

Metal Bulletin

Ore Pricing and Premiums

Pricing Dynamics of High- and Low-grade Fines, Lumps & Pellet

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Metal Bulletin Iron Ore Indices

Market leading iron ore market pricing coverage:

Lump & Fines

- 62% Fe Fines - History from May 2008
- 58% Fe Fines - August 2011
- 58% Fe High Specification Premium - August 2011
- 65% Fe Brazilian Index - December 2013
- 63% Fe Australian Lump Premium - May 2013
- RMB 62% Fe Chinese Port Price - January 2014
- 60% Fe Iranian Iron Ore Index - September 2015

Pellet & Concentrate

- 65% Fe Blast Furnace Pellet - April 2012
- 66% Fe Concentrate - September 2012
- 67.5% Fe DR-Grade Pellet Premium - February 2017

Value-In-Use

- \$ / % Fe Value-in-Use Index - July 2012
- \$ / % Fe 65 Value-in-Use Index - July 2012
- \$ / % Si Value-In-Use Index - December 2013
- \$ / % Al Value-In-Use Index - November 2014
- \$ / % P Value-In-Use Index - November 2015

Product Differentials

- 62% Fe Pilbara Blend Fines - December 2016

- ✓ **Widely-used** market benchmarks
- ✓ **Fair and representative** - robust calculation methodologies
- ✓ **Tonnage-weighted calculations** - indices reflect transactions
- ✓ Separate sub-indices for producers, consumers & traders mathematically guarantees **balanced and unbiased** index
- ✓ Focus on **compliance** - Passed 2017 PWC audit on IOSCO principles

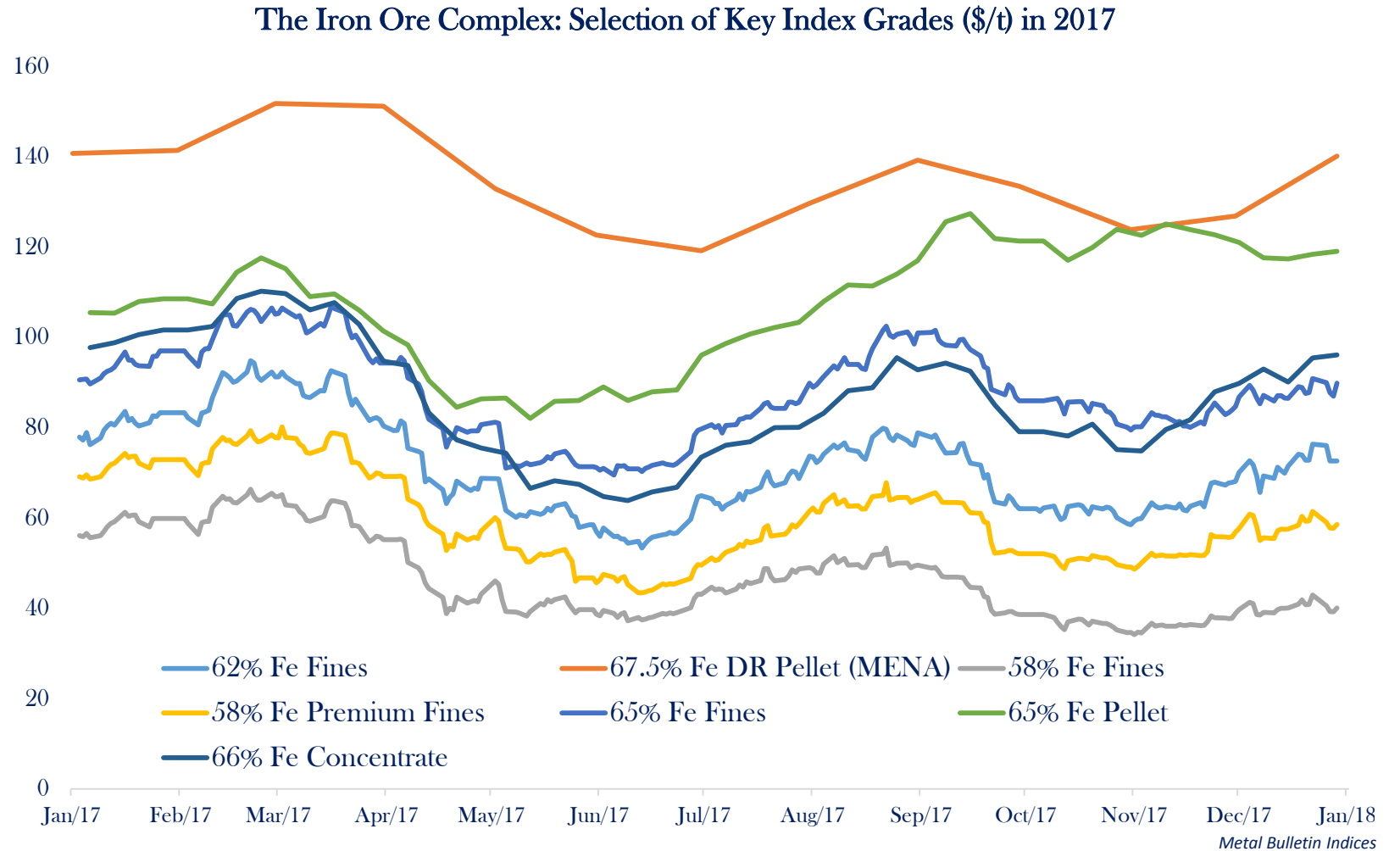


OICU-IOSCO

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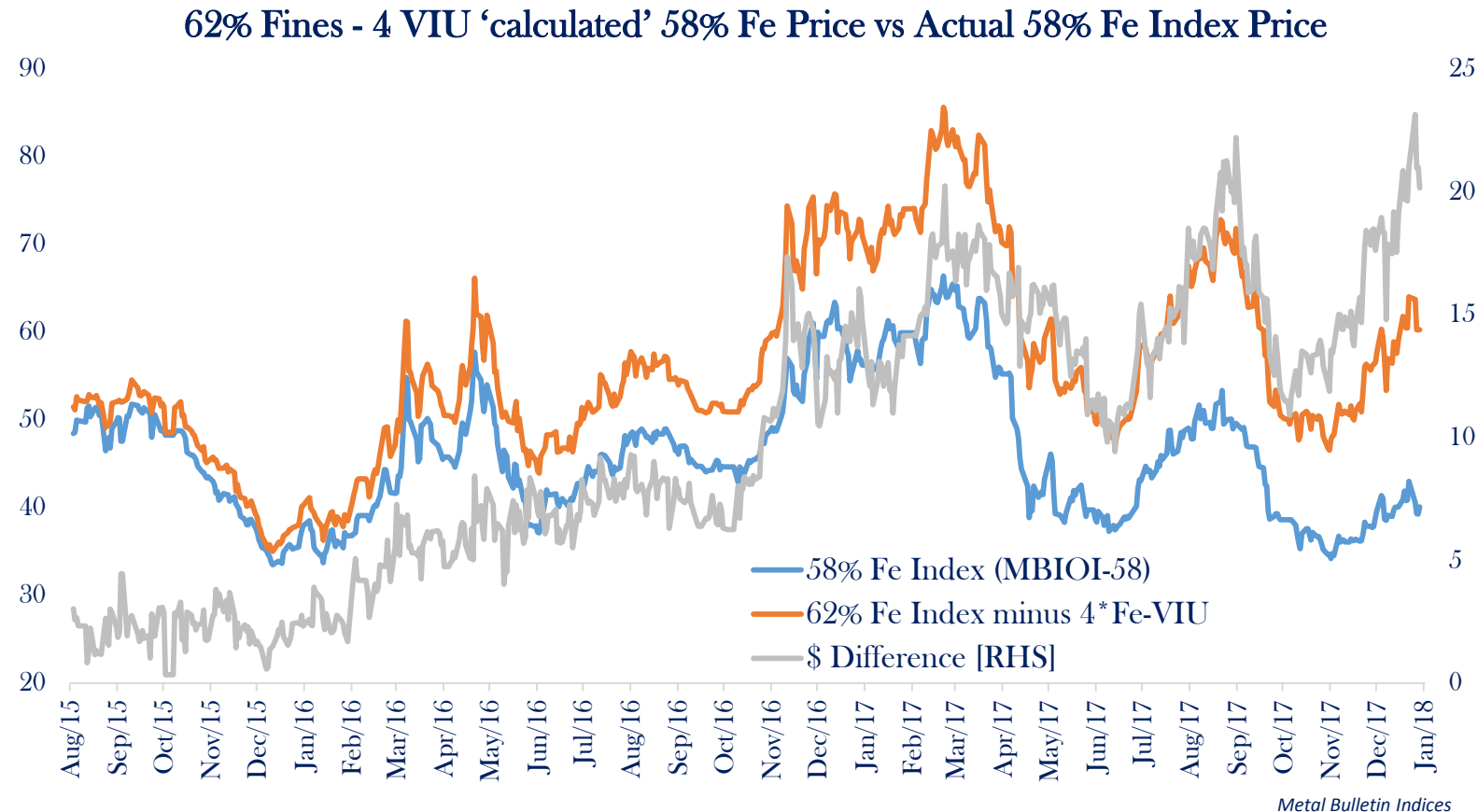
Iron Ore as a Commodity

