



**中信期货有限公司**  
CITIC Futures Company Limited

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# 中国铁矿石期货 China Iron Ore Futures

## 基础介绍 Introduction

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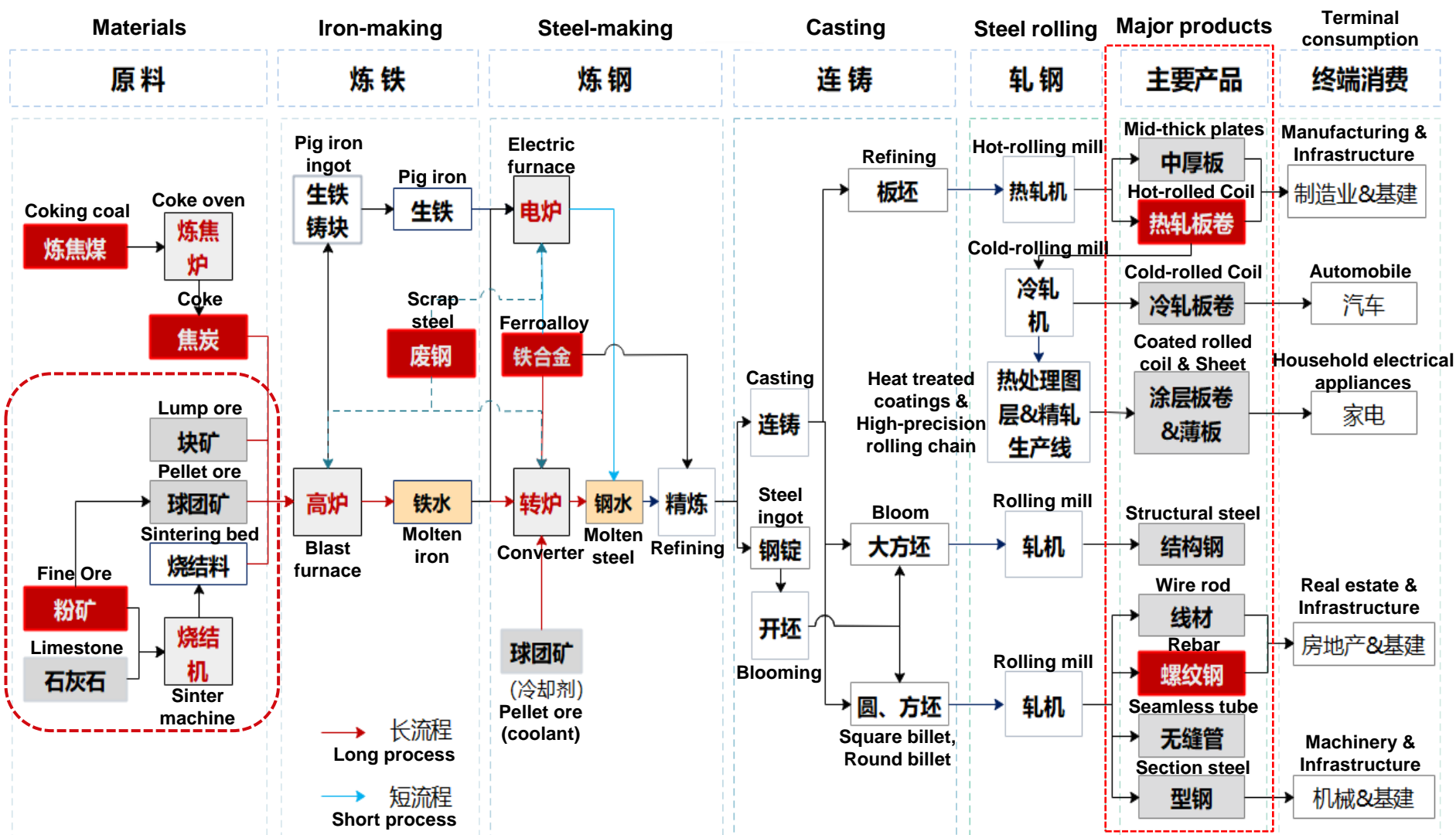
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# Ferrous metals industry chain

## 黑色金属产业链图示



Sources: Wind, Bloomberg, Mysteel, DCE, CITIC Futures

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## 一、总量矛盾分析框架

### Part I Analytical framework of total supply&demand contradiction

## 二、结构性矛盾分析框架

### Part II Analytical framework of structural contradiction

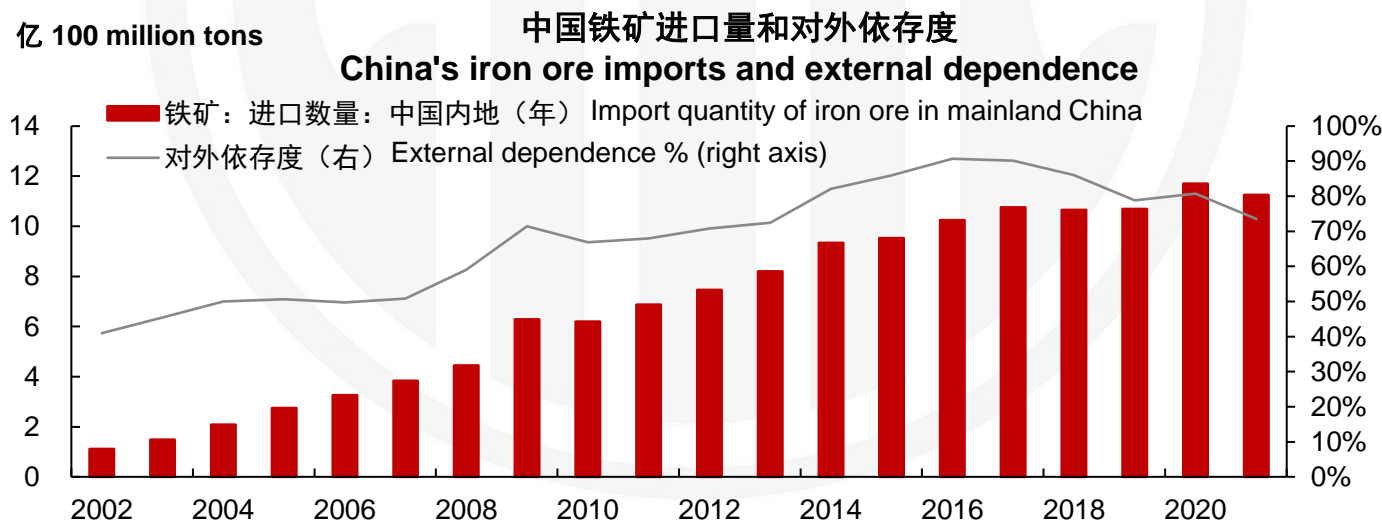
## 三、以基差和价差为核心的估值分析

### Part III Valuation analysis centered on basis and price difference

# Chinese iron is highly dependent on imports

## 1.1 我国铁矿对外依存度高

- 国内铁矿高度依赖进口，平均在80%左右。Iron ore supply is highly dependent on imports, with an average of around 80%.
- 铁矿现货市场的定价标杆为普氏指数，是中国港口的进口矿到岸价指数。国产铁矿的定价，往往由钢厂根据进口矿的价格变动情况，进行采购价的调整。因此，进口矿的供需情况，直接影响铁矿价格。**Platts Iron Ore Index, the CIF index of imported ores of Chinese ports, is the pricing benchmark of the spot market of iron ore.** The pricing of domestic iron ore is usually adjusted by steel mills in accordance with the prices of imported ore. **Therefore, the balance of imported ore directly affects the price of iron ore.**
- 由于进口铁矿必须在国内海港或江内港口卸货，港口库存成为了跟踪供需平衡的良好指标。Since imported iron ore must be unloaded at domestic seaports or the Yangtze River ports, so port inventory helps to track the balance between supply and demand.



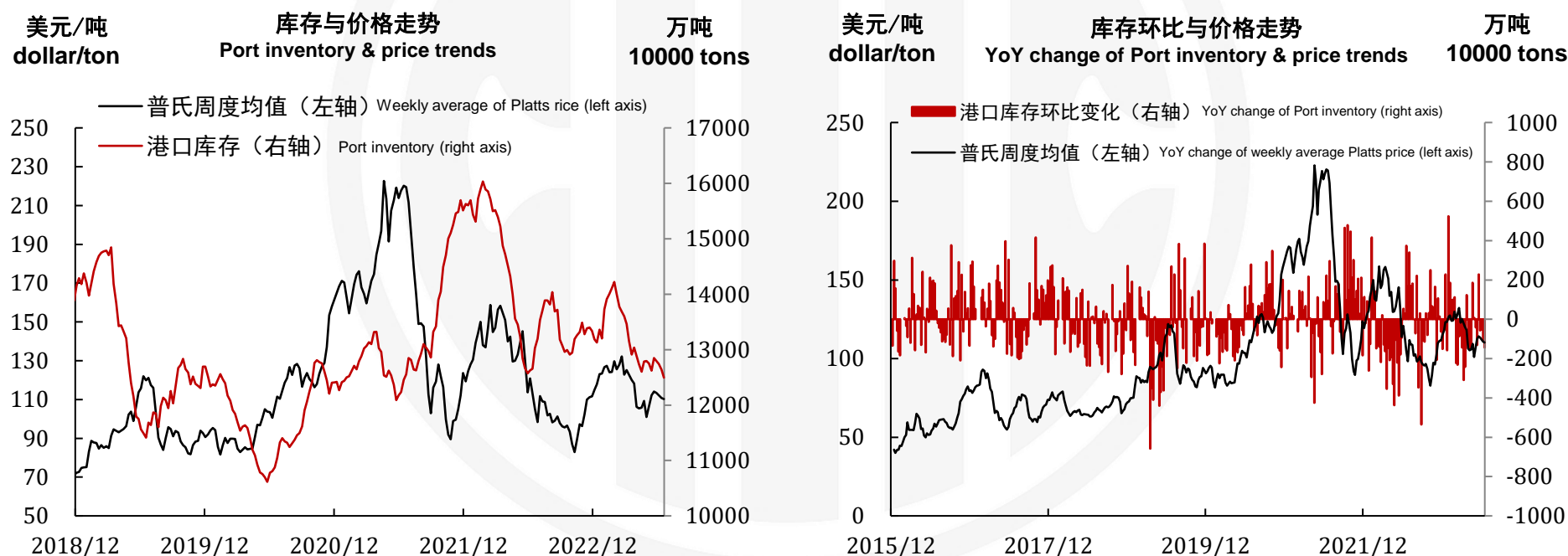
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# Port inventory is closely related to price trends

## 1.2 港口库存与价格走势联系紧密

- 从历年数据来看，港口库存绝对值及其环比变动，大部分时间与现货价格呈反向关系。部分背离区间，主要是受到结构性矛盾驱动，我们将在第二部分加以分析。According to historical data, it can be seen that the absolute volume and MoM change of port inventory are mostly inversely related to spot prices. The intervals with non reverse relationship are mainly driven by structural contradictions, which will be analyzed in Part II.
- 分析总量矛盾，核心就是判断未来库存的走势方向、变动速度。To analyze supply & demand contradiction, we must analyze the trend and the speed of inventory change in the future.



