Analytical techniques for modelling ship demand

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IMSF CONFERENCE
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The real world

- NEW MIGHTY - 179,851 dwt Cape built 2011

- Arrived Port Hedland on 17 October 2012 at 1850
- Berthed at Nelson Point A on 28 October 2012 at 2350
- Loaded 172,369 mt of iron ore
- Sailed on 1 November 2012 at 1130
- Discharged cargo at Kashima and Kokura in Japan
- Next Loaded Port Hedland arriving 4 December 2012 at 0720
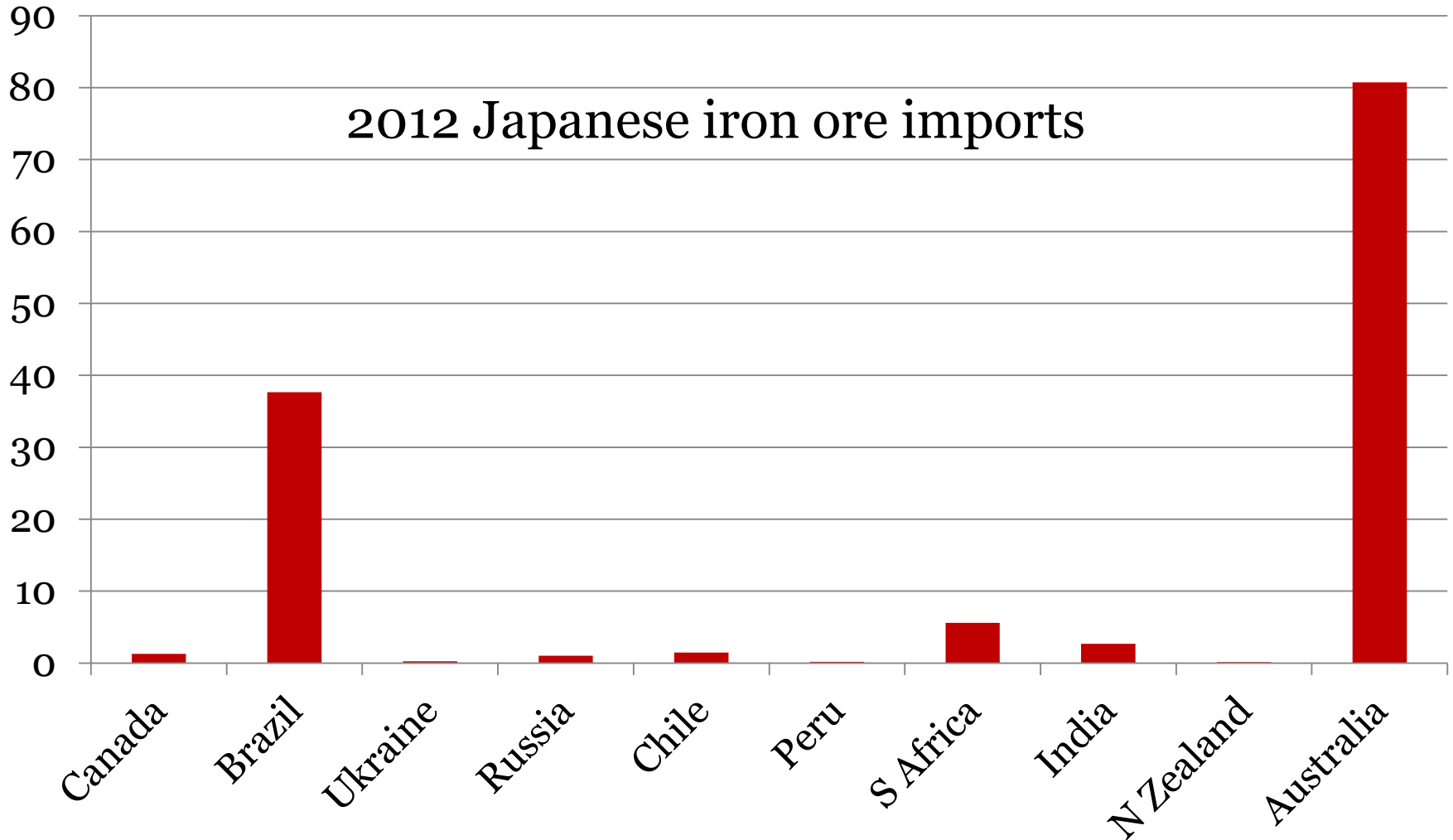- Voyage time of 48 days

Commodity balances – reality check

- ## Understanding and maintaining the relationship between:

- PRODUCTION
- IMPORTS
- EXPORTS
- STOCK CHANGE
- CONSUMPTION

- Consumption = Production + Imports – Exports – Stock Change

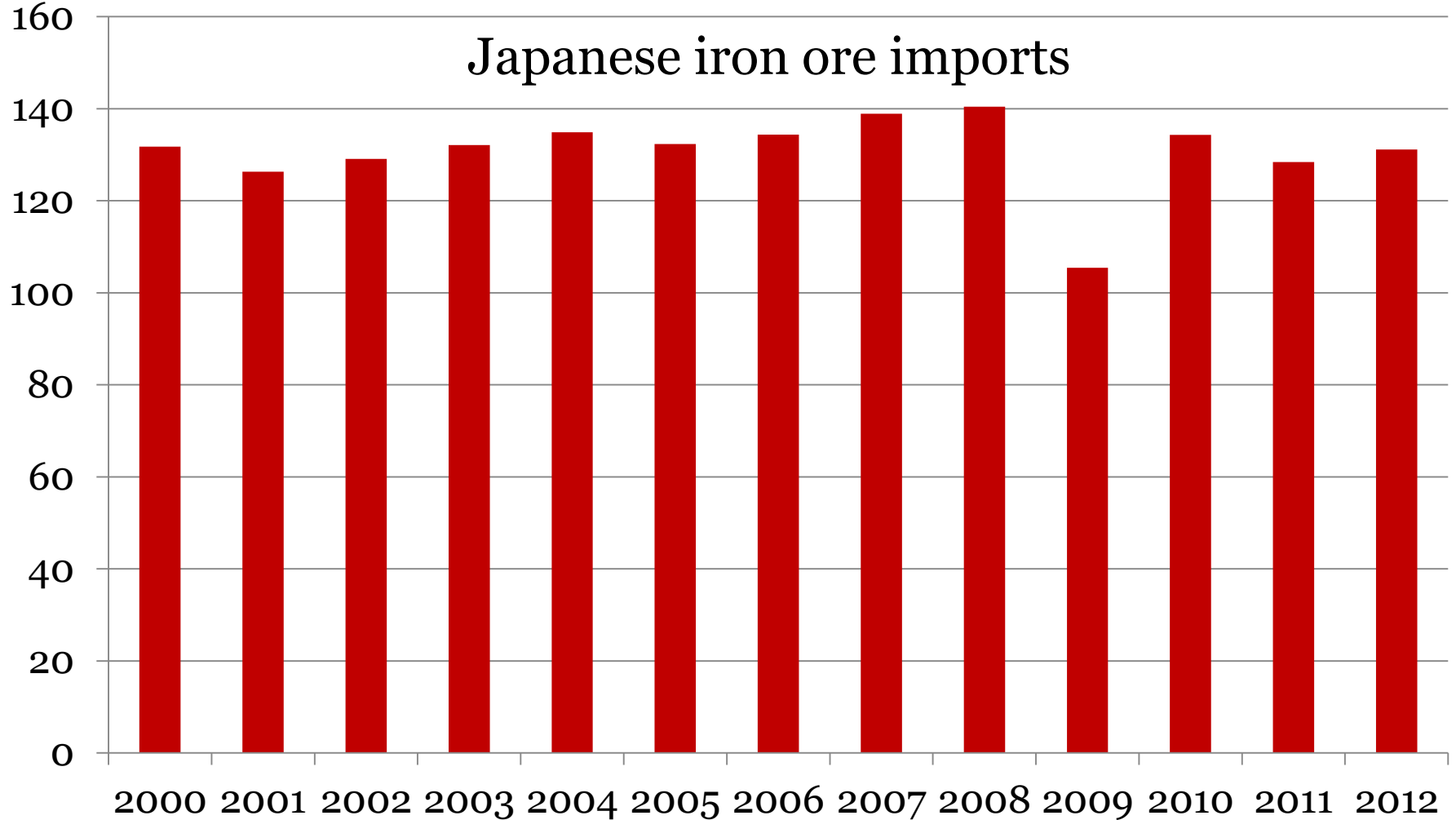# The pattern of commodity trade by source

