Iron Ore Market Outlook

September 2013



Makai Marine Advisors LLC

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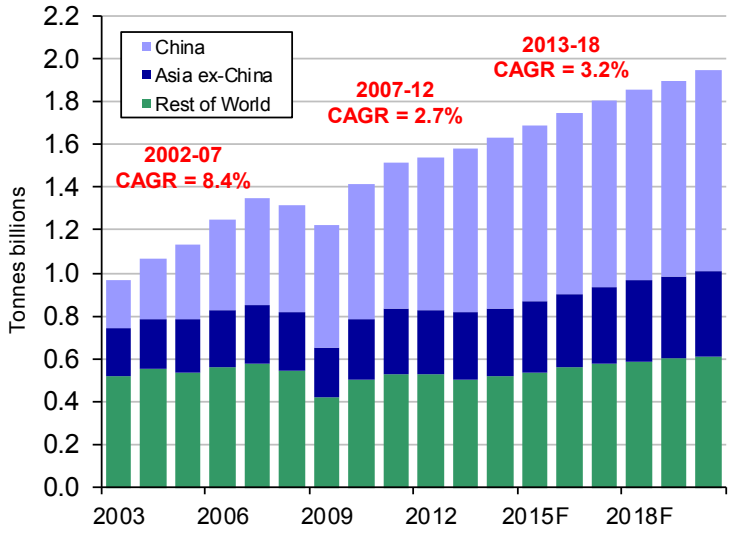
Key Observations

- Iron ore market poised to provide stronger tonne-mile demand growth, just as fleet supply slows, but heavily reliant upon Chinese import substitution
- Otherwise, demand outlook remains unexciting, as current market consensus grapples with evolution of Chinese economy and continued European recession…
- …yet miners developing massive supply surge over next 3-4 years, potentially ensuring iron ore oversupply and lower prices for years
- New supply would shift iron ore cost curve and eliminate high-cost Chinese production, allowing greater import substitution and market share gains for majors
- After two years of declining production and exports, Brazil poised to regain market share and to become key driver of tonne-mile demand for dry bulk market
- Still, Chinese import substitution has limited shelf life, as prices and domestic ore production stabilise…
- …while Chinese steel production and blast furnace output set to plateau by mid-2020s

Steel Market

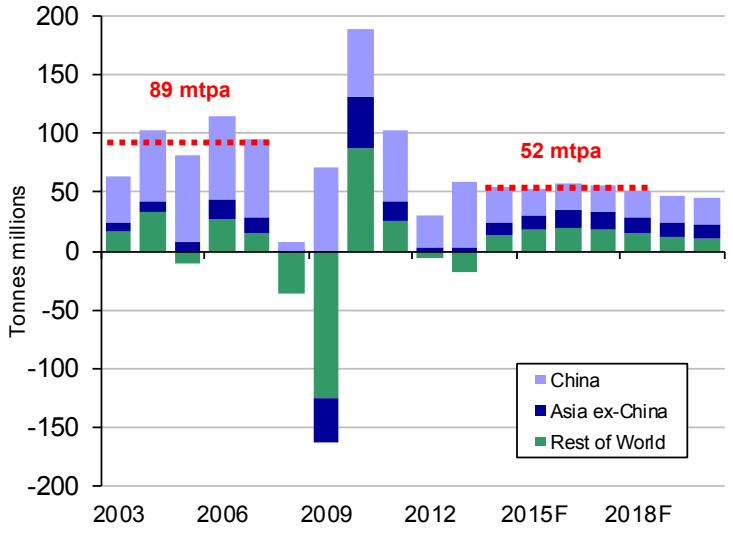
China continues its dominance of global steel production, but at decelerating pace, on more moderate demand growth

Global Crude Steel Production, by Region



Source: World Steel Assoc

Regional Steel Production, yoy Change

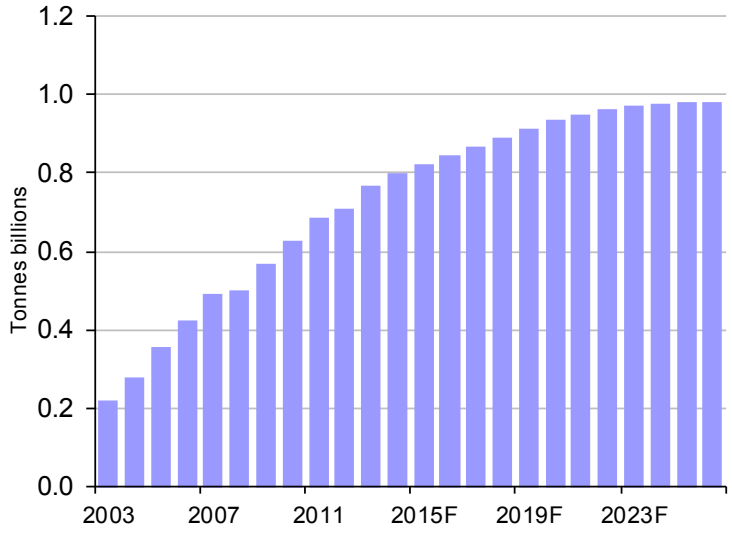


Source: World Steel Assoc

- China has come to dominate global steel production, with 48% share, as output in other regions has remained static near pre-crisis peak of 850 mtpa since 2010 recovery
- Modest gains in Asia ex-China have obscured continued weakness outside of Asia, especially in Europe, where 2013 forecast production of 200 mtpa remains 16% below 2007 peak
- Consensus estimates for medium-term global crude steel production centre around 3%
- Base case forecast provides for average annual gains of 52 mtpa during 2014-18, well below the 89 mtpa gains seen during credit boom

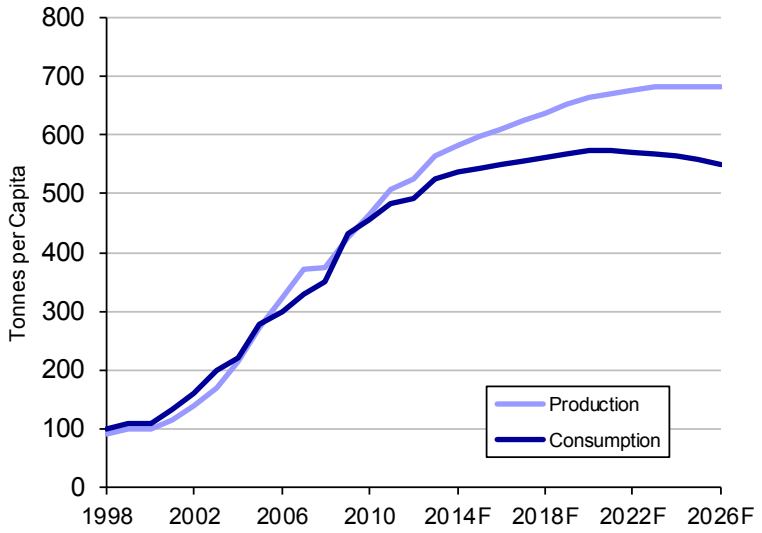
Chinese steel consumption and production growth should continue into the mid-2020s before peaking

Chinese Steel Production



Sources: World Steel Assoc, Rio Tinto, CRU

Chinese Steel Consumption per Capita

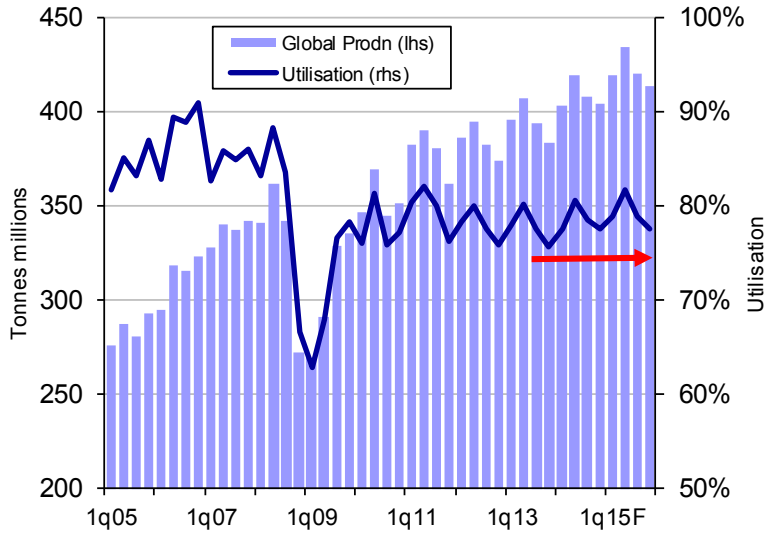


Sources: World Steel Assoc, CRU, Rio Tinto

- Estimates of peak Chinese steel production vary between 850 mtpa and 1,400 mtpa, but consensus centres around 1 billion tonnes
- Consensus based upon stabilising per capita steel consumption near 600 tonnes, as Chinese per capita income rises above $20,000 per year on PPP basis, and as GDP growth shifts away from fixed asset investment
- Chinese steel production would then plateau following peak consumption, with export potential reaching 200 mtpa, before saturation

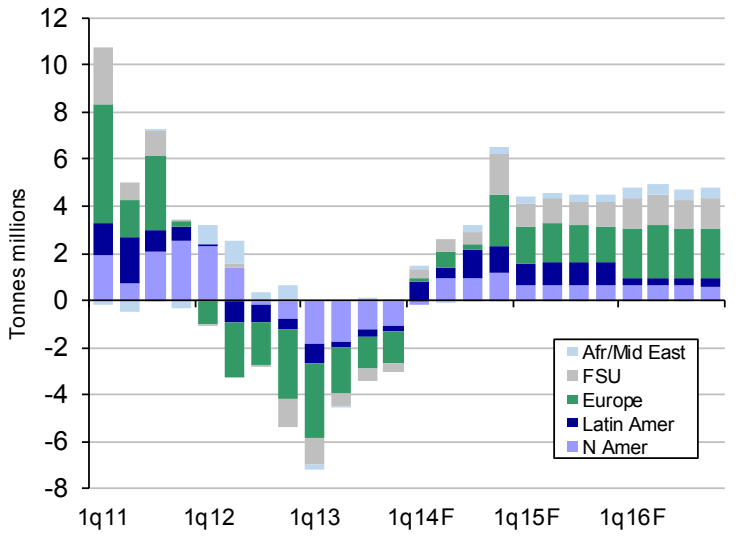
Yet the steel industry remains in dire shape, as Chinese and non-OECD capacity additions maintain global overcapacity

Global Steel Production & Capacity Utilisation



Sources: World Steel Assoc, BofML, Makai

Non-Asia Steel Production, yoy Change

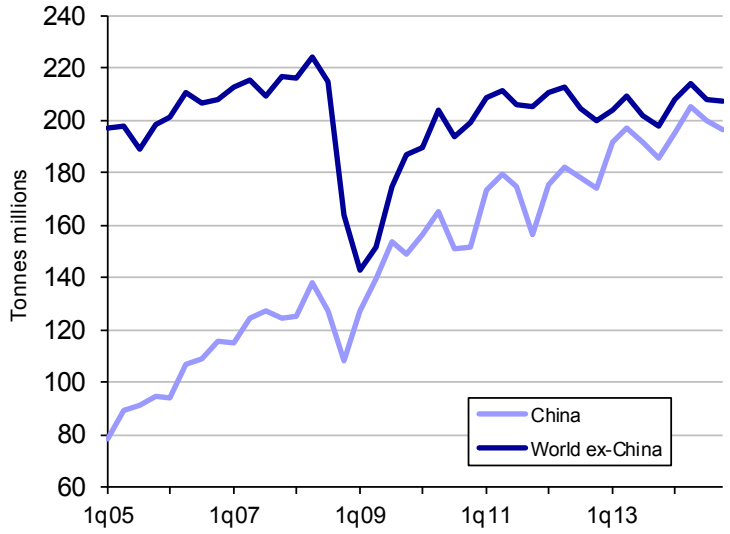


Sources: World Steel Assoc, Makai

- Although global steel output should continue to rise through 2014, utilisations not set to improve beyond current 80% level
- Continued growth in Chinese steelmaking capacity and export potential, along with other Asian producers, to keep global utilisations low
- Even a forecast recovery in depressed European markets, and a Latin American rebound ahead of Brazil Olympics during late-2014 and 2015, fails to stir global utilisations

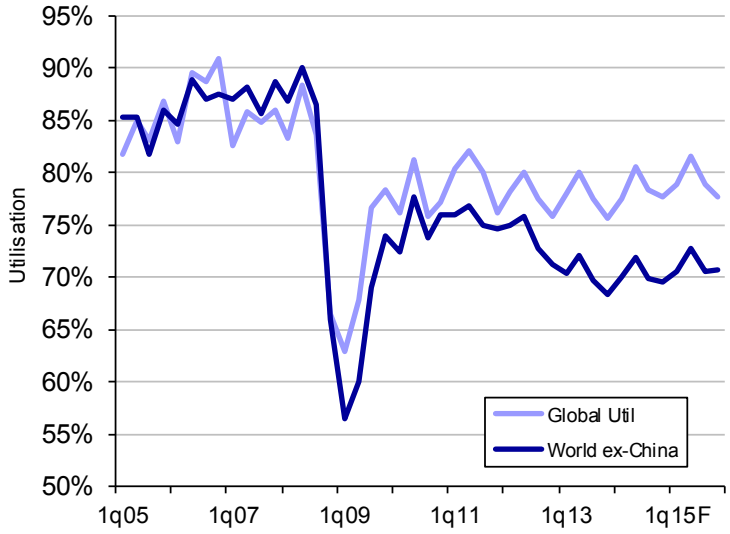
Relentless gains in Chinese steel output have expanded share and depressed utilisations in other steelmaking regions

