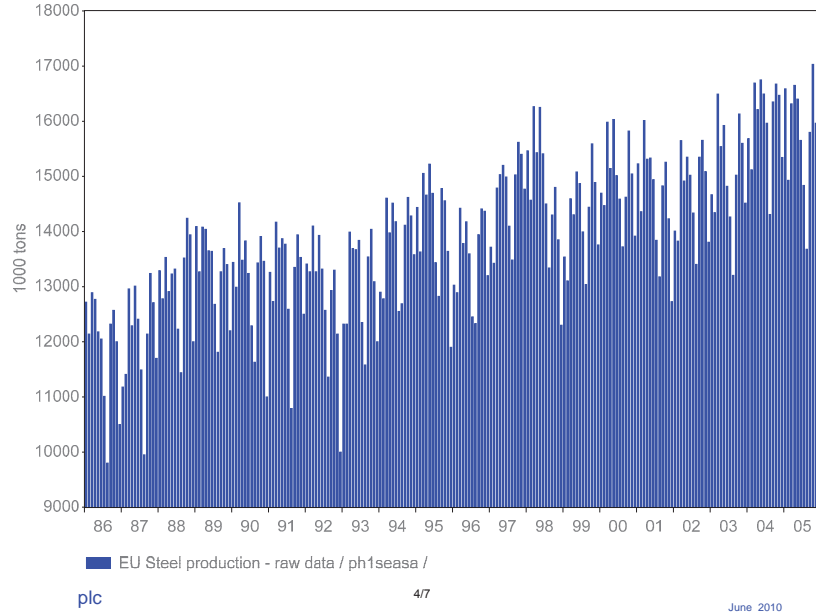


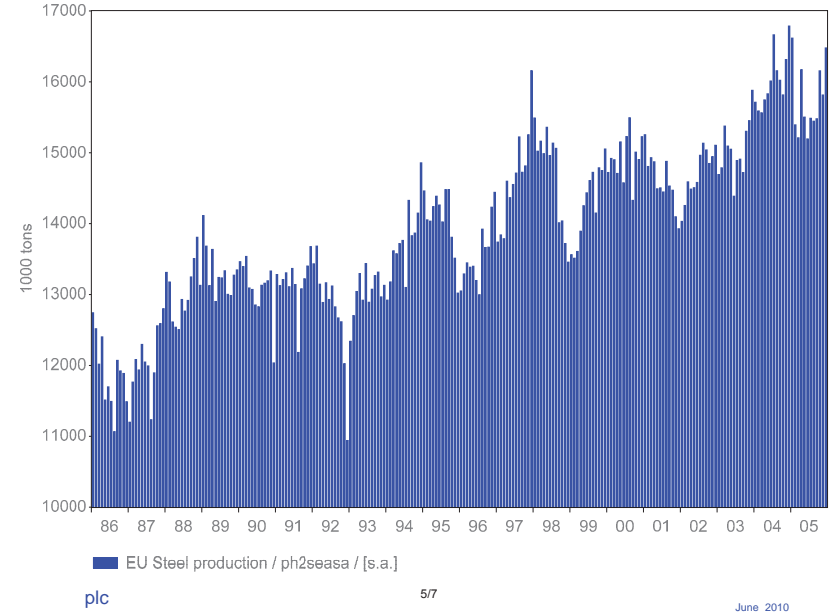


1. If it's cyclical, draw the cycle

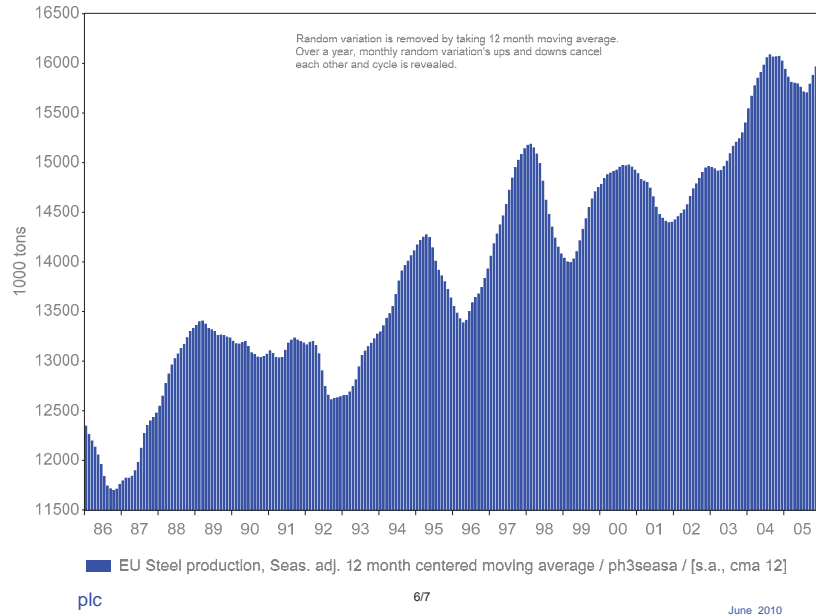
EU Steel production: raw data
1 Raw Data - Originally reported monthly values



EU Steel production: seasonally adjusted (s.a.)
2. Seasonal variation removed - Random variation left

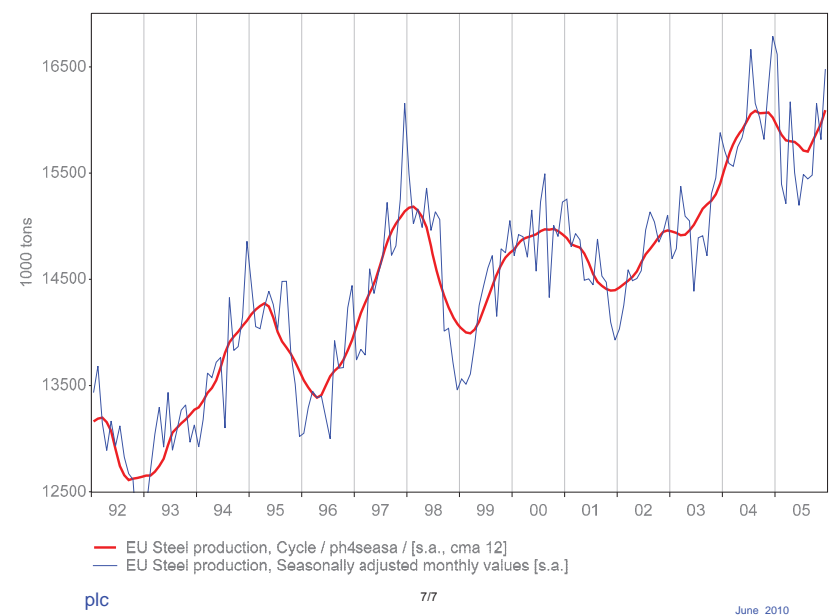


EU Steel production: cycle (s.a., cma 12)
3. Cycle: Seasonal and random variation removed



EU Steel Production: s.a., cma12 + s.a.

4. Standard presentation form: Cycle + Seas. adj. monthly values





Drawing the cycle

Preparing the data

If you do not monitor the cycle with right methods, you only react to events. You do not see in your data the critical phase of *beginning* downturn and in upturns, you are a half year late instead of one quarter ahead.

First, you have to make the cycle visible. In cyclical branches, you can see the cycle already in level development – no need to use y/y-growth presentation as for GDP.

Seasonal adjustment and *smoothing* of your raw data reveal the cycle (previous page). Seasonal adjustment removes the systematic variation that appears regularly in year's seasons: holidays, short/long months, summer/winter, year-end practices, seasonal production schedules, etc. It makes the months comparable. Smoothing reveals longer term tendencies.

Using statistical methods and long enough historical data you can draw the cycle month-by-month for your business, your customer industries and industrial end-users. You can identify the factors behind the changes, whether it is growing imbalance in supply chain, weakening end-user demand or loss of market share.