- Iron ore's non-fungibility is what makes the market so interesting!
- Huge value range across what can all technically be considered 'iron ore'
- Diversity of physical and chemical characteristics impacts value-in-use, and therefore pricing



Pricing: Iron Ore Maths... Doesn't Work

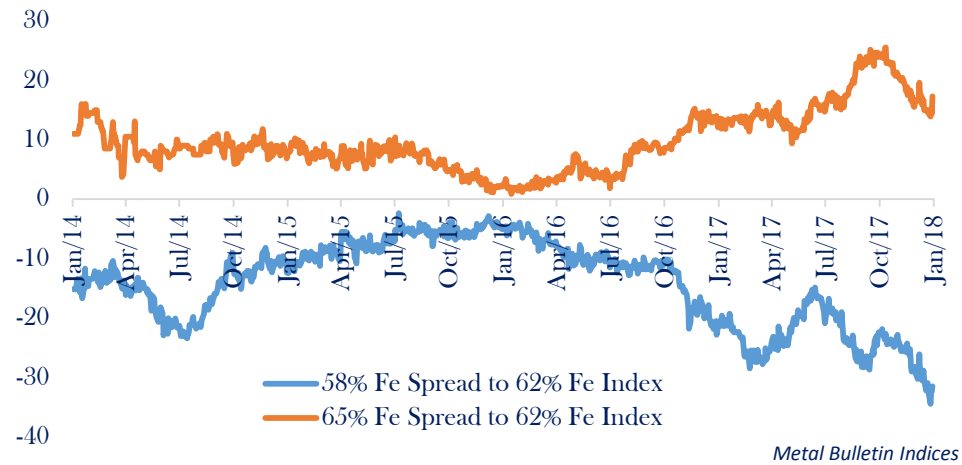
- VIU indices aid price adjustments for spec differences within certain grade segments
- Relationship break-down across major grade boundaries due to *market factors* and *mineralogy*



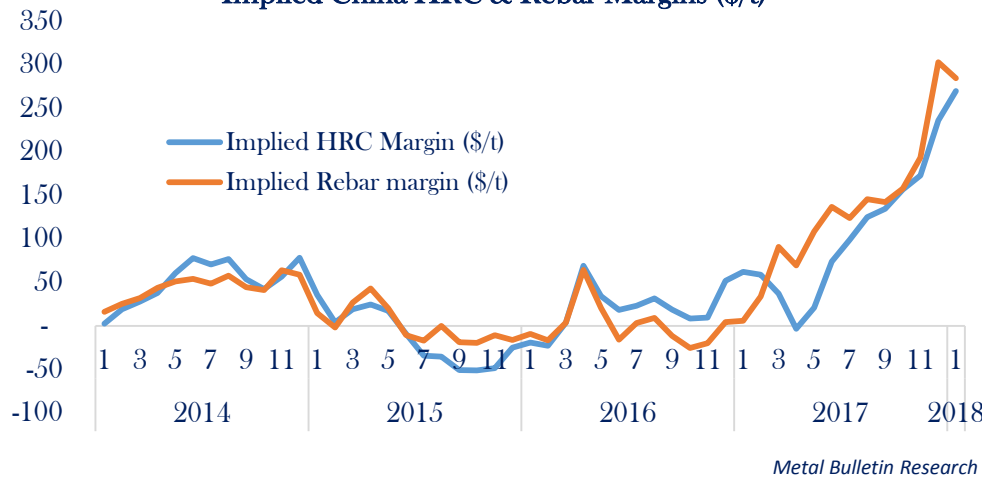
- Iron ore is complex, so approach to pricing needs to be sophisticated
- Implications for physical pricing *and* risk management – next stage of market evolution requires broader derivatives spectrum development

2017 - A Fundamental Shift

65/62% and 62/58% Fe Index \$-Spreads Since 2014



Implied China HRC & Rebar Margins (\$/t)

