



全球锰行业发展趋势与机遇研究

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全球锰行业发展趋势与机遇研究

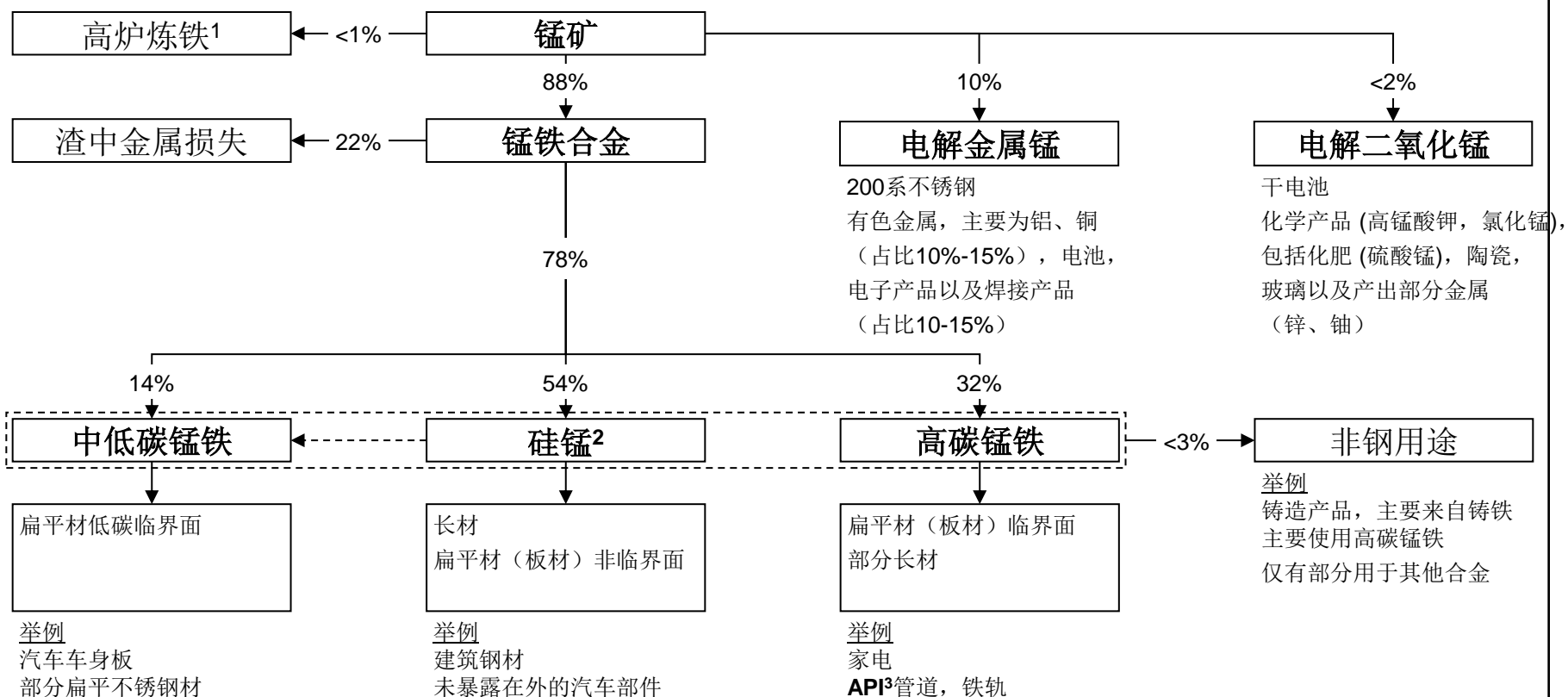
- 全球钢铁生产与未来趋势预测
- 炼钢产业锰消耗量研究
- 中国在全球锰生产与消费中的地位
- 炼钢中的锰铁合金选择与应用
- 锰矿供应研究
- 结论



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锰市场概述——绝大多数原矿被用于生产钢铁行业所需的锰铁合金

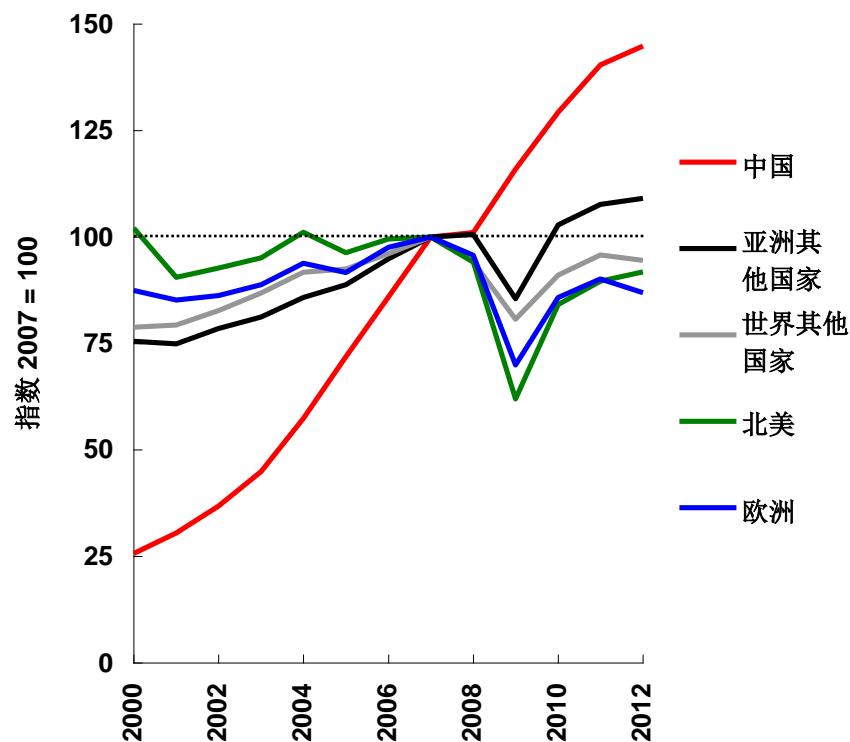
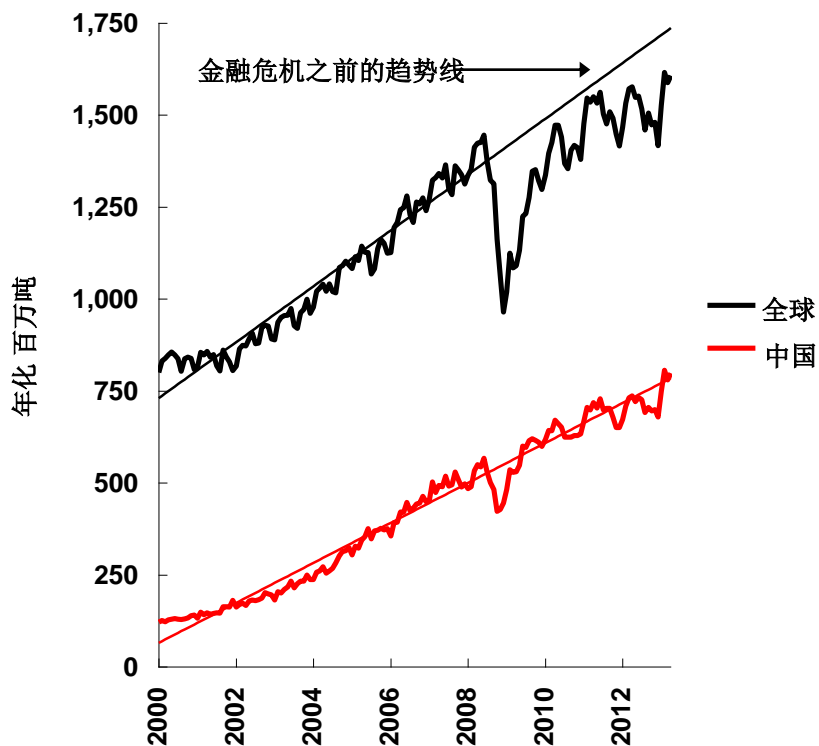


Source: CPM, K.Fowkes, Hatch, Macquarie Research, June 2013. 注: 2010年数据, 基础锰单位。 1. 部分锰矿的费用直接在高炉炼铁中收取, 主要在日本和韩国。

2. 部分硅锰被用于硅热还原法生产中碳锰铁, 主要在中国。 3. 美国石油协会。

中国推动世界粗钢产量创下新高。亚洲以外国家的粗钢产量仍低于危机前的高点

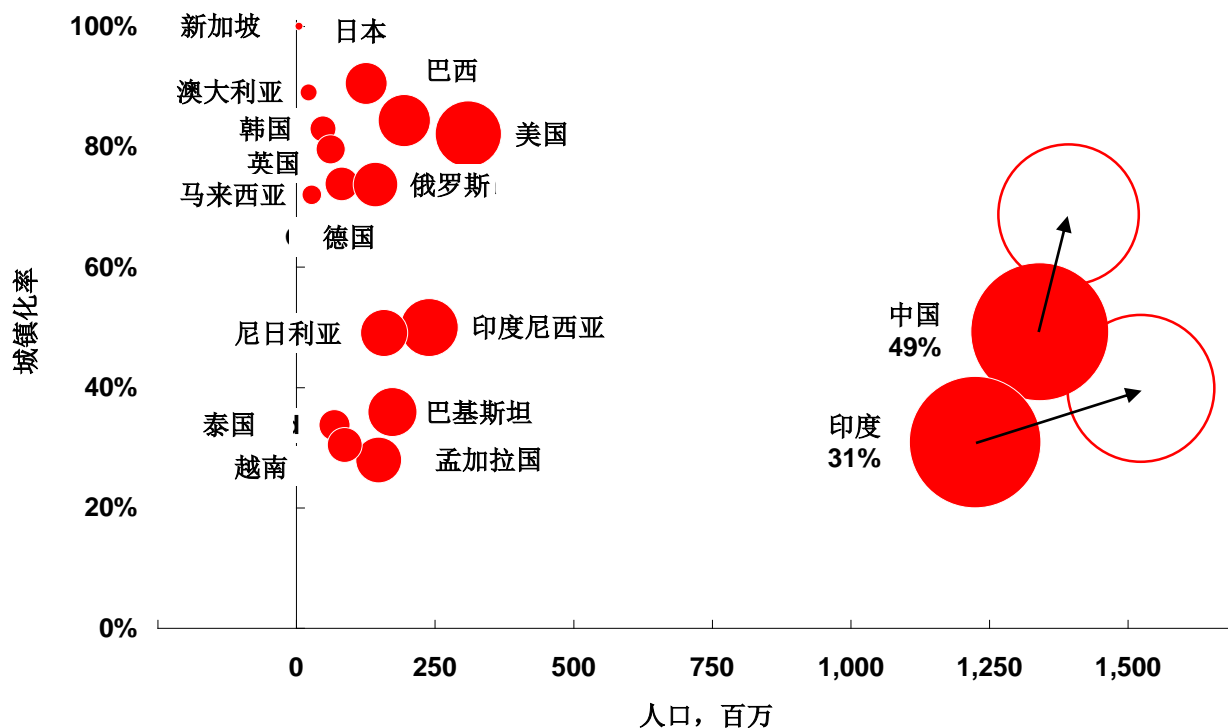
全球粗钢产量



Source: Worldsteel, Macquarie Research, June 2013. 注：金融危机前的趋势线指2000年1月至2008年6月。

长期来看，在城镇化驱动下钢铁需求仍然可能显著提高

2010年人口数量以及城镇化率



➔ 将中国的城镇化率提高到亚洲或者欧洲发达国家的水平意味着将有超过3亿的人口移居到城镇。

➔ 这个数字等同于美国现在的总人口数以及中国在20世纪90年代初城镇人口的总数。

Source: UN, Macquarie Research, June 2013. 注: 2010年数据. 中国与印度为2030年的预测数据. 圆环的大小与各国的人口数量成比例。