The turning point

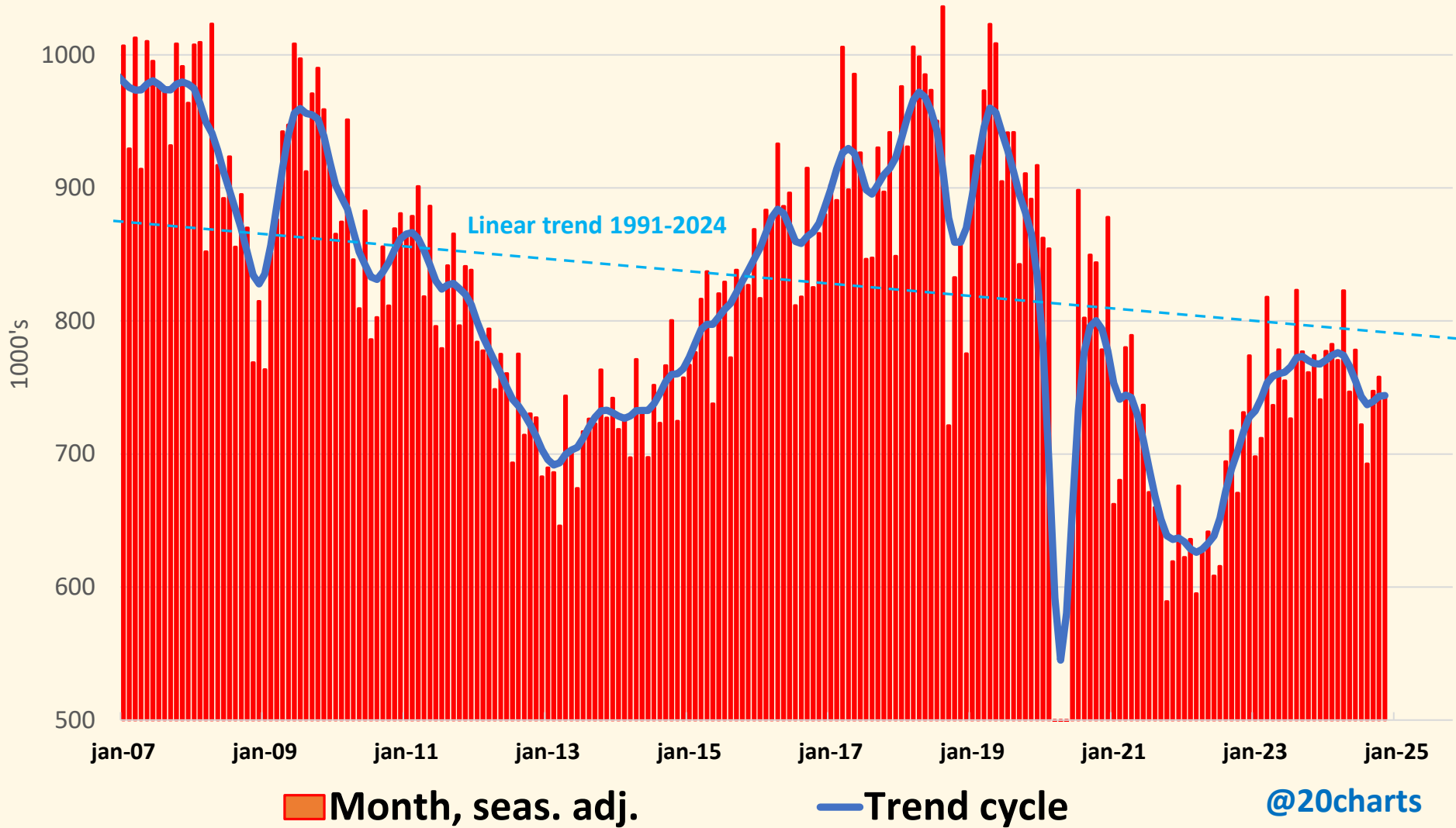
The crucial and hardest thing is to decide if turning point is being formed. The cycle normally goes only up or down, and the graphs show the development month by month. The question is when are you convinced. Normally 3 consecutive month-on-month movements in same direction in the *seasonally adjusted* data is enough. Sometimes the rule is '3 out of 4' if one month's change is exceptionally strong. One monthly value up is random variation, twice up is still common random variation, three times up begins to be a trend – the probability is 83%. And it is seen already in the cycle graph. The 'rule of 3' has been in use since biblical times.