China vs. Rest of World Steel Production



Sources: World Steel Assoc, Makai

Global Steel Capacity Utilisation

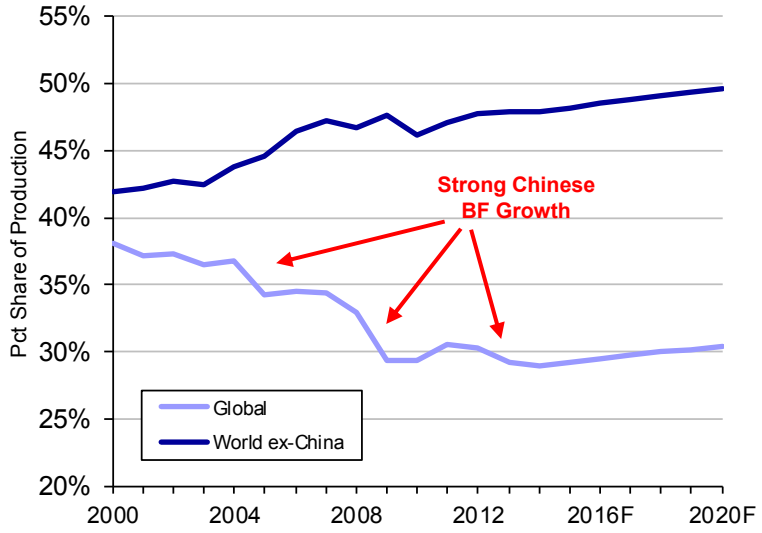


Sources: World Steel Assoc, BoAML, Makai

- Although global steel production plunged by 20% yoy during 4q08-2q09, Chinese steel production actually registered a 1.4% yoy gain in 2008 and surged by 14.1% during 2009
- This 59 mtpa jump in output during 2009, while production in the rest of the world fell 8 mtpa allowed a 8.6% global production share gain
- From a 15% share in 2000, Chinese steelmakers now command a 48% share, but set to stabilise
- With their utilisations still mired in the high-60s, European steelmakers need to cut capacity to provide any meaningful improvement in utilisations ex-China

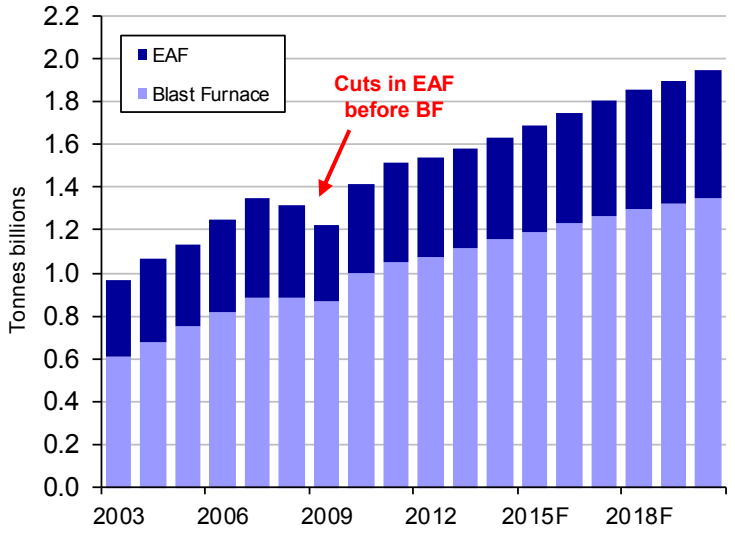
Explosive growth in Chinese blast furnace capacity has also lowered global EAF share, despite gains elsewhere

Electric Arc Furnace (EAF) Share of Production



Sources: World Steel Assoc, Makai

Global Steel Production, by Method

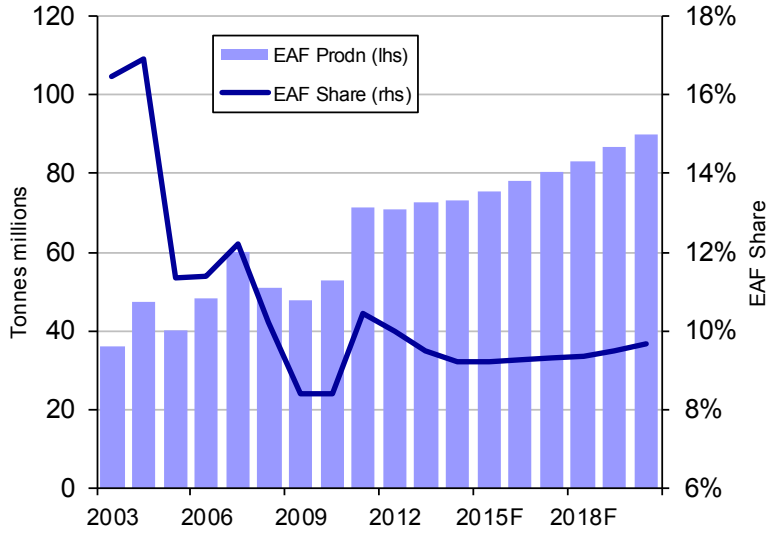


Sources: World Steel Assoc, Makai

- With Chinese blast furnaces providing 81% of all global steel production growth during past decade, the global share of electric arc furnace (EAF) production as has fallen by 700 bp during the period
- Financial crisis and recession cut into EAF share, as steel makers typically cut EAF output before undergoing expensive and politically-sensitive shut downs of blast furnaces
- EAF share ex-China to continue rising, as scrap markets in developing markets evolve and as European blast furnace capacity shuts down
- Still, gains limited by availability of scrap in developing countries and demand growth in specialty steels, which cannot tolerate impurity levels from scrap feed to EAFs

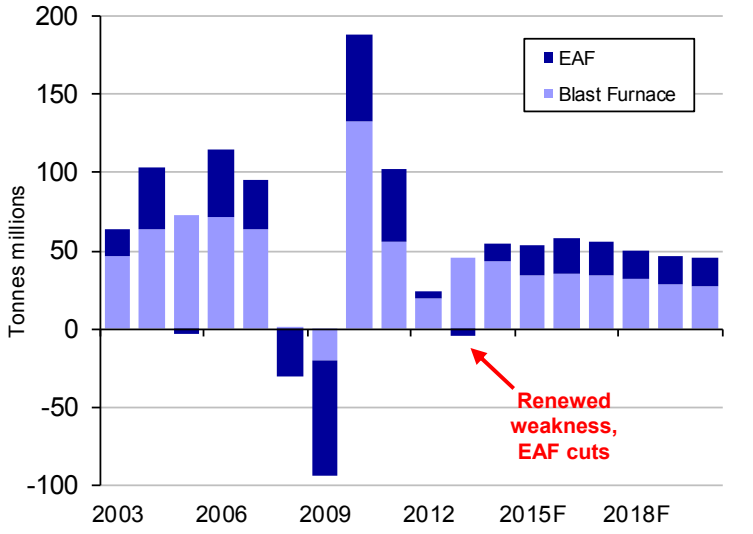
EAF share of Chinese steel production remains modest, but other regions will support future gains in EAF

Chinese EAF Production & Share



Sources: World Steel Assoc, Makai

Global Steel Production Growth, by Method

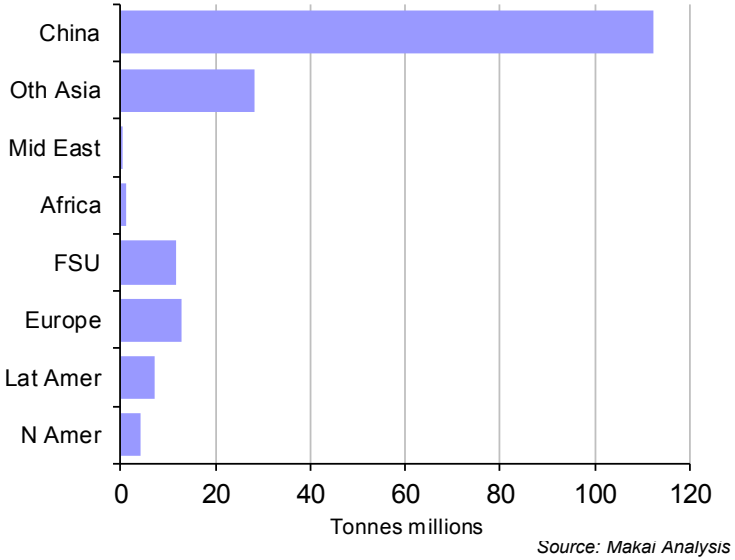


Sources: World Steel Assoc, Makai

- Dramatic expansion of Chinese blast furnace capacity has depressed its EAF share of steel production
- Young age of domestic car fleet, infrastructure and white goods in China limiting availability of scrap volumes required for significant EAF market development there
- Chinese EAF market unlikely to develop until mid-2020s, just as consumption begins to peak, which would lead to declines in Chinese blast furnace production and iron ore demand
- Europe, Russia and other Asia would lead global EAF gains, as steel demand recovers, with EAF providing 38% of total steel production gains during 2014-18

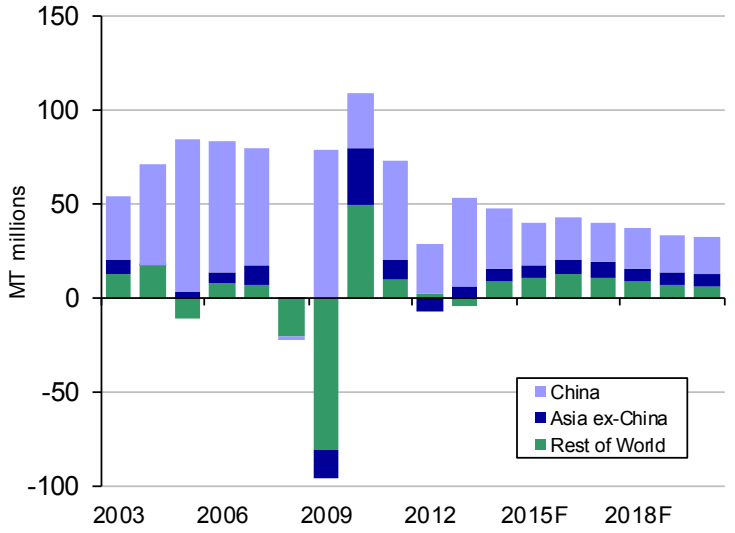
Modest gains in EAF share would cut into global blast furnace growth, but China would continue dominance

Blast Furnace Production Growth 2013-18



Source: Makai Analysis

Pig Iron Production Growth, by Region



Sources: World Steel Assoc, Makai

- Growth in EAF would limit average annual gains in blast furnace production to 32 mtpa during 2013-18, versus 64 mtpa pace during 2003-07 credit boom
- China would continue to dominate blast furnace output and growth, with 101 mtpa of 2013-18 growth, or 62% of global total
- Pig iron production for blast furnace feed would follow familiar pattern, with China dominating the average annual growth of 34 mtpa of global pig iron output for 2013-18

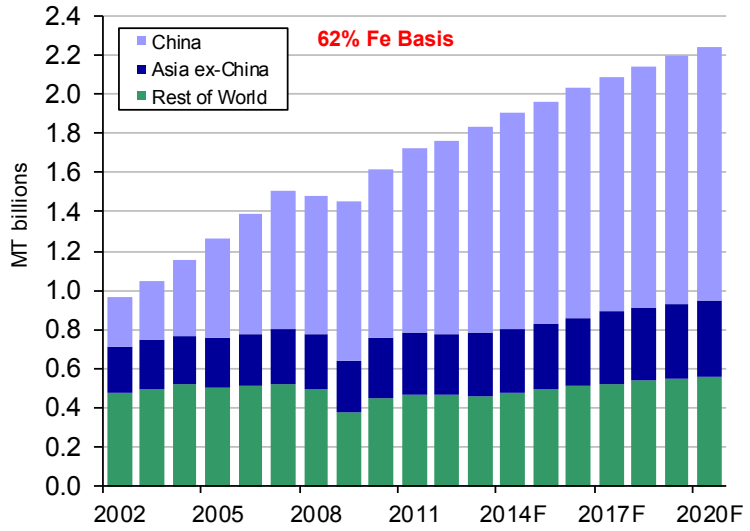
Conclusions -- Steel Markets

- Current consensus favours more moderate steel demand growth, as markets grapple with evolution of Chinese economy and continued European recession
- Forecast risk is that moderate consensus represents a milquetoast average for world facing bi-modal probabilities, either:
  - Extended weakness into 2014 and potential recession, as steel demand rolls over
  - Chinese growth concerns overstated once again, gradual OECD recovery
- Steel demand growth of 4.5% or 1.5% more likely than steady 3% performance
- EAF remains risk to blast furnace production and iron ore demand, but generally discounted by miners, given limited scrap availability in China & developing markets
  - Weak demand growth also to pressure EAF utilisations
  - Still, on longer-term horizon, plateauing Chinese steel consumption and rising EAF penetration would bring decisive end to rapid iron ore growth rates
  - Dry bulk market focused on near-term upside and escape from utilization hole, but given 25-year life of assets, Chinese denouement might be worthy of consideration
- Steel sector to remain saddled with excess capacity under moderate recovery scenario -- continued pressure to shut down capacity in Europe & other OECD markets

Iron Ore Supply & Demand

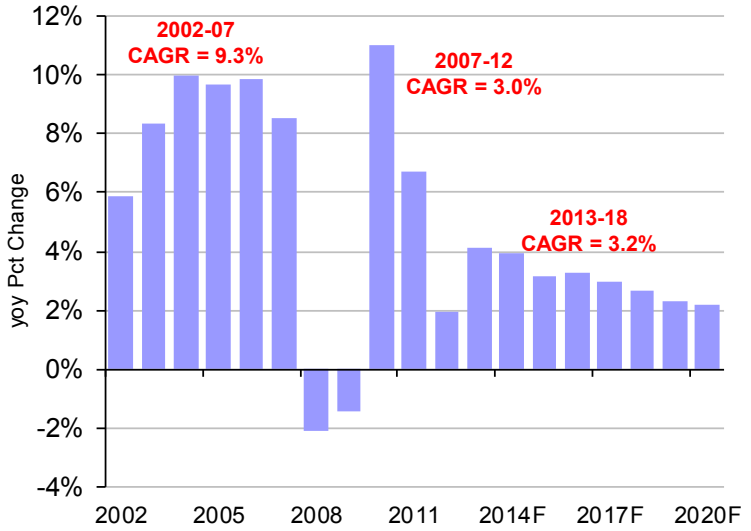
Continued growth in Chinese blast furnace production fuels further dominance in iron ore demand, but pace slowing