钢铁需求不仅来自新建楼房，也来自部分现存城市区域的重建

中国现存的城市景观逐渐在发生变化——从胡同到高楼大厦！

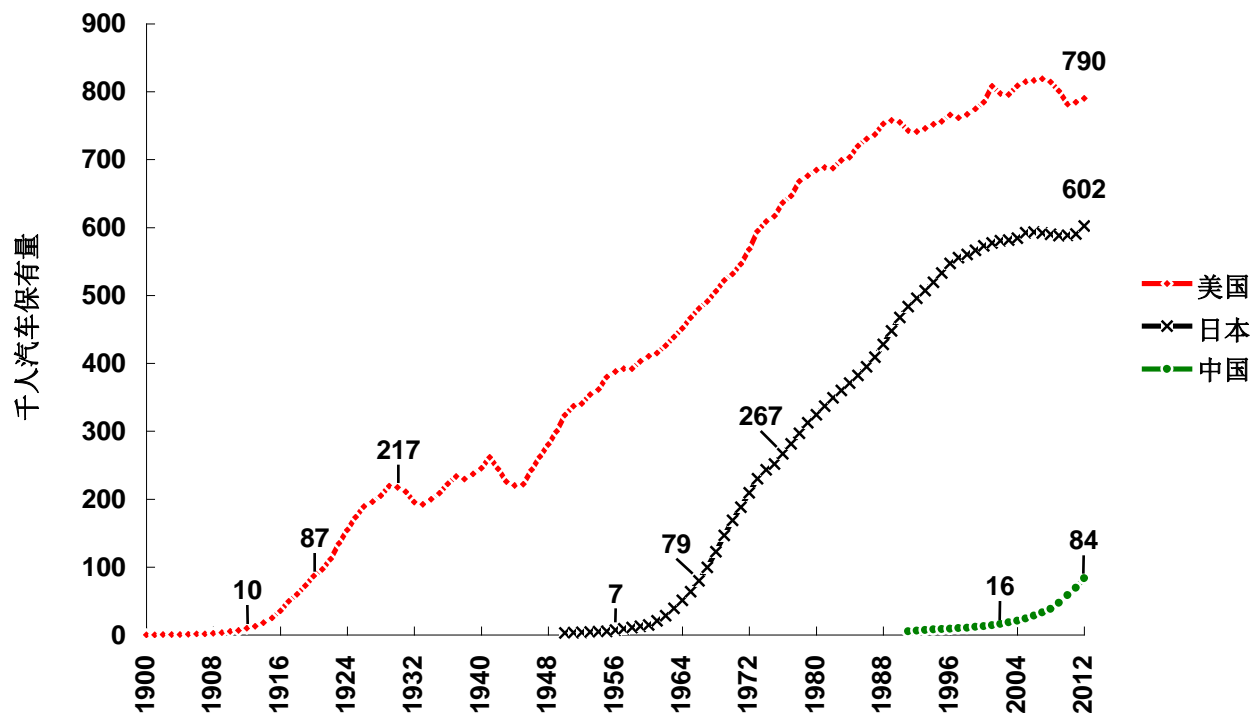


Source: Macquarie Research, June 2013

- 城镇化对大宗商品的需求并不仅在于对现有城市区域的扩展，
- 也在于对现存城市环境的重塑，从而满足市民对于改善居住条件的需求。
- 中国城市人口的人均居住面积低于2/3的亚洲高收入国家以及欧洲国家的水平。
- 城市重塑能够利用部分回收材料，这无疑将对原生大宗商品的需求造成明显影响。
- 然而，对于锰行业来说，使用回收材料的电炉炼钢与使用原材料的高炉/氧气转炉炼钢对锰的消耗量差不多。

更多的汽车涌上公路，将推动钢铁需求的增长

人均汽车保有量



- 美国汽车的保有量与1920-1930年相比增长了2.5倍。
- 日本汽车保有量在60年代中期至70年代中期以前所未有的速度增长。
- 在未来10年将中国汽车的保有量提高2.5倍意味着至21世纪20年代初将增加1.7亿辆汽车。
- 这个增量等同于超过2/3的美国汽车总量。
- 中国目前每年的汽车增长超过2000万辆。

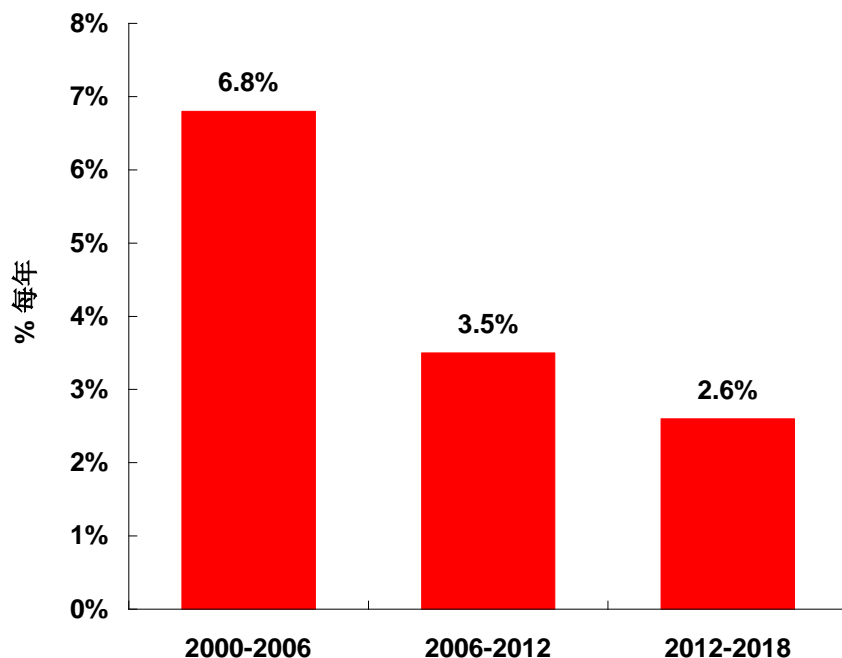
Source: CEIC, JAMA, US Federal Highway Administration, US Census Bureau, Macquarie Research, June 2013



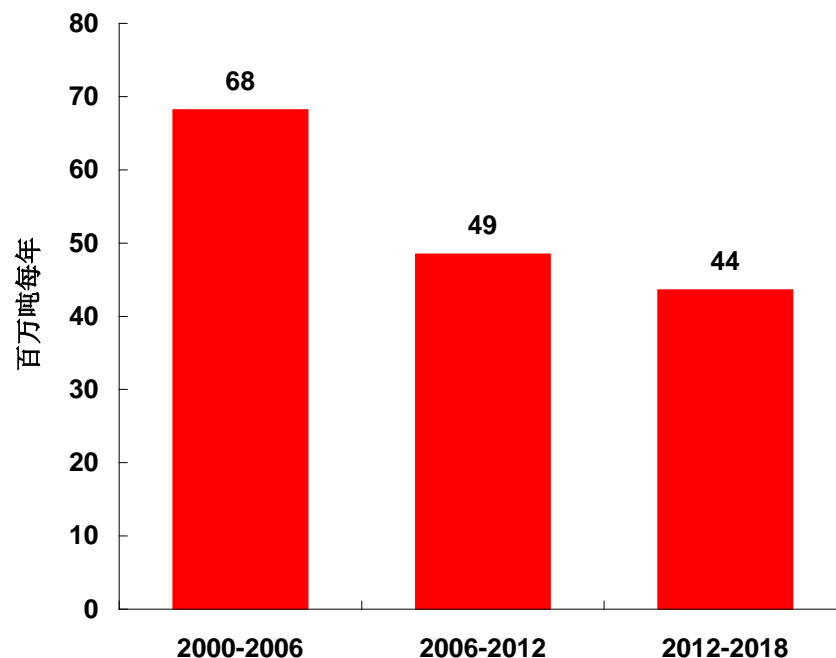
全球粗钢产量增速（百分比）放缓，然而绝对增量保持稳定

全球粗钢产量年均增长

增速变化



绝对增量变化



Source: Worldsteel, Macquarie Research, June 2013. 注：2018年的数据为预测值。



未来钢铁生产将受制于驱动供应与需求的几方面因素

需求方面的驱动因素

- ➔ 人口稠密发展中国家的钢铁需求
 - ➔ 中国、印度以及其他国家
 - ➔ 新兴消费阶层
 - ➔ 城镇化以及基础设施建设的发展
 - ➔ 工业化
- ➔ 替代其他材料以及被其他材料替代的程度
 - ➔ 建筑
 - ➔ 汽车
- ➔ 用钢制造业减少钢铁用量的程度
 - ➔ 轻量化
- ➔ 用钢制造业搬迁

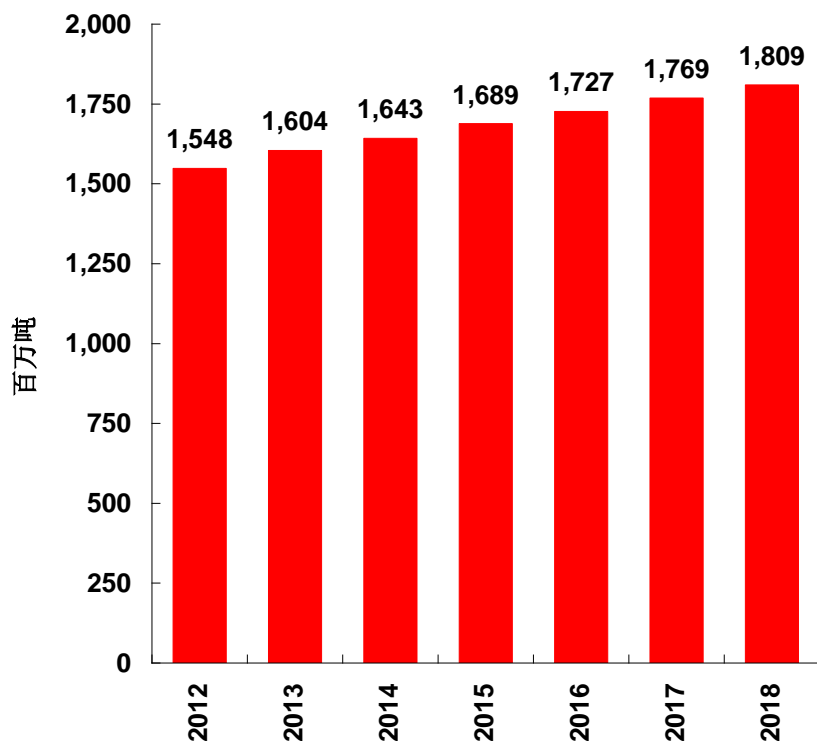
供应方面的驱动因素

- ➔ 所有权以及控制权的整合
- ➔ 后向一体化整合获取原材料资源
- ➔ 轧钢与炼钢的逆一体化（优缺点并存）
- ➔ 炼铁以及炼钢成本（不同国家及地区差异较大）
- ➔ 其他原材料以及能源供应的成本以及可获取的量
- ➔ 环境以及产业政策
- ➔ 炼铁以及炼钢行业的技术变化



2012-2018年，全球粗钢产量预计将增长15%以上， 一半的增量来自中国

全球粗钢产量



分地区粗钢产量 (百万吨)

	2012	2018F	复合年增长率	主要变化
北美洲	121	128	1.0%	
南美洲	48	61	4.0%	
欧洲	209	226	1.3%	
独联体	112	126	2.0%	
中国	717	847	2.8%	130
印度	77	118	7.5%	42
日本	107	111	0.6%	
亚洲其他国家	111	136	3.0%	25
世界其他国家	46	56	3.5%	
总量	1,548	1,809	2.6%	

Source: Worldsteel, Macquarie Research, June 2013. Note: 2013-2018 data are forecasts