These rules concern *return to normal* from unusually high or low position vs long term trend line (next page) or from bullwhip cycle extremes (pp 6-10). If a *new normal* is developing, deeper analysis of driving forces is needed.

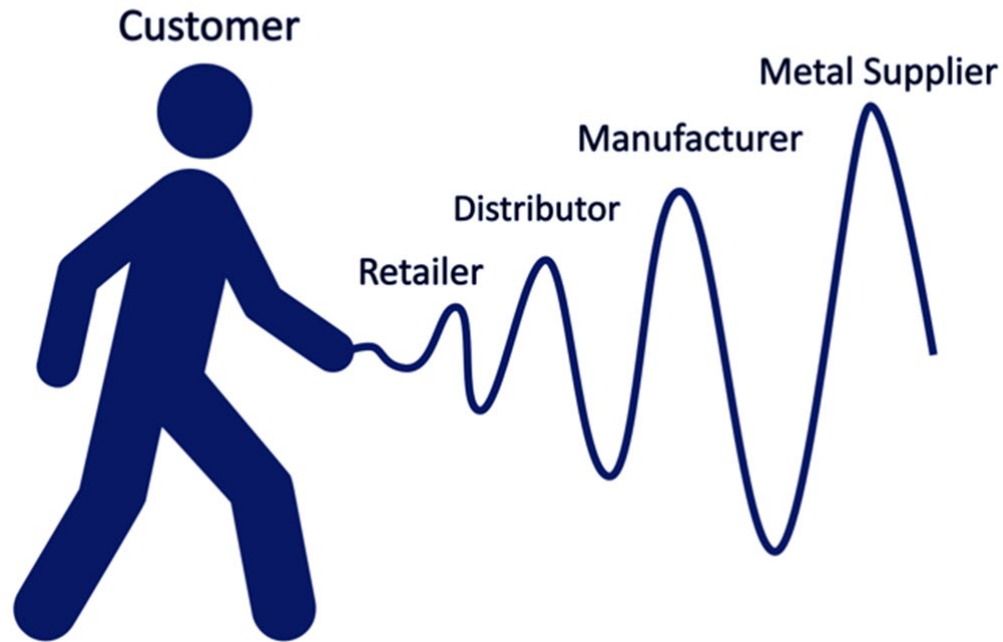
Note: For industry's suppliers, cycle is presented with *production* volume data - sales data is seldom available. For consumer products, use their *sales volume* when possible.

EU20 Passenger car sales/Nov (est) -4% y/y

Source: ECB, National associations, Own estimate



The Bullwhip Effect



Picture by AMT

Bullwhip variation through business cycle

Upstream supplier's production variation vs end-customer industries':