Global Iron Ore Demand, by Region



Sources: Makai Analysis

Global Iron Ore Demand, yoy Pct. Change

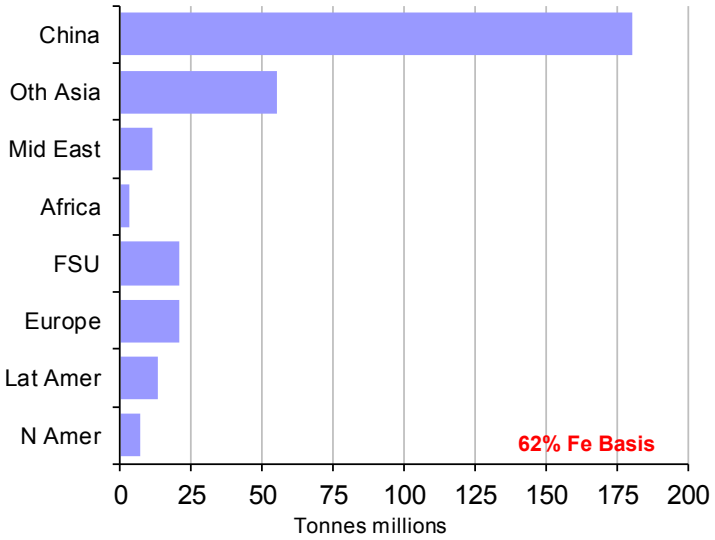


Sources: Makai Analysis

- Along with modest Direct Reduced Iron (DRI) production growth, blast furnace pig iron demand would drive a 274 mtpa rise in global iron ore demand (at 62% Fe content) during 2013-18
- Iron ore demand would reach 2 bn tonnes by 2017, as global steel output pushes past 1.8 bn tonnes
- Slower steel demand and production growth near 3% to keep iron ore demand at 3.4% during 2013-18
- With recovery in steel production in Europe and other non-Asia locations, China's share of global iron ore demand remains near current level of 58%

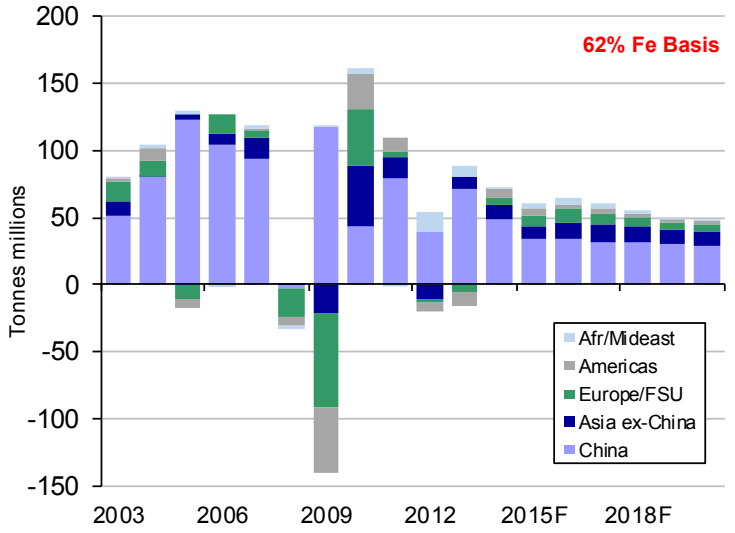
Iron ore demand remains an Asian affair, with the region representing 75% of global growth during next five years

Iron Ore Demand Growth 2013-18



Sources: Makai Analysis

Regional Iron Ore Demand, yoy Change

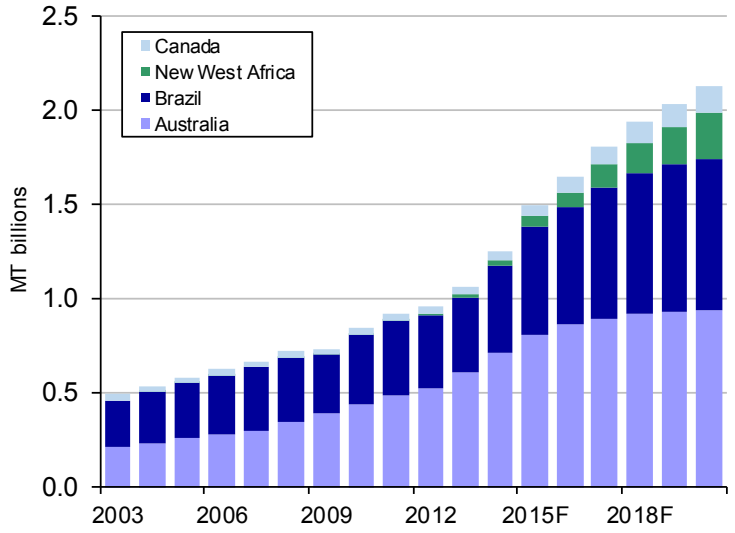


Sources: Makai Analysis

- China iron ore demand would rise by 156 mtpa during 2013-18, or 57% of global total, with fairly consistent average annual gains of 31 mtpa
- Other Asia would provide another 50 mtpa of demand over period, led by India and South Korea
- Demand growth of 67 mtpa outside of Asia led by regions with limited tonne-mile impact (Europe) or none (Russia, Brazil)

Despite moderate iron ore demand forecasts, iron ore miners planning massive production surge, pressuring price outlook

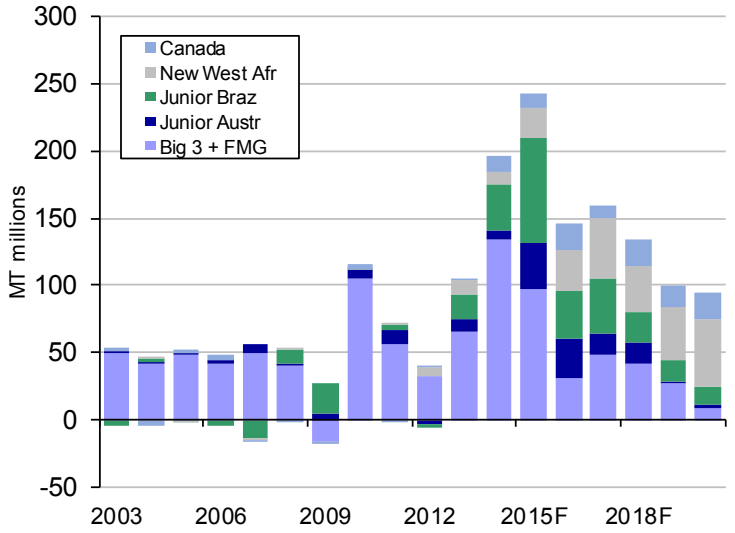
Regional Iron Ore Production Aspirations



New WAF = Guinea, Sierra Leone, Liberia

Source: Company Reports

Production Aspirations, yoy Change

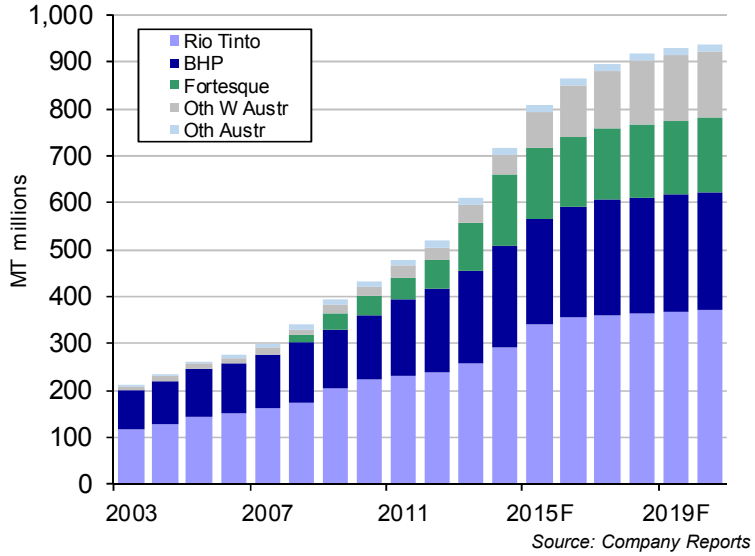


Source: Company Reports

- Planned mining projects in four key geographies would double output by 2020, if completed, and add almost 900 mtpa of new capacity by 2018
- Australian and Brazilian miners alone would contribute 650 mtpa by 2018, but output from Big Four miners (Rio, BHP, FMG, Vale) would represent only 53% of planned incremental output in two countries
- Aggressive production plans heavily reliant on junior miners in Australia & Brazil and new projects in Canada and West Africa, providing 60% of additional output from four geographies during 2013-18

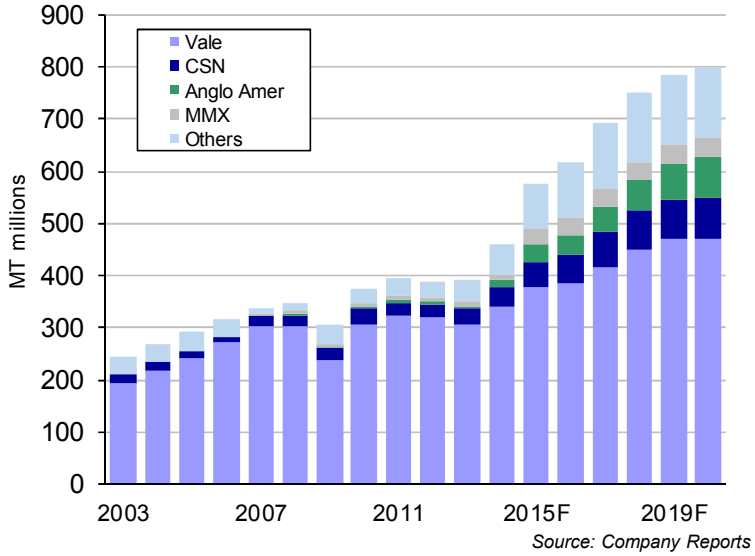
Junior miners would contribute significant portion of Australian and Brazilian production iron ore aspirations

Australia Iron Ore Production Aspirations



Source: Company Reports

Brazil Iron Ore Production Aspirations

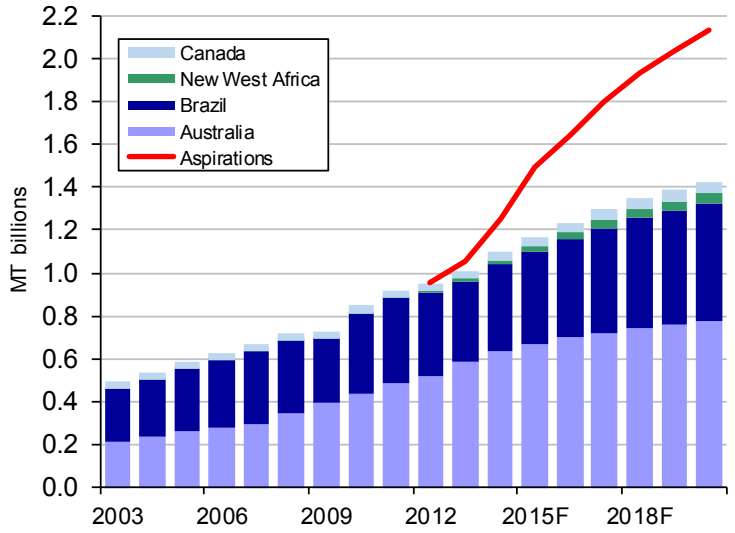


Source: Company Reports

- If junior miners actually met their ambitious plans, they would make up 40% of incremental Australia & Brazil volumes during 2013-18, but meanwhile…
- Rio Tinto's Pilbara expansion to 290 mtpa on track for end of 3q13 start (from 239 mtpa in 2012), with Port Lambert infrastructure in place; work starting on 340 mtpa in 4q14 and 360 mtpa in 1h15
- BHP Billiton's 35 mtpa Jimblebar mine expansion ahead of schedule for 4q13 start, towards 220 mtpa
- Fortesque finally reaching long-discussed 155 mtpa output on Firetail and Kings projects
- Vale's CLN 150 mtpa logistics project and its new Valemax berth should support additional Carajás volumes, with a large 2016-17 jump from the 90 mtpa Serra Sul S11D project

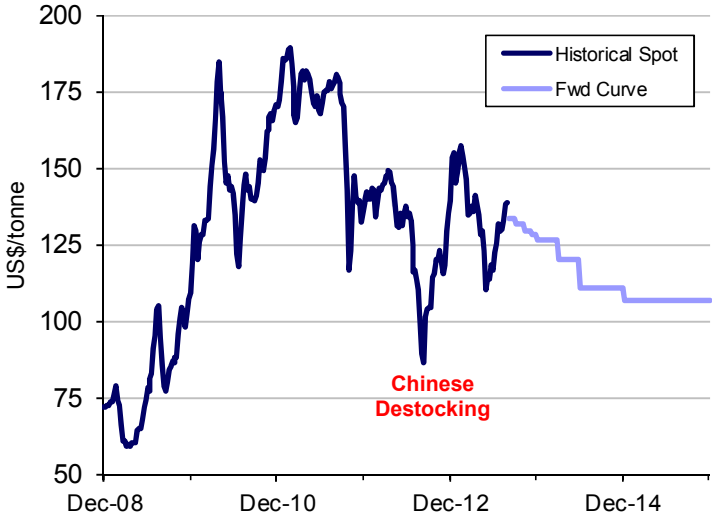
Reality bites -- limited demand and majors' supply push will ensure that majority of planned projects never reach potential