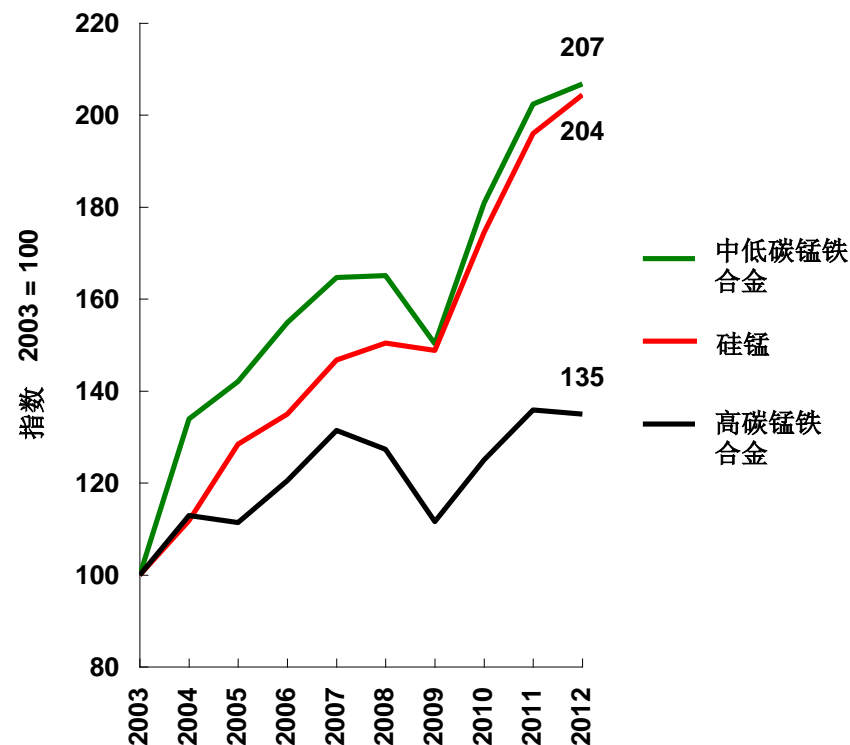
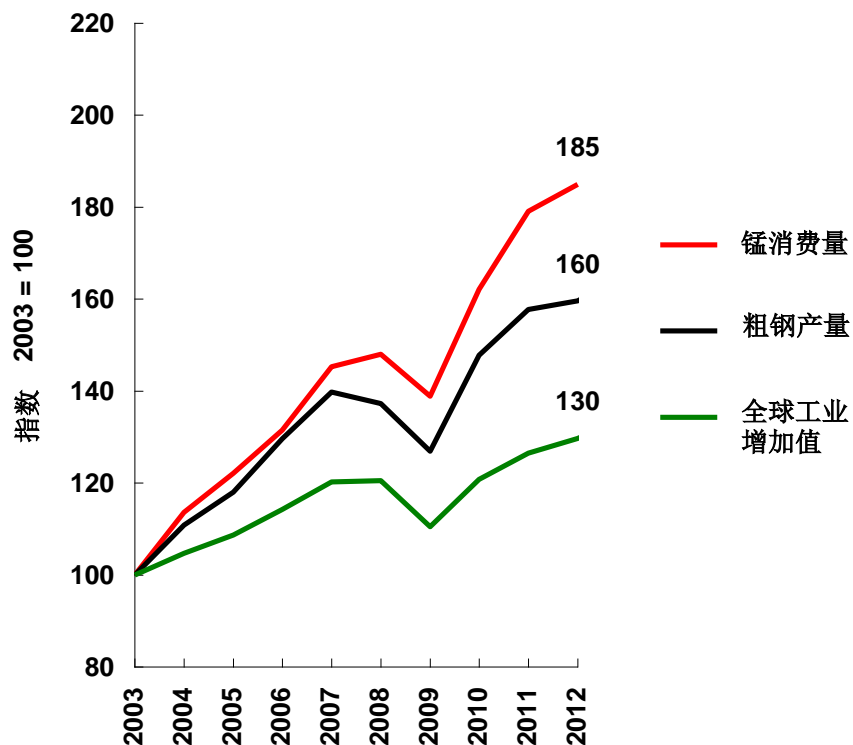


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钢铁产量增速已高于工业增加值，锰消耗量快速增长

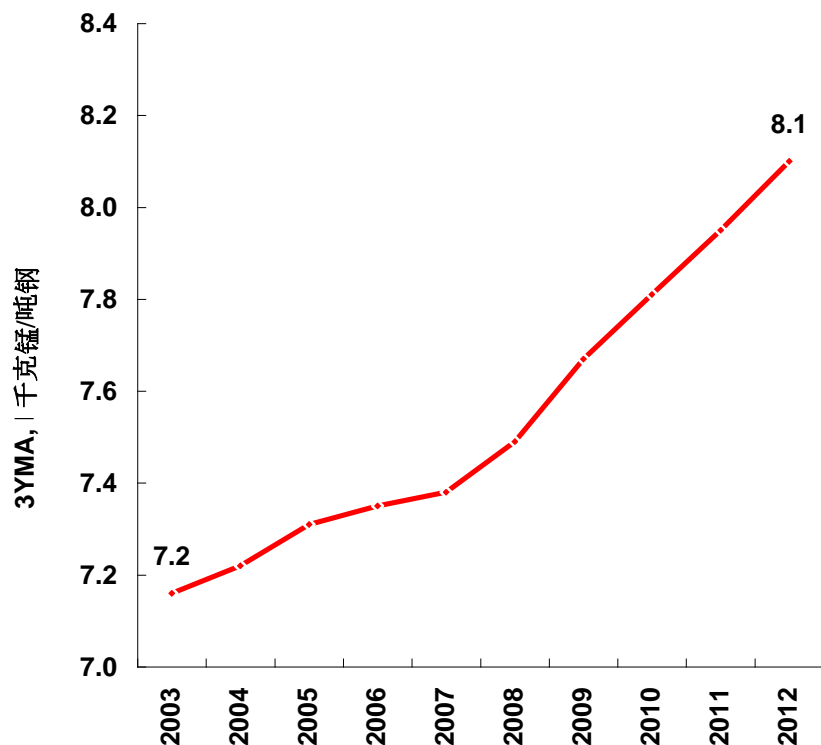
全球工业增加值，粗钢产量以及锰铁合金消费量



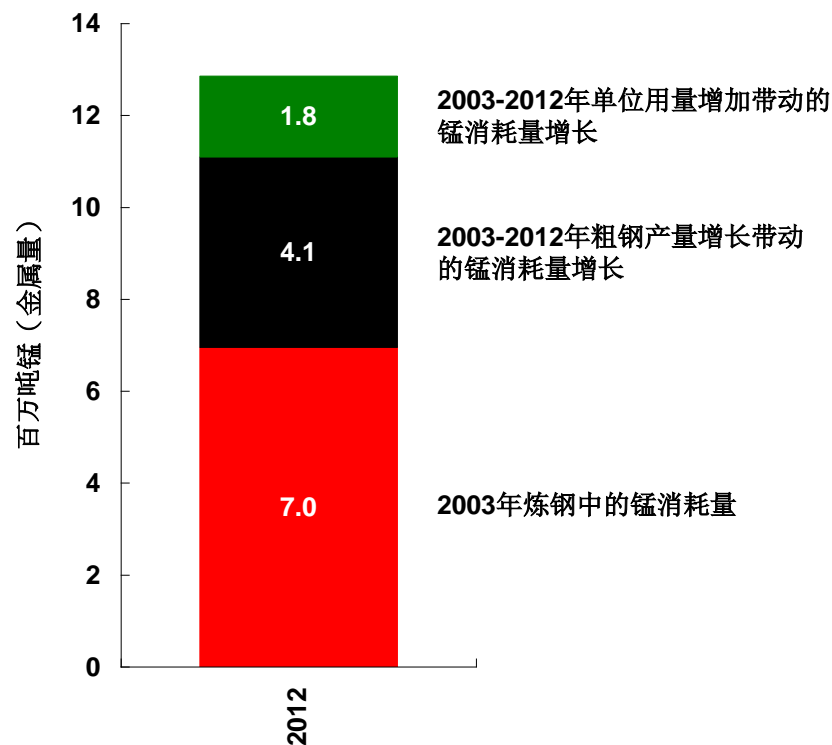
Source: CRU, IMnI, K.Fowkes, Worldsteel, Macquarie Research, June 2013

炼钢中的锰用量在过去10年中已增长了15%

钢铁生产中的单位锰用量



全球锰铁合金消耗量



Source: K.Fowkes, IMnI, Worldsteel, Macquarie Research, June 2013 注: 数据包括金属锰以及直接收费的锰矿。