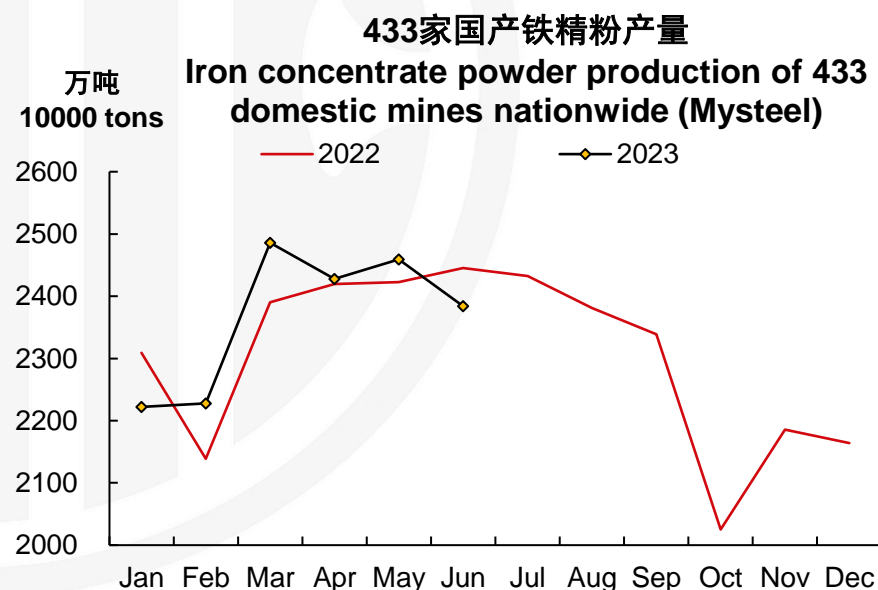
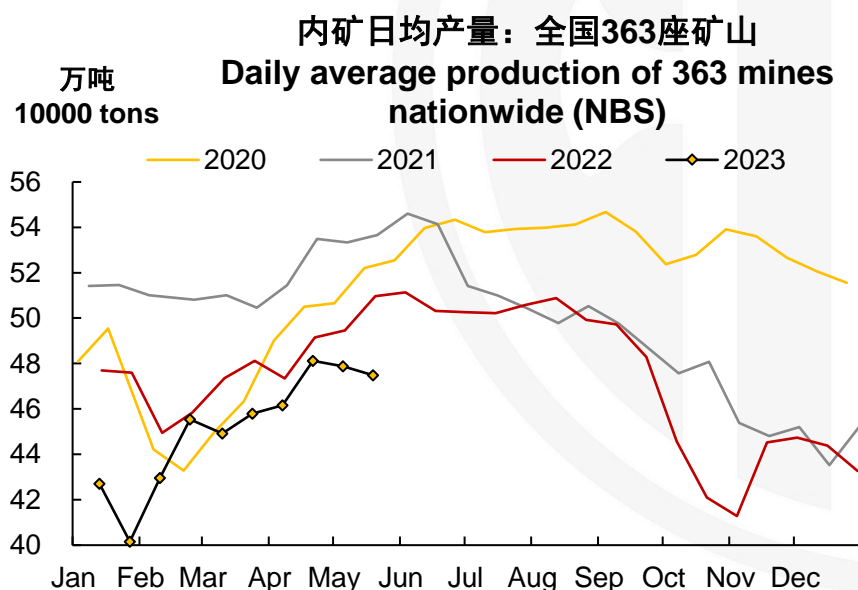
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# Total supply: domestic

## 1.3 总量供应：国产

- 总量供应分为国内供应和进口供应。Total supply consists of domestic supply and imported supply.
- 国内供应方面，主要关注国产精粉产量，但统计局只公布原矿产量，和最终可以实际利用的精粉口径差距较大，且由于国内铁矿品位逐步下降，也很难有固定的换算公式。To calculate domestic supply, the main focus is the production of domestic concentrate powder. However, NBS only publishes the production of raw ore, which has a significant gap with the actual available concentrate powder. Moreover, the grades of China's domestic iron ore are declining, it is difficult to set a fixed conversion formula.
- 采用钢联口径统计的433座矿山精粉产量数据推算，这个样本约占总量的94%左右。We calculate the supply of iron ore by concentrate power produced by 433 mines collected by Mysteel, accounting for 94% of the total.



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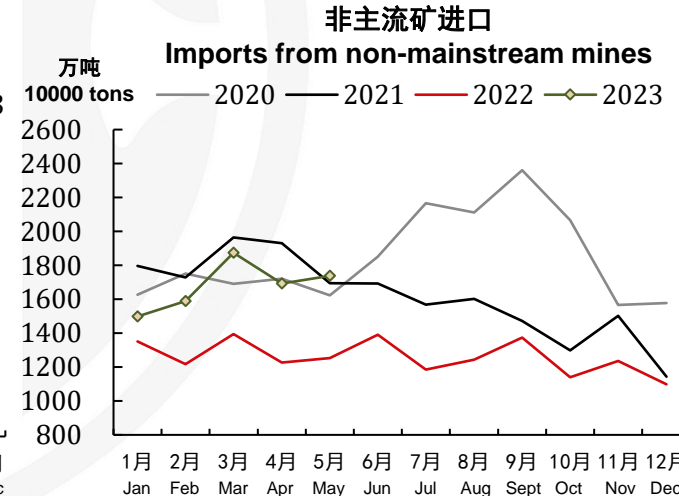
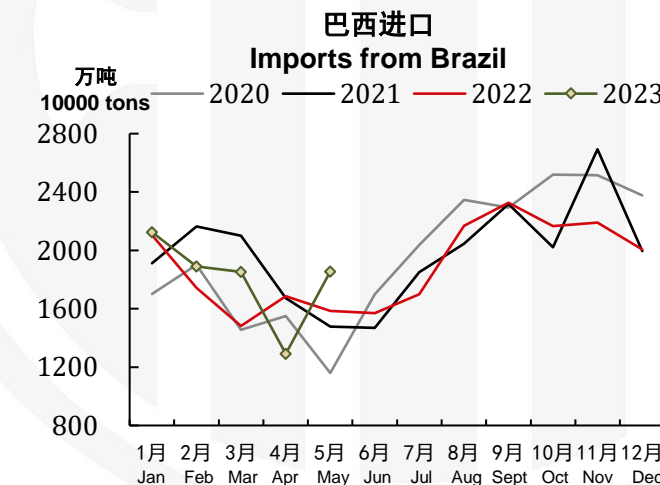
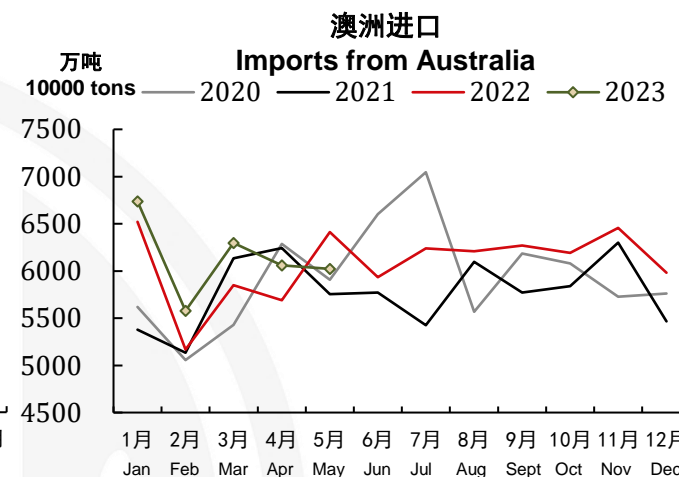
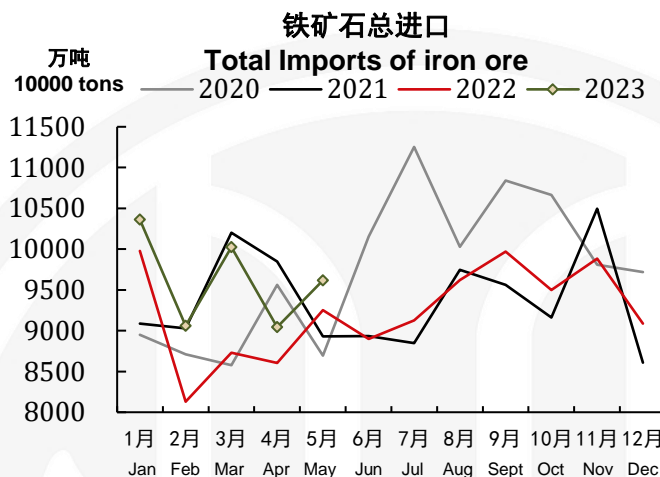
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# Total supply: imports

## 1.3 总量供应：进口

- 中国铁矿供应高度依赖进口，我们重点分析进口预估方法。  
China's iron ore supply is highly dependent on imports. So we will focus on how to estimate import volume.

- 总量进口可以根据不同来源国家，分为澳大利亚、巴西、印度、南非等。对各个国家的供应情况预估，从而预估未来总进口量。 By source countries, imports are from Australia, Brazil, India, South Africa, and others. We could estimate the total by aggregating the estimated supply from each country.