Regional Iron Ore Production Forecast



Source: Makai analysis

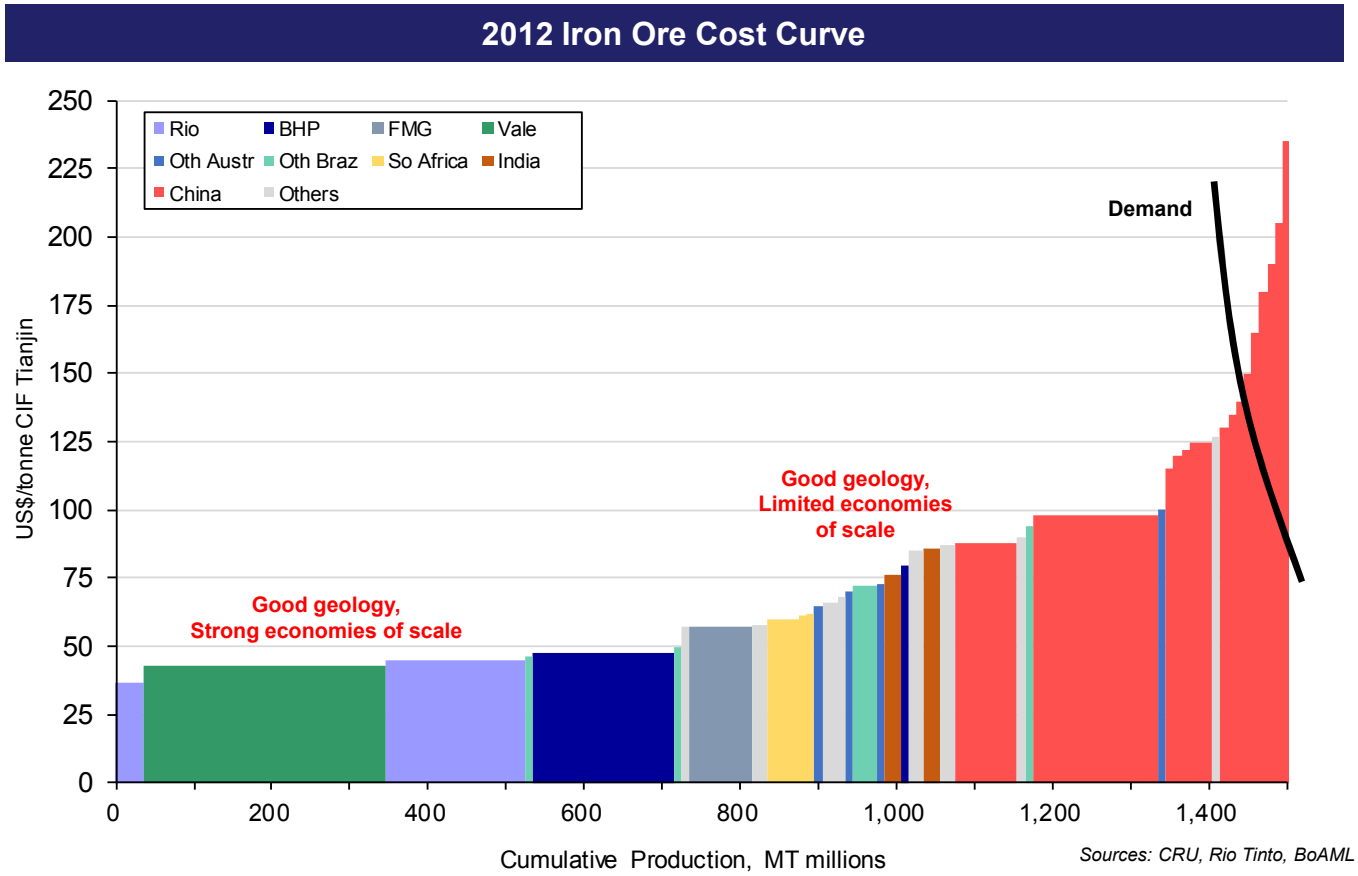
Iron Ore Prices, 62% Fe Tianjin CIF



Sources: Bloomberg, SSY

- Mid case demand forecast and relative mine economics suggest that miners will meet only 56% of volume aspirations in four geographies
- New mining projects unable to compete with majors' lower production costs, while junior miners unable to secure financing for projects, as investor enthusiasm cools
- Still, potential volumes and excess export capacity amongst majors will continue to pressure iron ore prices for several years
- Current Tianjin 62% Fe forward curve in backwardation, with Cal15 trading near $106/tonne

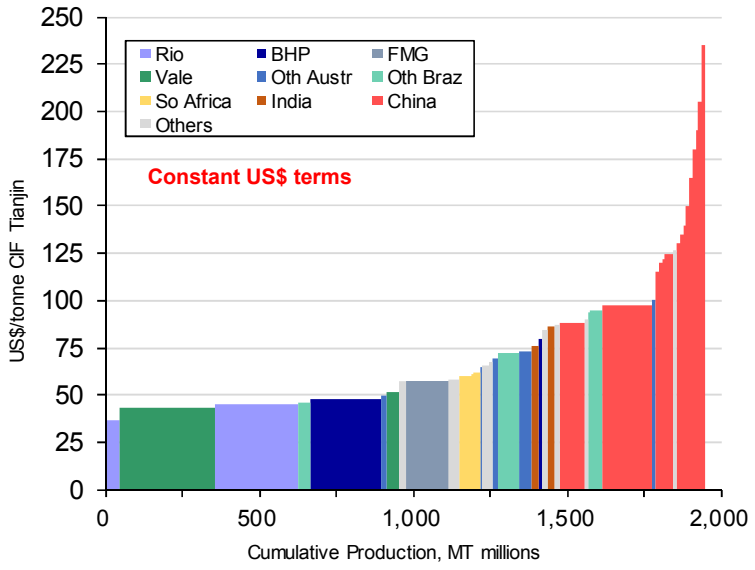
Majors dominate lower end of iron ore cost curve, while small Chinese miners exposed at higher-cost end of curve



- Seaborne iron ore trade of 1.14 billion tonnes, plus Chinese domestic production of 317 mtpa, provided average 2012 pricing around $128/tonne
- Expansion of majors' Pilbara output and Vale volume gains would push out iron ore cost curve, leaving higher-cost mines and new projects exposed

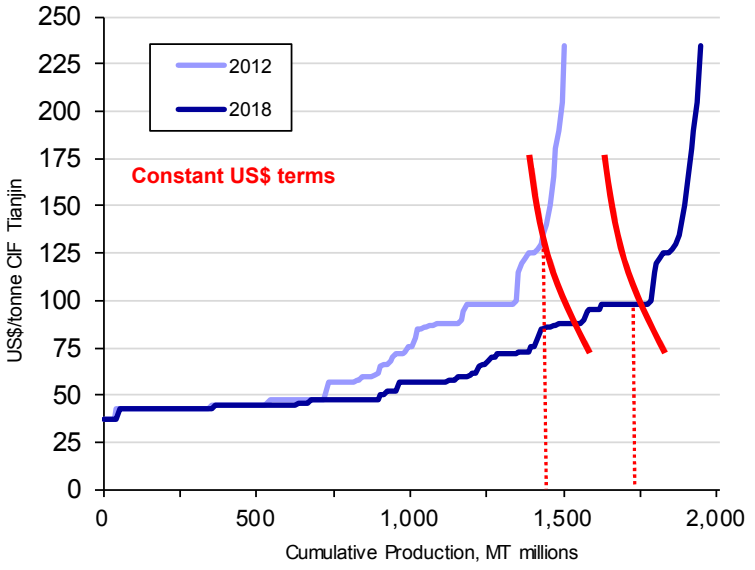
Opportunity to push out cost curve and remove Chinese output via import substitution offers strong hope for seaborne trade

Iron Ore Cost Curve 2018, 62% Fe Tianjin



Sources: CRU, Rio Tinto, BoAML, Company Reports

Iron Ore Cost Curves, 2018 vs 2012

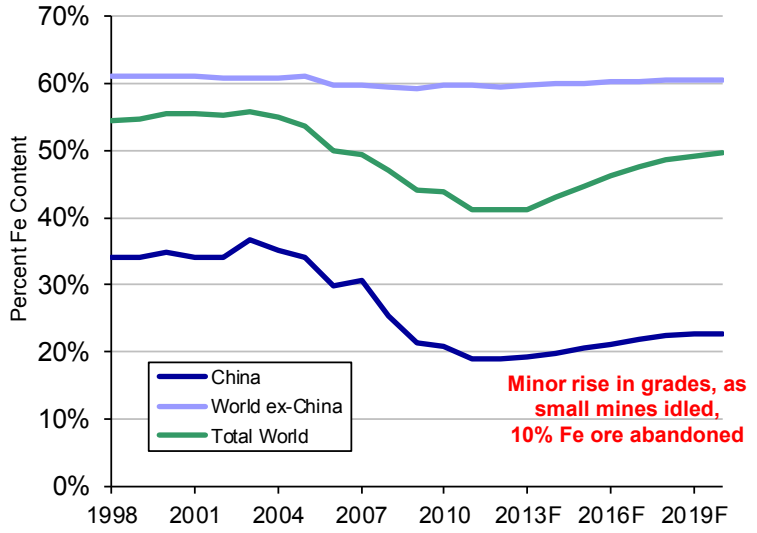


Sources: CRU, Rio Tinto, BoAML, Makai

- In a moderate demand environment, import substitution in China offers the only potential excitement for iron ore seaborne trade, as new, lower-cost production in Australia and Brazil displaces Chinese output
- Seaborne trade would jump by 340 mtpa during 2013-18, while Chinese domestic ore production would decline by 100 mtpa (62% Fe basis) during period
- Removal of high-cost Chinese ore places supply/demand equilibrium amongst Chinese medium-cost suppliers near $100/tonne, as reflected by forward curve
- Margins and cash flows still remain comfortable for Majors, while newer projects may struggle

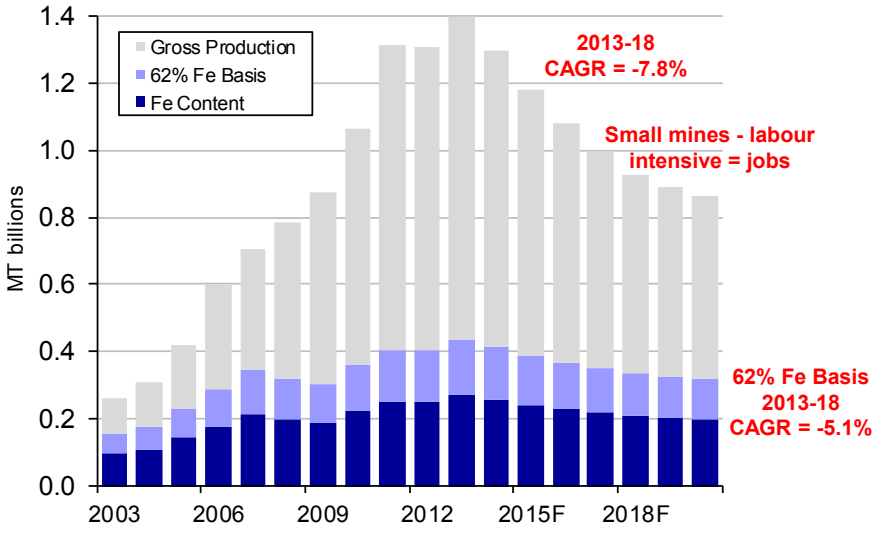
Lower Fe grades and smaller, uneconomic mine sizes have hampered Chinese domestic ore production

Regional Iron Ore Grades



Sources: USGS, BREE, Makai

Chinese Iron Ore Production

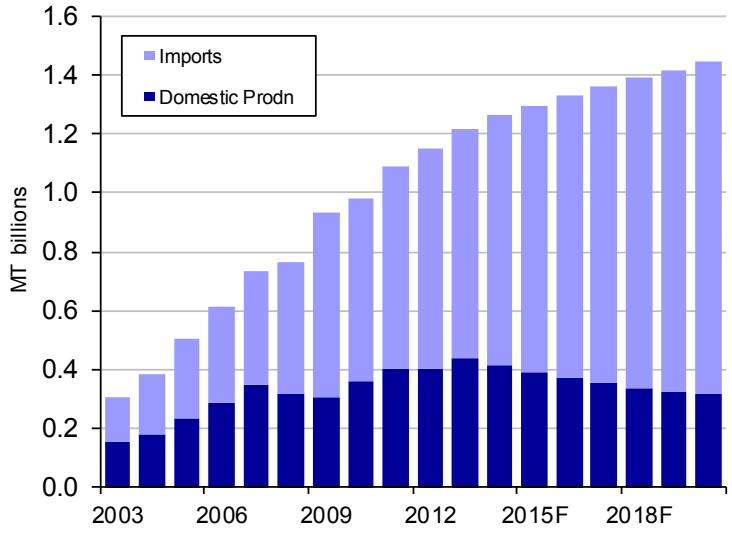


Sources: UNCTAD, China Statistics Bureau, Makai

- Average Fe grades for Chinese domestic iron ore production have plunged, as local miners have scrambled to find *any* ore in the ground to support rapid steel demand growth
- Chinese Statistics Bureau only reports iron ore production on gross basis, so analysts left to impute average Fe content from import figures and pig iron production
- Consensus suggests that average Chinese grades are below 20%, reflecting small Chinese mines that must sell output to central processors for beneficiation/upgrading
- Shift in cost curve suggests 100 mtpa decline in Chinese output (62% Fe basis) during 2013-18

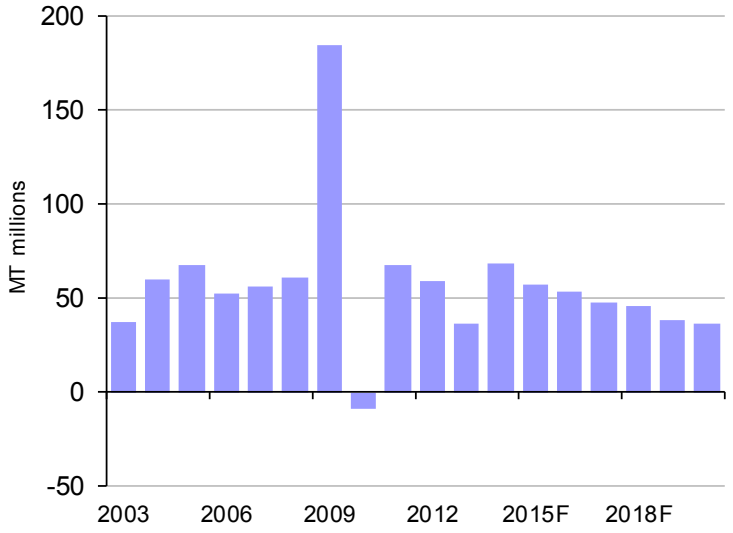
Declining Chinese iron ore production would prompt steady rise in imports, even under moderate demand growth

Chinese Iron Ore Balance, 62% Fe Basis



Source: Chinese Customs, Makai Analysis

Chinese Iron Ore Imports, yoy Change



Source: UNCTAD, Chinese Customs, Makai Analysis

- Moderate growth in Chinese steel production would provide opportunity for 6.8% average annual growth in iron ore imports during 2013-18
- Domestic iron ore demand growth of 160 mtpa and production declines of 100 mtpa during period would additional 260 mtpa of import demand growth
- Chinese import dependency (on Fe content basis) would rise from 65% in 2012 to 80% by 2018

Risks to iron ore outlook

- General macro outlook
- Shift in Chinese growth composition away from FAI and heavy steel consumption
- Higher EAF penetration
  - Shift to EAF with blast furnace shutdowns
  - Aging Soviet infrastructure in Russia/CIS provides rising scrap availability
  - Chinese move to EAF arrives earlier than expected mid-2020s due date
- Failure to shift iron ore cost curve due to slower additions to Australia & Brazil supply
- Limited import substitution effect
  - Reluctance of Chinese provincial governments to allow massive cuts in gross iron ore production and jobs
  - Improvement of Chinese mining cost structure under consolidation
  - Limited Chinese central government tolerance of high import dependency levels