锰用量受生产工艺以及生产的产品影响，而这些因素所施加的影响有的是对立的

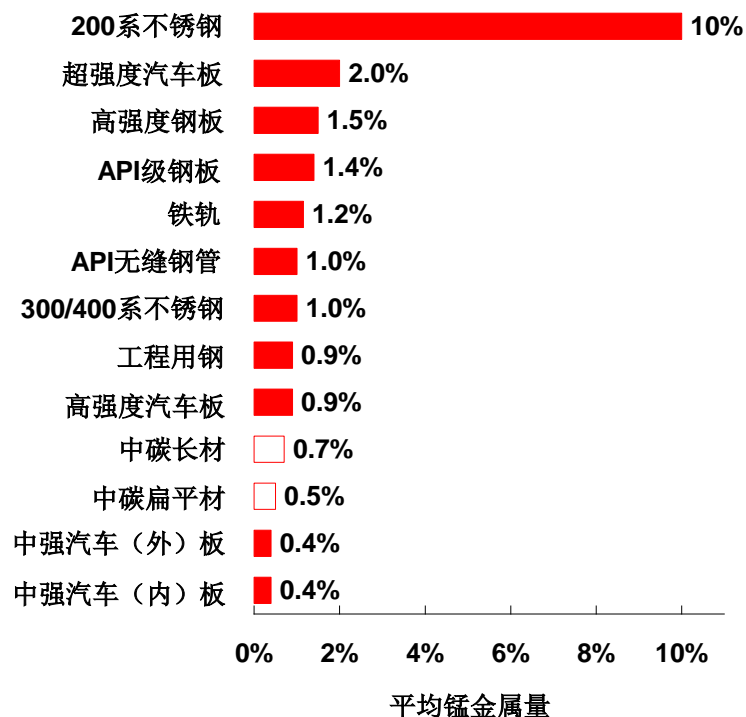
减少锰单位用量的因素

- ➔ 平炉钢产量以及铸锭的下降
- ➔ 扁平钢材占比增加

增加锰单位用量的因素

- ➔ 部分高锰钢材（尤其是汽车与能源行业用钢）产量增速高于粗钢总产量的增速
- ➔ 200系不锈钢增长明显（锰被用于替代低镍奥氏体不锈钢中的镍）

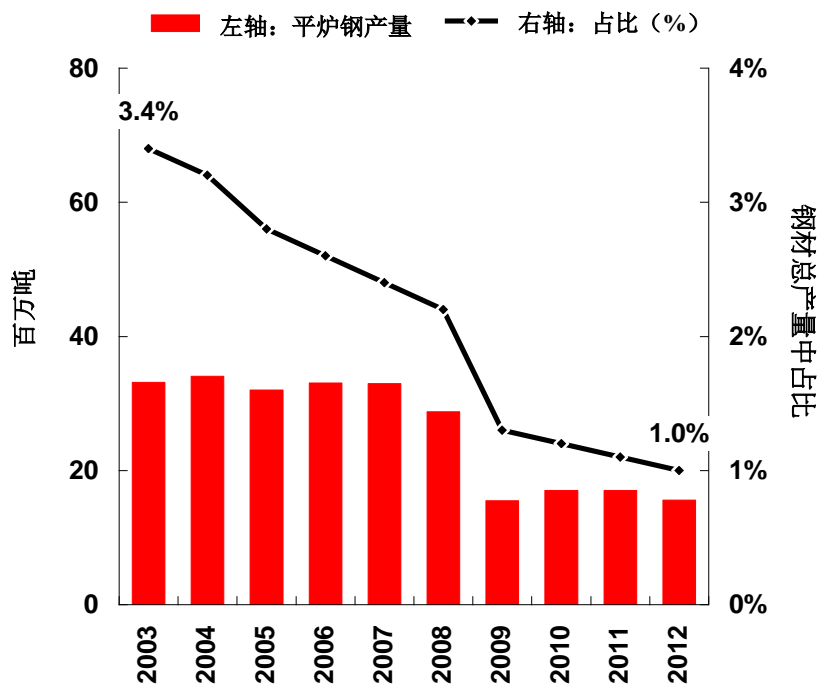
部分钢材锰含量



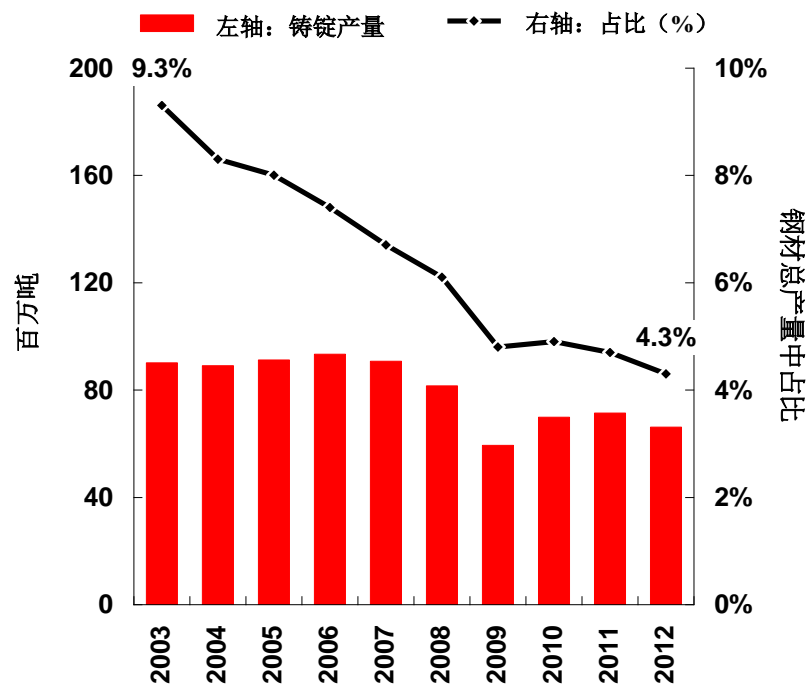
平炉钢及铸锭的产量和产量占比都持续下降

➔ 锰在平炉炼钢以及铸锭中的损耗高于高炉/电炉炼钢和连续浇铸。

全球平炉钢产量



全球铸锭产量

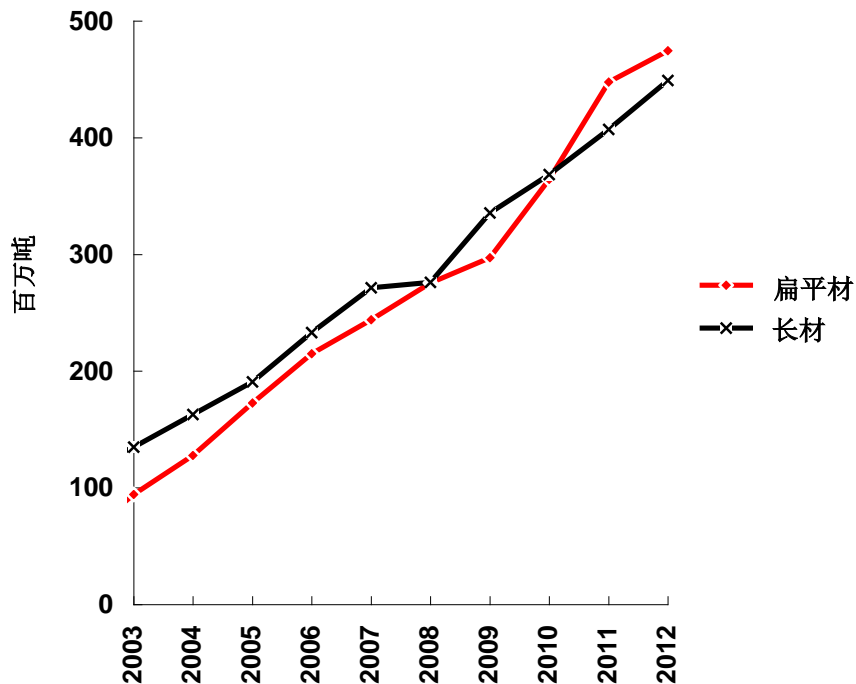


Source: Worldsteel, Macquarie Research, June 2013

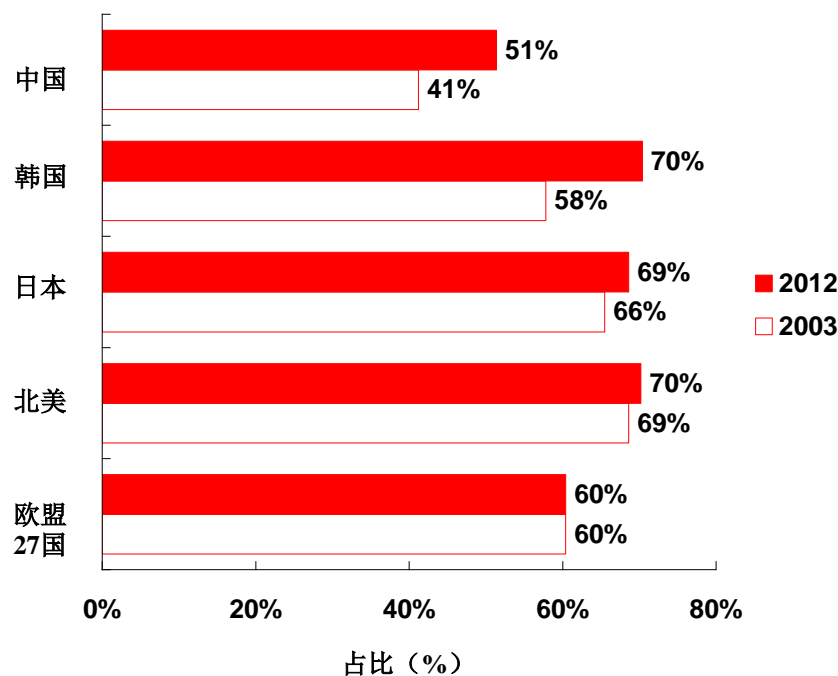
中国扁平材产量占比增长，然而仍然低于工业化国家的水平

➔ 中碳扁平钢材产品通常含锰约0.5%，而长材产品含锰约0.7%。

中国分产品钢材产量



扁平钢材产量



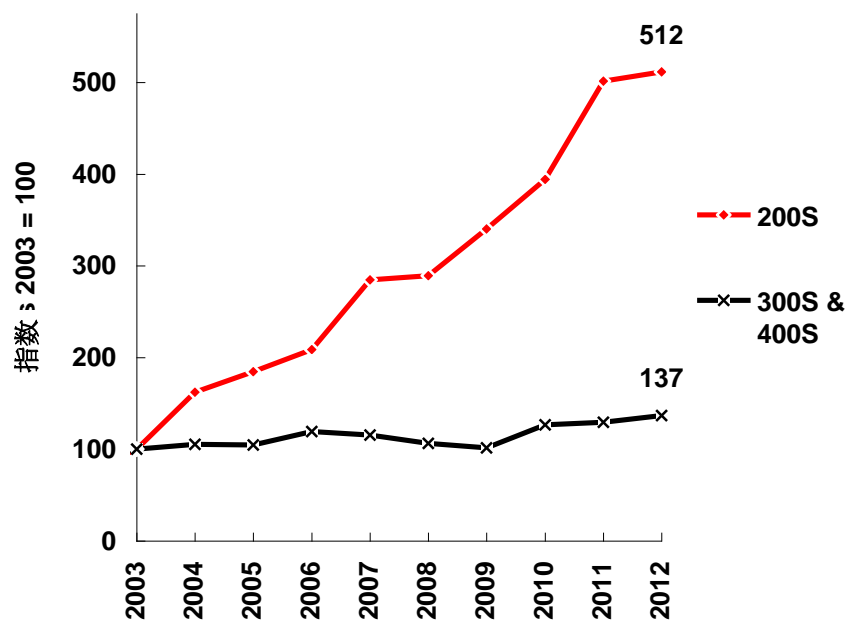
Source: K.Fowkes, IMnI, Worldsteel, Macquarie Research, June 2013



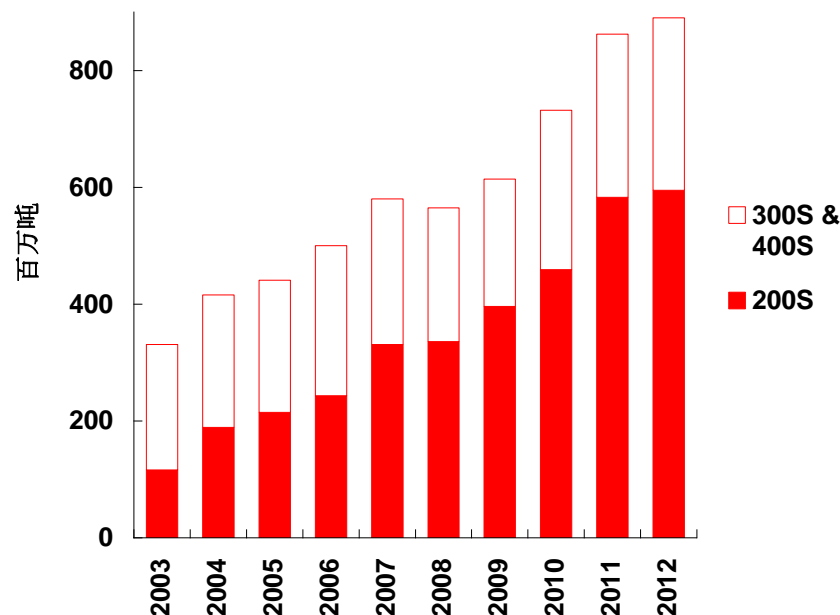
推动锰用量增长的因素：200系不锈钢产量在过去10年中增长了五倍

- ➔ 200系不锈钢通常含锰约6%-15%；300及400系通常仅含锰约1%。
- ➔ 200系在不锈钢总产量中占比低于20%，然而在不锈钢总耗锰量中却占比2/3。