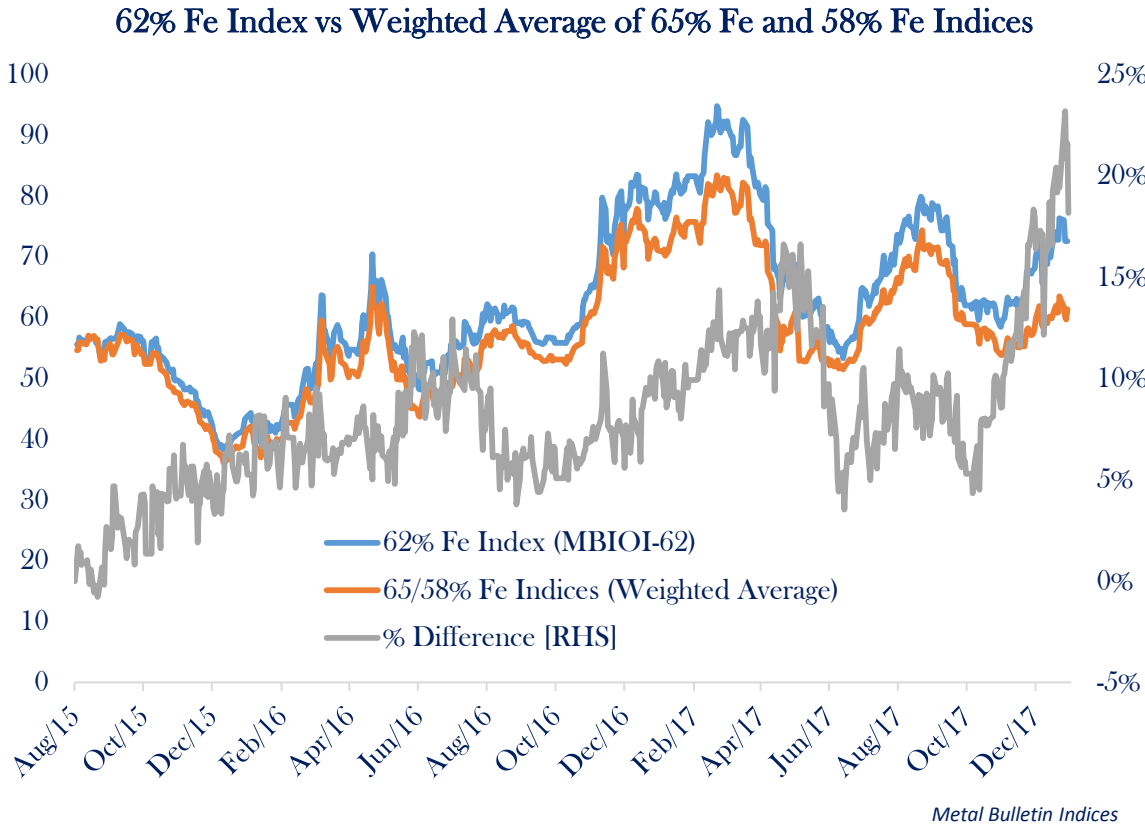


- 2017 was China's year of commitment:
 - Capacity reduction
 - Production quality
 - Environmental protection
- Tight steel market & higher profit margins drove expansion in raw material grade spreads
- Inter-grade spreads - still same key drivers:
 - Steel prices & mill profitability
 - Environmental regulation
 - Material supply
 - Coke price

Breakdown by Segment: Fines & Concentrate

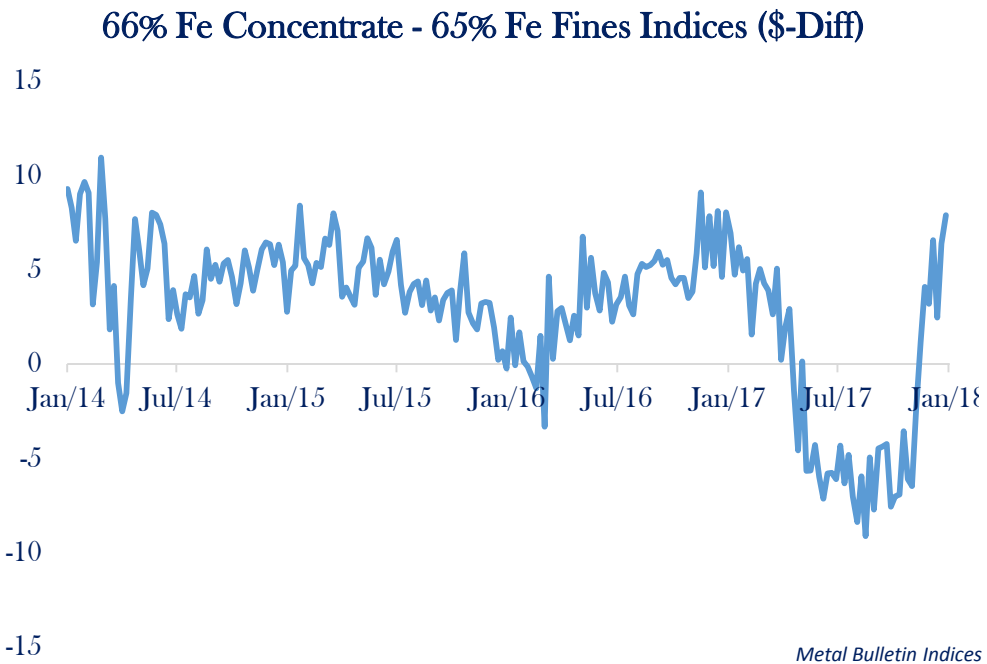
Fines

- Still an interconnected sector despite gulf between grades



Concentrate

- Domestic production, and environmental restrictions on pelletizing, impacts concentrate premium



Breakdown by Segment: Lump

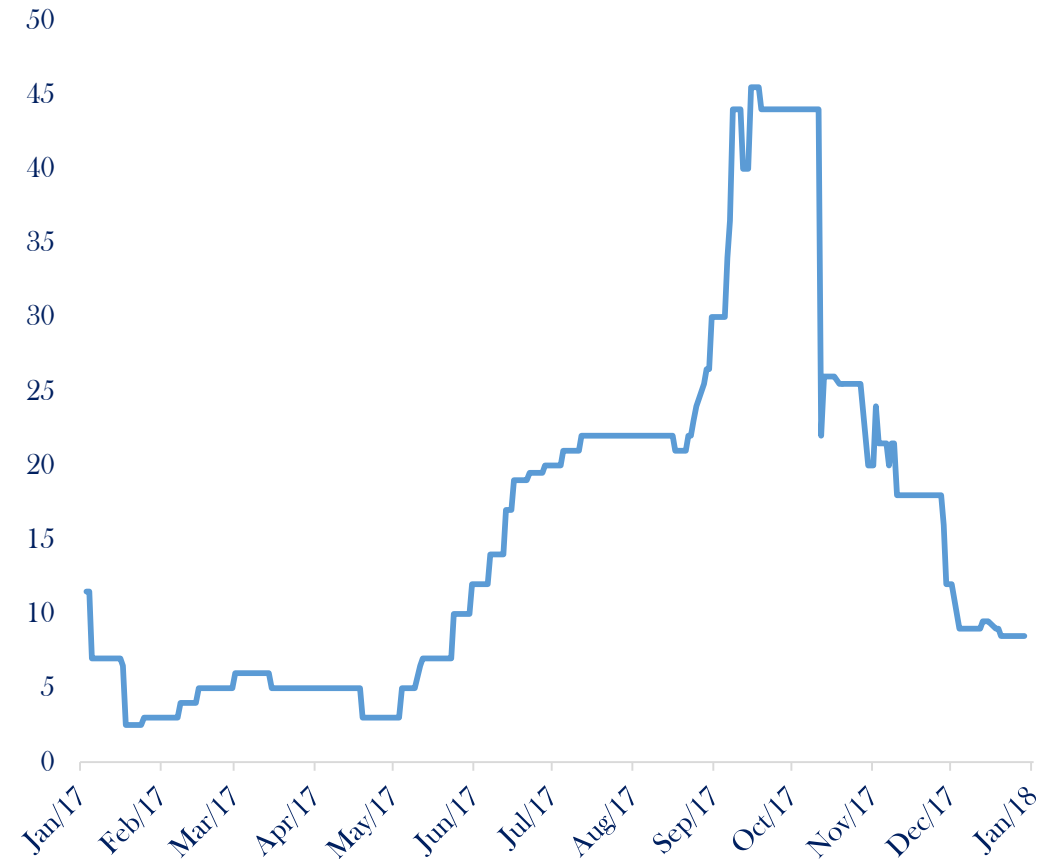
Lump Premium

- 2017 spike driven by environmental restrictions on sinter and pellet plant operation
- Future lump demand factors dependent on:
 - Sinter/pellet plant operating restrictions
 - Pellet availability
 - Mill margins (gangue tolerance)

Lump Variability

- Lump properties vary by ore type & region (eg. Australian, Brazilian, S. African lump quality difference)