The pattern of commodity trade over time
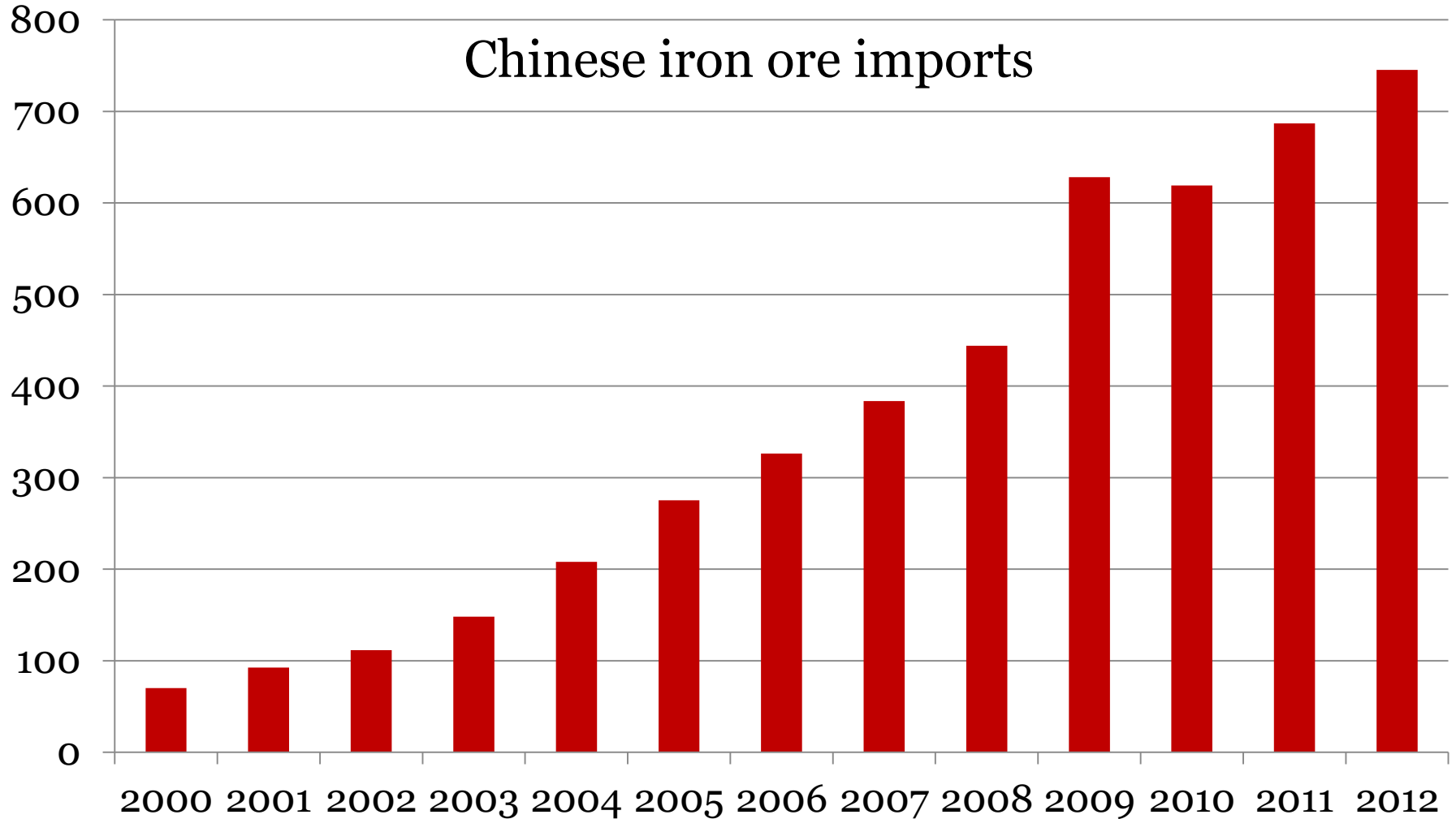
Million mt