全球不同系别不锈钢生产



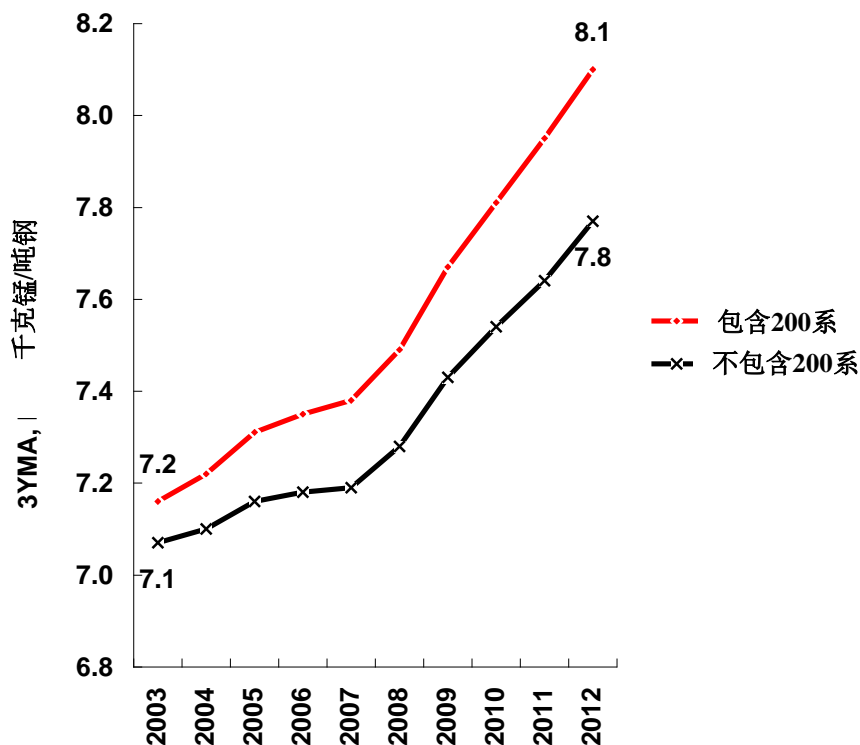
不锈钢生产中的单位锰用量



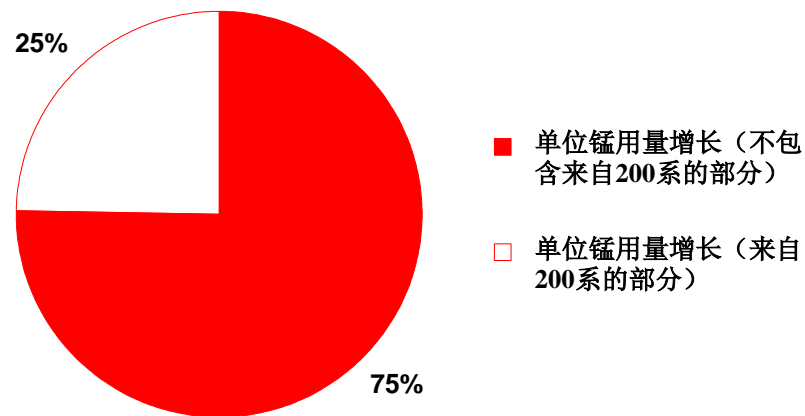
Source: CSSC, IMnI, ISSF, K.Fowkes, Macquarie Research, June 2013

推动锰用量增长的因素：200系不锈钢贡献了25%的单位锰消耗量增长

钢材生产中的单位锰消耗量



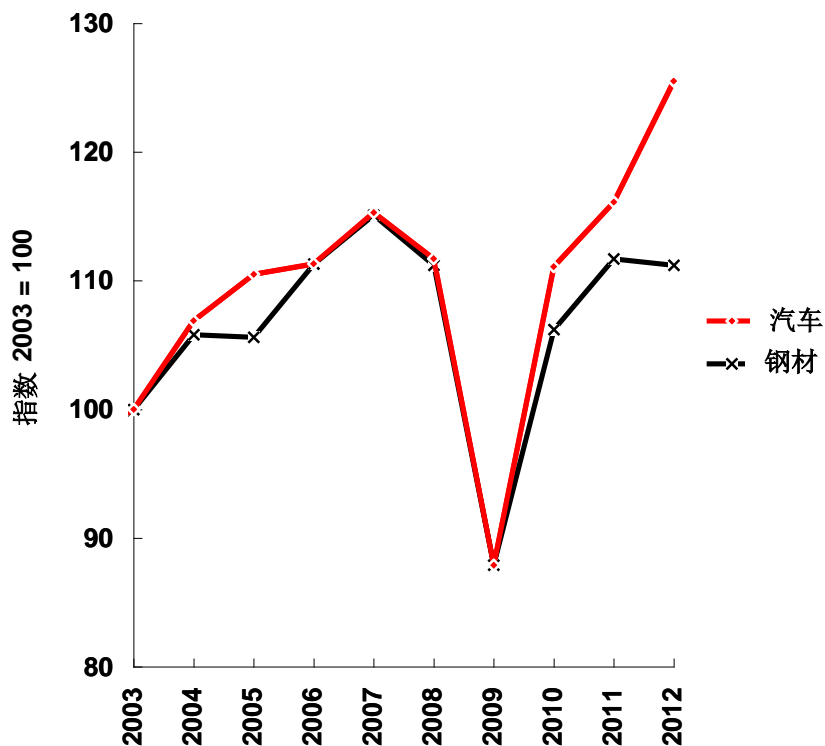
促进2003-2012年中单位锰消耗量增长的因素





推动锰用量增长的因素：汽车产量增速高于钢材产量增速，并且使用更多的高强度钢材以减轻重量

中国以外国家的汽车及钢材生产



- 中国以外国家的汽车产量增速已经高于钢材产量增速
- 更多的汽车开始使用更高强度的钢材，推动锰用量的增长

■ 中强度钢材<300MPa抗拉强度
■ 高强度钢材<500MPa抗拉强度
■ 超高强度钢材<1,000MPa抗拉强度
■ 极高强度钢材<1,500MPa抗拉强度
■ 铝
■ 塑料
■ 铁





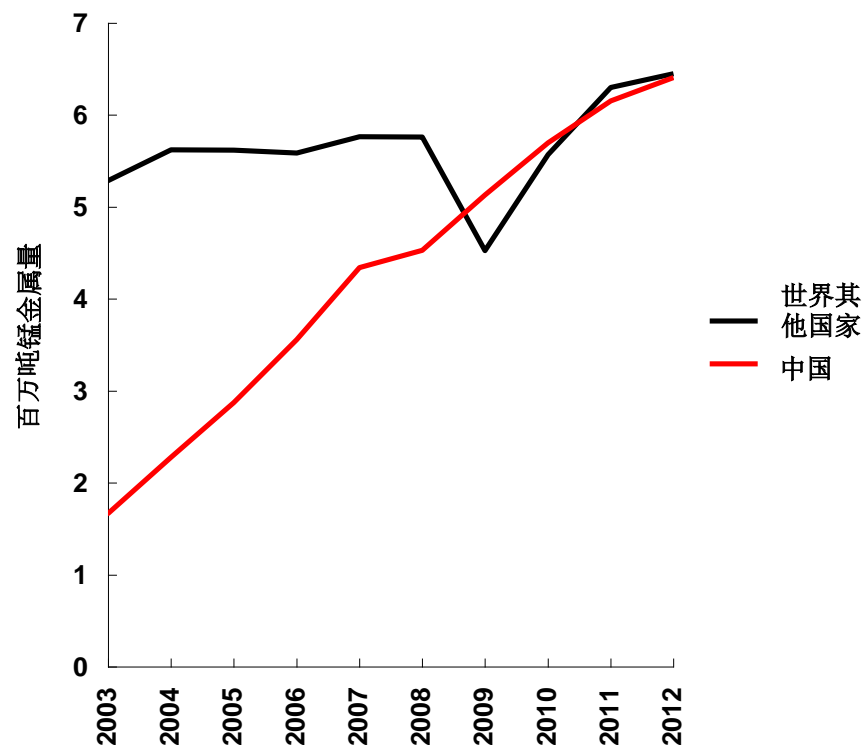
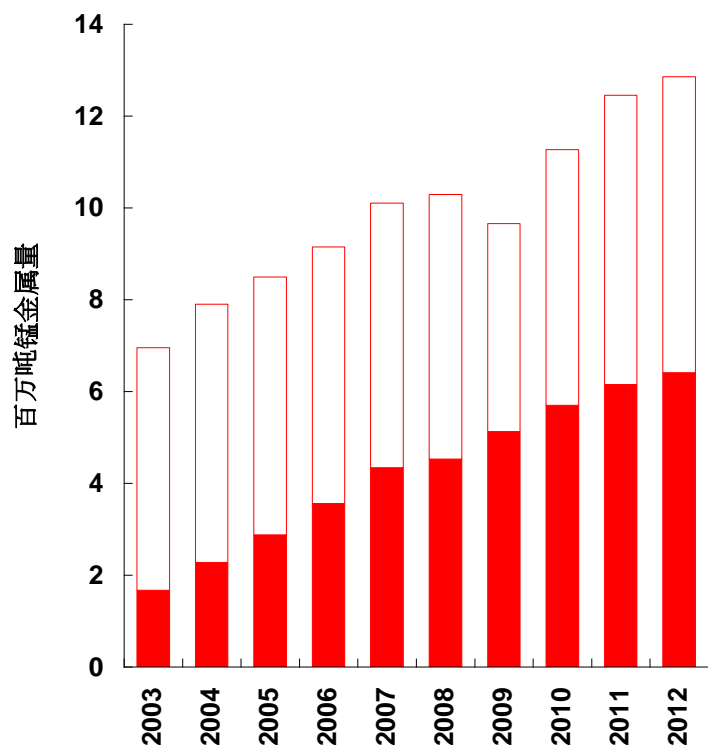
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全球锰消费量处在历史高位，中国是推动其增长的主要因素，已占据全球消费量的一半

锰消费量



Source: K.Fowkes, IMnI, Macquarie Research, June 2013



中国锰矿资源：资源量大，然而品位低且仅用于国内

中国主要锰产区



● 主要成矿带
— 次要成矿带

- ➔ 报道的中国锰矿资源量多至4亿吨，平均品位约22%，主要分布在中国南部。按照目前的利用率推算，中国锰资源可使用25年，但部分区域资源已接近枯竭。
- ➔ 大部分的资源是硅质碳酸盐矿石，适于生产硅锰和富锰渣，但不适于生产高碳锰铁，也不能通过选矿大幅提高品位。

中国锰矿资源¹

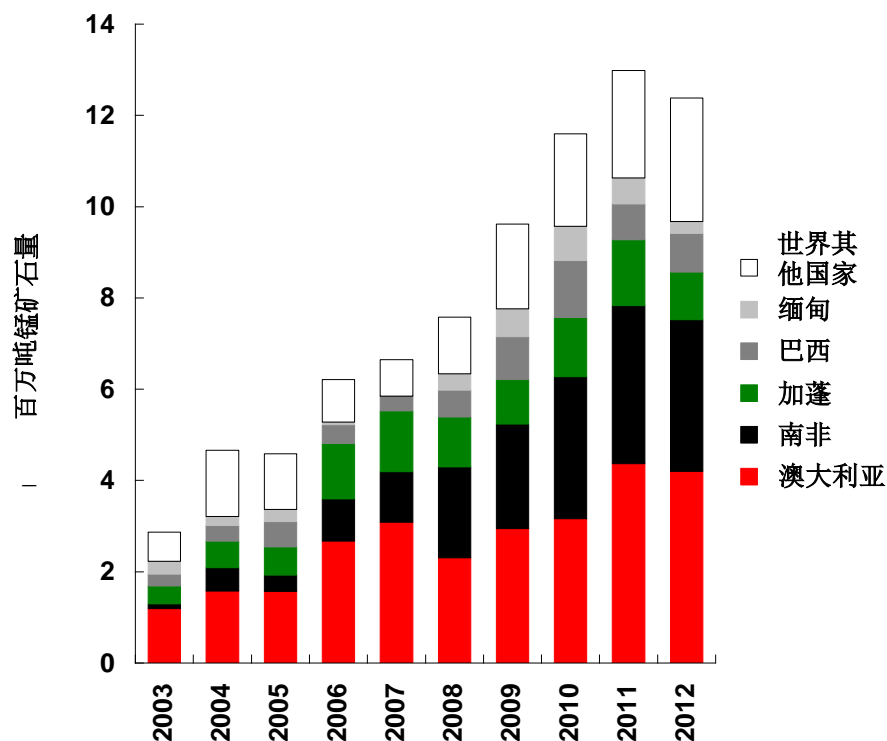
省区	锰矿品位	锰铁比例	二氧化硅	磷	锰矿资源 百万吨	占比 (%)
广西	氧化矿约32% 碳酸盐矿石约22%	4:1	18%	0.1%	133	34%
湖南	~20%	10:1	10%	0.1%	69	18%
其他省区	187	48%
中国	~22%	6:1	16%	0.1%	389	100%

