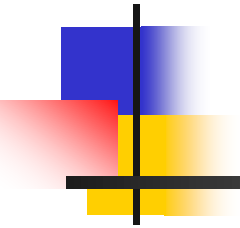


2. Downturns and Upturns

Why upturns end – who started the war?

'None of US expansions of the past 40 years died in bed of old age; every one was murdered by the FED (Central bank).'
(Controversial statement by economist Rudi Dornbusch)

Upturns may end due to various internal causes or due to the effects of well known external crisis.

Internal cyclical (inventory&investment) – through actors within the economy (next page).

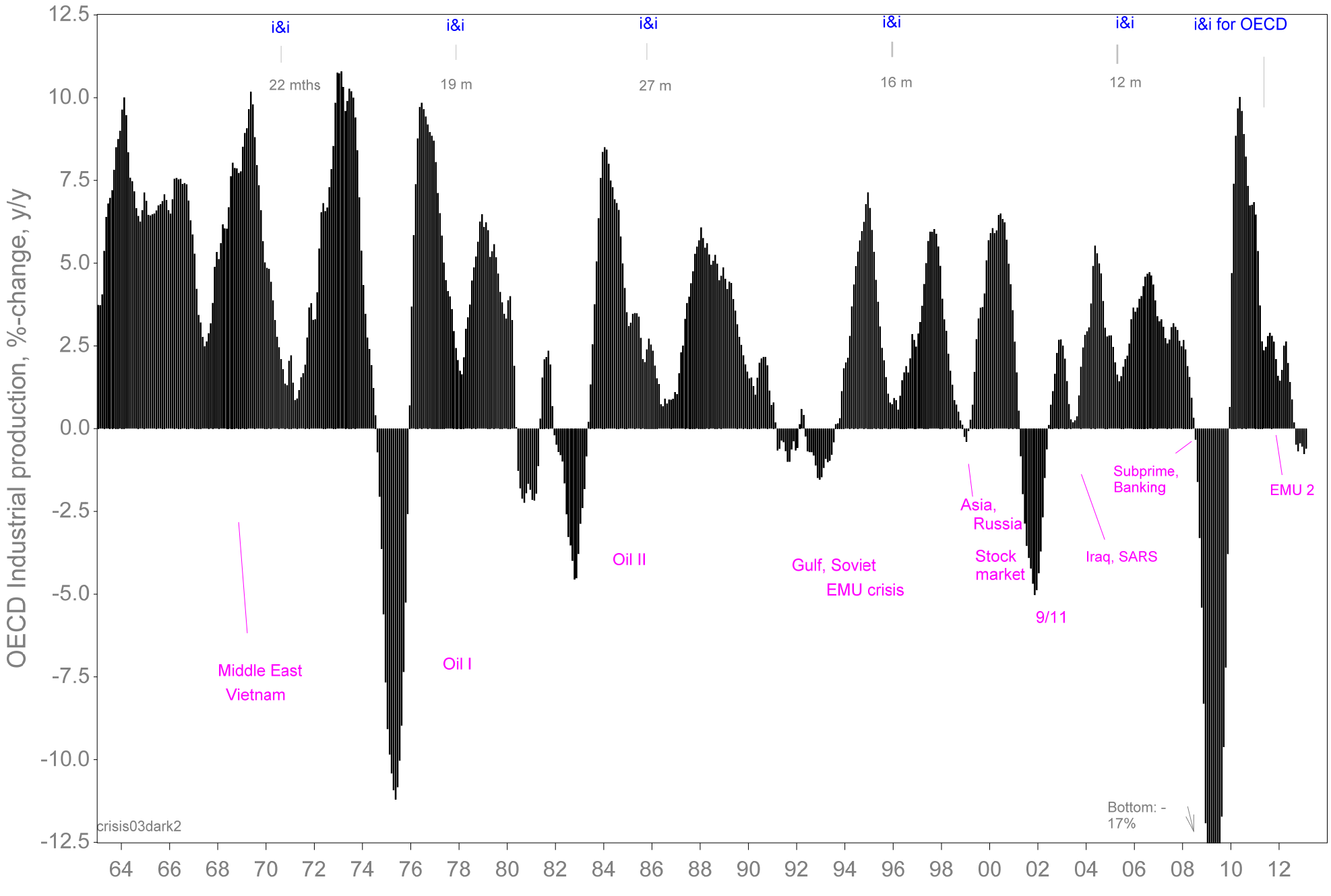
- Until late-90's: correction of overheating in wages, commodity and asset prices. The *triggering* events came from the financial-fiscal sector: higher interest rate, credit tightening and government actions.
- During last two decades, when wage inflation gradually disappeared, other factors beside financial-fiscal became the suspects: technological change, expectations, market distortions and malfunctions, etc. Imbalances in supply chains are obvious suspects in this category.
- The triggering cause of a cyclical downturn is usually hotly debated but after the turning point, the sequence of events is straightforward: when growth slows, inventories start to amplify the slowing (Chapters 3-4) and then investments follow (page 5).
- Purely *cyclical industrial* downturn has a predetermined duration, within a range. It can be estimated from historical data for total industry and individual branches – special steel as an example, page 11. But also a calculation with a system dynamics model with a company's purchasing parameters gives similar results. See Chapter 3.
- Internal downturn can be traced month-by-month, underlying factors identified and their effects measured. With forward indicators, the range of development can be predicted 1-2 quarters ahead.