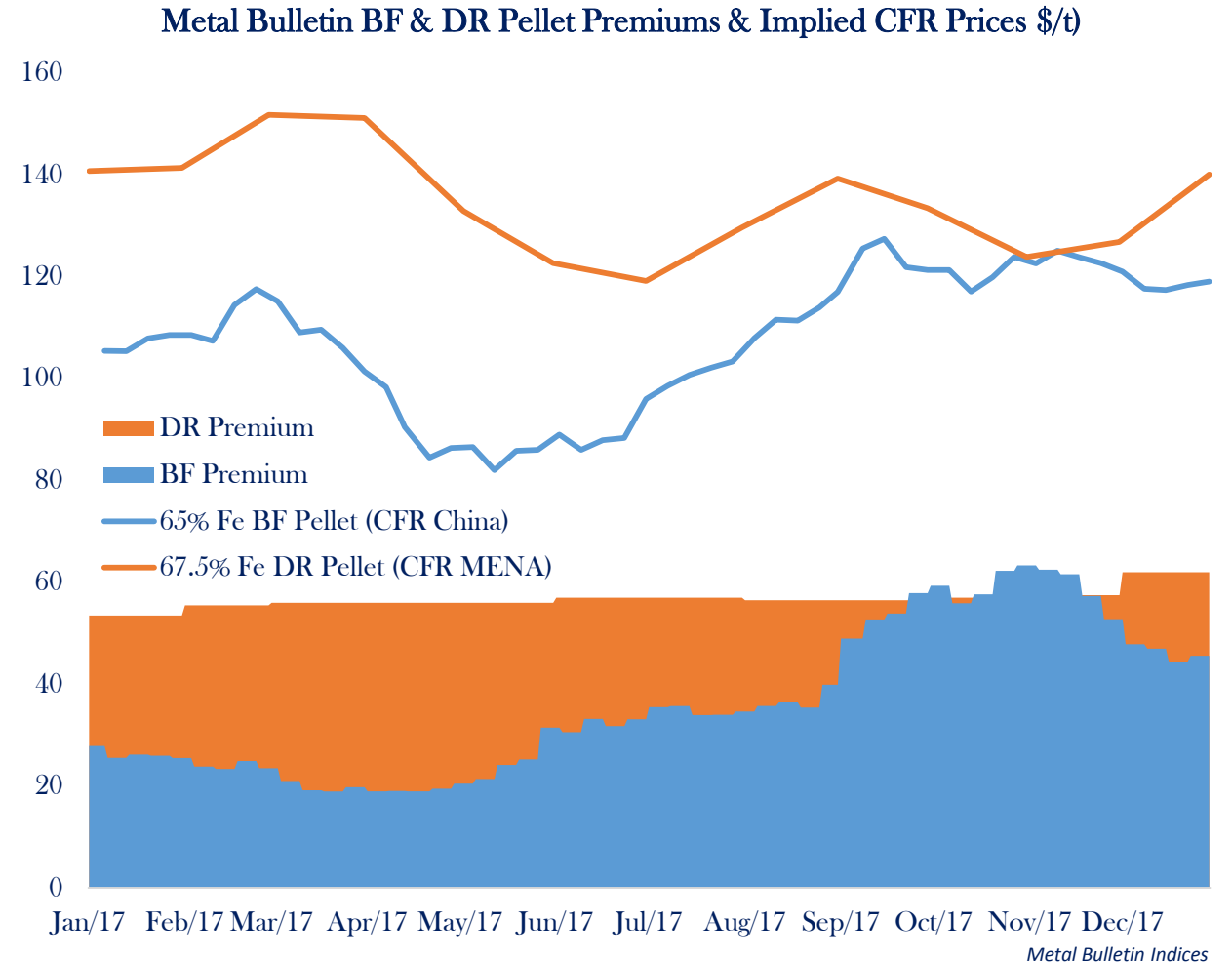
Lump Premium (MBIOI-LP, CFR Qingdao, cents/dmtu)



Metal Bulletin Indices

Breakdown by Segment: Pellet

- 3 Major pellet markets split by region & type:
 - China/Asia (BF)
 - Atlantic Basin (BF)
 - MENA (DR)
- Usually function relatively distinctly but *can* interact:
eg. BF pellet price capped by DR Premium?
- Value drivers similar to lump (both direct-charge)
- Environmental restriction on pelletizing plants important driver for China market
- DR-grade production volume is smaller, so market more sensitive to supply issues (eg. Samarco)



Future Trends to Watch

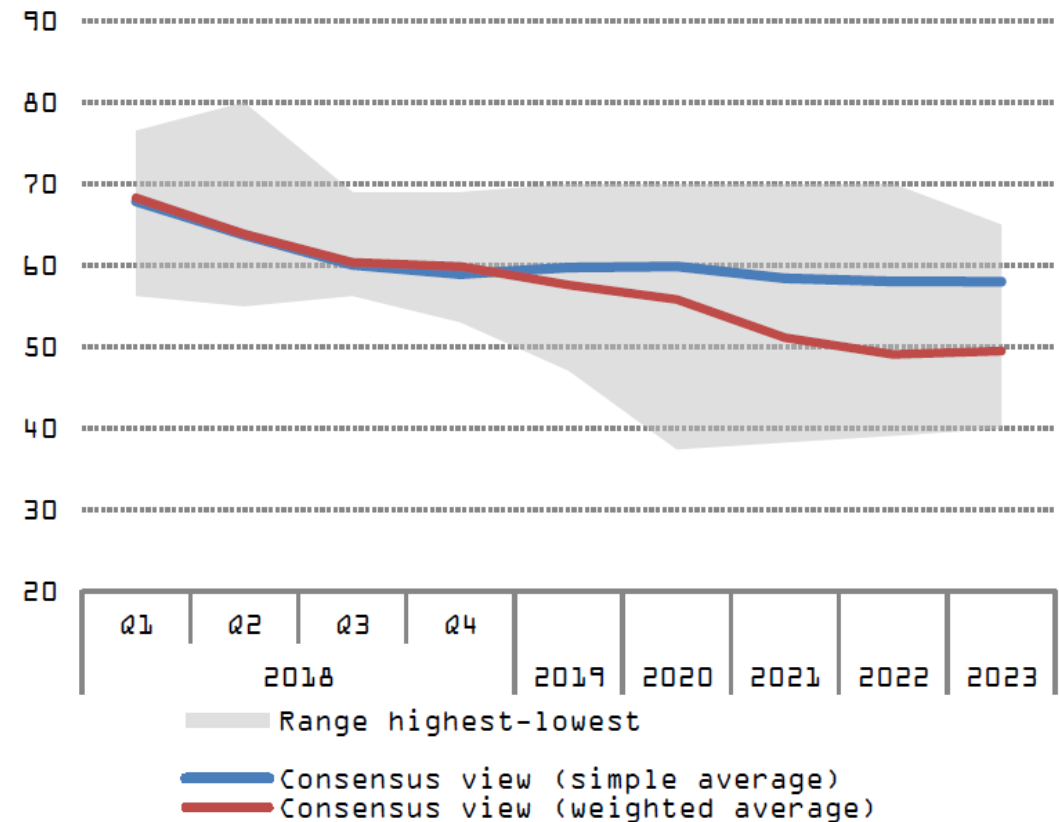
Can grade spreads expand further?