Source: C&M, K.Fowkes, Hatch, SRK, USGS, Macquarie Research, June 2013. 注：1. 数据为2012年底探明及推定资源量。

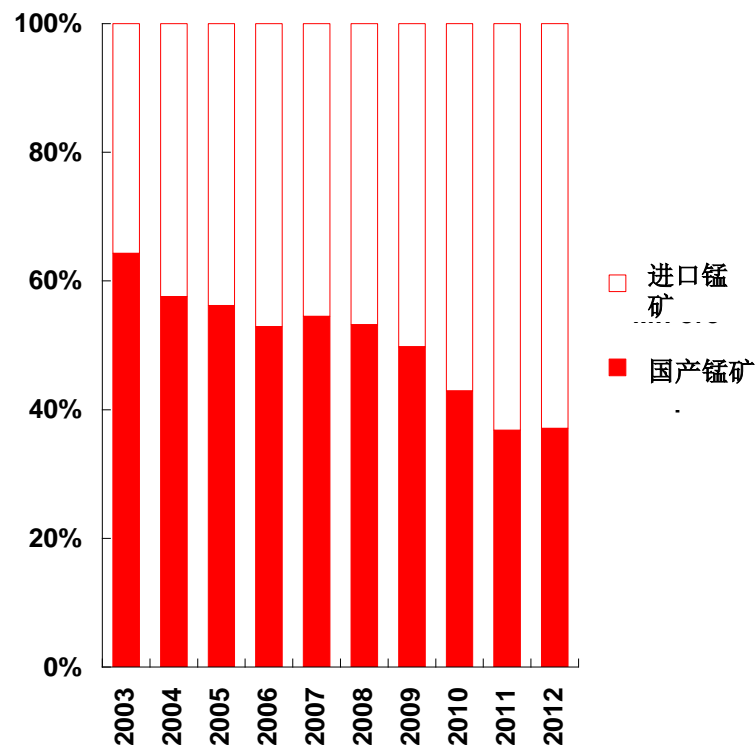


中国的锰矿进口在过去10年增长了四倍，目前供应国内60%的锰需求

中国分国别锰矿进口



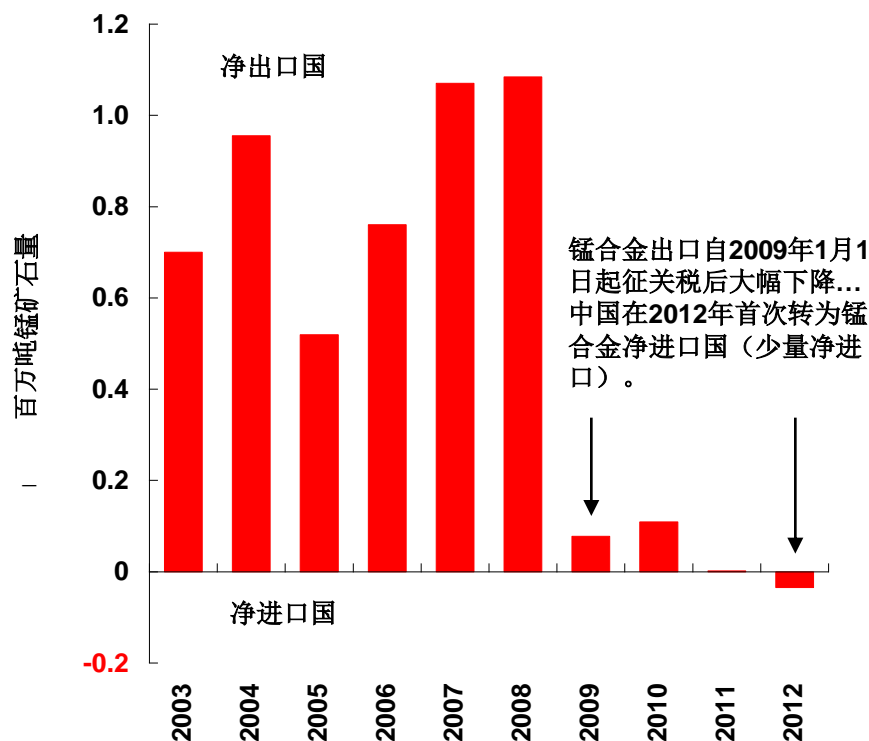
中国锰消费



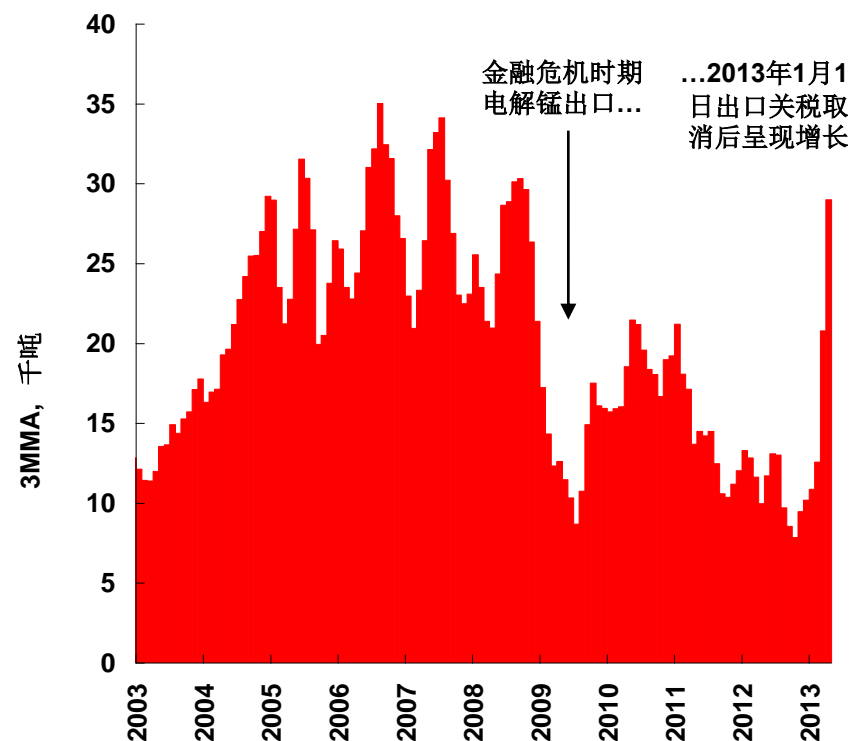
Source: China Customs, K.Fowkes, IMnI, Macquarie Research, June 2013

中国从锰铁合金主要净出口国转变为净进口国；电解锰出口也呈现下降，直到今年关税取消后开始增长

中国锰合金净出口



中国电解锰出口



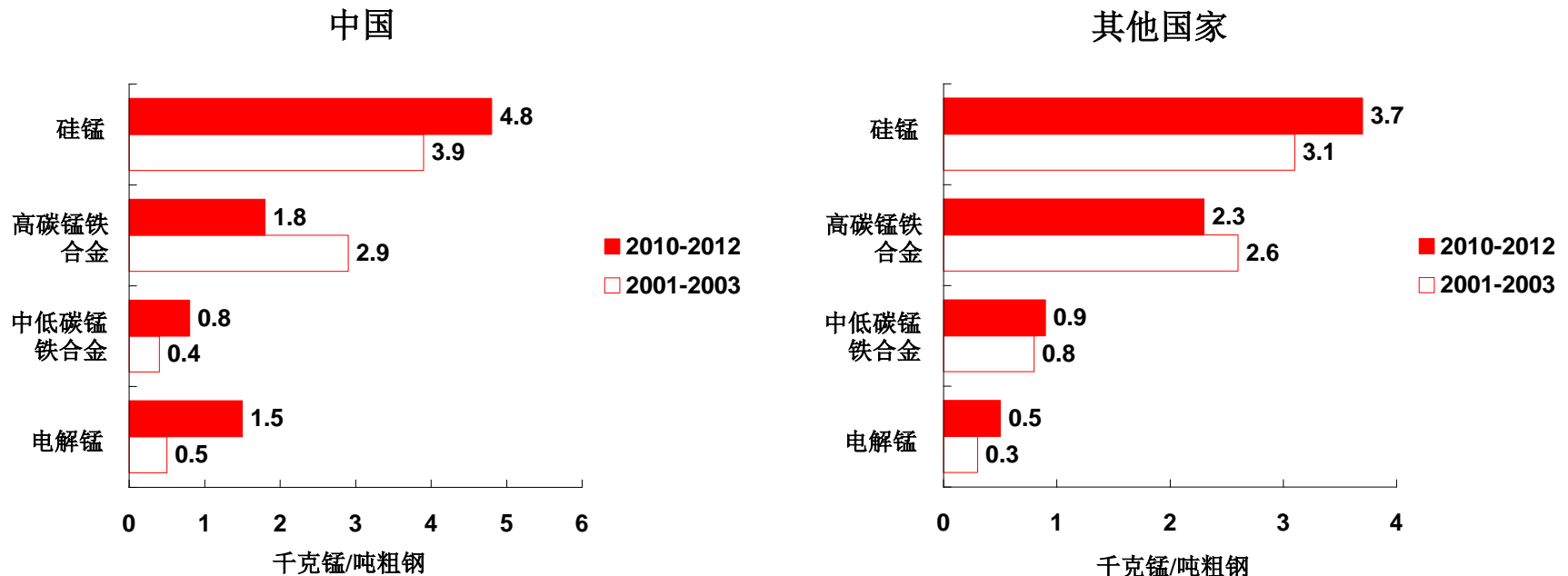
Source: China Customs, Macquarie Research, June 2013



中国锰铁合金的使用不同于其他国家。硅锰以及中低碳锰铁合金用量增长快，高碳锰铁合金用量下降

- 炼钢中的单位硅锰用量在过去十年增加；只要“适用”，钢厂通常都选择使用硅锰合金。
- 高碳锰铁合金用量下降而中低碳锰铁合金用量增加，这在中国尤其明显，一定程度上与富锰渣相关。