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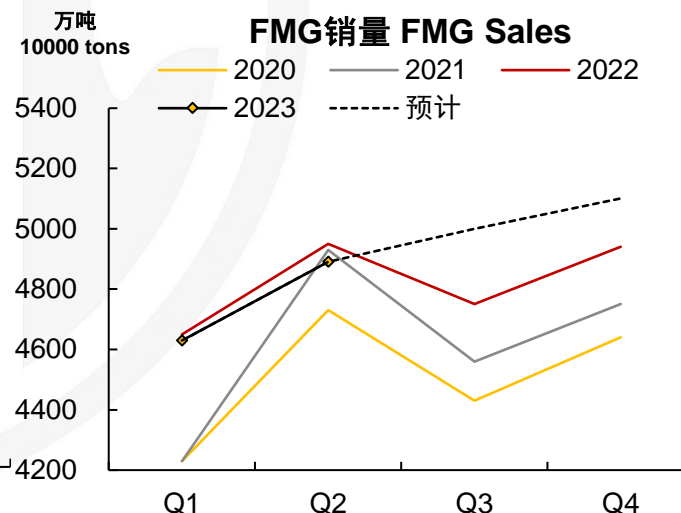
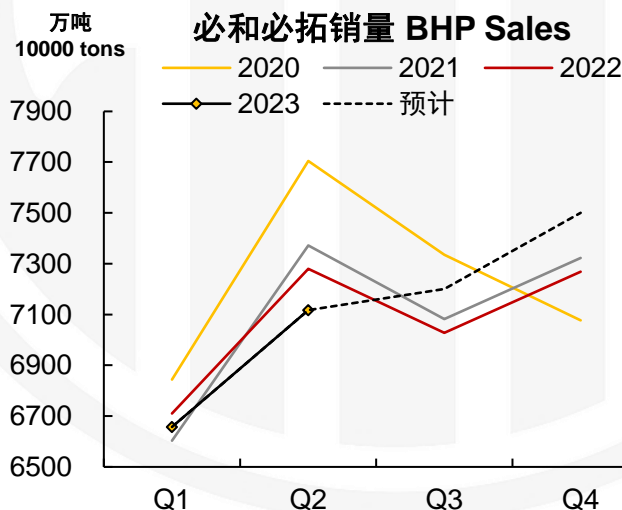
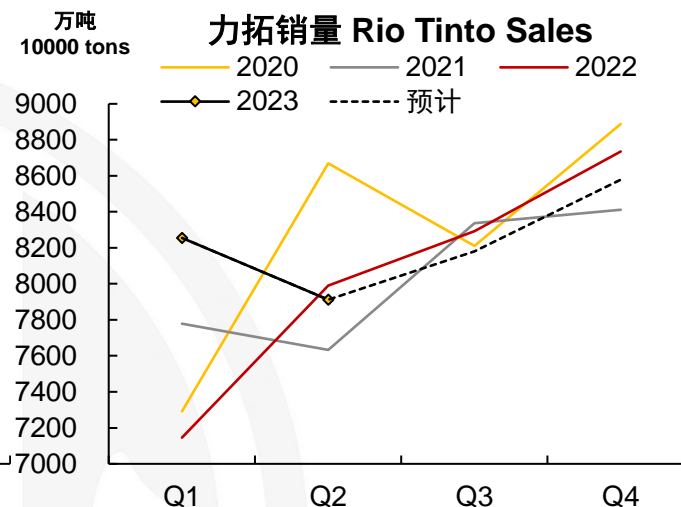
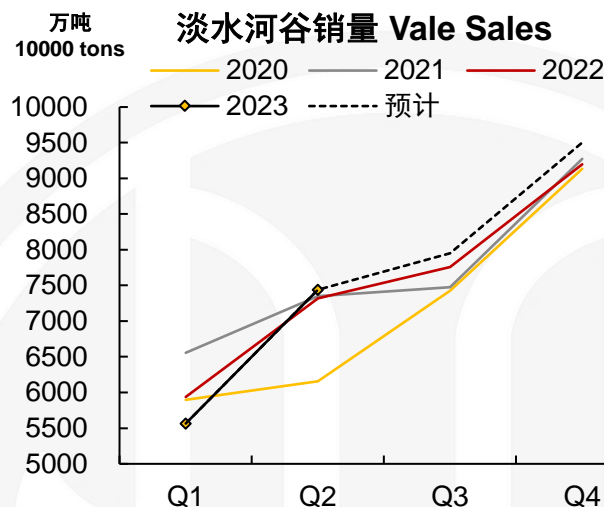
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# Total supply: mainstream mines

## 1.3 总量供应：主流矿山

- 四大矿山占据了铁矿海运市场供应的70%左右。这些矿山会给出未来财年/自然年度的产量目标，因此从年报目标和已实现的产量数据，可以推算未来每个季度还有多少供应释放。
- The four mainstream mines account for about 70% of the iron ore seaborne supply. These mines are all listed companies with **detailed financial reports and clear production targets for the future fiscal/natural year**, so from the annual targets and production data achieved, it is possible to predict how much supply will be released in each future quarter.



Sources: Wind, Bloomberg, Mysteel, DCE, CITIC Futures

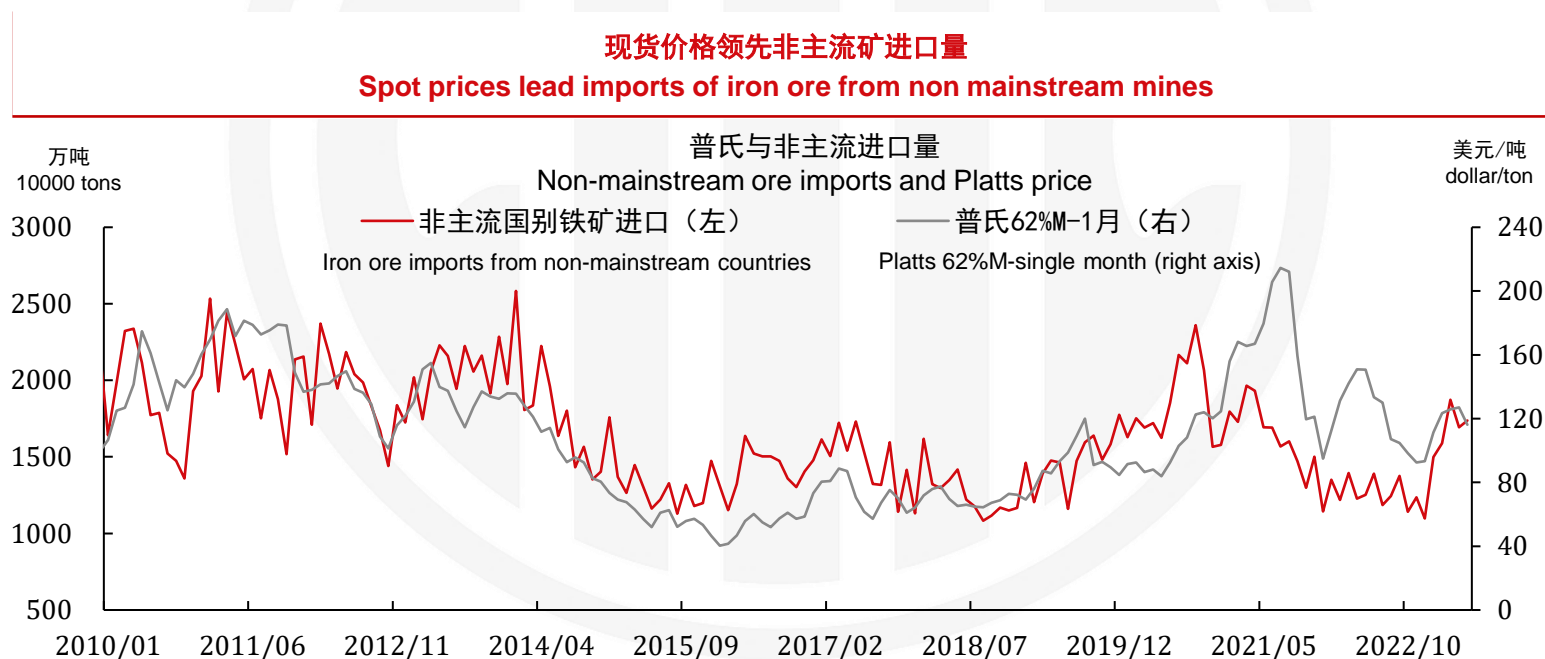
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# Total supply: non-mainstream mines

## 1.3 总量供应：非主流矿山

- 四大矿山之外供应统称非主流矿山。Supply except for four major mines is referred to as non-mainstream mines.
- 对于非主流矿的中长周期预估，一方面是看产能计划，再将增量或者减量均摊到月度，预估未来月度进口情况。另一方面，现货价格对其领先性非常有效，可以预估未来2个月左右的进口量。但需要注意的是，若矿价大跌触及矿山成本线，非主流发运可能会有所减量。 To estimate the medium to long term supply of non-mainstream mines, 1) estimate the monthly imports in the future by distributing the **planned production capacity** evenly to each month; 2) the leading role of **spots price** effectively foreshadows the import volume in the following two months. If ore price falls below the cost line of mines, non-mainstream mine shipments may be reduced.
- 可以用高频数据对月度预估进行校准。High-frequency data can be used to calibrate monthly estimation.