Japanese iron ore imports

The pattern of commodity trade over time
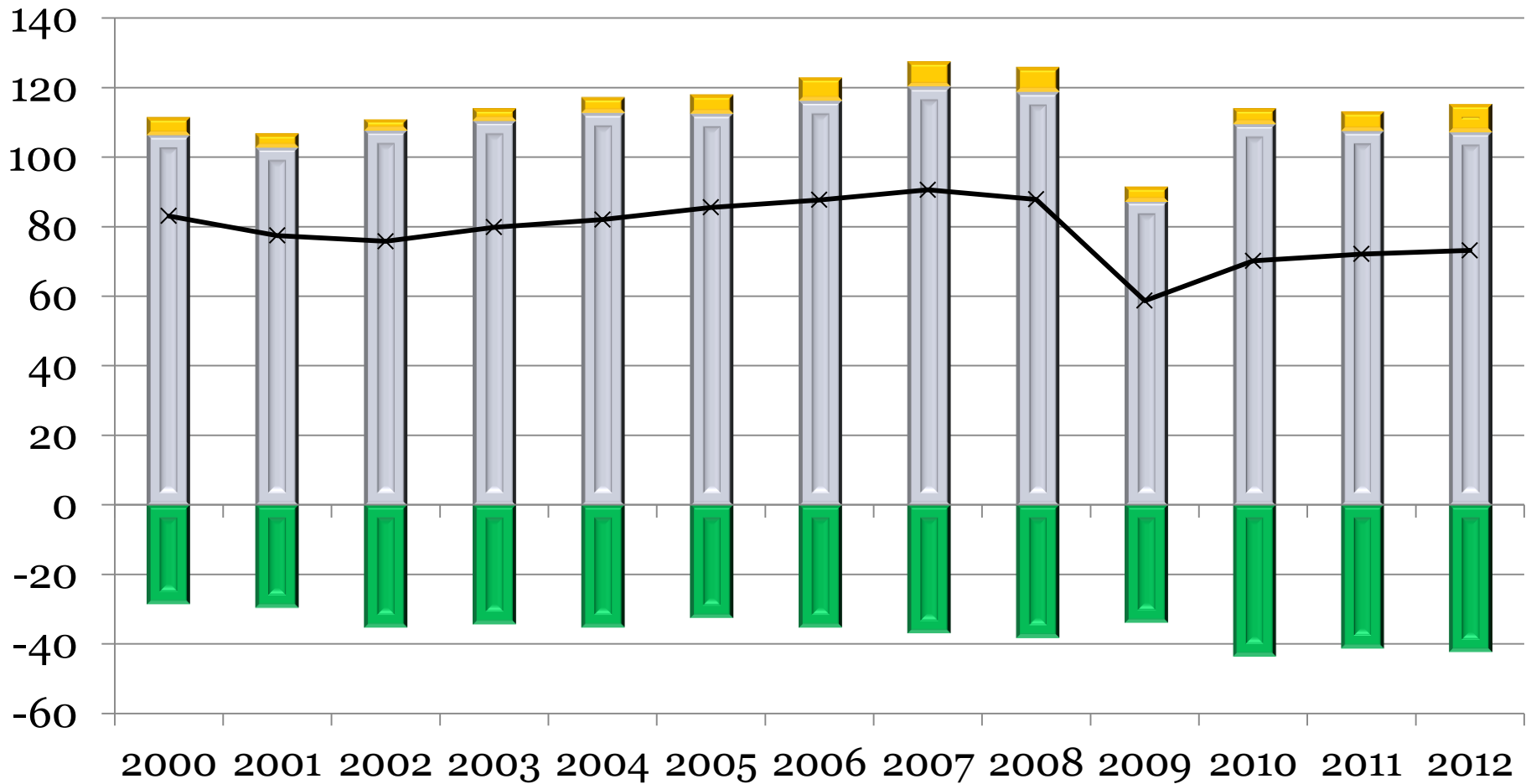
Million mt