External crisis – shocks from outside (page 4)

- Factors outside the ordinary production-consumption sphere dominate. Effects are measurable to some extent but depth and duration are unpredictable at the beginning. The events and solutions are on the political front. Inventory/supply chain effect is also present but masked by weakening consumer demand and rapidly falling corporate investments.

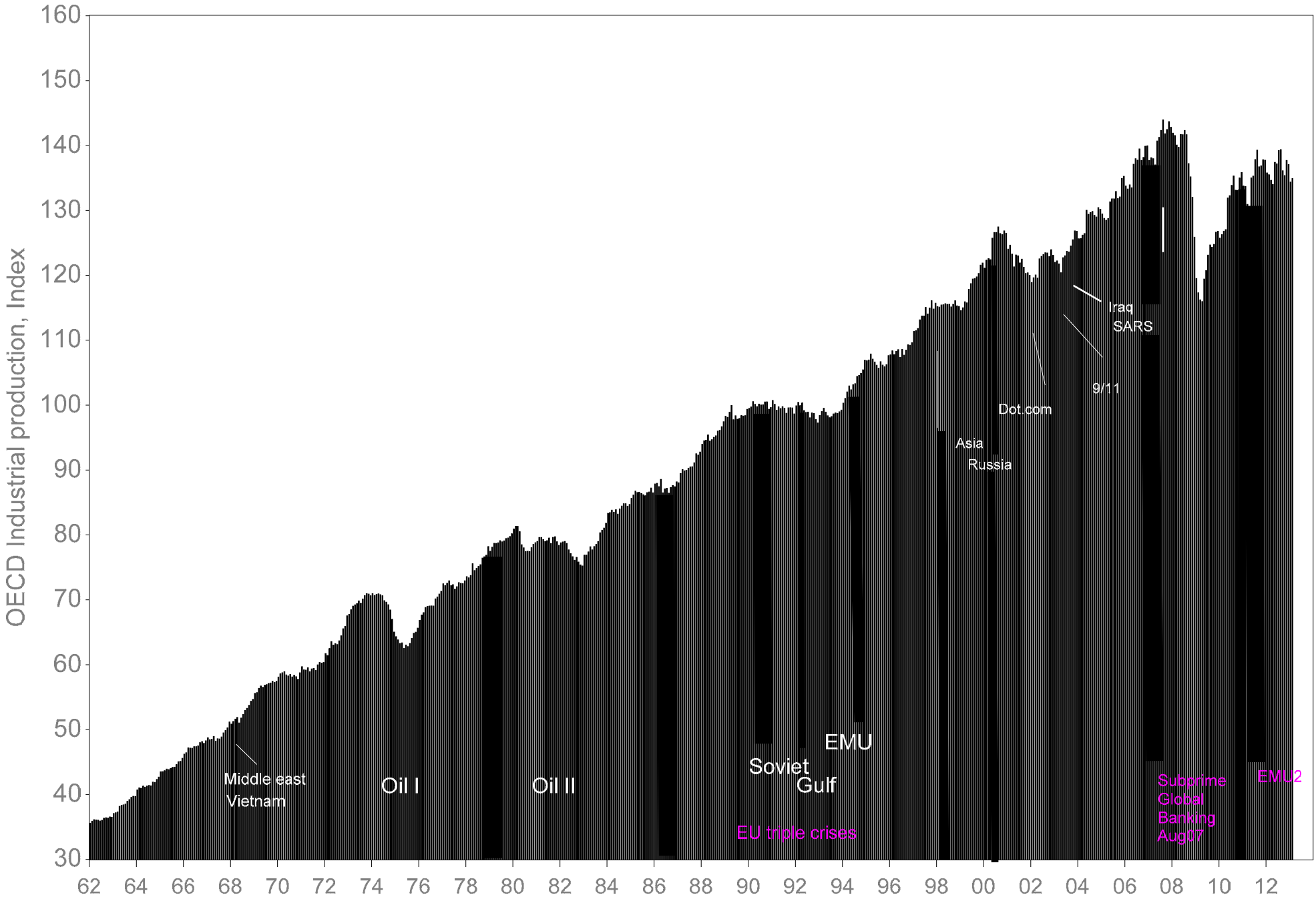
OECD Industry downturns by cause, Cyclical internal + External / Feb

i&i: Investment&Inventory cyclical downturn. Origins internal to economy.