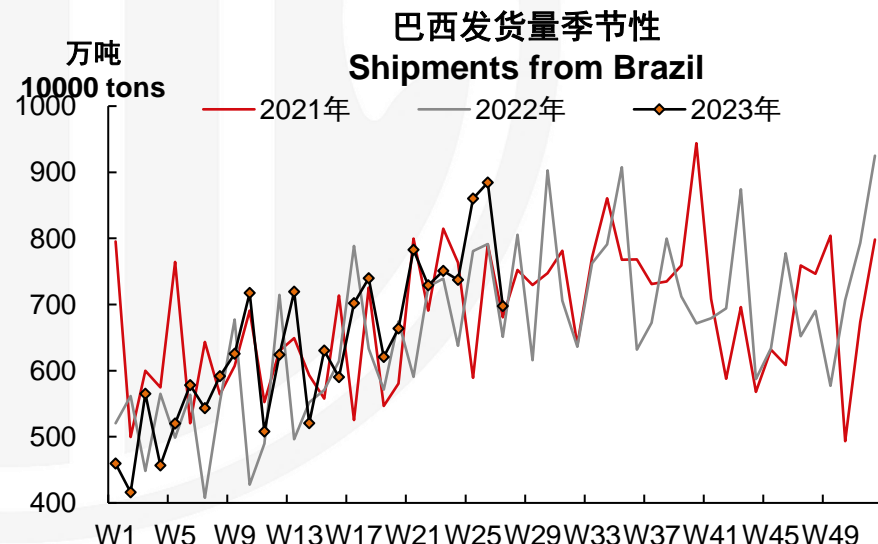
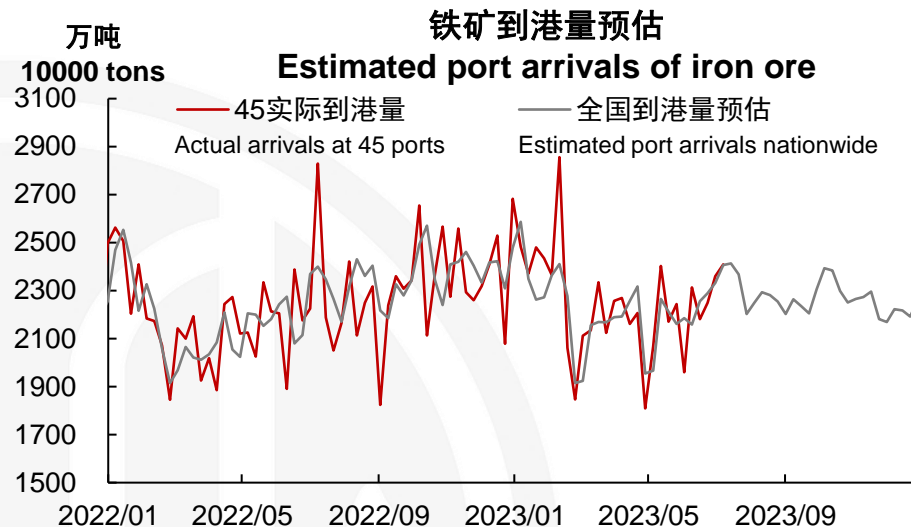
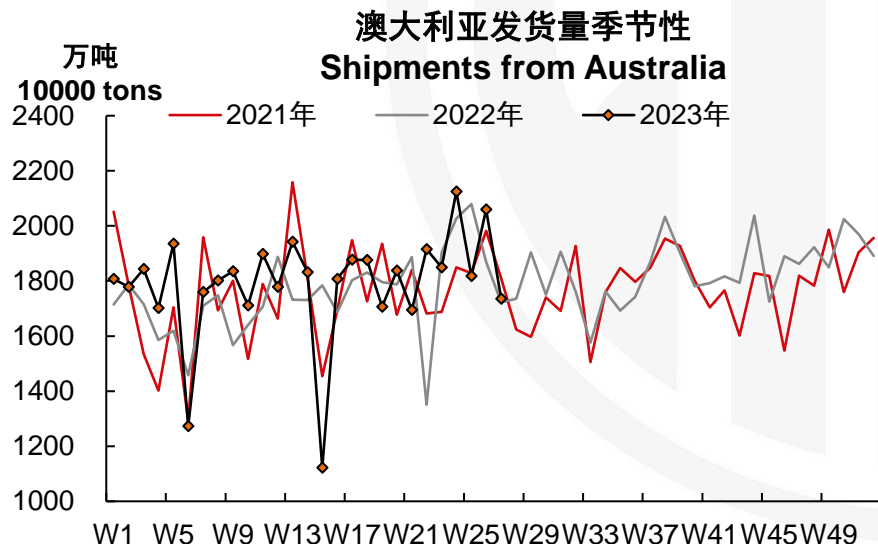
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# Total supply: weekly supply is mainly estimated through shipment volume

## 1.3 总量供应：周度级别主要通过发货量预估

- 周度供应量，主要通过发货量预估。Weekly supply is mainly estimated through shipment volume.
- 澳洲至中国船期平均14天，巴西至中国船期平均45天。通过已有发货量，预估到港量。Average sea freight from Australia to China generally takes around 14 days; average sea freight from Brazil to China generally takes around 45 days. Port arrivals can be estimated by shipments.

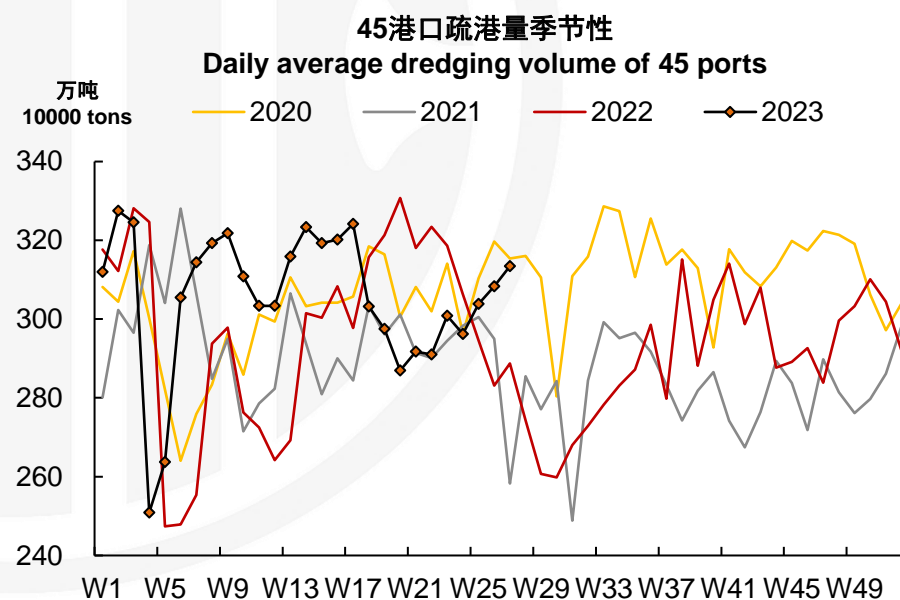
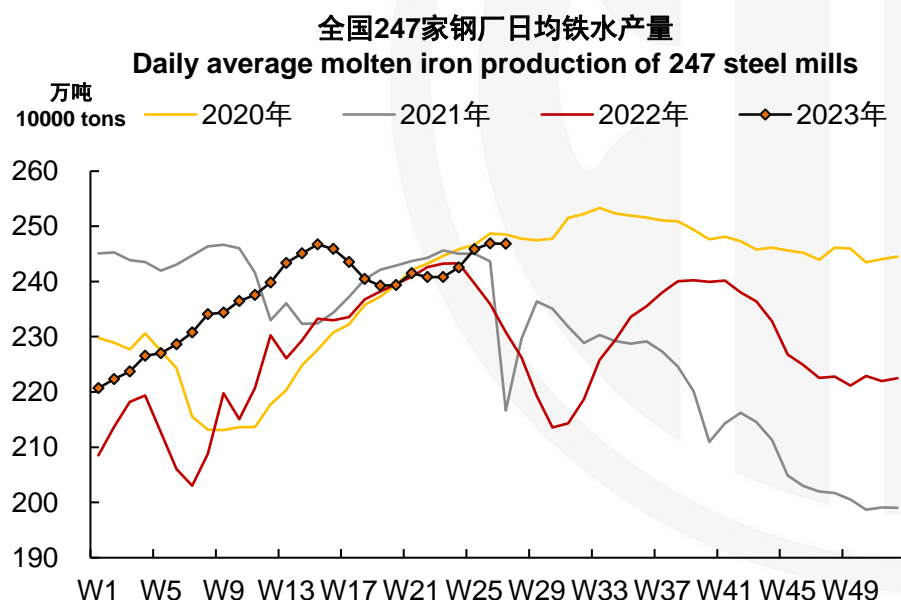


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## 1.4 总量需求：主要跟踪铁水产量和疏港量

- 铁矿需求只用于炼铁，主要跟踪生铁产量和疏港量两个指标。Iron ore is only used for iron-making, so total demand mainly tracks molten iron production and port dredging volume.
- 月度需求可以用统计局口径生铁产量推算。Monthly demand can be calculated by NBS molten iron production.
- 周度级别上，钢联247家样本钢厂铁水产量为大样本数据，接近统计局全样本，可以重点关注。同时，我们在周度级别供应上预估的是进口矿到港量，因此与疏港量预估结合，可以对周度级别的港口库存走势进行预估。  
At the weekly level, the molten iron production data of 247 steel mills collected by Mysteel is close to the total production data collected by NBS. In addition, based on the estimated port arrivals of imported ore and the port dredging volume at the weekly level, the trend of port inventory at the weekly level can be estimated.



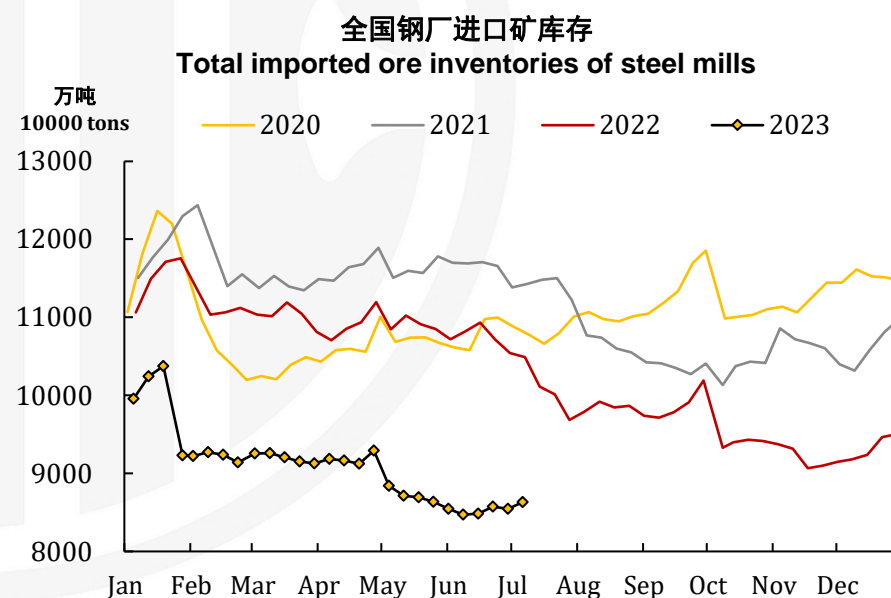
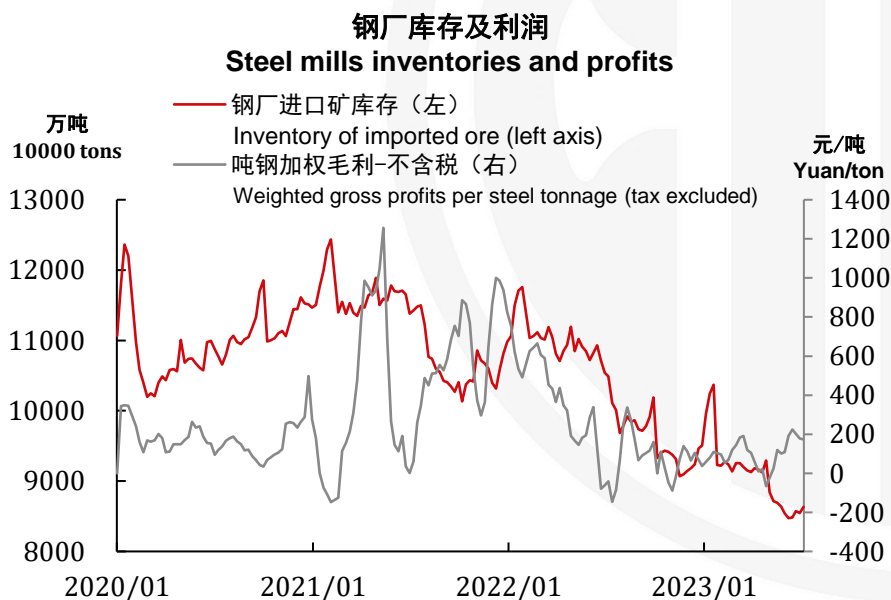
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# Total demand: replenishment of steel mills