Chinese iron ore imports

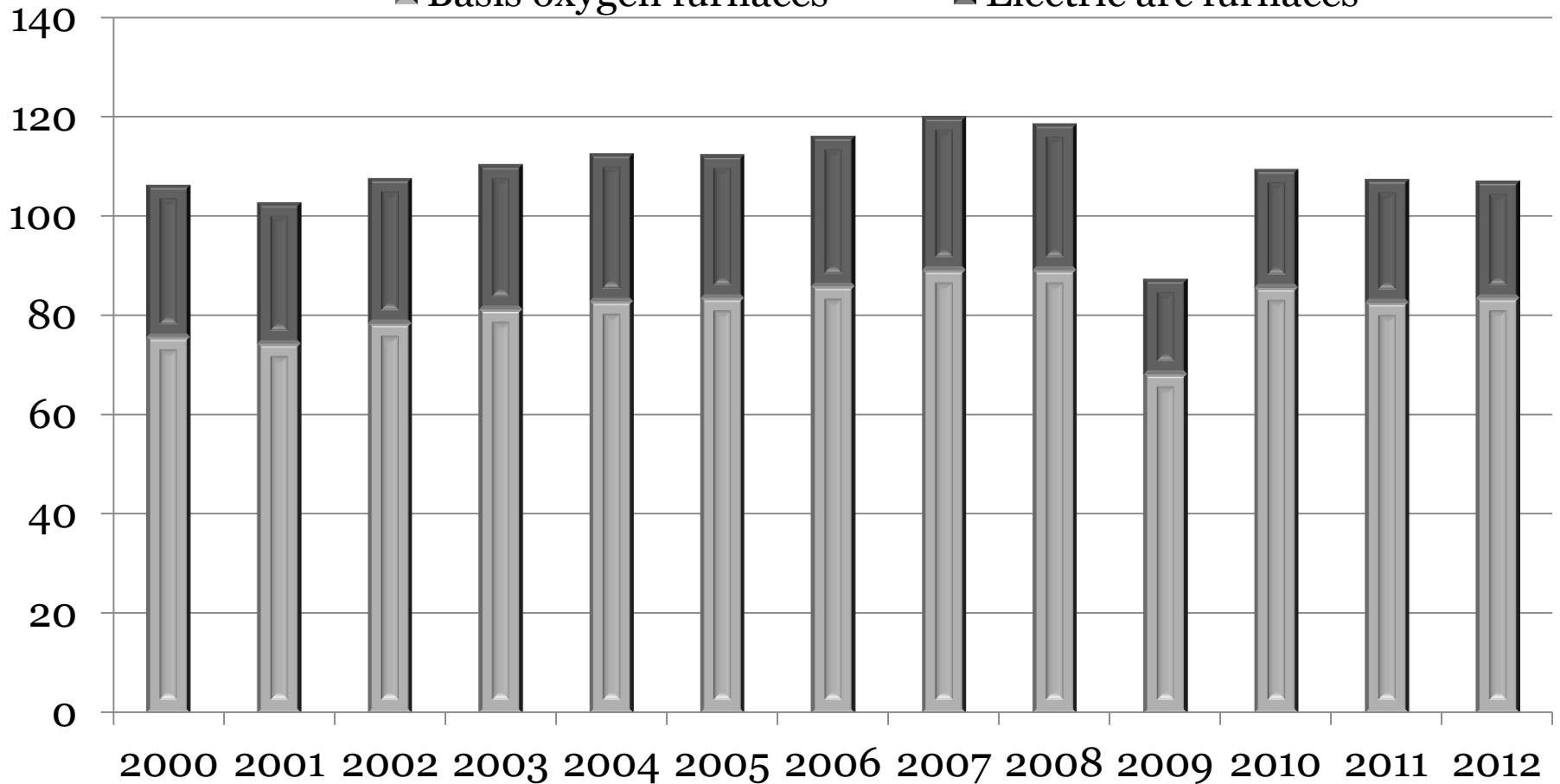# Japanese steel balance

Steel production processes in Japan

Million mt

■ Basis oxygen furnaces   ■ Electric arc furnaces

BOF production v iron ore imports in Japan
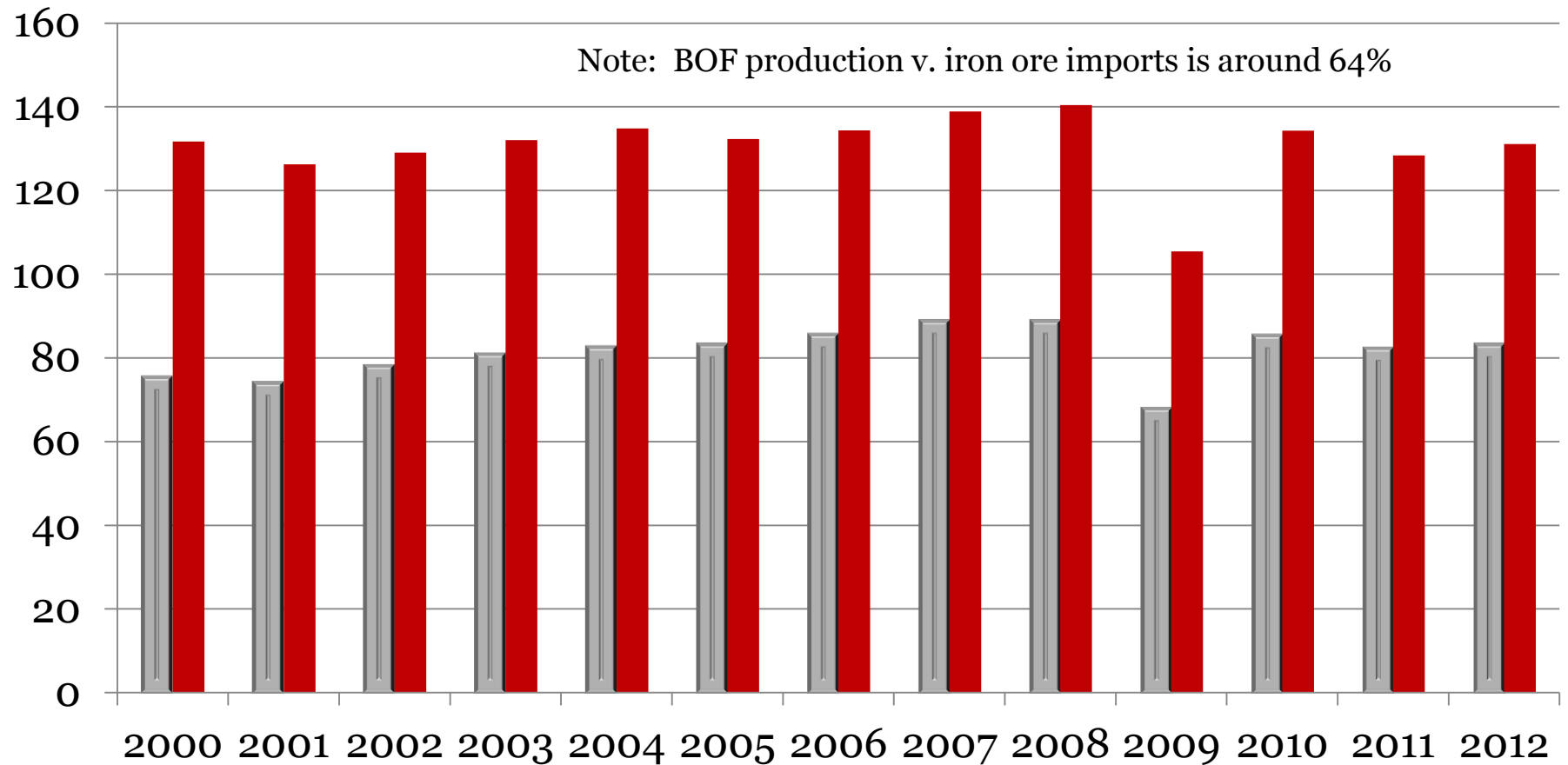
Million mt