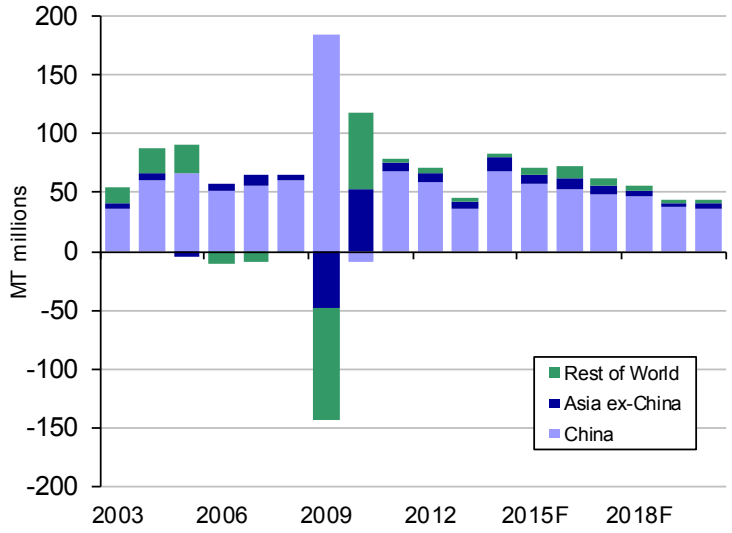
Conclusions -- Iron Ore Supply & Demand

- Tepid steel demand outlook prompting slower iron ore demand forecast…
- …yet miners developing massive supply surge over next 3-4 years, led by the Big 4, ensuring ore oversupply and lower prices for years
- Major miners argue that this is all part of deliberate strategy to weaken junior miners and to force import substitution away from high-cost Chinese domestic producers
  - More likely explanation is over-building on facile extrapolation of Chinese growth
- Still, looming supply glut *will have* precisely that effect, to balance supply & demand
  - New projects becoming uneconomic, while junior miners unable to secure financing
  - Majors' supply shifting iron ore cost curve, eliminating Chinese production
- Iron ore price and volume trends will depend upon Big 3 approach to revenue elasticity between higher ore prices vs. Chinese import substitution
- Chinese import substitution is *the only* excitement in the iron ore seaborne trade market but has a limited shelf life, while a finite amount of Chinese supply disappears

Iron Ore Trade

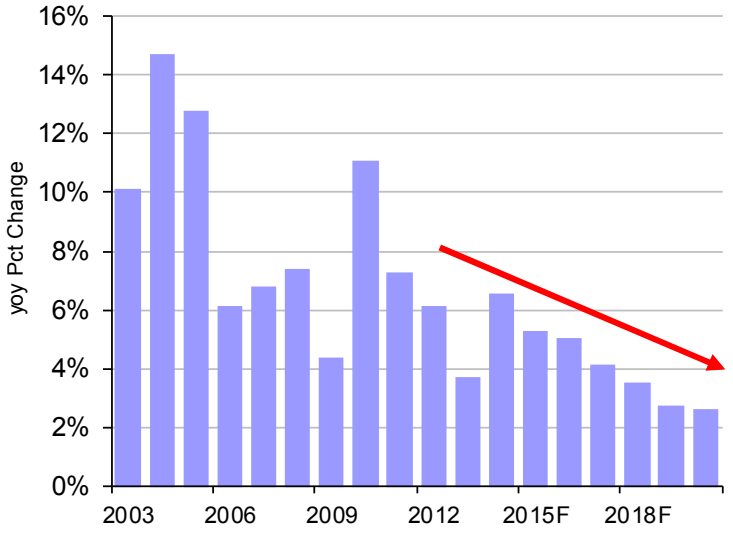
Chinese import substitution providing strong trade volume, but only real source of growth, as other steel markets remain tepid

Iron Ore Imports, by Region, yoy Chg



Sources: Various, Makai Analysis

Global Iron Ore Imports, yoy Pct Chg

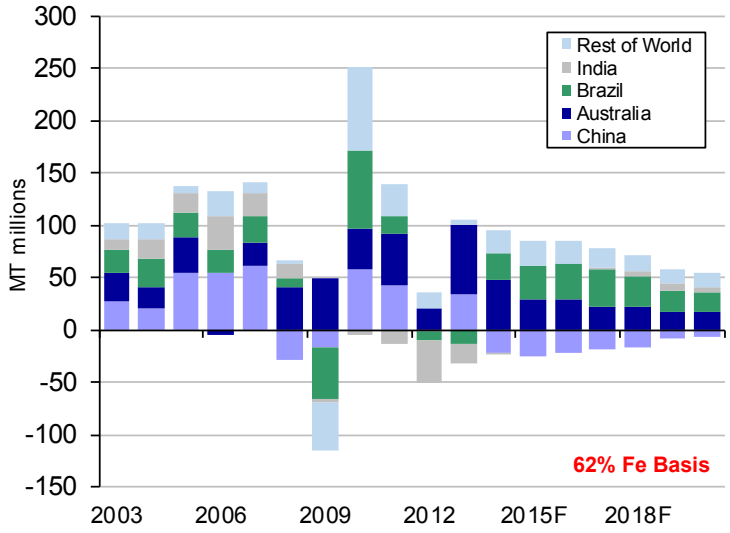


Sources: Various, Makai Analysis

- Although the 50 mtpa of annual Chinese import growth would support dry bulk tonnage demand, it would also represent almost 80% of all incremental demand during 2013-18
- Import demand outside of China showing few flourishes, aside from India's shift to net importer, as domestic ore production slides on government crackdown on illegal mining
- Without further demand impetus, growth in iron ore seaborne trade would slip to 4.8% average annual growth during 2013-18, following 6.8% growth in 2007-12 and 9.2% during 2002-07

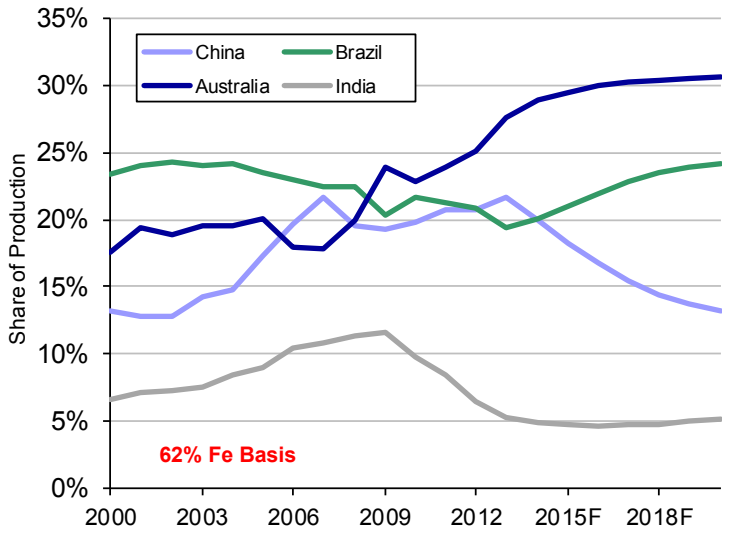
With Chinese ore production declining, Aussie and Brazilian miners to extend global shares of production

Regional Iron Ore Production, yoy Change



Sources: UNCTAD, Makai Analysis

Share of Global Iron Ore Production

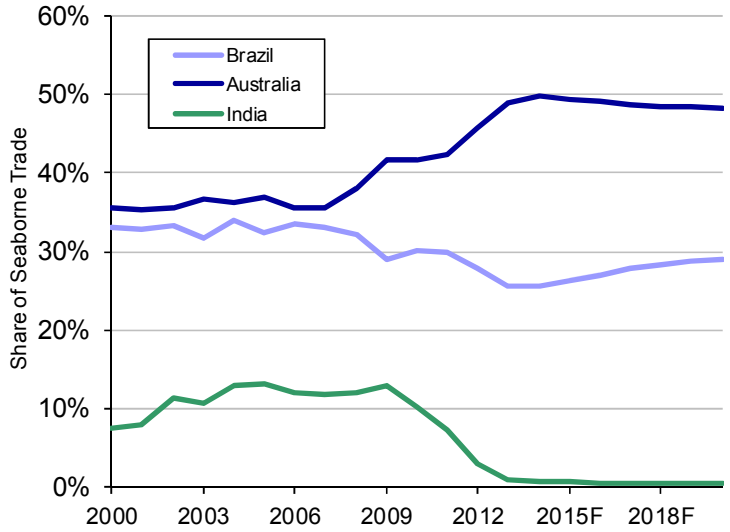


Sources: UNCTAD, Makai Analysis

- Australian miners have been primary beneficiaries from Indian export bans and production declines since 2009 peak, as well as stable global share of Chinese miners during 2008-13
- Flat Brazilian output from government environmental permit delays allowed global share losses
- Rash of new Australian projects starting up during 2013-14 allowing further share gains, until key Vale and other Brazilian projects come on line in 2015-17

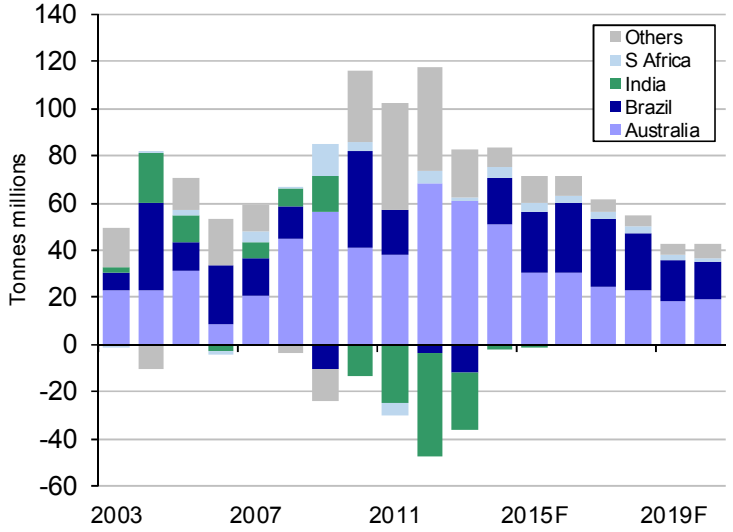
Looming iron ore oversupply to spark market share fight amongst miners for Chinese imports

Share of Global Seaborne Iron Ore Trade



Sources: Various, Makai Analysis

Seaborne Iron Ore Exports, yoy Change

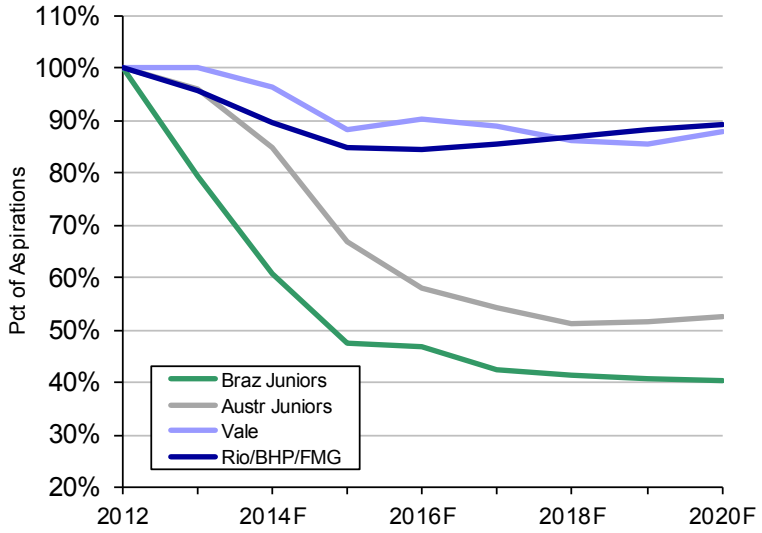


Sources: UNCTAD, Makai Analysis

- Effective removal of India from iron ore export market has allowed other producers to gain share in otherwise unremarkable 3-4% growth market during 2011-12
- With Vale production declining in 2013 and junior mining projects under pressure, Brazil unable to participate in this year's jump in iron ore import demand from strong Chinese steel production
- Brazilian delays allowed strong surge in Australian market share during 2012-13, with new projects providing further share gains until 2015, when key Vale and other Brazilian projects come on line

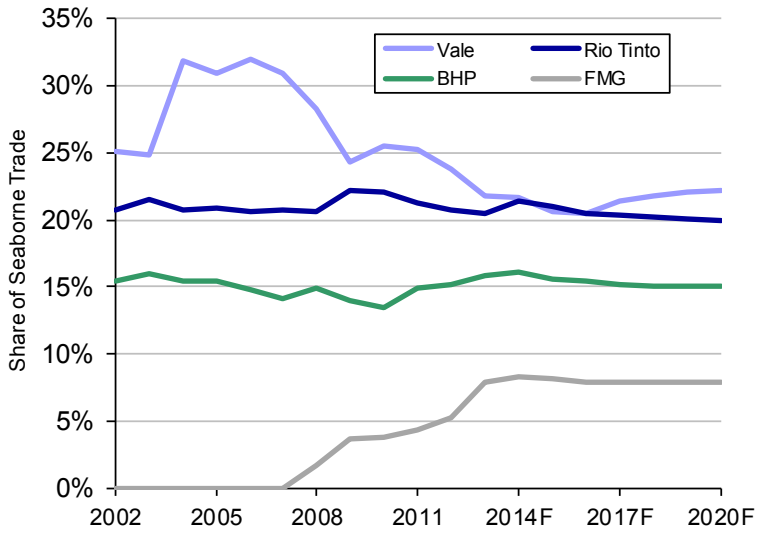
Junior miners in Brazil & Australia look to be losers in market share tussle, reaching only half of their output aspirations

Ore Production as Percent of Aspirations



Sources: Company Reports, Makai Analysis

Share of Global Seaborne Iron Ore Trade

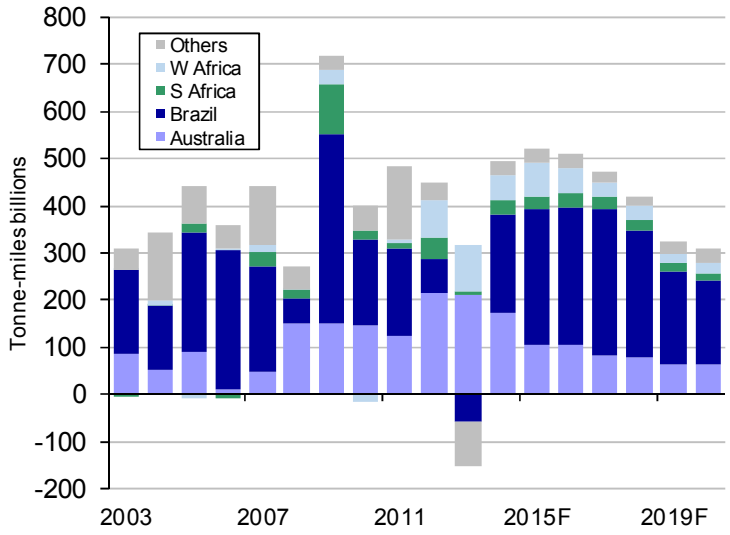


Sources: Company Reports, Makai Analysis

- Facing marginal economics and difficulties securing financing, junior miners unlikely to come close to reaching their production aspirations
- Majors' superior economies of scale and control of key transport infrastructure place them in the lower end of cost curve, allowing them to maintain share in growing market
- Vale able to regain market share lost since 2011 on future Carajás production, with higher-quality ore
- Majors' likely success in market share fight to keep ore prices low and volatility muted, as market remains in more elastic part of the supply curve