## 1.4 总量需求：钢厂补库

- 钢厂对铁矿库存周期的变动，会在铁水产量不变的情况下，影响疏港量。In addition to production demand, changes in the inventory cycle of iron ore in steel mills will affect the dredging volume even if the production of molten iron remains unchanged.
- 钢厂库存受多方影响，春节等长假前会出现集中补库；通常钢厂维持厂内低库存并采取按需补库策略。一是，2018年后环保要求钢厂原料在大棚中存放，而大棚投资较高，使厂内原料容量有限；二是，近年钢厂利润下降，铁矿价格高位，补库动力减弱，仅保持正常生产所需库存天数。The inventory cycle of iron ore in steel mills is influenced by multiple factors. Centralized replenishment usually occurs before long holidays such as Spring Festival. Normally steel mills keep low inventory and restock as needed. 1) due to environmental requirements proposed after 2018 require steel mills to store raw materials in greenhouses, high investment of greenhouses leads to limited room for storing raw materials; 2) declining steel mill profits and high iron ore prices make steel mills less motivated to replenish and just keep appropriate inventory required for normal production.



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# Estimate total supply-demand balance: monthly

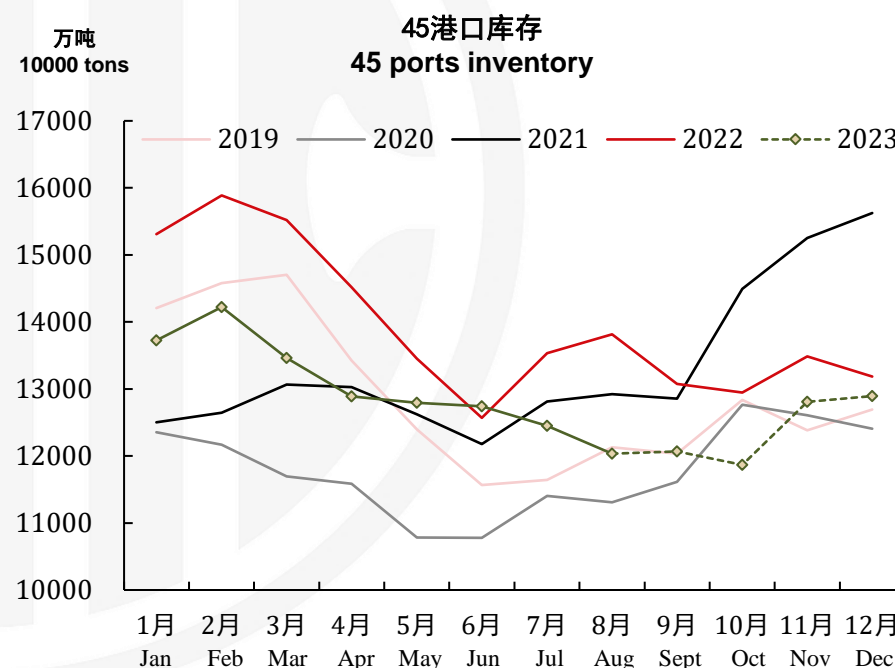
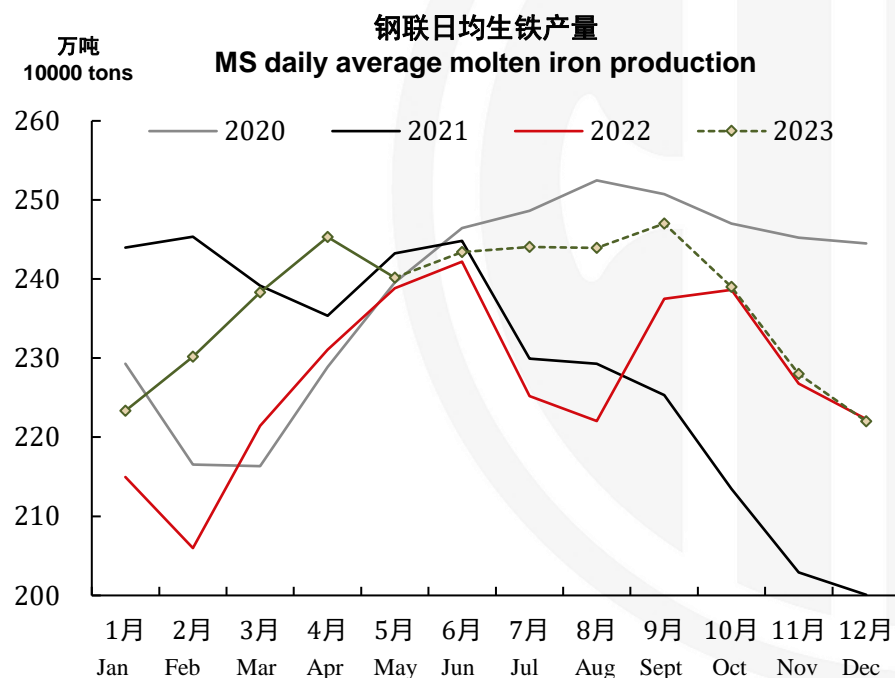
## 1.5 总量平衡预估：月度

- 通过前面对总量供应和需求的预估，可以得到未来的总量平衡预估。

Based on the above-mentioned estimates of the total demand and supply respectively, we can estimate the total balance in the future.

- 根据时间周期的不同需求，可以用月度和周度级别展示。

It can be displayed at monthly and weekly levels.



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# Estimate total supply-demand balance: weekly

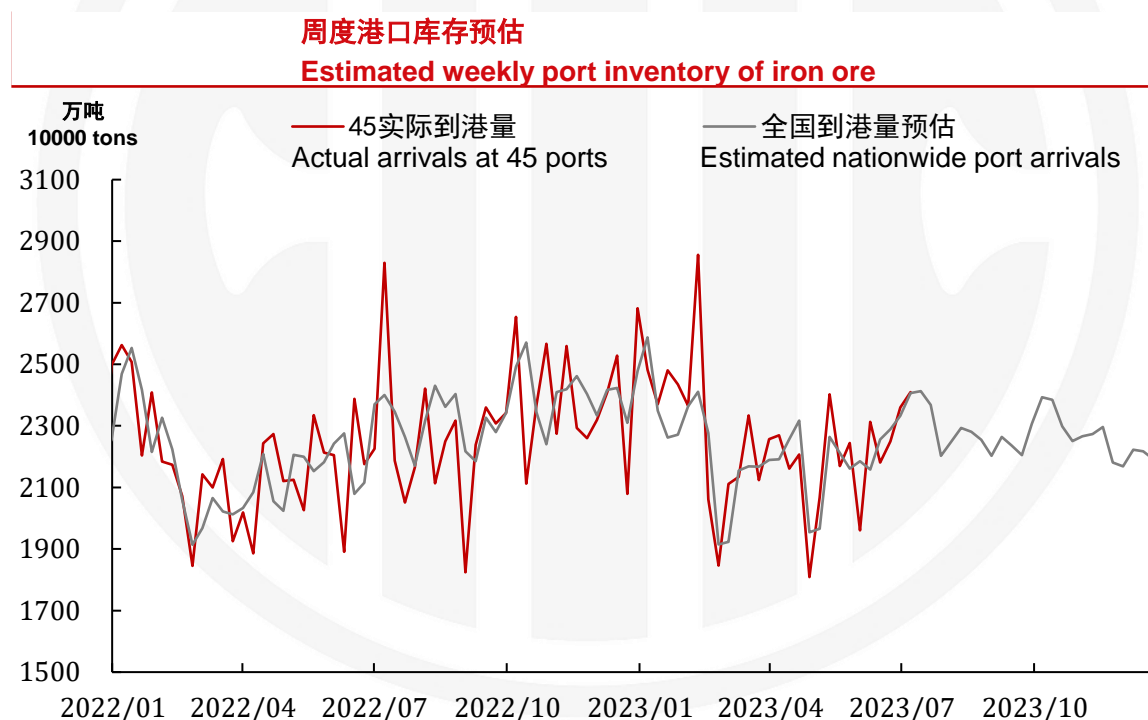
## 1.5 总量平衡预估：周度

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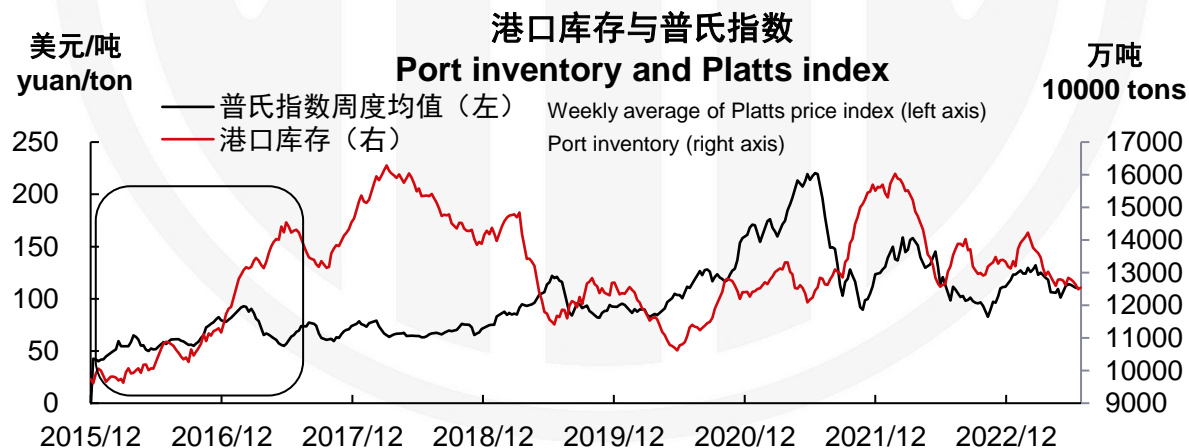
### Part III Valuation analysis centered on basis and price difference



# Structural contradictions may be dominant

## 2.1 结构性矛盾也可能成主导矛盾

- 在市场总量矛盾平衡或是不明显时，结构性矛盾可能成为主导。Structural contradictions may become dominant when total supply & demand contradictions are balanced or unclear.
- 由于铁矿石期货是实物交割的品种，期货价格锚定的是最便宜可交割品现货价格。在总库存持续累积时，可交割品的库存可能不增反降，从而支撑现货和期货价格。Iron ore futures are physical delivered, futures prices are based on the spot prices of the Cheapest to Deliver. As total inventories continue to accumulate, deliverable inventories may fall rather than rise, supporting spot and futures prices.
- 例如，2016年至2017年，港口总库存不断累积，但现货价格却持续上涨。核心驱动就来自，钢厂利润好转后，盘面标的高品粉矿需求好转，甚至出现结构性紧张，从而驱动期现货价格上涨。For example, from 2016 to 2017, the total inventory of ports continued to accumulate, but spot prices continued to rise. The core driving force was that the improvement in profits of steel mills led to the increasing demand for medium to high grade fine ore on the market and even the tight structure, thereby driving up spot prices.



