately $645.3 million in December 2022 and 2023. According to the data, Shangji Automation is a PV equipment company. After entering the production of monocrystalline silicon wafers in 2019, it has achieved leapfrog growth in performance. In the first three quarters of this year, its revenue was $2.507 billion with a year-on-year increase of 130.49%. The net income attributable to the parent company was $405.965 million, with a year-on-year increase of 101.43%.

JA Solar announced that according to the company's strategic development needs, it plans to expand the integrated production capacity. Through the establishment of a new project company, JA Solar will invest in the construction of the projects with an annual production of 10GW slices and 10GW battery in Shijiazhuang, the project of Shijiazhuang new battery technology R&D center, and the project with an annual production of 10GW battery and 10GW module in Dongtai, with a total investment of $1.656 billion. The statistics show that JA Solar is a leading PV company in China. In 2021, the shipment of PV modules will be 25.45GW, and the shipment of modules in the first three quarters of this year was 27.1GW. Meanwhile, its production capacity is also increasing rapidly. The capacity of PV modules is 40GW, and the production capacity of silicon wafers and cells is about 80% of the capacity of modules in 2021. In 2022, the production capacity of components can reach 50GW. It is estimated that by the end of 2023, the production capacity of modules will exceed 75GW, and the production capacity of silicon wafers and batteries will increase accordingly.

IC EYES THE WORLD

CMAI 2022, which was hosted by the Chinese Society for Biomedical Engineering and organized by the Medical Artificial Intelligence Branch of the Chinese Society for Biomedical Engineering, was held online. At the meeting, the Medical Artificial Intelligence Branch of the Chinese Society for Biomedical Engineering and the Institute of Medical Information of Chinese Academy of Medical Sciences jointly released the Frontiers and Trends of Medical Artificial Intelligence Development Research Report, pointing out that the scale of medical artificial intelligence technology development in China accounts for 38.7% of the global total with the compound growth rate of 34.2% in the past 10 years. China's AI medical device management system has been gradually established, standard formulation has been accelerated, and the registration and evaluation path has gradually become clarified. According to incomplete statistics, as of November 2022, 54 domestic and 2 imported artificial intelligence medical device products have been launched in China.

Bosch Rexroth presents the new ACTIVE Shuttle with advanced interactive functions for the autonomous, safe and flexible transport of small trucks. The camera-based 3D obstacle detection system can identify objects in its path to improve obstacle avoidance. With the new integrated touch screen, individual configuration and quick troubleshooting operations can be done on the mobile robot body. The updated AMS (ACTIVE Shuttle Management System) control software can seamlessly interconnect with the workshop infrastructure, and individual transport tasks can be executed by configuring task templates.

ABB released a series of innovative robotic automation products, solutions and services at China International Industry Fair(CIIF) online, aiming to help customers open up more possibilities for flexible production in the new era of automation through ABB's strategy and value proposition. IRB 1010, the smallest six-axis industrial robot in ABB's history, made its debut at the CIIF, helping wearable smart devices achieve faster, more flexible, high-quality production.

According to the official information of BMW Group, BMW recently took the lead in deploying an artificial intelligence (AI) platform code -named BEACON in China, providing a platform for development, deployment, integration and operation services related to AI application innovation, and accelerating the realization of digitalization of multiple business scenarios. According to BMW, the deployment of the AI platform has launched a "super brain" for the production and operation of the company, injecting new momentum into BMW's digital development in China. This is another important milestone in the process of digital transformation for BMW Group in China after the BMWiFACTORY production strategy was launched in Shenyang in June 2022.

Intelligent Industrial Control Market

According to the latest statistics from Canalys, smart watches became the only sub-category that maintained growth in the Chinese mainland market in the third quarter, with a year-on-year increase of 16.8% to 3.4 million units. In the third quarter of 2022, the wearable wristband market in mainland China continued to be weak, with overall shipments of 12.1 million units, a year-on-year decrease of 7.0%. The wristband market has experienced a year-on-year decline for eight consecutive quarters, with shipments falling to 3.5 million units. Basic watches also suffered a decline in the quarter, down 7.7% year -on-year, remaining at 5.1 million units shipped. Basic watches still maintain the largest market share in mainland China, with more than 40%, while smart bracelets and smart watches are almost evenly divided, with 29% and 28% respectively.

According to the latest statistics from Canalys, smartwatches were the only segment that maintained growth in the Chinese mainland market in the third quarter, growing 16.8% year- on-year to 3.4 million units. In the third quarter of 2022, the wearable wristband market in Chinese mainland continued to be weak, with overall shipments of 12.1 million units, down 7.0% year-on-year. The wristband market has declined for eight consecutive quarters year-on-year, with shipments falling to 3.5 million units. Basic watches also suffered in the quarter, falling 7.7% from a year earlier to 5.1 million units shipped. Basic watches maintained the largest market share in the mainland at more than 40%, while smart bands and smartwatches were almost evenly split at 29% and 28%, respectively.

The industrial control and factory automation market is expected to grow from $147.9 billion in 2022 to $218.8 billion in 2027. It is expected to grow at a compound annual growth rate of 8.2% from 2022 to 2027. The key factors driving the growth of the industrial control and factory automation market are the increasing number of government initiatives to promote industrial automation, and the growing integration of technologies such as IoT and artificial intelligence with various industrial control and factory automation solutions. The increasing use of automation in process and discrete industries is another major factor contributing to the growth of the industrial control and factory automation market.