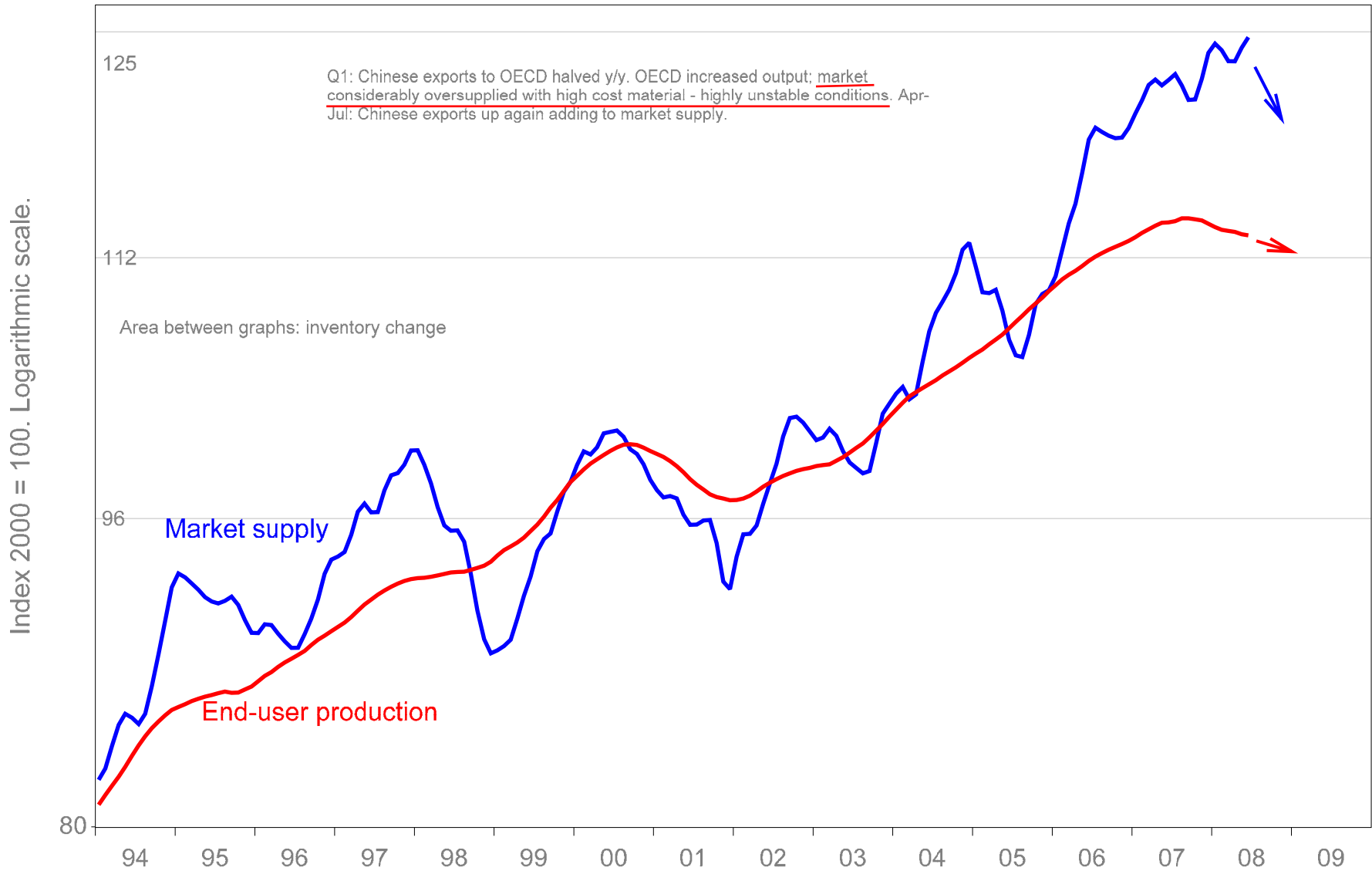
- Ordinary steel producer vs construction&auto+3others: x2-3
- Special steel producer vs auto&machinery: x3-4
- Micro chip producer vs industrial end-users: >x4

[More on Bullwhip: 20charts.com](http://20charts.com), Chapter 3. Inventory cycle and Bullwhip

See proxies for 'OECD' at the bottom.