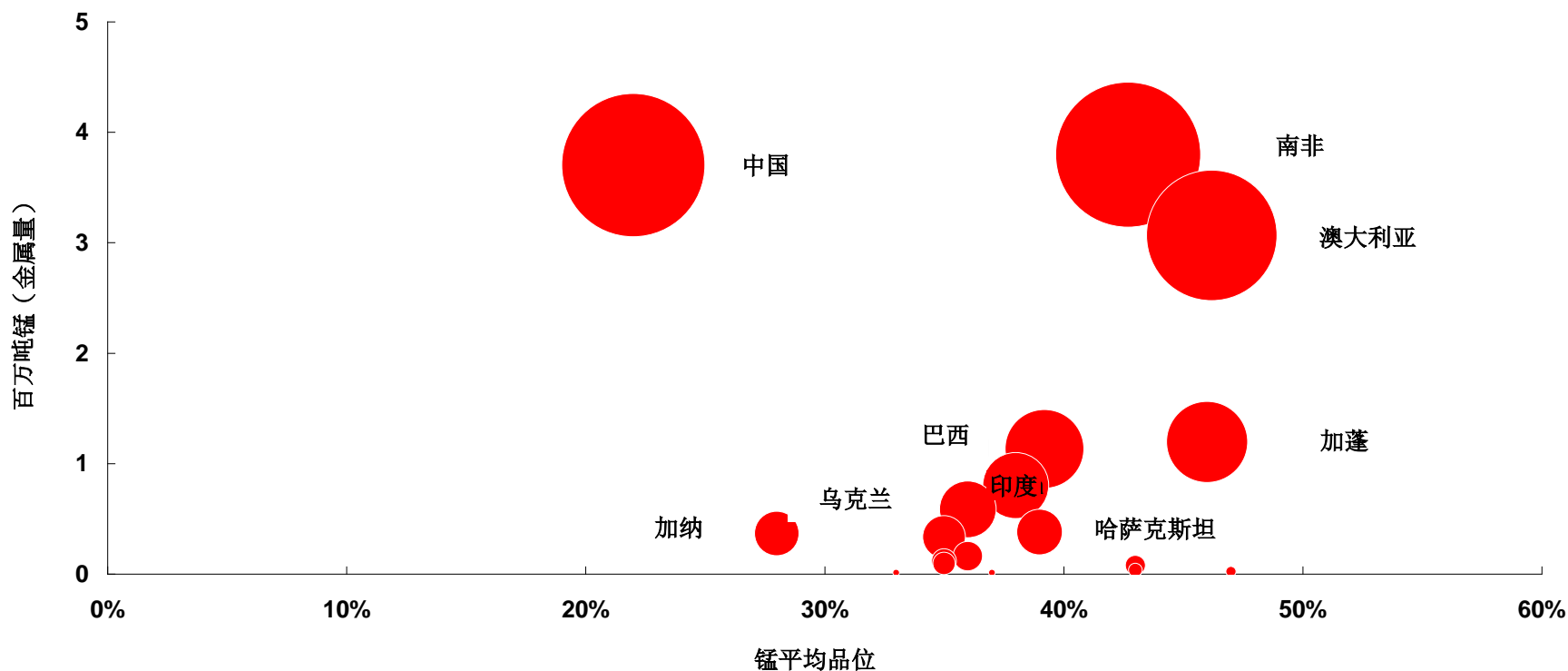
炼钢中的锰铁合金用量



Source: K.Fowkes, IMnI, Worldsteel, Macquarie Research, June 2013

中国的矿石锰金属量仅次于南非，然而矿石品位较低

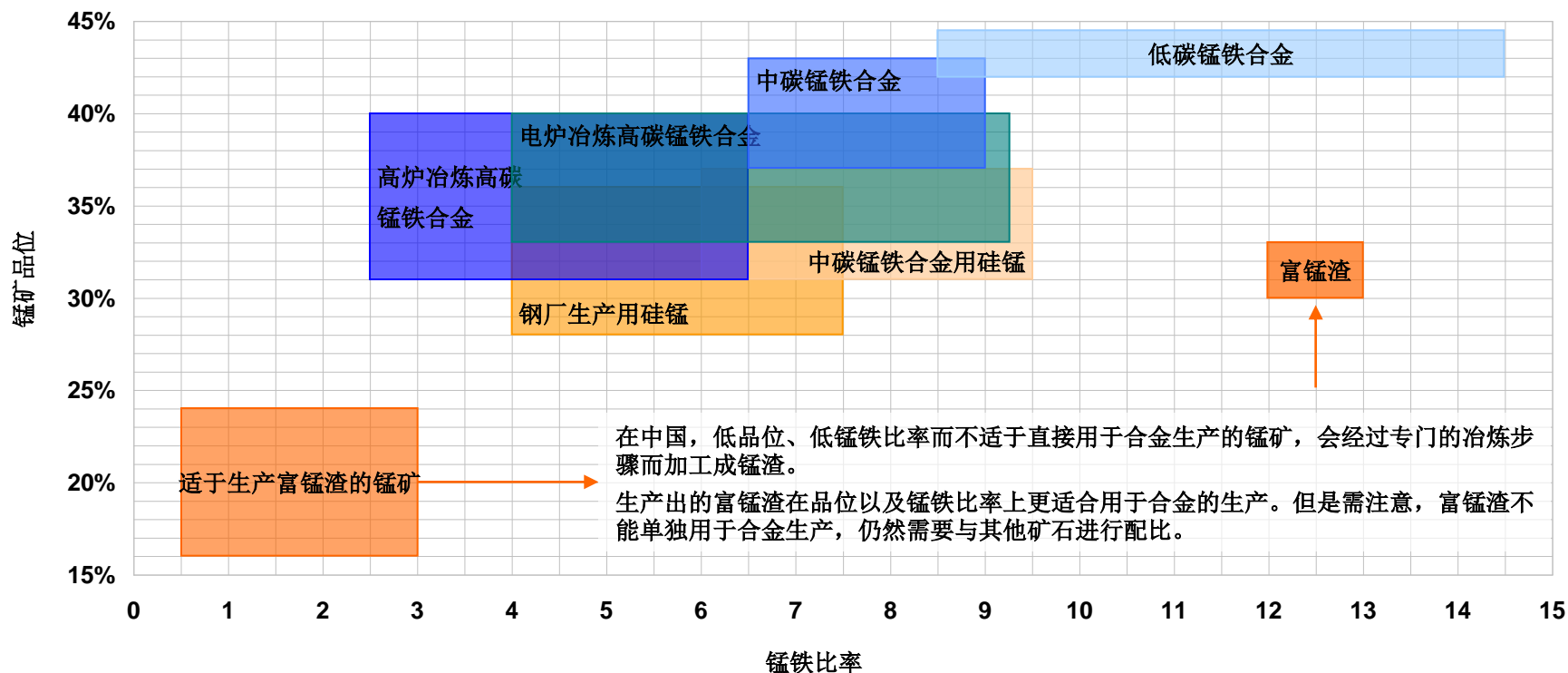
2012年全球锰矿产量



Source: K.Fowkes, IMnI, Macquarie Research, June 2013

中国锰铁合金厂家使用当地低品位、低锰铁比率的矿石以减少进口需求

锰铁合金产品及矿石品位配比



Source: C&M, Metallurgy of Manganese, Macquarie Research, June 2013



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炼钢中的锰使用情况概述

→ 当代炼钢中，锰主要有两大用途：

1. 作为合金助剂
锰用于增强拉伸强度、硬度、韧性、耐磨性以及机械加工性。
2. “解决”残留的硫
就这一用途而言，锰在炼钢中是必需的，没有可替代品，但是用量因现在实践中均采用的铁水预处理脱硫工艺而减少。

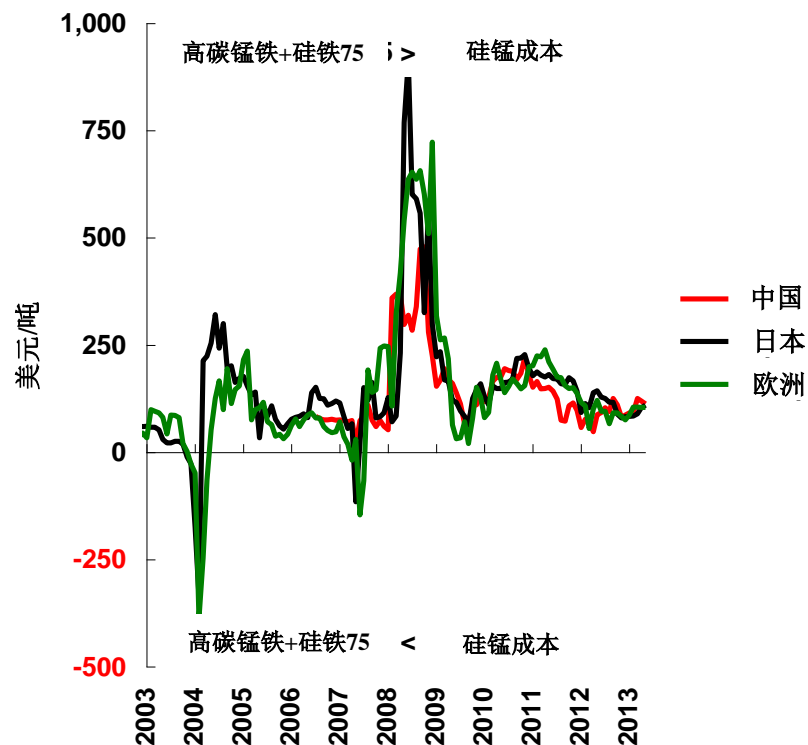
→ 锰铁合金及其用量主要受三方面因素影响：

1. 各钢材产品对化学元素含量的不同要求
锰含量用于控制碳及硅含量。扁平钢材碳含量通常低于长材碳含量。硅含量的控制对于对表面要求严格的扁平钢材很重要。
2. 炼钢过程（会影响达到符合要求的化学元素组合的效率）
除了底吹用于减少炼钢中的碳含量，高炉/转炉以及电炉炼钢没有明显不同。
3. 将其他合金附加品的成本控制在元素组合以及钢厂设计要求的范围以内
漏斗喂炉配置

在满足产品以及生产程序要求的前提下，硅锰通常是钢厂使用合金的不二选择

- ➔ 钢厂在选择锰铁合金时，首要的考虑因素是在炼钢程序和钢厂设计限制范围以内，实现符合相应钢材产品所要求的化学元素组合
- ➔ 在满足产品以及生产程序要求的前提下，硅锰通常是钢厂使用合金的不二选择，原因有三：
 1. 加入一个产品等于加入两种合金
 2. 作为脱氧剂，硅锰中硅的表现比硅铁中硅的表现要强得多
 3. 加入硅锰可以避免用液态金属燃料熔化多余的铁时的热量流失，对控制生产周期和提高生产效率很重要
- ➔ 硅锰在大多数市场的成本效率要明显高于同样含量的高碳锰铁合金与硅铁的混合物（美国因对硅锰进口征收从价税除外）

锰铁合金成本比较





未来钢材产品结构的变化可能改变钢厂锰铁合金的使用情况

- ➔ 预计高强度、高锰钢材在部分领域的应用将增加，尤其是汽车与能源行业用钢，钢厂可能寻求调整或者使用新的锰铁合金以适应新的需求
 - ➔ 组合更加优化、熔化更快、在大小及合金化学方面更有一致性的产品。熔化速度对生产周期很重要。从铁合金到钢材过程中的锰回收是炼钢实践中的工艺，同时也影响合金质量；持续的回收将减少钢材不合格的风险
 - ➔ 高锰品位将减少对用量的需求以及钢材温度下降，对生产周期、生产效率以及成本控制有积极影响
 - ➔ 减少碳及有害残留物含量，尤其是氢、氮以及磷
- ➔ 将来，钢厂将考虑熔化锰铁合金，将其以液态形势加入液态金属燃料中，使其易于加入液态钢铁中，减少能源消耗。这一工艺已在部分不锈钢和特钢厂家中采用