- Mill margins likely to gradually narrow in 2018, with other contributing factors also expected to ease:
 - Winter production cuts
 - Capacity cuts (incl. substandard steel)
 - Low-/high-grade iron ore production ratio
- Convincing case for spreads to narrow, but may remain above historical averages

Impact of increased scrap utilization

- BOF & BF scrap rates to increase as Chinese mills absorb growing obsolete scrap availability – potential impact on ore demand is obvious...
- But how might this impact iron ore grade spreads?

Metal Bulletin Apex Iron Ore
Forecasts (\$/tonne cash price)



Thank You

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铁矿石定价和溢价水平

高低品位矿石，块矿球团价格变动

Peter Hannah - MB铁矿指数部门

2018年1月31日

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Metal Bulletin 铁矿石价格指数

块矿/粉矿

- 62%铁粉 – 历史价格从2008年5月起
- 58%铁粉- 2011年8月
- 58%高品质铁粉- 2011年8月
- 65%巴西铁矿石指数-2013年12月
- 63% 澳洲块矿溢价—2013年5月
- 62% 中国港口价格指数-2014年1月
- 60%伊朗铁矿石指数-2015年9月

球团/精粉

- 65%高炉球团-2012年4月
- 66%造球精粉-2012年9月
- 67.5%直接还原球团溢价-2017年2月

化学元素调整

- 铁调指数-2012年7月
- 65%铁品铁调指数-2012年7月
- 硅调指数-2013年12月
- 铝调指数-2014年11月
- 磷调指数-2015年11月

品牌价值调整

- 62%PBF价格—2016年12月

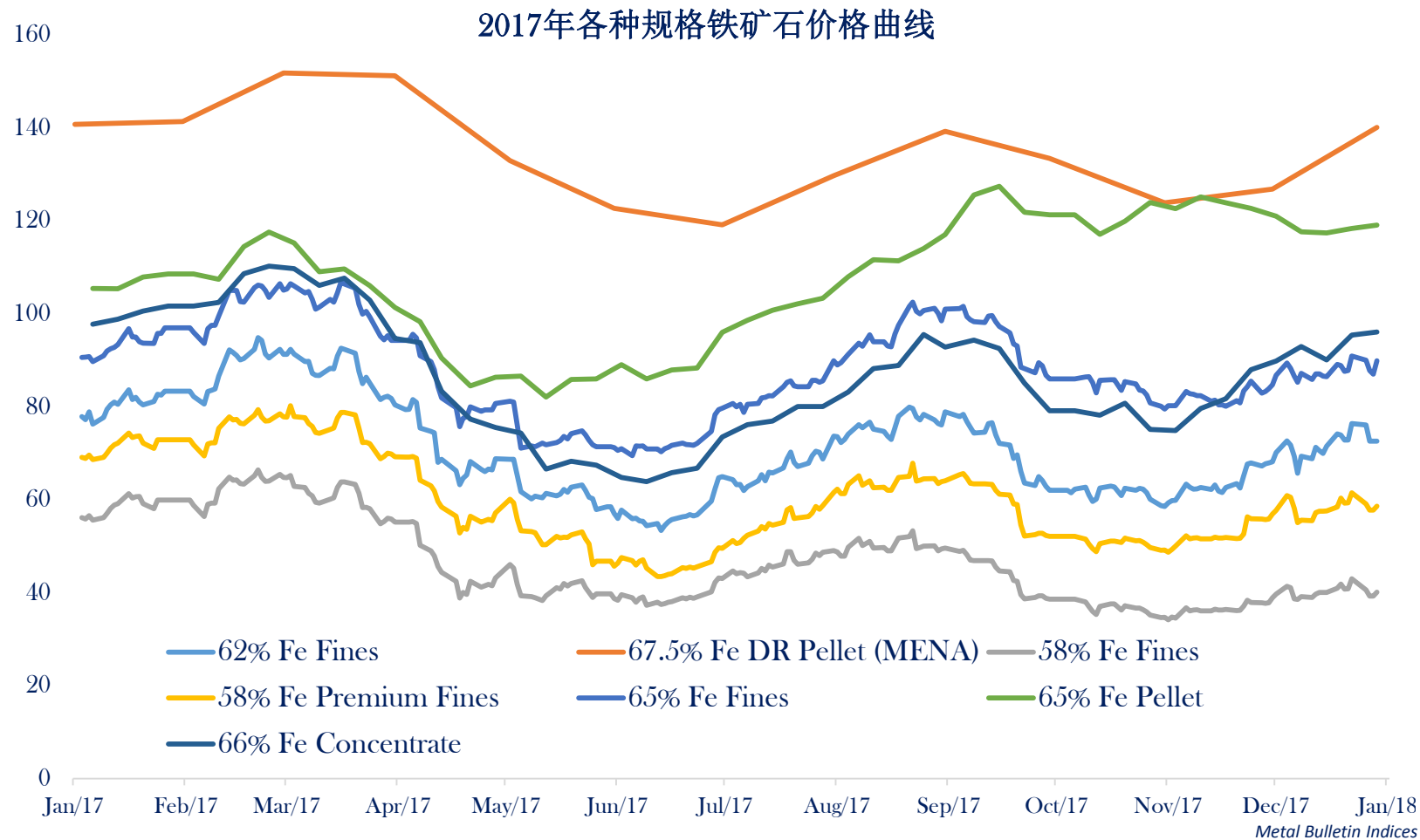
- ✓ 市场基准价格已被广泛使用
- ✓ 公平，有代表性--基于强健的方法论
- ✓ 吨位加权平均计算--反映真实交易价格
- ✓ 采用矿山，钢厂和贸易商的分项指数—保证指数均衡无偏向性。