Source: Gasgoo Net, China Economic Net, Zhitongcaijing Net, OFweek, China Auto News Net, China Automation Net, GlobeNewswire, Canalys

Founded in 2015, R&A Electronics is an independent distributor of electronic components, focusing on shortage supply, PPV Saving Opportunity, purchase OEM excess inventories with cash and component quality inspection, and provided full-scale services for the top OEM, ODM, EMS, automotive part suppliers and industrial equipment manufacturers around the world with comprehensive electronic component supply chain solutions.

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OEM Excess Inventory Management

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After 7-year's cultivation, R&A has developed a large number of suppliers with reliable quality, wide channels, sufficient supply and close relationships. With 8 offices worldwide, R&A Electronics has distinctive capabilities to bargain for the best price and purchase under global shortages.

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R&A always insists on “Quality first”, and has set up special testing laboratories in Shenzhen, Dongguan and Hong Kong. The laboratories, equipped with a series of high-quality, precise and advanced testing instruments and devices, have obtained CNAS certification and strictly complied with international testing standards.

Our Laboratories can not only conduct in-depth testing and analysis of electronic components, but also provide PCB & PCBA and related electronic products for failure analysis and product testing, as well as professional technical services for manufacturing technology verification, technological standards development, process technology research, etc. R&A aims to provide diversified and one-stop testing and certification services for global customers.

R&A electronics

R&A Electronics Testing Laboratory

Comprehensive testing laboratory certified by CNAS

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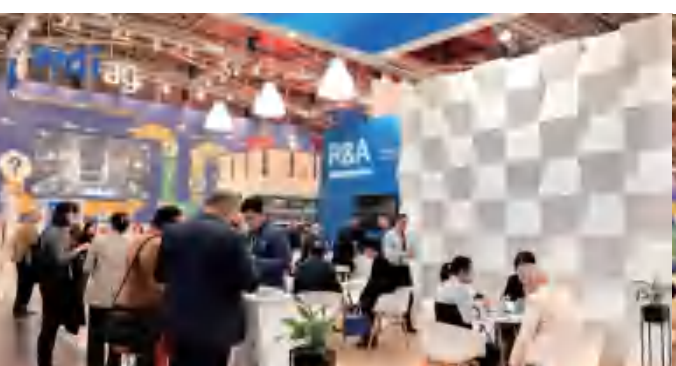
R&A Electronics is perseverant and keeps moving forward in the global semiconductor industry. R&A persistently participated in various electronic fairs that are valued by inside and outside industry at home and abroad, such as Electronica Munich 2022 in Germany and Shenzhen, and harvested a lot.

A trip to Electronica Munich 2022 in Germany and Shenzhen in November

R&A Electronics

Electronica Munich 2022 in Germany

The stuff of R&A Electronics leaved for Germany to visit the Electronica Munich 2022 during fifteenth and eighteenth of November. Many brilliant sales and purchasing around the world presented at the fair and met customers from industries. In the exhibition, there are suppliers and manufacturers from a variety of regions, industries and positions calling in R&A, exchanging and discussing the trends of the electronic area. Meanwhile, the R&A team actively introduced their strengths and services. The firm could take their efforts to solve the shortage of semiconductors supply of customers, which fully displayed the advantages and sophisticated services of it.



R&A Electronics was awarded one of the greatest progressive distributor for the outstanding performance in International IC & Component Exhibition and Conference(IIC). This time R&A beat other distributors to gain the prize, which highly recognized the enormous growth of R&A Electronics over the past two years. It also represented approval of excellent competence and quality of the enterprise from domestic and abroad specialists and industries.

International IC & Component Exhibition and Conference in Shenzhen ,China

The team of R&A Electronics participated in Electronica Munich 2022 in Shenzhen, China amid fifteenth and seventeenth of November, exchanging views with counterparts.

Electronica Munich 2022 in Shenzhen, China

A wisdom says: “ Green mountains are gold mountains.” Human should coexist with nature peacefully, with awing, adapting and protecting nature. R&A Electronic Co,. Limited is a company with humanism. We focus on the balance between nature and humans. Our company engages in desertification prevention and works with the non-profit environmental organizations, enterprises and individuals to plant trees in the desert to improve the local ecological environment and hinder the spread of desertification.

Desertification Prevention Project

R&A strives to respond positively to the low-carbon policy to deal with climate change, and push and support the establishment of ecological civilization.

Volunteer Teaching Program

R&A also emphasizes the education of rural areas. The company founded a R&A non-profit fund together with Shenzhen Charity to improve the education level of rural areas. R&A fund intends to facilitate the comprehensive advancement of rural students in morality, intelligence, sport and kindness by providing professional teachers in music, sport, art, English and IT with high-quality and equal education.

IC Eyes the World was launched in January 2023.
It is a showcase for the global economy and the semiconductor industry.
We collect and compile all relevant data to provide insight into the future
of the economy and the semiconductor industry.
To probe the progress of the electronics industry
behind the world economy is also to look at the world economy through semiconductors.

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