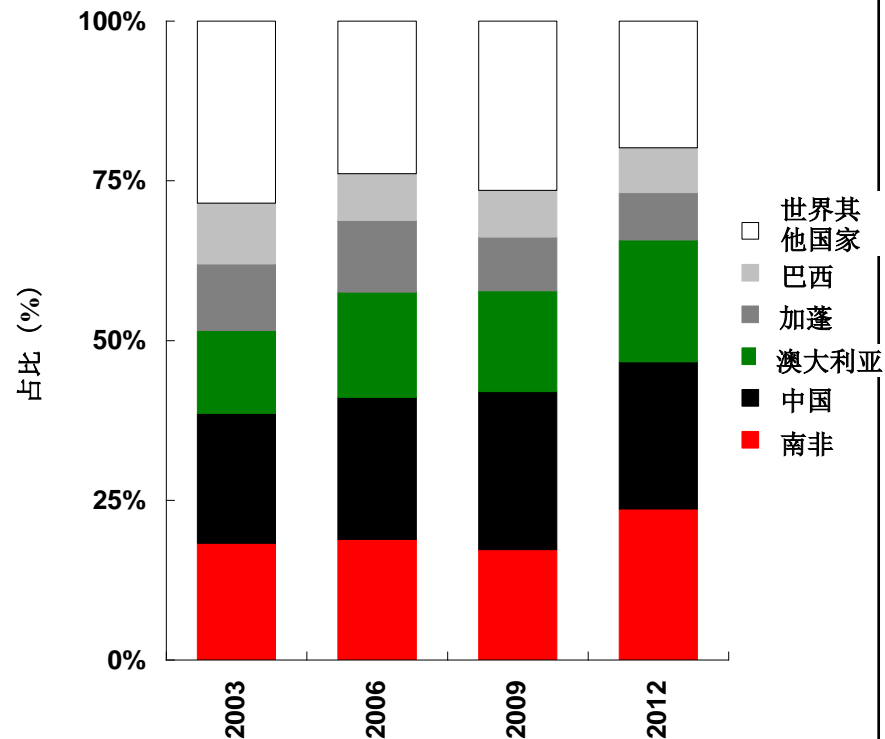
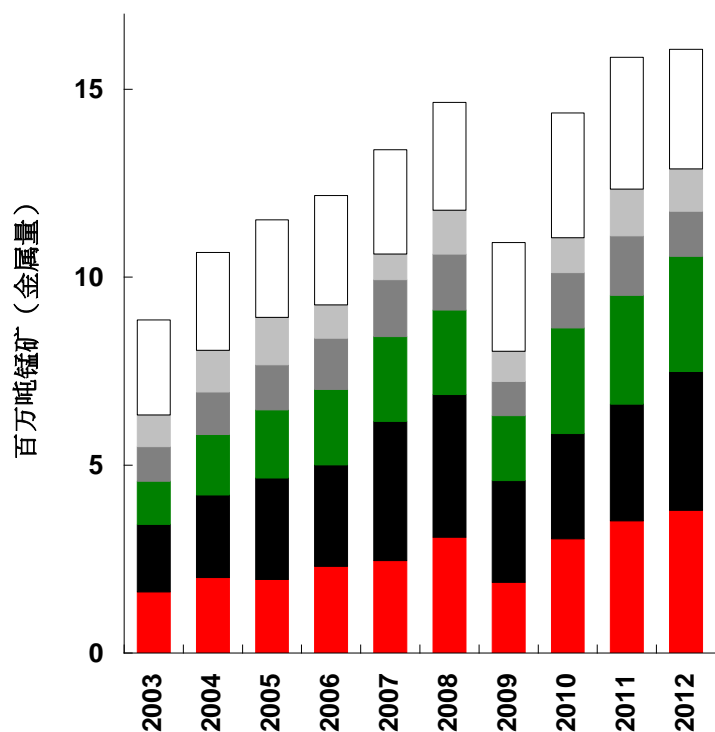
全球锰行业发展趋势与机遇研究

- 全球钢铁生产与未来趋势预测
- 炼钢产业锰消耗量研究
- 中国在全球锰生产与消费中的地位
- 炼钢中的锰铁合金选择与应用
- 锰矿供应研究
- 结论



南非、中国和澳大利亚推动全球的锰矿生产，但中国在全球产量中的占比下滑

全球锰矿产量



Source: K.Fowkes, IMnI, Macquarie Research, June 2013



关于未来几年主要生产国锰矿供应的预测——不会出现明显短缺

主要国家	产量, 百万吨 ¹	注释
澳大利亚	3,795	必和必拓正推动锰矿生产但总量不确定。预计在北部和西部地区将有新的勘探项目
巴西	1,130	中高品位资源, 但正在枯竭; 并非运营商的首选
布基纳法索	-	高品位资源, 但缺乏配套基础设施。Tambao项目
中国	3,700	资源品位低且逐渐枯竭, 对进口矿的依赖将增加
加蓬	1,195	大型未开发的高品位资源。Moanda扩建。Bembélé投产。
加纳	365	低品位干净矿资源。开采成本低, 资源量大, 预计将有更多新扩建项目
印度	800	产量主要供应国内使用, 最近产量因进口矿增加而下降
哈萨克斯坦	380	资源地处偏远, 品位低, 成本高, 生产企业面临挑战
俄罗斯	-	Chek-Su、SGMK项目, 但时间尚不明确
南非	3,790	超大资源量, 品位高, 在世界范围内属低成本矿, 但缺乏配套基础设施
东南亚	460	印尼、马来西亚、缅甸、越南。成本低, 但主要为低品位矿, 资源未完全开发
乌克兰	585	资源量大然而品位低。Tavrichesky矿山可能重启
西非	90	刚果、科特迪瓦、纳米比亚、赞比亚。品位高, 成本可能较低。资源未完全开发, 缺乏配套基础设施

Source: CRU, K.Fowkes, Macquarie Research, June 2013 注: 1. 2012 锰金属量



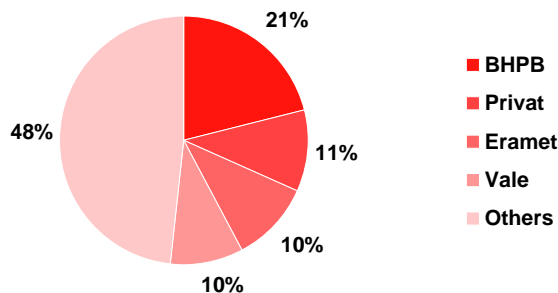
南非缺乏供锰矿出口的基础设施，限制其供应量， 还需较长时间来开发

路径	运力	最新状态	较便宜
伊丽莎白港 – 铁路运输	5.5百万吨/年	之前所说2016年起不再从伊丽莎白港出口，目前看来在2017-2018年以前都不太可能。与此同时，竞争生厂商之间铁路运力分配的问题仍然有待解决。	
萨尔达尼亚湾– 铁路运输	~13百万吨/年	Transnet公司（南非国家交通运输集团有限公司）不再考虑在Sishen矿至萨尔达尼亚湾的铁路运力扩充项目中分配运力用于锰矿运输。新运力在2016/17年以前还不能够被启用。	
德班港 – 铁路/公路运输	3m–4百万吨/年	BMA码头正在扩建，可供集装箱运输。铁路运力在增加但仍然需要部分公路货运，价格仍然昂贵（运输低品位矿石价格约1.80-1.90美元/吨）。	
理查兹贝港口 – 公路运输	~1百万吨/年	通往该港口的公路货运费用较通往德班港的费用大约高15%。锰矿出口运输须面对铬矿及铁矿石出口增长冲击，出口量下降。	
Coega – 铁路运输	10m–16百万吨/年	Transnet公司的优先选择。该公司投资27亿南非兰特的一期项目已在5月获得其首席执行官批准，力图在2017年中期实现1200万吨/年的运力。然而，业界担心营运成本将达到110亿南非兰特。在当地建锰铁合金冶炼厂的可能性很小。	
			更贵



十年来锰矿的整合没有发生明显变化，所有权结构变化可能提供一些机会

2003年锰矿分公司产量

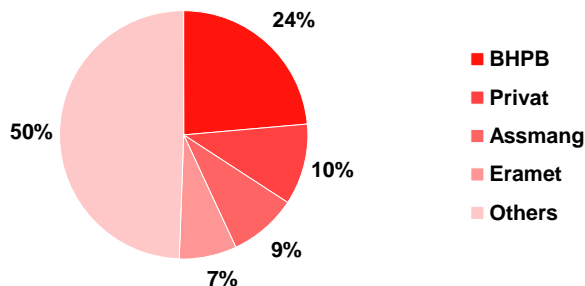


→ 十年来锰矿的整合没有明显变化。中国抵消了主要生产商产量增长的影响。四大生产商产量占比50%

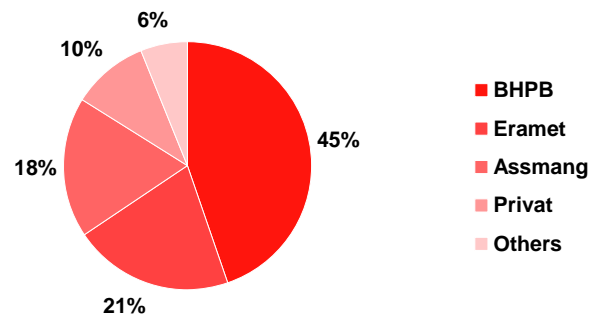
→ 生产高品位矿的市场高度集中。四大生产商产量占比高于95%

→ 据报道，部分主要矿山正在审视所有权（关于规模等问题），可能给新入行业者提供机会；但纵向合并不太可能发生

2012年锰矿分公司产量



2012年高品位锰矿分公司产量



Source: Company Reports, K.Fowkes, IMI, Macquarie Research, June 2013. 注：高品位锰矿指锰含量≥40%的锰矿。



全球锰行业发展趋势与机遇研究

- 全球钢铁生产与未来趋势预测
- 炼钢产业锰消耗量研究
- 中国在全球锰生产与消费中的地位
- 炼钢中的锰铁合金选择与应用
- 锰矿供应研究
- 结论



全球锰行业发展趋势与机遇研究

结论

- 全球钢铁产量创历史新高。城镇化以及汽车产量增长将刺激钢铁产量进一步增长，尤其在中国
- 锰在炼钢中的用量一直在增长，并将继续增长，即使增速可能放缓（利用效率提高的空间已经有限）
- 无需怀疑锰需求增长的潜力！！
- 中国在未来很多年仍将作为世界最大的锰消费国，并且由于本国资源有限，中国的锰进口量将增加
- 钢厂对锰铁合金的需求仍可能发生变化，但是在满足产品及生产程序要求的前提下，硅锰仍将是钢厂的不二选择
- 虽然南非受限于基础设施建设，锰矿供应仍然能够满足2015-2020年的需求量。关注长期的新扩建项目

Important disclosures:

Recommendation definitions

Macquarie - Australia/New Zealand

Outperform – return > 3% in excess of benchmark return
Neutral – return within 3% of benchmark return
Underperform – return > 3% below benchmark return

Benchmark return is determined by long term nominal GDP growth plus 12 month forward market dividend yield.

Macquarie – Asia/Europe

Outperform – expected return >+10%
Neutral – expected return from -10% to +10%
Underperform – expected <-10%

Macquarie First South - South Africa

Outperform – return > 10% in excess of benchmark return
Neutral – return within 10% of benchmark return
Underperform – return > 10% below benchmark return

Macquarie - Canada

Outperform – return > 5% in excess of benchmark return
Neutral – return within 5% of benchmark return
Underperform – return > 5% below benchmark return

Macquarie - USA

Outperform – return > 5% in excess of benchmark return
Neutral – return within 5% of benchmark return
Underperform – return > 5% below benchmark return

Volatility index definition*

This is calculated from the volatility of historic price movements.

Very high–highest risk – Stock should be expected to move up or down 60-100% in a year – investors should be aware this stock is highly speculative.

High – stock should be expected to move up or down at least 40-60% in a year – investors should be aware this stock could be speculative.

Medium – stock should be expected to move up or down at least 30-40% in a year.

Low–medium – stock should be expected to move up or down at least 25-30% in a year.

Low – stock should be expected to move up or down at least 15-25% in a year.

* Applicable to Australian/NZ stocks only

Recommendation – 12 months

Note: Quant recommendations may differ from Fundamental Analyst recommendations

Financial definitions

All "Adjusted" data items have had the following adjustments made:

Added back: goodwill amortisation, provision for catastrophe reserves, IFRS derivatives & hedging, IFRS impairments & IFRS interest expense
Excluded: non recurring items, asset revals, property revals, appraisal value uplift, preference dividends & minority interests

EPS = adjusted net profit /efpowa*

ROA = adjusted ebit / average total assets

ROA Banks/Insurance = adjusted net profit /average total assets

ROE = adjusted net profit / average shareholders funds

Gross cashflow = adjusted net profit + depreciation
*equivalent fully paid ordinary weighted average number of shares

All Reported numbers for Australian/NZ listed stocks are modelled under IFRS (International Financial Reporting Standards).

Recommendation proportions – for quarter ending 31 March 2013

	AU/NZ	Asia	RSA	USA	CA	EUR	
Outperform	45.12%	53.24%	50.00%	40.70%	62.98%	43.30%	(for US coverage by MCUSA, 6.10% of stocks covered are investment banking clients)
Neutral	41.52%	28.01%	41.43%	55.01%	32.60%	34.10%	(for US coverage by MCUSA, 4.91% of stocks covered are investment banking clients)
Underperform	13.36%	18.74%	8.57%	4.29%	4.42%	22.60%	(for US coverage by MCUSA, 3.33% of stocks covered are investment banking clients)



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