OECD Steel Market supply vs End-User Production / Jun 2008

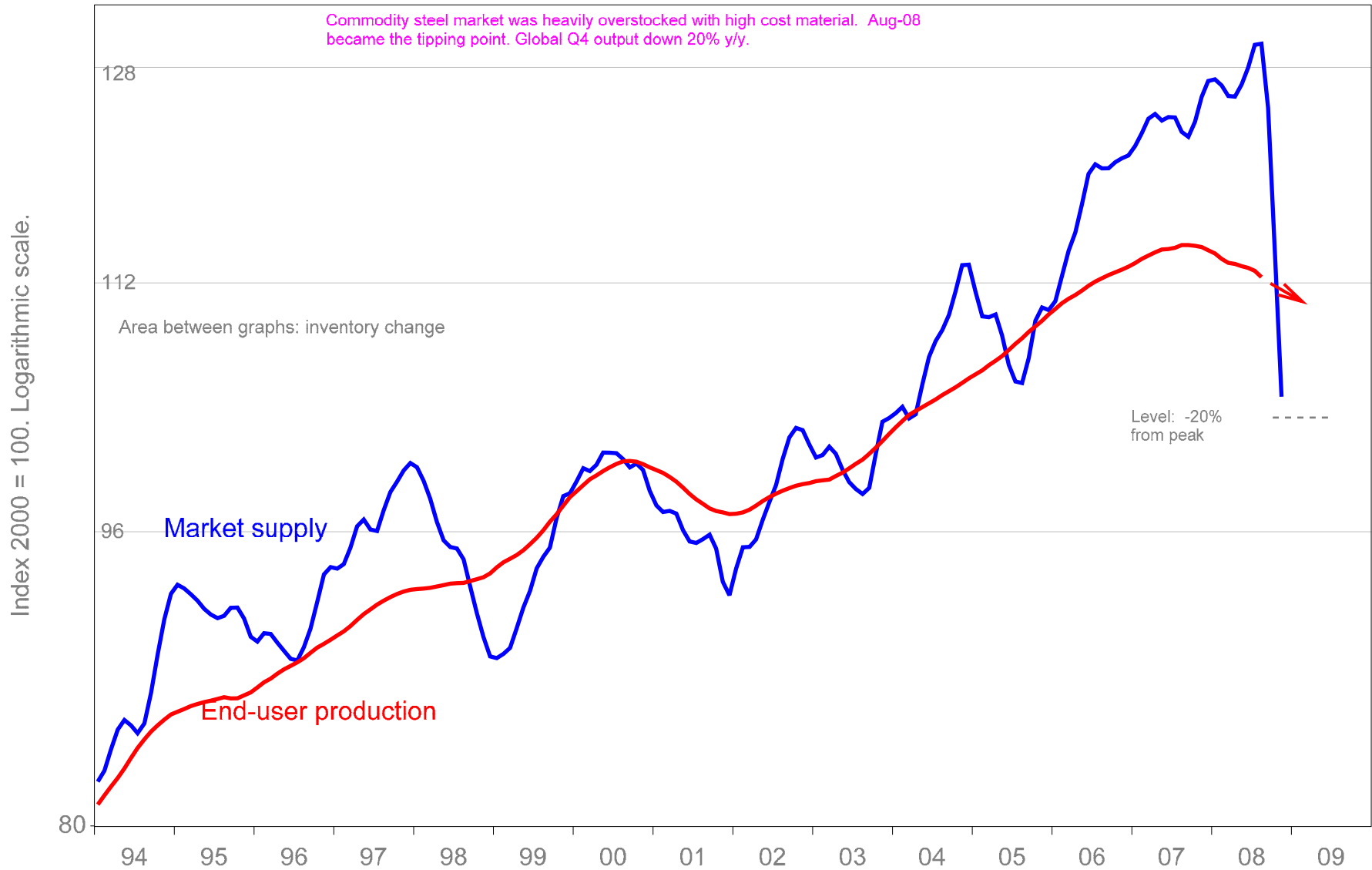
Construction 30%, Machinery 25, Vehicles 20, Metal goods etc 25