- ✓ 注重合规性，2017年通过普华永道审计并取得IOSCO认证



铁矿：作为一种商品

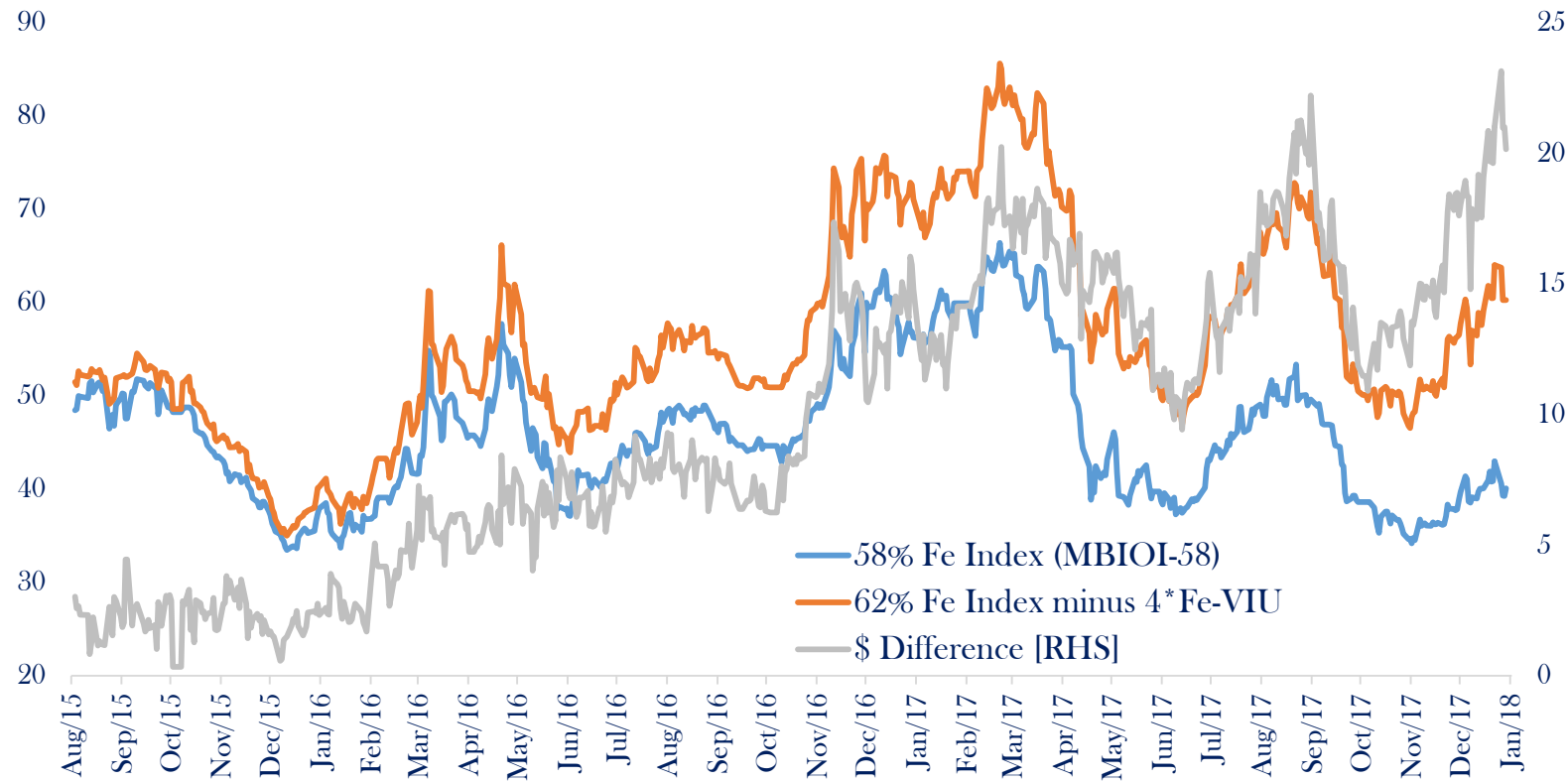
- 无可替代性
- 价值差距增加
- 物理和化学性能的差异影响定价



定价：数学方式...行不通

- 化学成分调整帮助定价特定范围内的不同规格的产品
- 市场因素和矿物学对主流矿价格的影响

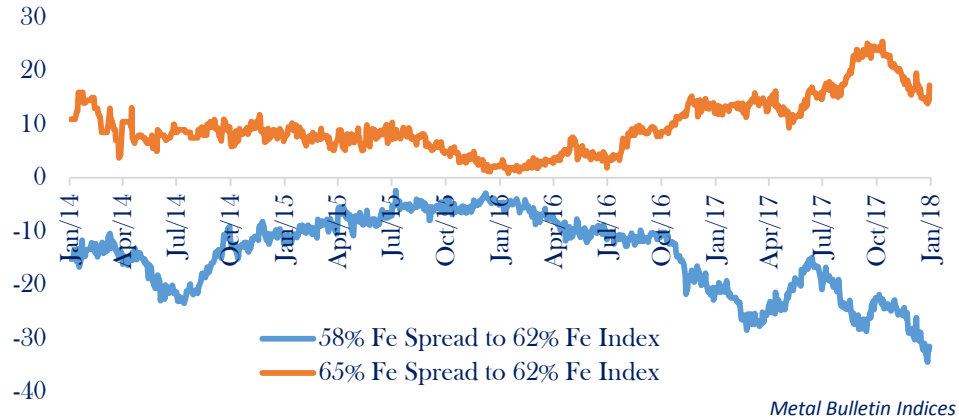
62%指数减去4个铁调指数计算的58%价格 VS 市场实际的58%价格指数



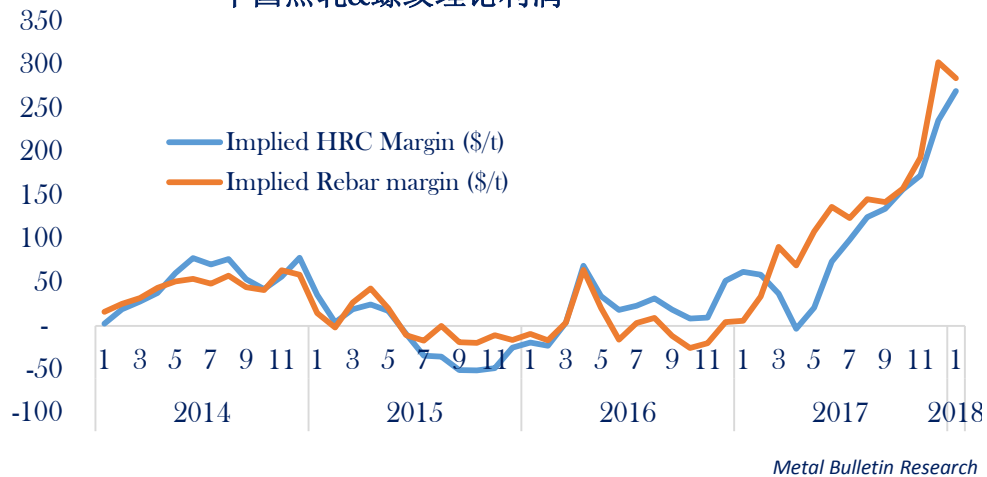
- 铁矿市场复杂性，需要定价的工具
- 现货价格和风险控制—下一步市场发展需要更广泛的掉期应用。