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## 2.2.1 关注可交割品牌的供需情况

- 只有粉矿可以交割，因此首先需要关注粉矿的需求。

Only fine ore can be delivered, so attention shall be first paid to the demand for fine ore.

- 从2009合约开始，铁矿石期货实施品牌交割。

Starting from the 2009 contract, iron ore futures must be delivered by designated brands.

- 表中可交割品牌，除了国产铁精粉是钢厂自用为主，很少现货流通，基本都是进口粉矿，特别是澳洲主流中品粉矿。

Except domestic iron concentrate powder mainly used by steel mills for their own use, seldom see spot circulation, brands are mostly imported fines, especially mainstream Australian medium grade fines.

# Pay attention to the supply and demand of deliverable brands

## 2.2.2 关注可交割品牌的供需情况

可交割品 Deliverable goods	Fe	H2O	质量升贴水 Quality premium	品牌升贴水 Brand premium	合计升贴水 Total premium
PB	61.6	9	15.5	15	30.5
卡拉加斯粉 Carajas Fines	65.3	8	117.7	15	132.7
Kumba	63.8	2.2	53.0	0	53.0
BRBF	62.5	8.4	35.8	15	50.8
纽曼粉 Newman Fines	62.4	7.5	25.3	0	25.3
IOC6	61.7	9.1	1.0	0	1.0
麦克粉 Mac Fines	60.8	7.3	-0.5	0	-0.5
金布巴粉 Jumblebar Fines	60.5	7.2	-61.5	0	-61.5
罗伊山粉 Roy Hill Fines	60.7	8.5	-4.5	0	-4.5
SP10	58.5	9	-49.3	0	-49.3
FMG混合粉 FMG Blend Fines	58.3	8.6	-77.8	0	-77.8
杨迪粉 Yandi Fines	57.3	9	-131.0	0	-131.0
超特粉 SSF	56.9	7.8	-148.4	0	-148.4
卡拉拉精粉 Karara Concentrate	65.6	7.26	55.9	0	55.9
河钢精粉 HBIS Concentrate	65.8	8.7	76.0	0	76.0
鞍钢精粉 Ansteel Concentrate	66.0	9	95.0	0	95.0
本钢精粉 Bensteel Concentrate	67.5	9	122.5	0	122.5
五矿标准粉 Minmetals standard fines	61.5	8.9	15.5	0	15.5
乌克兰精粉 Ukrainian concentrate	64.7	9.44	17.0	0	17.0
马钢精粉 Masteel concentrate	65.0	9	63.0	0	63.0
太钢赤精粉 TISCO hematite fines	65.5	0	122.5	0	122.5
太钢磁精粉 TISCO magnetic fines	65.5	0	52.5	0	52.5

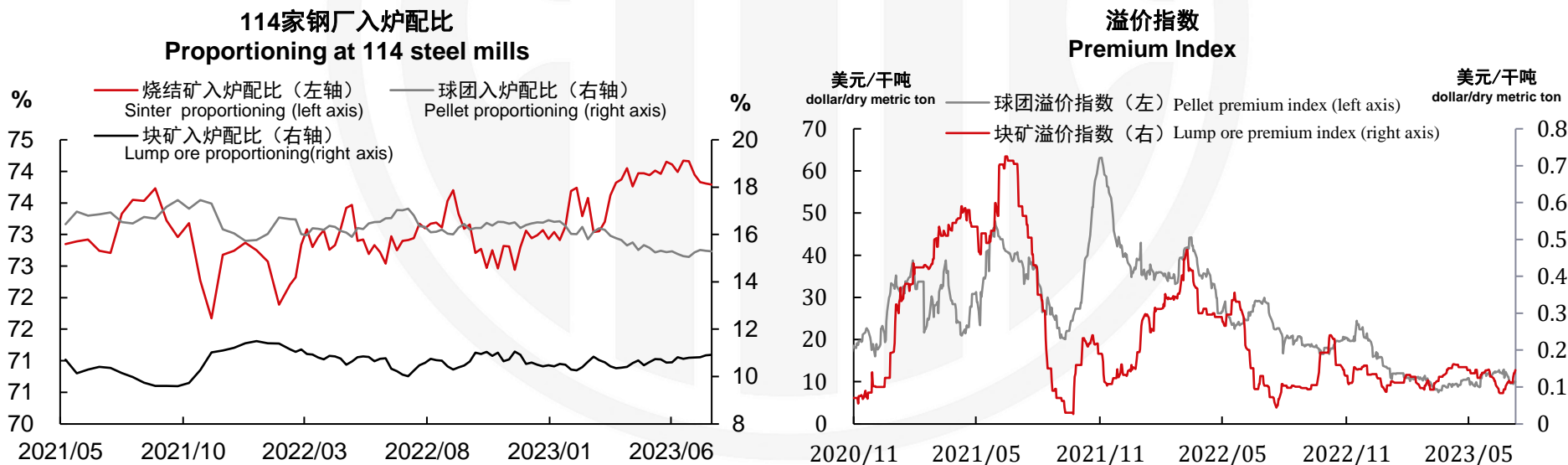
Sources: Wind, Bloomberg, Mysteel, DCE, CITIC Futures

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# Attention is first paid to the overall demand for fine ore

## 2.3 首先关注整体粉矿需求

- 粗粉不能直接进入高炉冶炼，必须经过烧结成为烧结矿，才可以入炉。Coarse fine ore cannot be directly fed into the blast furnace for smelting, it must be sintered into agglomerate first.
- 球团矿和块矿是另外两大主要入炉品种。当球团和块矿溢价下降至低位时，钢厂有动力增加球团和块矿用量，降低粗粉的用量。Pellet ore and lump ore are the other two main varieties that can be directly fed into furnace. When the cost-effectiveness of pellet ore or/and lump ore increases, steel mills will be motivated to use more pellet ore or/and lump ore, and fewer coarse fine ore.
- 需要注意的是，我国高炉冶炼以烧结矿为主，球团和块矿总配比由于工艺限制，一般低于30%。In China, raw materials of blast furnace smelting are mainly agglomerate; pellet ore and lump ore generally account for less than 30% due to processing limitations.



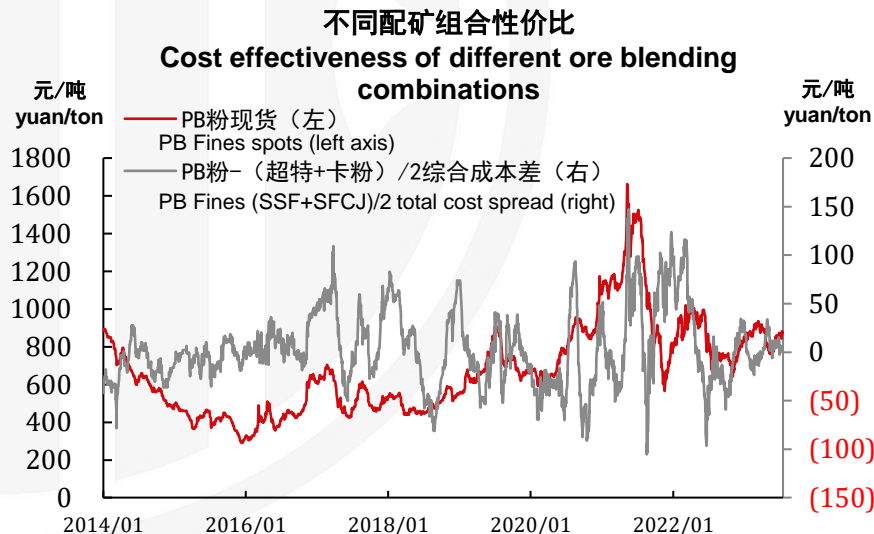
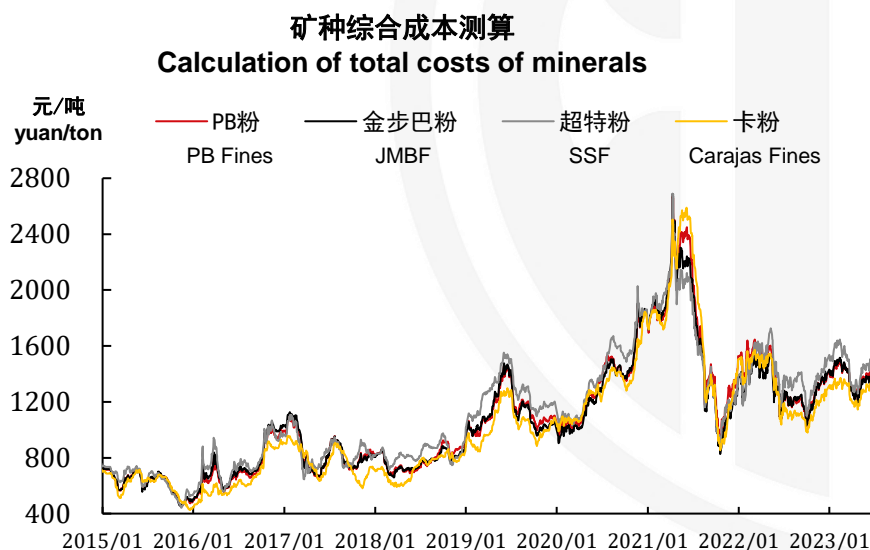
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# Changes in cost-effectiveness of different varieties of fine ore

## 2.4 不同品种的性价比变化

- 通过跟踪品种之间价差的变化，关注粉矿内部不同品种的性价比。Pay attention to the changes in cost-effectiveness of different varieties of fine by tracking price difference.
- 不同矿种之间，不仅有绝对价格的差异，还会有产量和焦炭用量的不同。将这两个因素考虑进来之后，可以测算出不同品种的综合成本，越低的品种则性价比越高，容易在未来获得钢厂青睐，从而增加需求。There are not only absolute price differences, but also differences in production and coke consumption between varieties of fine. We can calculate the total cost of different ore varieties, the lower the total cost, the higher the corresponding cost-effectiveness; and steel mills will be motivated to use more, driving up the demand.