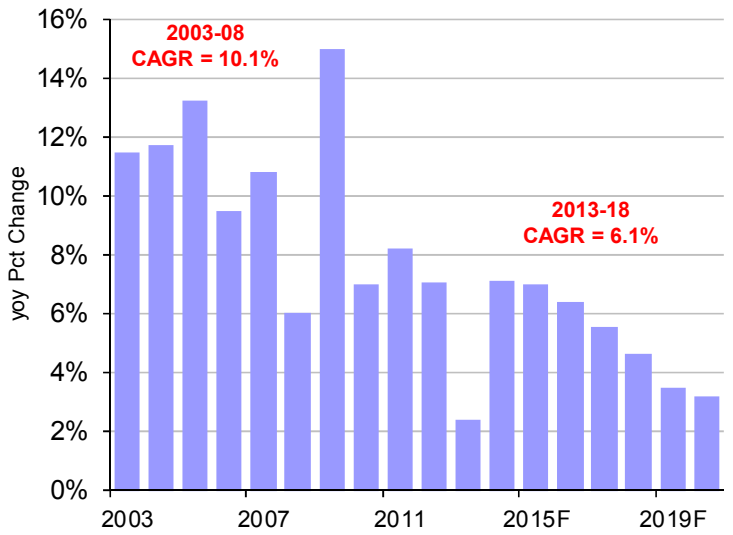
With return of Brazilian export volumes, tonne-mile demand set to surge significantly in 2014

IO Tonne-mile Demand Changes, by Exporter



Source: Makai Analysis

Iron Ore Tonne-mile Demand, yoy Pct Change

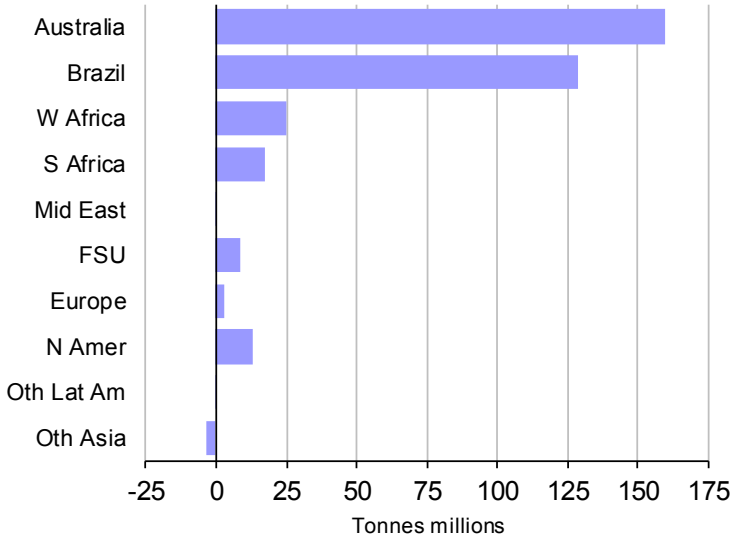


Source: Makai Analysis

- Reversal in Brazilian export performance in 2014, from a recovery in ore production, would provide substantial surge in tonne-mile demand
- Rising Chinese import substitution in 2014 allows a continuation of Australian 2013 export gains, contributing a similar level of tonne-miles
- Movement of new West African supply to China also providing a material boost to demand, and has offset the 2013 Brazilian losses
- Tonne-mile demand growth would average 6.1% over 2013-18, but slowing during period on stabilising China import substitution

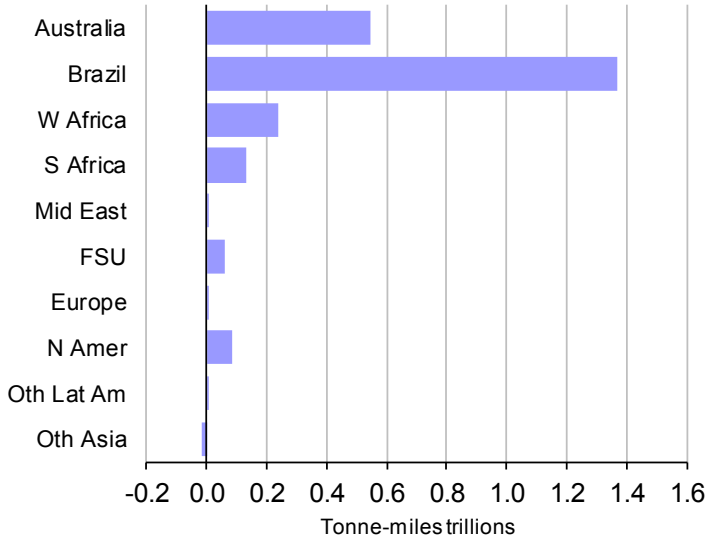
Although gains in Australia exports likely to outpace Brazil, tonne-mile impact of Brazil output to overwhelm

IO Seaborne Trade Growth 2013-18, by Exporter



Source: Makai Analysis

IO Tonne-mile Growth, 2013-18, by Exporter

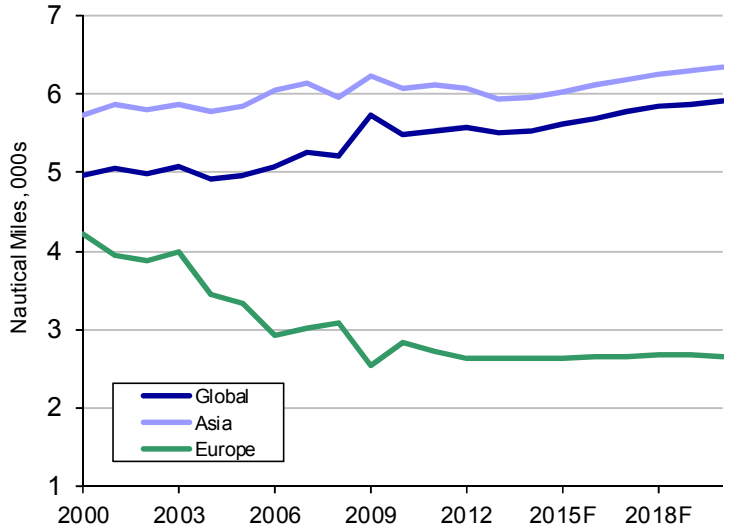


Source: Makai Analysis

- Following 85 mtpa jump in Australian exports during 2014-15, miners there would register a 159 mtpa rise during 2013-18, or 47% of incremental global seaborne trade
- Although Brazil would capture only 38% of incremental global trade volume, it would represent 57% of 2.4 trillion tonne-mile rise in demand during 2013-18, while Australia takes only 22%
- South Africa and emerging West African producers would provide an additional 15% of demand
- Tonne-mile impact of Canadian ore exports would be limited, given European share, but China would take 30% of output gains

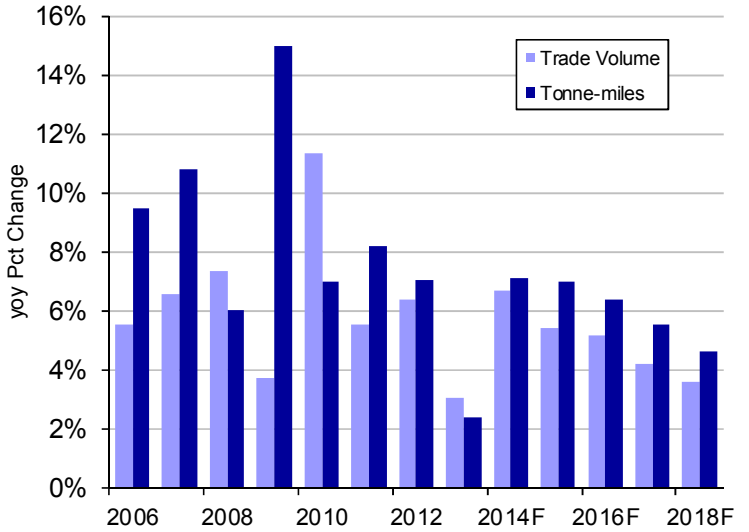
With lengthening voyage distances from Brazilian exports, tonne-mile demand would grow faster than trade volume

Iron Ore Avg Voyage Distance, by Importers



Source: Makai Analysis

IO Trade Volume vs Tonne-mile Growth

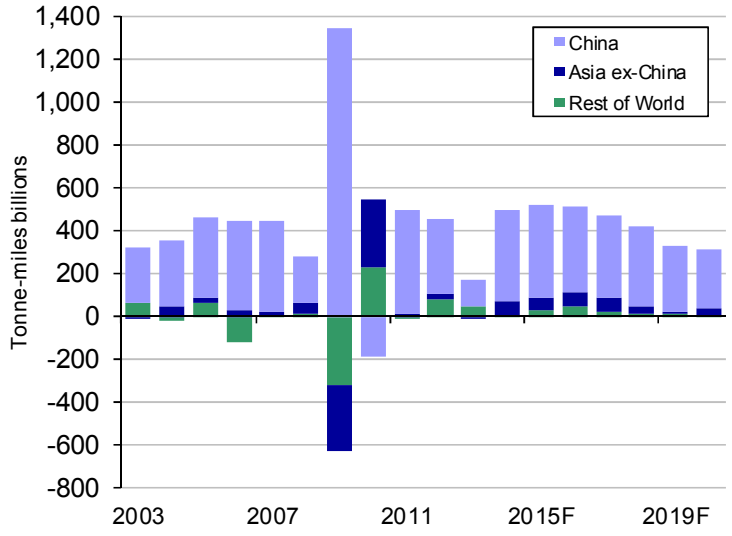


Source: Makai Analysis

- Rising Brazilian exports to Asia would boost average voyage distances for Asian imports by an average of 1.1% during 2013-18, while sending the global average 1.2% higher per annum
- With a 5.0% annual rise in global seaborne trade during the period, tonne-mile demand growth would average 6.1%
- European voyage distances to remain stable on Canadian and West African supply

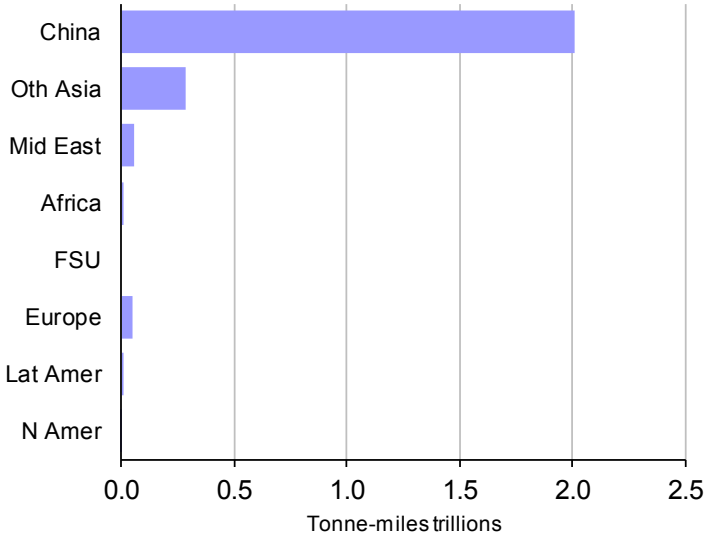
China would also dominate tonne-mile demand, providing 83% of incremental global demand during 2013-18

IO Tonne-mile Demand, by Importer, yoy Chg



Source: Makai Analysis

IO Tonne-mile Growth, 2013-18, by Importer

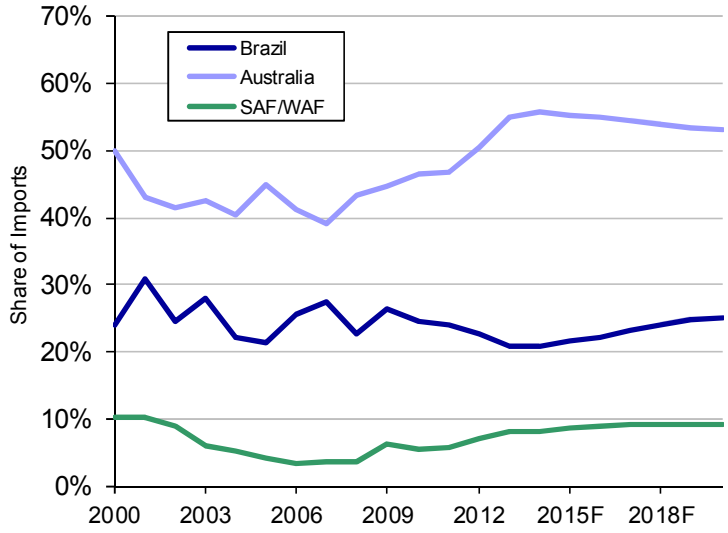


Source: Makai Analysis

- China imports would represent 2.02 trillion tonne-miles of the 2.42 trillion rise in global demand during the next five years
- Other Asia would provide another 12% of demand, led by South Korea
- The rest of the world would represent only 5% of incremental demand during 2013-18, with Brazilian volumes into the Mid East and a later recovery in European steel demand

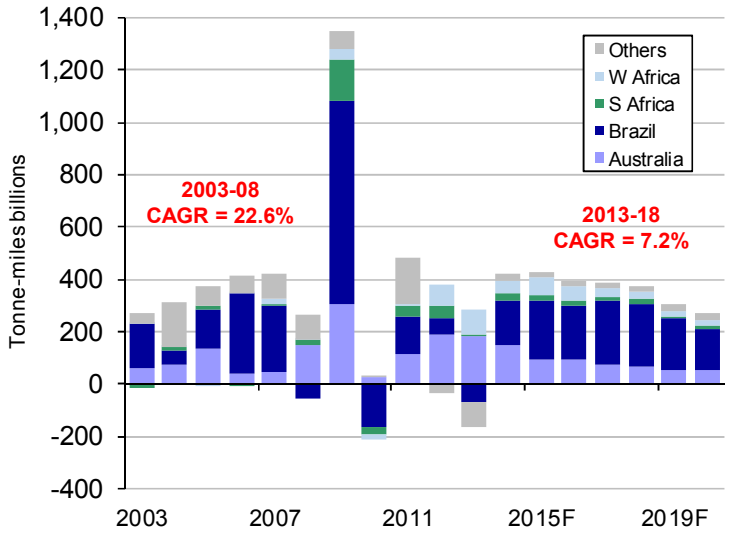
Recovering Brazilian share of Chinese iron ore imports would support steady gains in its tonne-mile demand