◻ BOF production   ▮ Iron ore imports
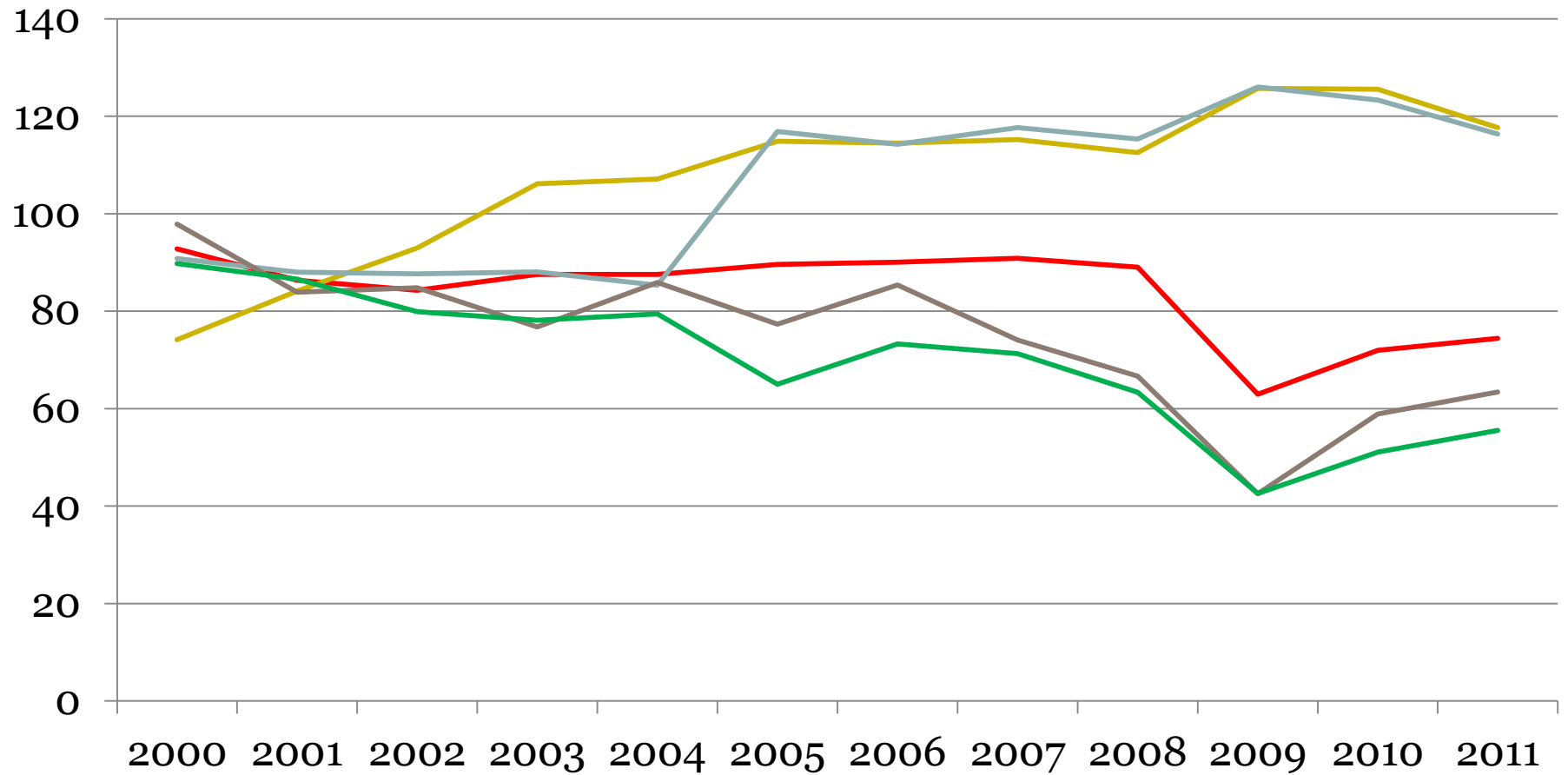
Note: BOF production v. iron ore imports is around 64%