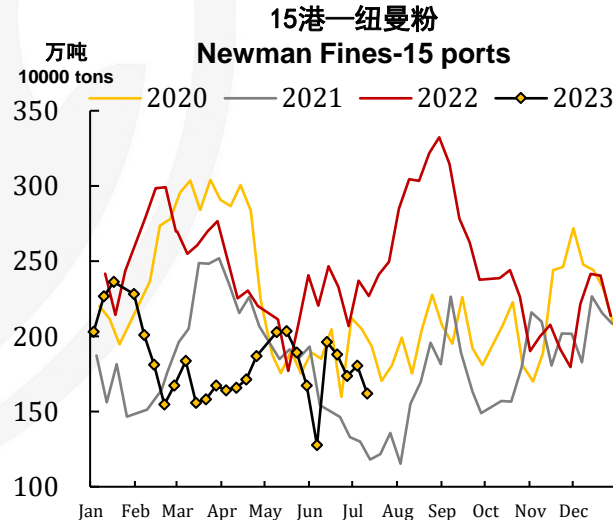
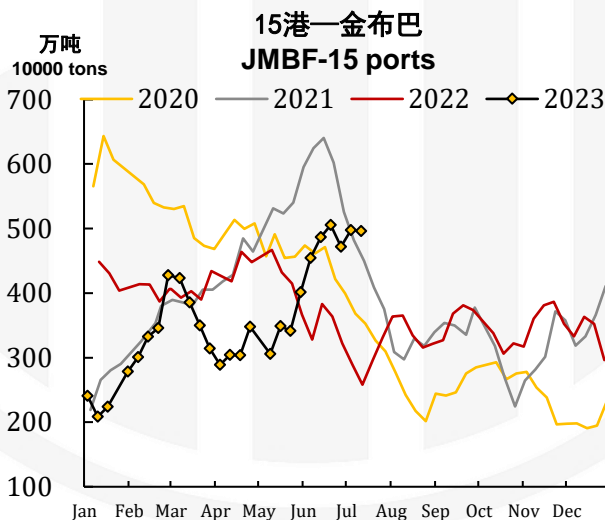
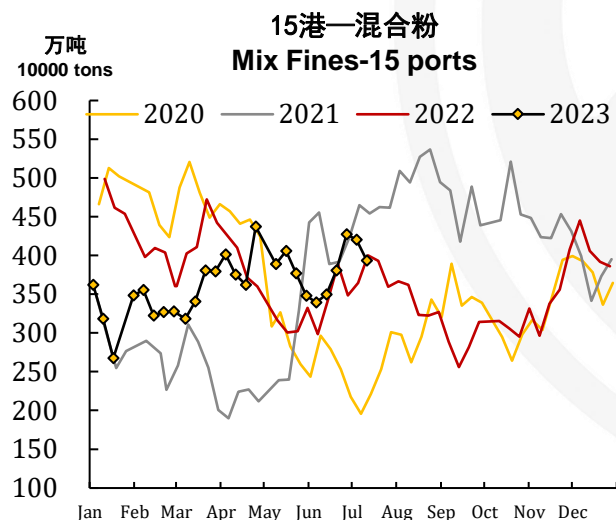
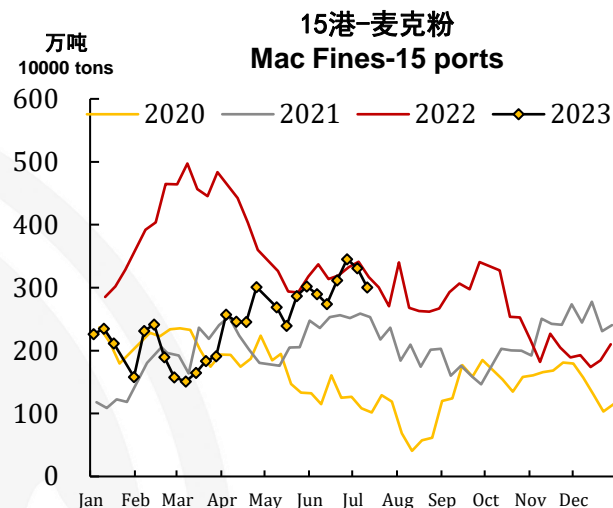
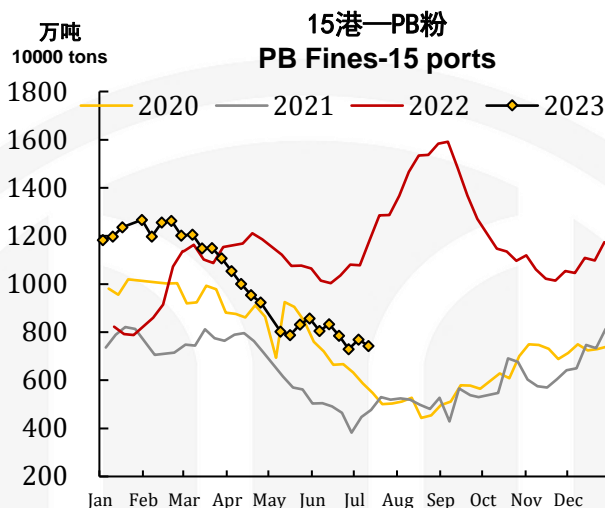
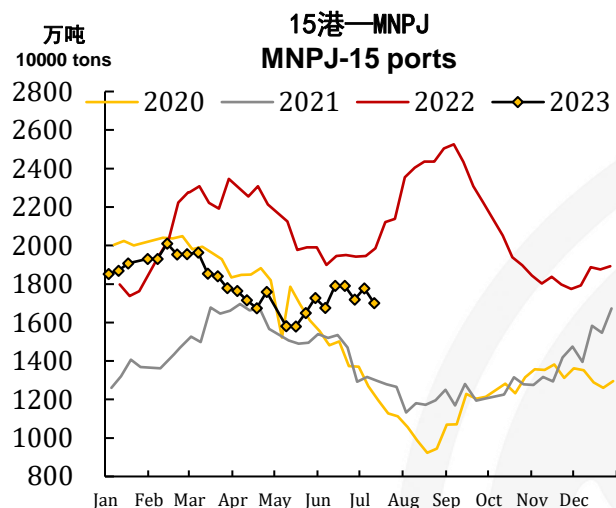


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# Track structural contradictions through the trends of different varieties

## 2.5 通过细分品种库存走势跟踪结构性矛盾



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## 一、总量矛盾分析框架

### Part I Analytical framework of total supply&demand contradiction

## 二、结构性矛盾分析框架

### Part II Analytical framework of structural contradiction

## 三、以基差和价差为核心的估值分析

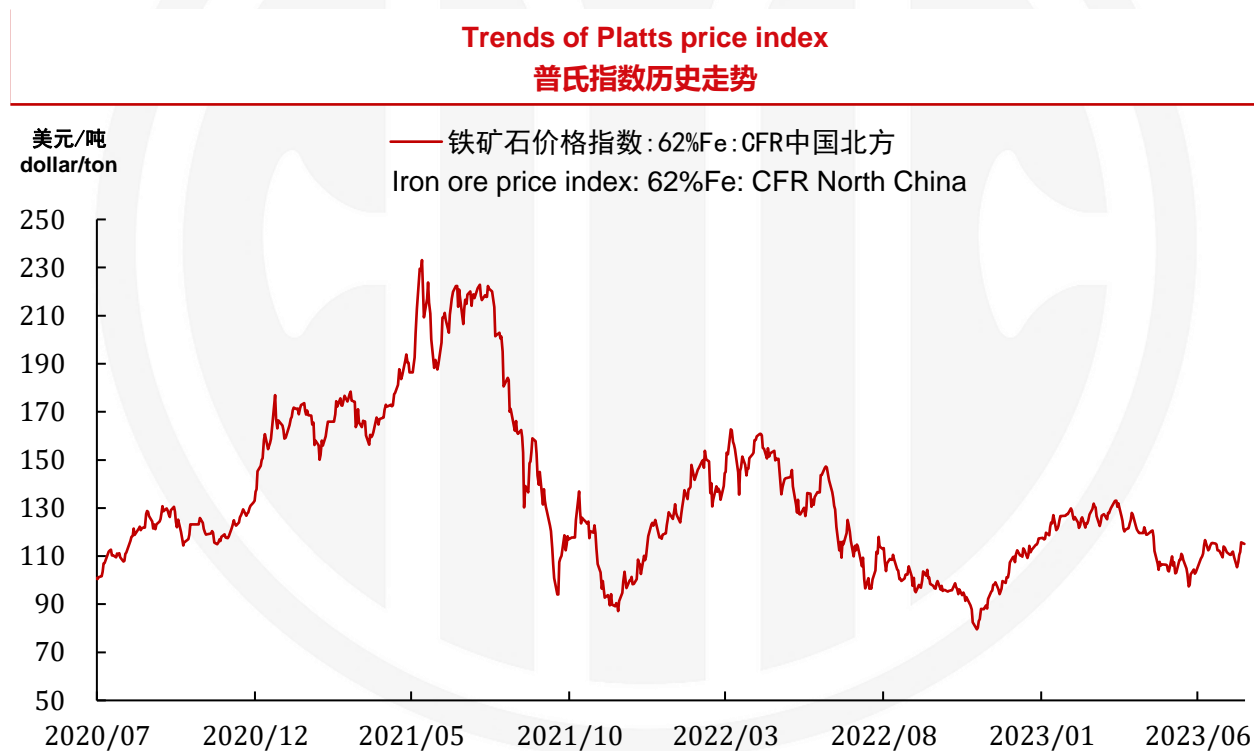
### Part III Valuation analysis centered on basis and price difference



# Measure the spot valuation by US dollar price

## 3.1 美元价格衡量现货估值水平高低

- 自2009年长协模式逐步瓦解后，普氏指数成为了铁矿现货定价基准。其绝对值的高低，可以衡量当前现货市场的估值水平。With the gradual collapse of long-term contract mode since 2009, Platts iron ore index is a benchmark assessment of the spot price of physical iron ore.