Share of Chinese Seaborne Imports



Source: Makai Analysis

Chinese Tonne-mile Demand, yoy Change



Source: Makai Analysis

- Recovery in Brazilian ore production and export would allow rebound in its Chinese market share, boosting tonne-mile demand
- Brazil would represent 54% of incremental Chinese tonne-mile demand during 2013-18, with Australian miners providing another 24%
- African producers would add another 17% of Chinese demand, as their market share approaches 10%

Conclusions -- Iron Ore Trade

- Amid modest steel demand growth, Chinese import substitution only source of excitement in seaborne iron ore market
- China continues to dominate all of the iron ore statistics -- with 58% of incremental ore demand, 80% of seaborne trade and 83% of tonne-miles during 2013-18
- After two years of declining production and exports, Brazil poised to regain market share and to become key driver of tonne-mile demand for dry bulk market
- Junior miners in Brazil and Australia to be likely losers in scramble for Chinese market share, reaching only 50% of production aspirations, while Big 3 maintain dominance
- Global iron ore tonne-mile demand growth would average 6.1% during 2013-18, with a large 7.4% jump in 2014, just as VLOC/Capesize fleet growth slows to under 5%
- Improving supply/demand balance would allow improving fleet utilisations and freight rates, but higher supply of VLOCs may limit participation of normal Capes in Brazil trade

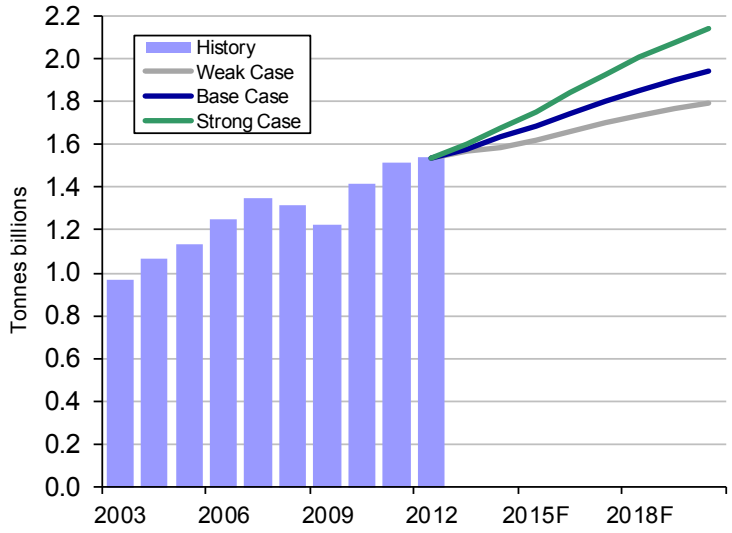
Scenario Analysis

Scenario analysis

- Scenario analysis includes major upside & downside risks to the iron ore outlook
  - General macro conditions
  - EAF penetration
  - Chinese import substitution
- **Methodology** -- utilises Makai global iron ore model, which balances Fe content for steel production, iron ore output and trade across 103 countries
  - Trade flows provide tonne-mile demand for vessel sector models, to determine fleet utilisations, spot & period earnings and asset prices
- **Macro scenarios:**
  - *Weak Case* -- continued recession in Europe, slower China & emerging market steel demand in 2014, with 2% global growth over period
  - *Base Case* -- moderate global steel demand growth of 3%, but notable slowing in Chinese production
  - *Strong Case* -- another Chinese head fake, with its steel output hitting 1 bn tonnes by 2019, with 4.6% average global growth

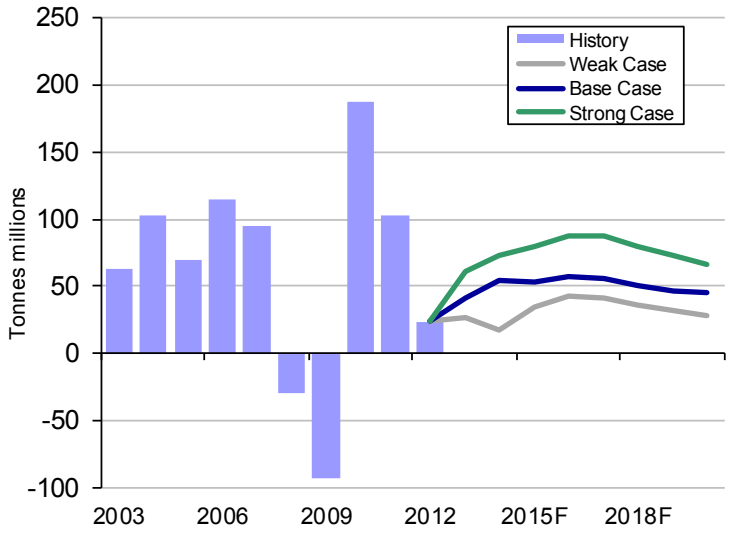
Steel demand scenarios centre around 3% base case growth, but all represent decelerating production growth

Global Steel Production, by Scenario



Source: Makai Analysis

Global Steel Production, yoy Change

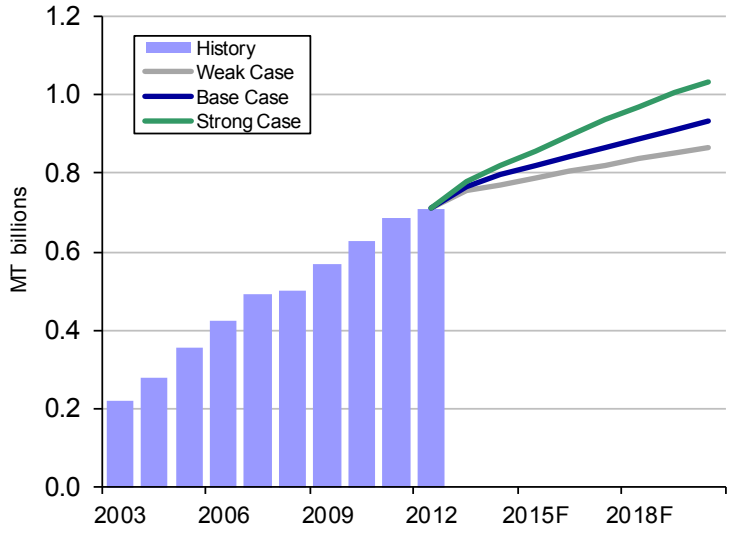


Source: Makai Analysis

- Base Case follows current market consensus for 3% global steel demand growth, based upon expectations for slower Chinese GDP growth and declining steel intensity
- The 4.6% average steel demand growth in the Strong Case would reflect a more robust recovery in OECD and developing markets outside of China, while suggesting a 1.4 billion tonne China peak
- The Weak Case provides 2.1% global steel demand growth, with only minute growth in 2013-14, from continued Europe recession and Chinese government rationalisation of steel capacity

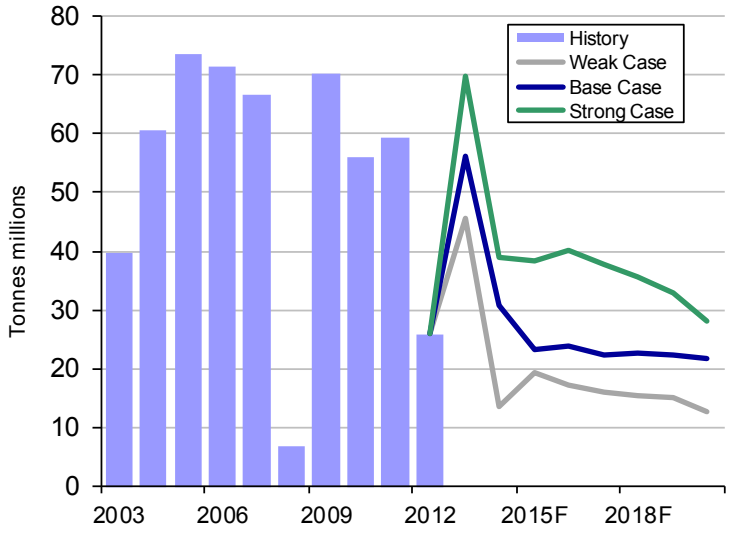
Chinese steel production growth likely to slow, following rebound in output during 2013

China Steel Production, by Scenario



Source: Makai Analysis

China Steel Production, yoy Change

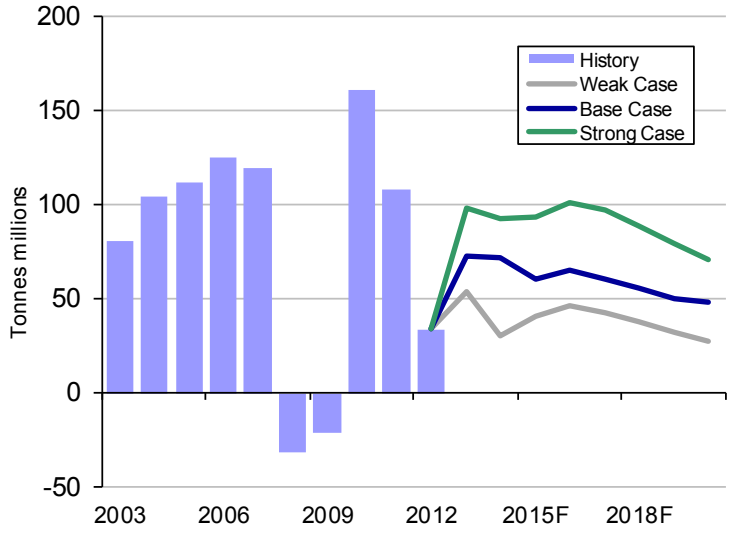


Source: Makai Analysis

- Following 17.8% average growth during 2003-08, and expected 9.0% gains in 2008-13, even the rapid growth case for Chinese steel production, at 4.5%, would represent significant slowing
- Still, this trajectory would place Chinese production above 1 billion tonnes by 2019, on course for 1.4 billion tonne peak seen by more bullish forecasters
- For 2013, strong case includes 780 mtpa forecast from China's NDRC and favoured by mining CEOs
- Weak case represents significant deceleration, but assumes that China does not respond with another massive infrastructure investment programme

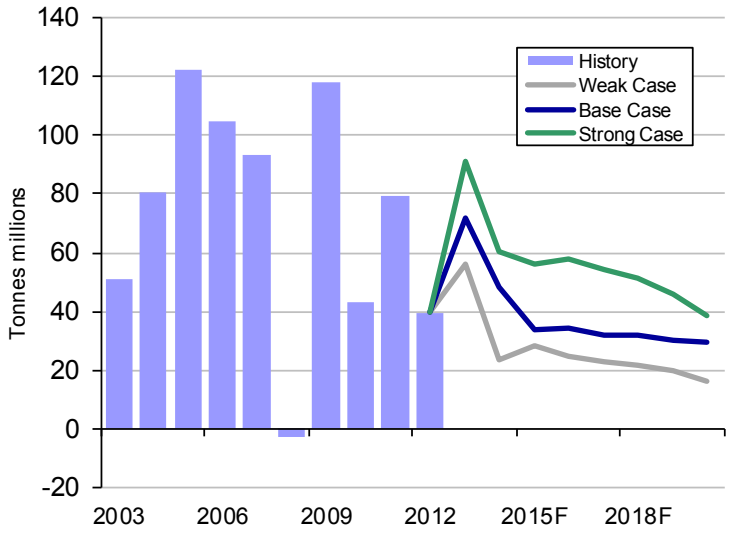
Rebound in China steel production leading global demand in 2013, but plays lesser role, as others recover

Global Iron Ore Demand, yoy Change



Source: Makai Analysis

China Iron Ore Demand, yoy Change

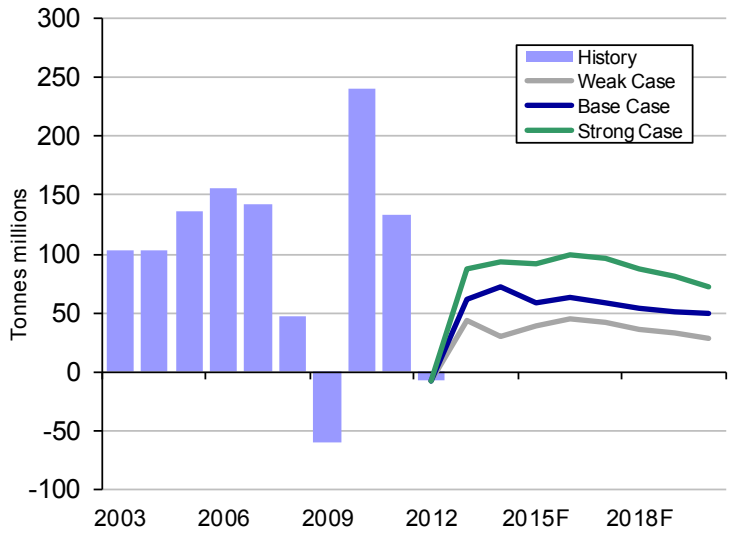


Source: Makai Analysis

- Despite minor gains in EAF penetration, global iron demand follows similar percentage growth patterns as steel production
- Strong Case sees similar 100 mtpa annual gains in ore demand to 2004-07, but based less upon Chinese steel growth and more from rebound in weak OECD economies and other developing markets

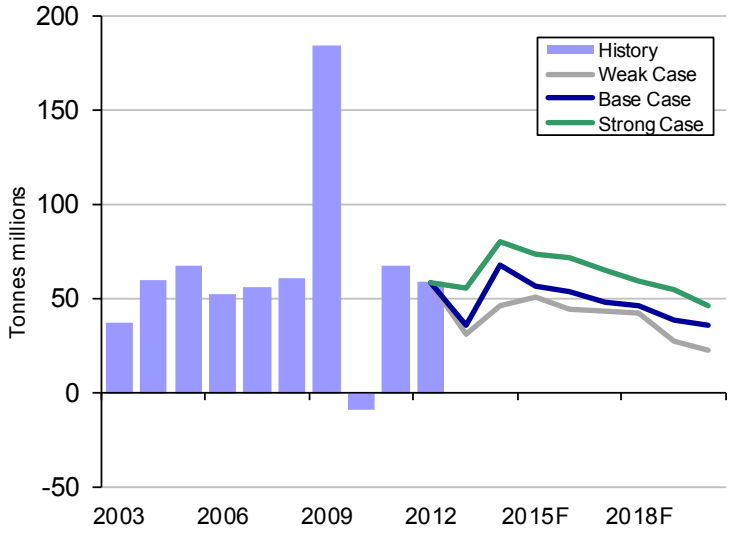
Global iron ore output gains mirror demand growth, but Brazil and Australia lead Chinese import substitution