Steel intensity of economies

(relationship between GDP growth & steel consumption growth, 1993 = 100)
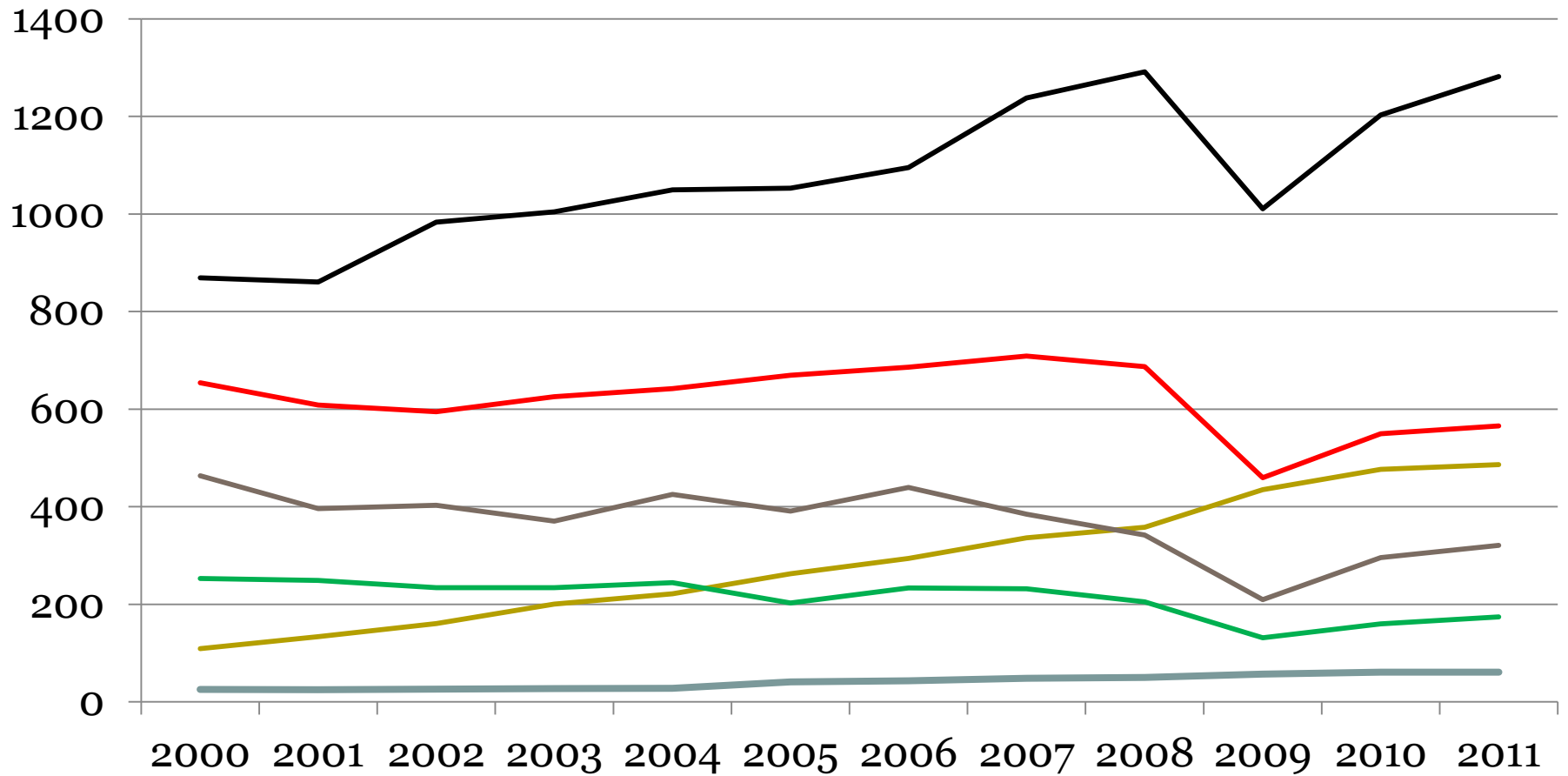
Legend: Japan — China — India — USA — UK