Sources: Wind, Bloomberg, Mysteel, DCE, CITIC Futures

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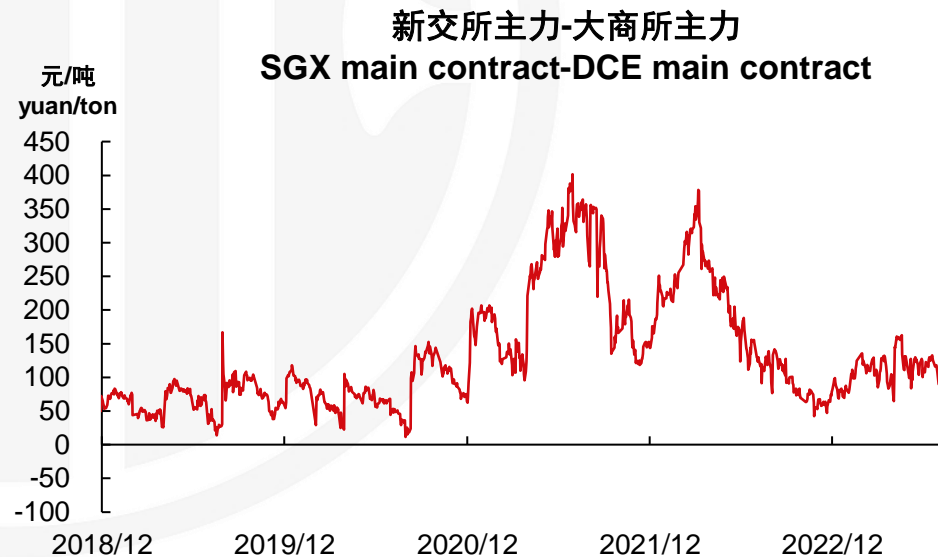
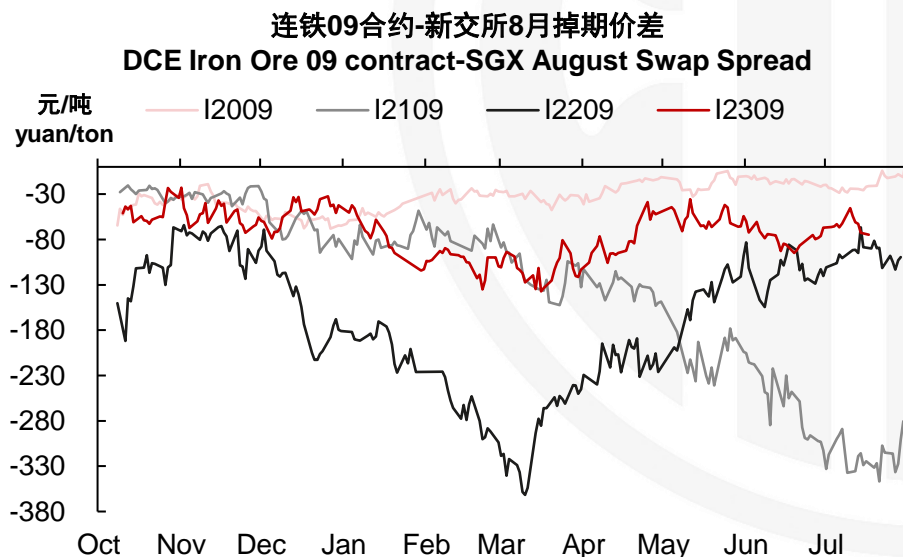
## 3.2 国内外市场相对高低

- 掉期价格\*汇率\*增值税 → 连铁价格。

Swap price in SGX \* USD/CNY exchange rate \* value-added tax → DCE iron ore price

- 国内港口现货市场与普氏指数之间存在价差波动；国内铁矿石期货与新加坡掉期之间，同样存在价差波动，因此用内外价差，可以衡量国内外两个市场的相对高低及估值水平。

There exists a price difference fluctuation between the domestic port spot market and the Platts index, and also between domestic iron ore futures and Singapore swaps. Thus, we can measure the relative relationship between domestic and foreign markets by internal and external price difference.



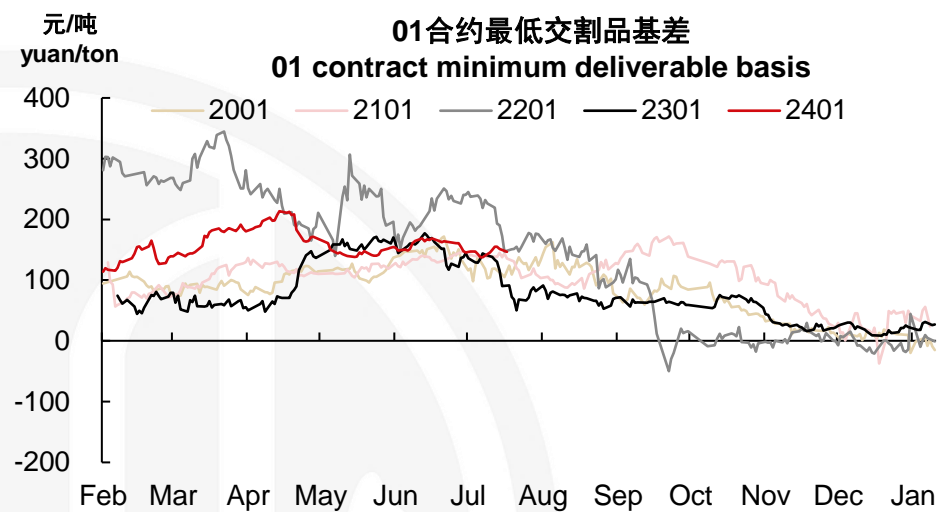
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# The relative valuation levels of futures compared with spots

## 3.3 相对估值水平

- 用基差的绝对水平、与历史同期的比较，可以衡量期货价格相对现货的估值水平。
- We can measure the relative valuation levels of futures compared with spots by the absolute level and the YoY change of basis.



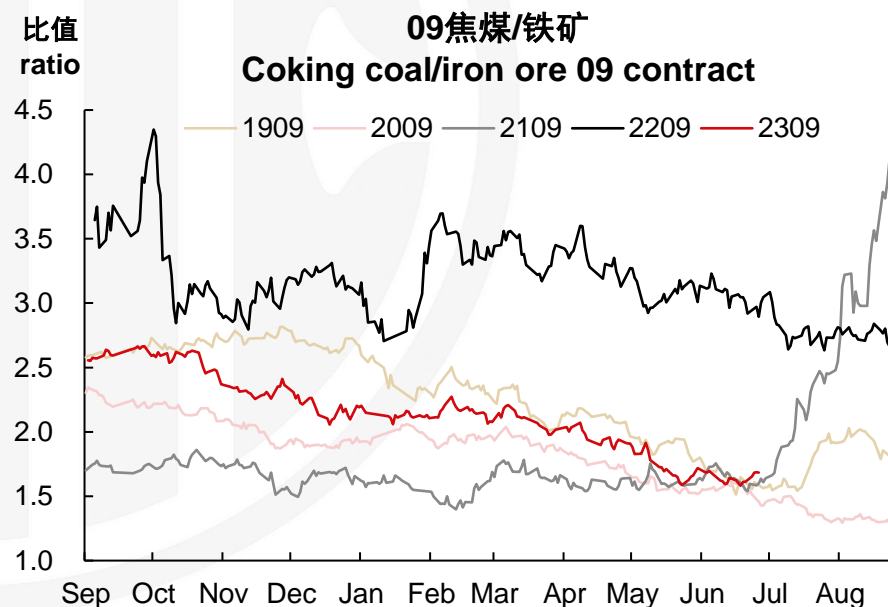
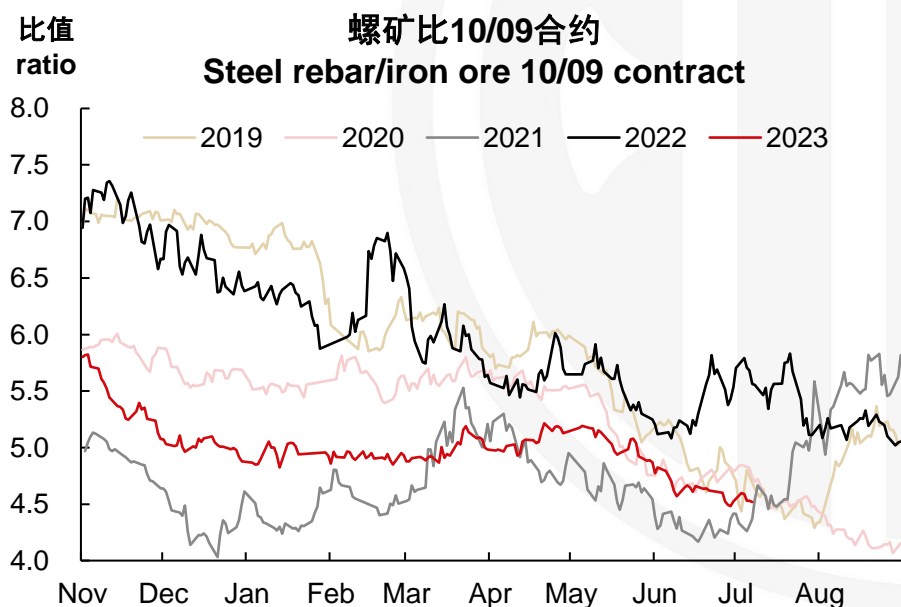
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# The relative valuation levels of iron ore in the industry chain

## 3.4 产业链中相对估值水平

- 黑色金属产业链上市品种完整，利用不同品种之间的比价关系，可以衡量在产业链中的相对估值水平。如果在产业链中的利润分配如果出现极端扭曲，带动基本面发生变化后，可能出现修复机会。
- Since ferrous metals industry is complete in listed varieties, we can measure the relative valuation levels of iron ore in the industry chain by the spread between iron ore and other futures variety. If any extremely unreasonable profit distribution in the industrial chain leads to changes in iron ore fundamentals, there may appear opportunities to redistribute profits.



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