Global Iron Ore Production, yoy Change



Source: Makai Analysis

Chinese Iron Ore Imports, yoy Change

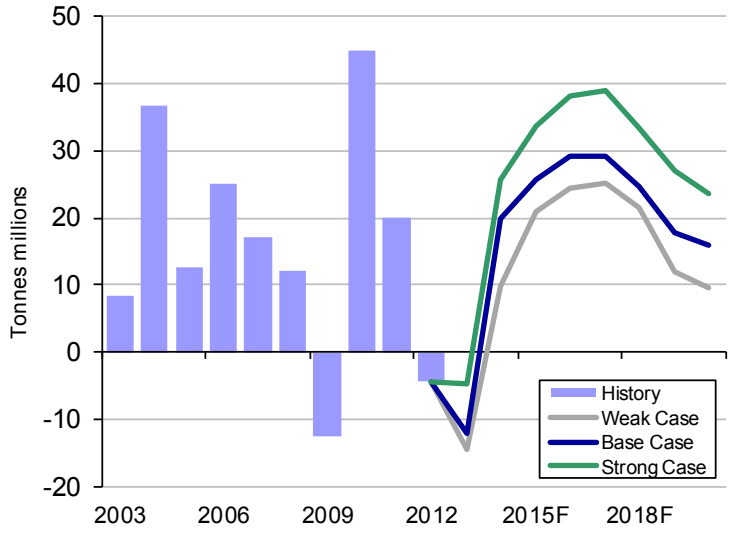


Source: Makai Analysis

- Various iron ore production cases meet ore demand requirements
- Chinese iron import cases slow less variation, as weaker global demand environment would weaken ore prices and force domestic production cuts, providing higher import substitution
- Similarly, stronger demand cases would support ore prices and allow higher Chinese ore production, limiting import substitution and imports

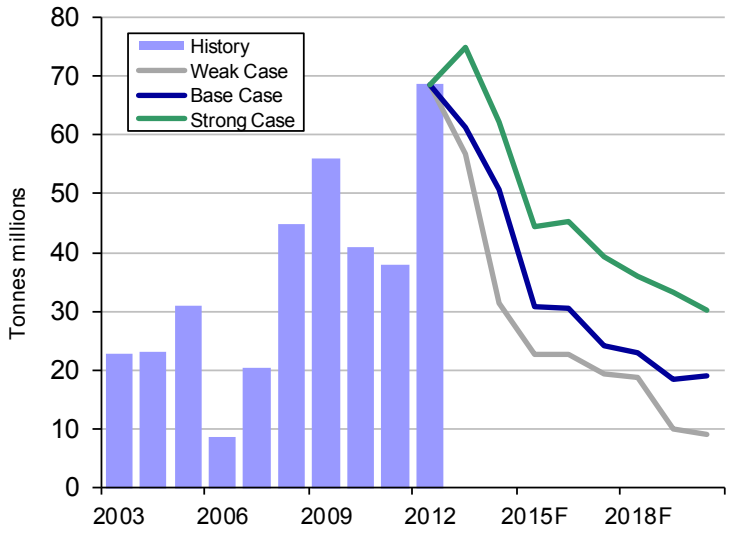
Australian output gains provide early export boost, but Brazil returns to seaborne market in 2015

Brazil Seaborne Exports, yoy Change



Source: Makai Analysis

Australia Exports, yoy Change

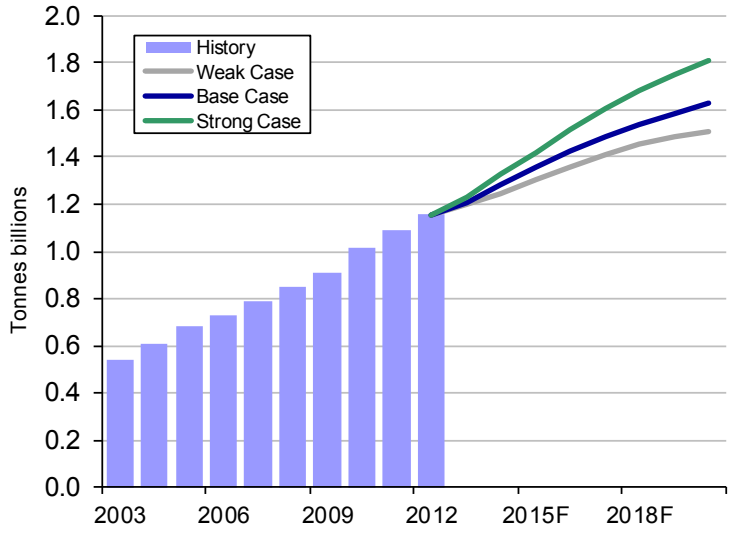


Source: Makai Analysis

- Capacity increases from Rio Tinto and Fortesque would continue recent export gains, before slowing, as rising Brazilian output allows share gains
- Strong Case with high Chinese steel production would allow acceleration in Aussie gains in 2013, but ultimately, supply meets demand
- Brazilian seaborne exports would slow startling gains during 2015-18, but weaker cases would limit participation in 2013, with higher export declines

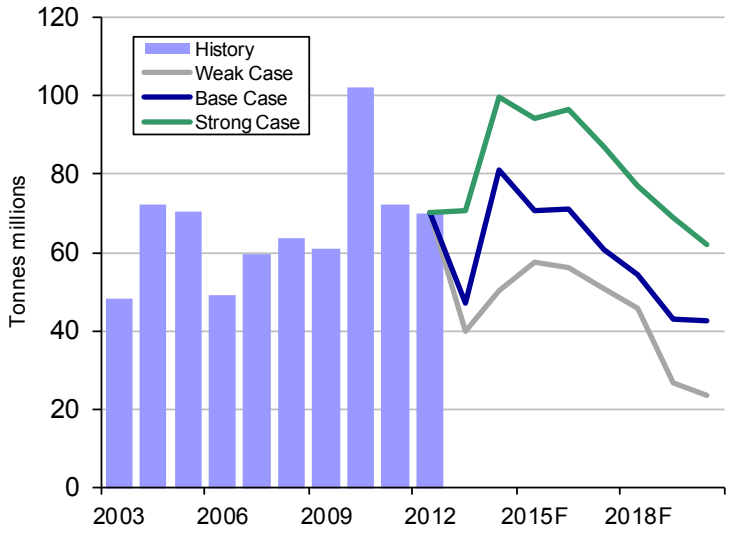
Iron ore seaborne trades grows more rapidly than underlying steel demand, with potential for record gains

Global IO Seaborne Trade, by Scenario



Source: Makai Analysis

Global IO Seaborne Trade, yoy Change

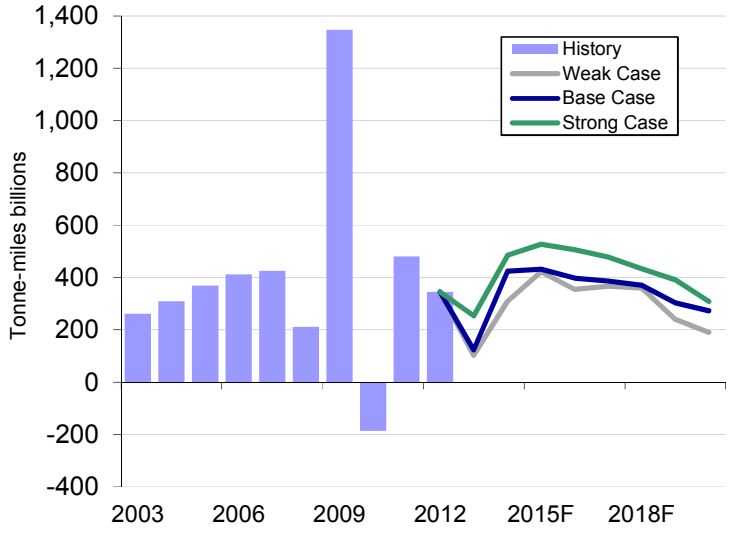


Source: Makai Analysis

- Steel demand base case of 3.2% provides 5.1% average growth in iron ore seaborne trade
- Seaborne iron ore trade could jump near-record 100 mtpa in 2014 under strong case, with rising Chinese import substitution, and show 6.5% average growth
- Weak Case would provide 4.0% average seaborne trade growth, only half of the 2007-12 pace

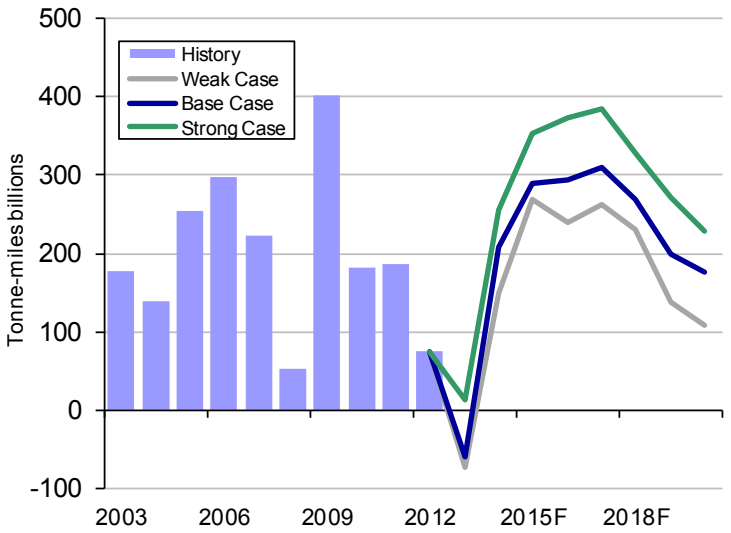
Chinese import tonne-mile demand growth remains steady, but Brazilian tonnage demand surges dramatically

China IO Tonne-mile Demand, yoy Chg



Source: Makai Analysis

Brazil IO Tonne-mile Demand, yoy Chg

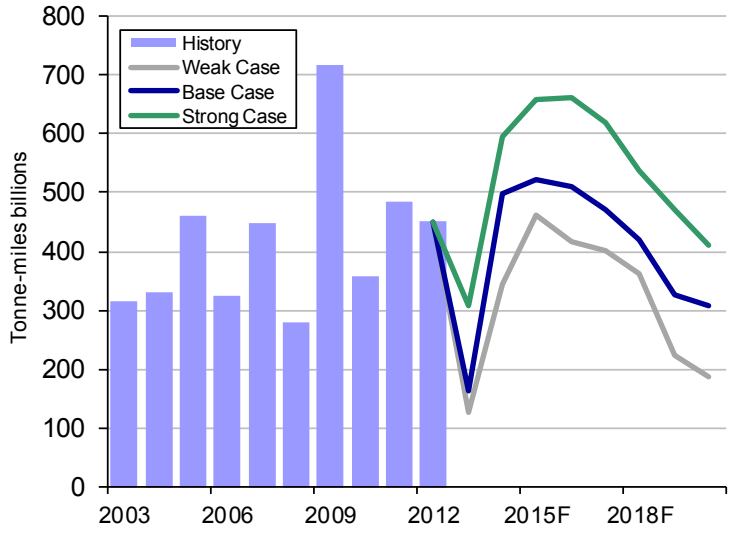


Source: Makai Analysis

- With Chinese iron ore import cases constrained by shifts in domestic ore production and import substitution, gains in Chinese tonne-mile demand remain relative steady, near 400 billion tonne-miles
- Tonne-mile demand from Brazilian exports, however, would show significant variation, as higher-demand cases allow greater export market share participation
- Most cases provide for a decline in Brazilian tonne-miles for 2013, from 10 mtpa drop in exports, which has cut into global tonnage demand

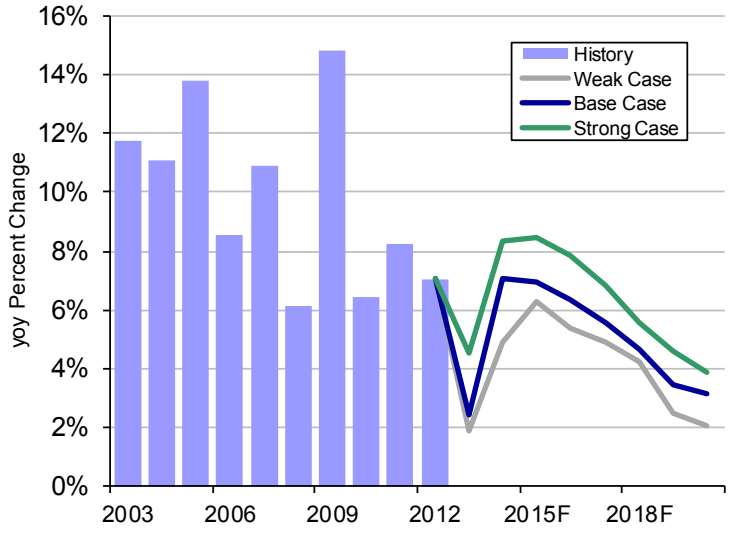
Global iron ore tonne-mile demand poised to jump in 2014-15, just as Capesize/VLOC fleet growth slows

Global IO Tonne-mile Demand, by Scenario



Source: Makai Analysis

Global IO Tonne-mile Demand, yoy Change



Source: Makai Analysis

- Brazilian output and export declines prompting global tonne-mile slowdown in 2013, but share gains would boost demand in 2015-18
- Base Case sees 7.1% tonnage demand gains in 2014-15, while Strong Case would provide 8.4%
- Jump in demand would occur as combined Cape/VLOC fleet growth slides below 5% during 2013 and potentially fading to 1-3% during 2014-15
- Combined with moderate growth in steam & coking coal seaborne trade, could provide stronger-than-expected rebound in Cape utilisations and earnings

Summary

- Iron ore market poised to provide stronger tonne-mile demand growth, just as fleet supply slows, but heavily reliant upon Chinese ore import substitution
- Otherwise, demand outlook remains unexciting, as current market consensus grapples with evolution of Chinese economy and continued European recession…
- …yet miners developing massive supply surge over next 3-4 years, potentially ensuring iron ore oversupply and lower prices for years
- New supply would shift iron ore cost curve and eliminate high-cost Chinese production, allowing greater import substitution and majors' market share gains
- After two years of declining production and exports, Brazil poised to regain market share and to become key driver of tonne-mile demand for dry bulk market
- Still, Chinese import substitution has limited shelf life, as prices and domestic ore production stabilise…
- …while Chinese steel production and blast furnace output set to plateau by mid-2020s

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