2017—根本性的改变

2014年起65/62价差和62/58价差



中国热轧&螺纹理论利润

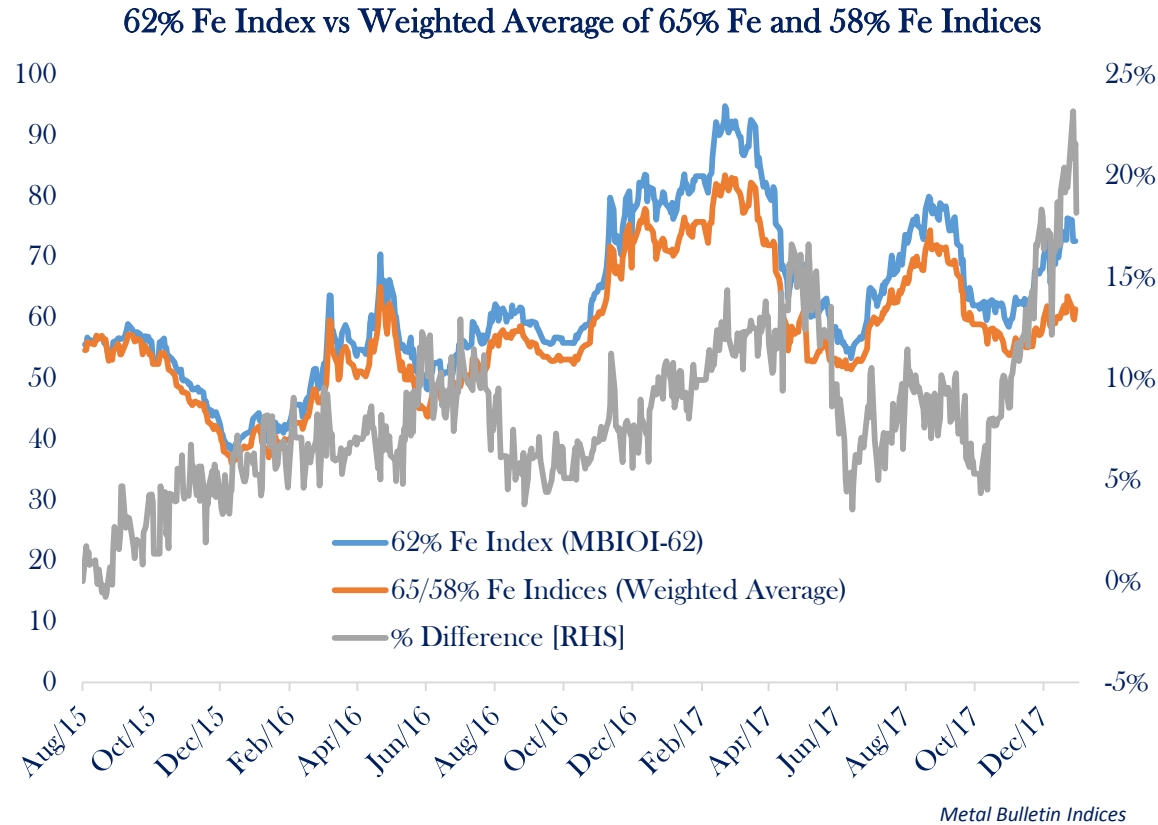


- 2017年是中国承诺年
 - 缩减产能
 - 提高产品质量
 - 环境保护
- 钢材市场供应减少&钢厂效益转好加大原料各品位间的差距
- 各品种间差距主要原因
 - 钢材价格&钢厂效益
 - 环保政策
 - 原料供应
 - 焦炭价格

粉矿&造球精粉

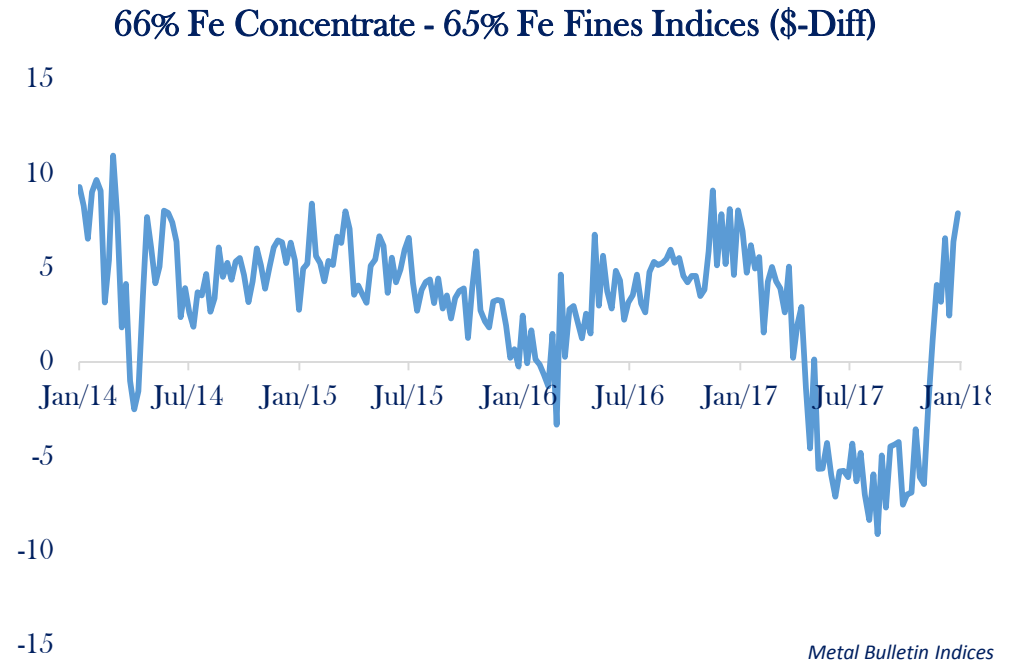
粉矿

- 各品位间虽然价差拉大，仍然相互联动



造球精粉

- 国产精粉产量，环境保护对竖炉的限制影响造球精粉溢价



块矿

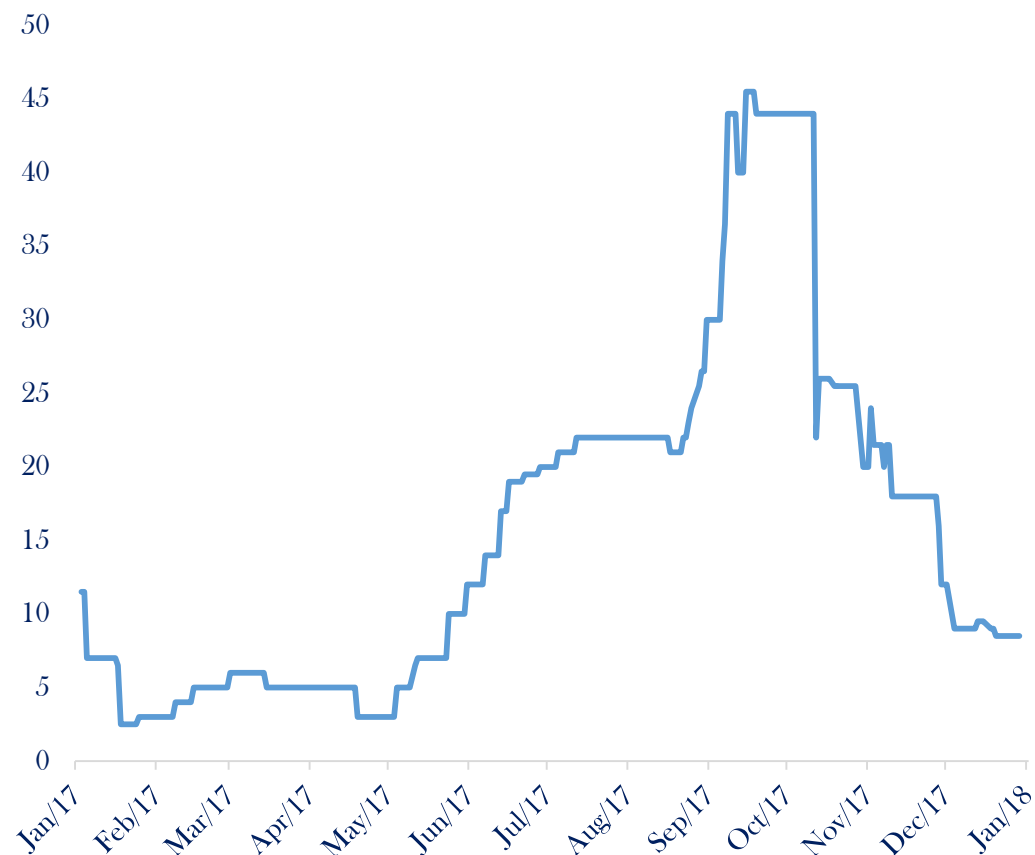
块矿溢价

- 环保政策对烧结和竖炉设备的限制
- 未来块矿需求主要影响因素：
 - 烧结和竖炉设备的限制
 - 球团供应
 - 钢厂利润（对脉石的容忍）

块矿分类

- 块矿不同的来源和矿石种类
(澳洲，巴西，南非块质量差距)