- Western world market supply
- Triad (EU, US, Jpn) End-user production

OECD Steel Market supply vs End-User Production / Nov

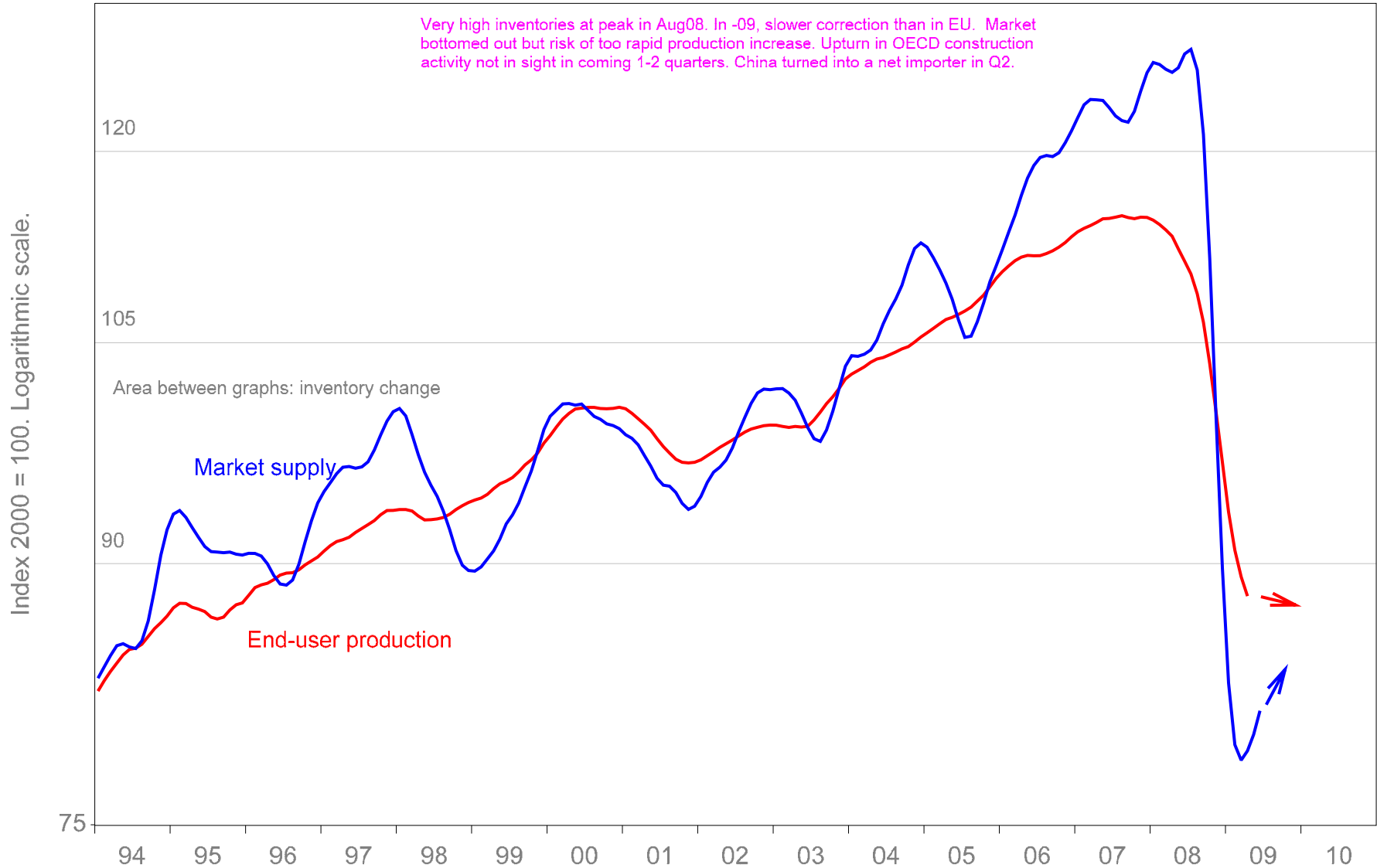
Construction 30%, Machinery 25, Vehicles 20, Metal goods etc 25



- OECD Steel Market supply / oestveu2 / [rebase 2000 = 100.0, s.a., cma 2]
- OECD Steel End-users, aggregate production [rebase 2000 = 100.0, s.a., cma 12]

OECD Steel Market supply (Jun) vs End-User Production (May)

Construction 30%, Machinery 15, Vehicles 20, Cons. durables, Metal goods, Energy 35



- OECD Steel End-users, aggregate production [rebase 2000 = 100.0, s.a., cma 6]
- OECD Steel Market supply / oestveu2ih / [rebase 2000 = 100.0, s.a., cma 4]

OECD Steel Market supply (Nov) vs End-User Production (Oct)

Construction 30%, Machinery 15, Vehicles 20, Cons. durables, Metal goods, Energy 35