Steel consumption per capita

Dry bulk commodities

- Iron ore
- Coal: coking coal, thermal coal
- Agribulks: wheat, coarse grains, oilseeds, oilmeal, rice, sugar
- Aluminium raw materials: bauxite, alumina
- Minor ores: copper, lead, manganese, nickel, zinc
- Steel minor bulks: coke, DRI, pig iron, scrap, steel
- Fertilizers: phosrock, nitrogenous, phosphatic, potassic, complex
- Forest products: woodchips, rough wood, sawn wood
- Minor bulks: cement, petroleum coke, salt, sulphur
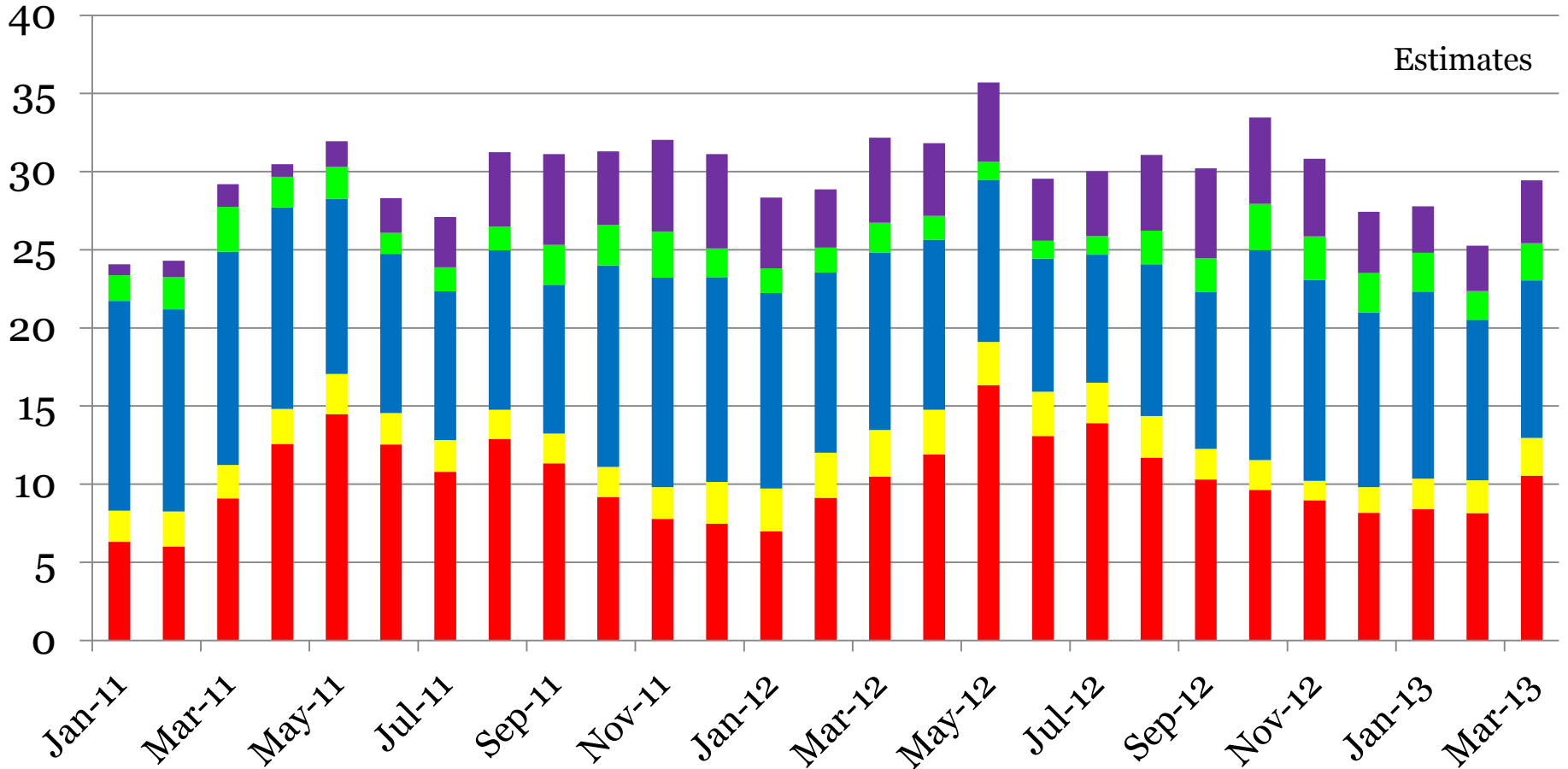
- Steel industry accounts for around 47% of above global trade

Monthly Grain Exports By Loading Area

Legend: ■ S America ■ Australia ■ N America ■ EU ■ Rus+Ukr+Kaz

Million mt

Estimates

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1 7 April 2013

Key drivers in bulk commodity trades

- Commodity prices
- Global economic growth
- Population growth
- Global politics
- Geographical distribution of new bulk commodity supply
- Geographical distribution of commodity processing plants
- Trade protectionism
- Resource nationalism

Back to the real world

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- Annual dwt employment: 179,851 x (48/366) = 23,587

Advantages of using annualized dwt employment

- Takes into account real world practices such as:

- Part loading of ships
- Port delays
- Port loading and discharge operation times
- Ship routings including using canals and bad weather avoidance
- Vessel speed
- Multi-porting
- Ballasting patterns

- BUT.....
- Employment is not the same as demand

Strategies to measure annualized dwt demand

- Measure annualized dwt employment in a strong market where ships are rationed by price
- Extract out of annualized dwt employment any elements that can be monitored independently, e.g. port loading delays
- Overlay structural change, e.g. the extent of ballasting between the Atlantic and Pacific basins
- Make allowance for ship demand in emerging trades
- Allow demand to shift between market sectors, e.g. Capes v. Panamaxes
- Monitor key developments, e.g. Valemax ship inefficiency
- Monitor major port developments
- Address slow steaming issues, is some slow steaming becoming permanent?