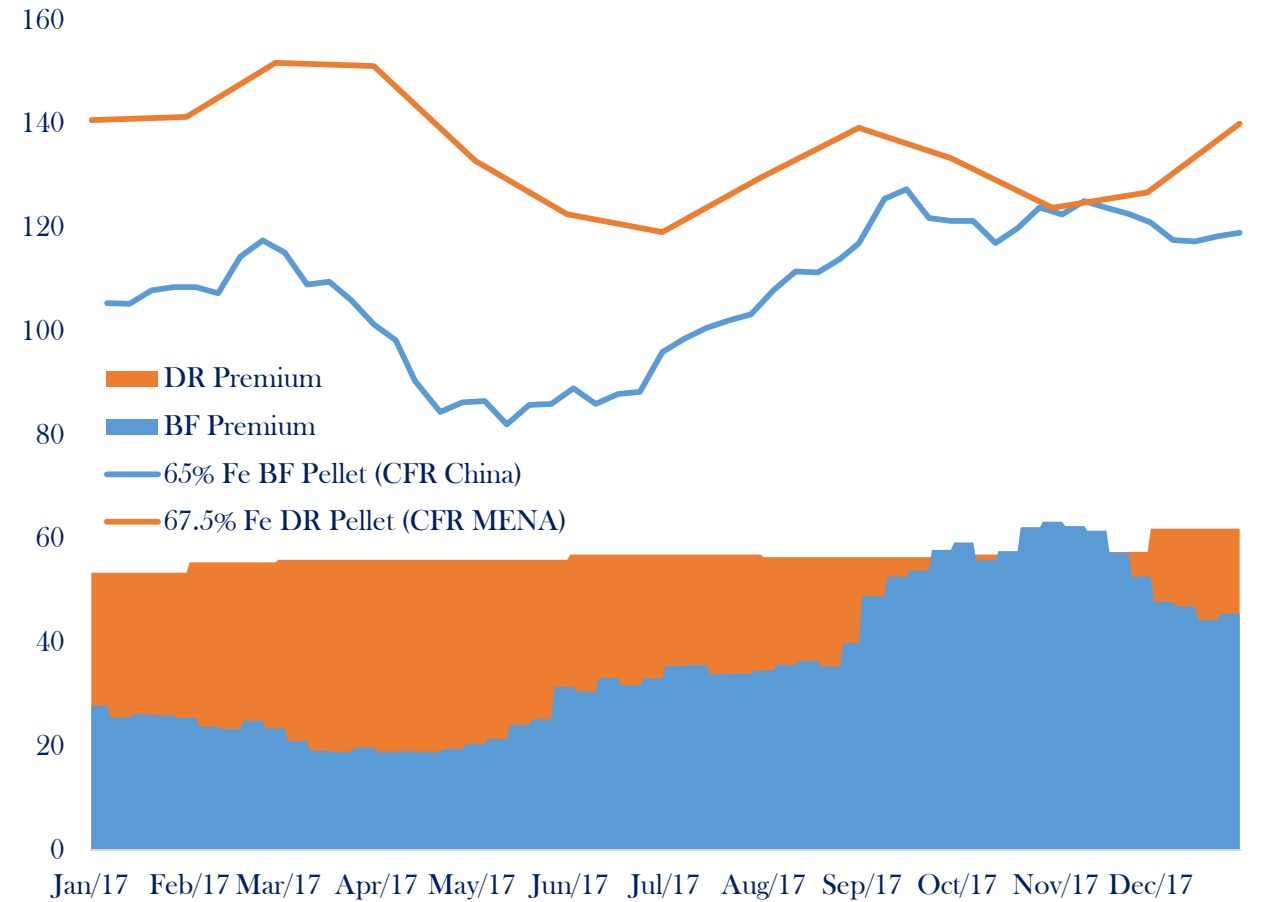
MB 块矿溢价曲线 美分/吨度



球团

- 3大球团市场
 - 中国/亚洲（高炉球团）
 - 大西洋盆地（高炉球团）
 - 中东地区（还原球团）
- 市场相对独立相互影响：还原球团胜过高炉球团？
- 使用价值类似块矿（直接入炉）
- 环保政策对竖炉的限制增加球团的需求
- 直接还原球团生产量相对较小，对供应缩小的反应更强烈（Samarco事件）

MB 高炉球团和还原性球团溢价比较 美元/吨



未来的关注点

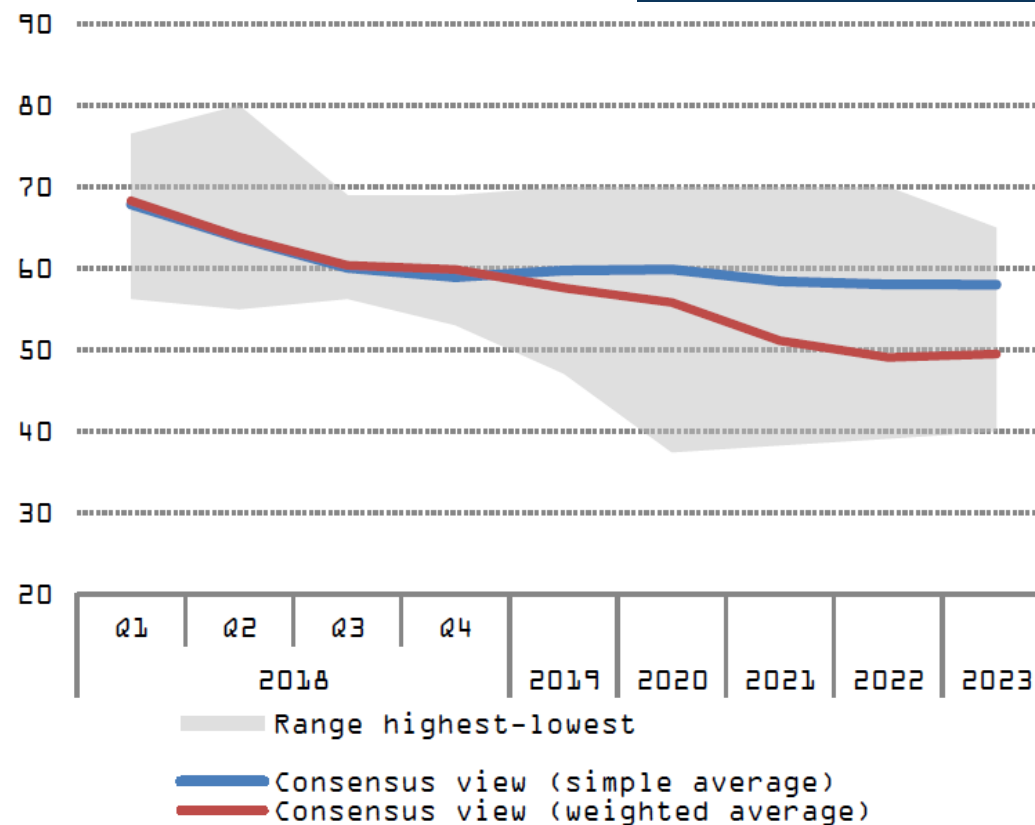
品位间价差继续扩大？

- 2018年钢厂利润预计将逐步缩减，其他的影响价差的 因素预计减弱。
 - 冬季减产
 - 缩减产能（地条钢）
 - 高低品位矿生产量比例
- 价差缩小，预计依然保持历史平均水平上

废钢使用量增加的影响

- 转炉&高炉中废钢使用比例的增加-对矿石需求量的影响显而易见
- 对矿石品位间价差有什么样的影响？

Metal Bulletin Apex Iron Ore
Forecasts (\$/tonne cash price)



谢谢大家

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