Pekka Laukkanen Apr 2013

OECD Industry in External crises



Pekka Laukkanen May 2013

Source: Reuters EcoWin + Own est.

What downturns are made of

93 macro cycles in 21 OECD economies 1973-2000:

Sources: IMF (2002), NBER working papers, IIE, Own estimates

Note: The following are the acting factors *during* the downturn, not necessarily the *triggering* factors.

Contribution to downturn, whole duration (average of all)

- 50% inventories
- 50% private investments
- Consumers and Government, net: 0%

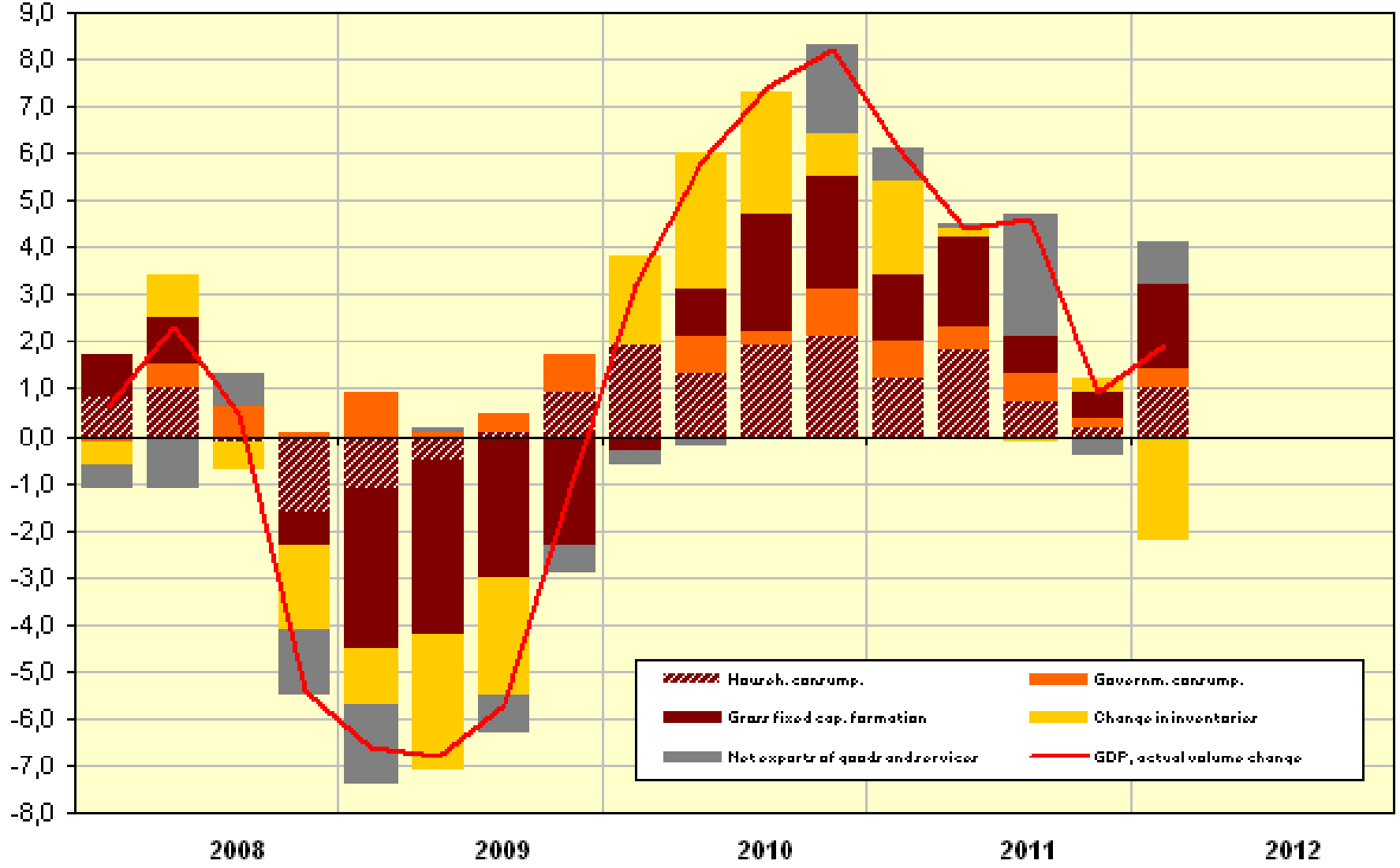
In a typical non-crisis downturn, inventories and fixed investments more than fully accounted for the decrease of GDP growth.

When external crisis hits, sales and orders fall instantly and effects in industry are dramatic – like in 2008-09 crisis. Most discretionary products are hit at the same time: investment goods and related intermediate goods as well as consumer durables like cars, white goods, etc. Steep production cuts follow immediately. As consumer sales projections are revised down, inventory reductions in *retail sales* and in industry take place simultaneously.

Sweden: Contributions to change in GDP, %-points

Crises 2008-09: all components - except Gov - contribute to downturn

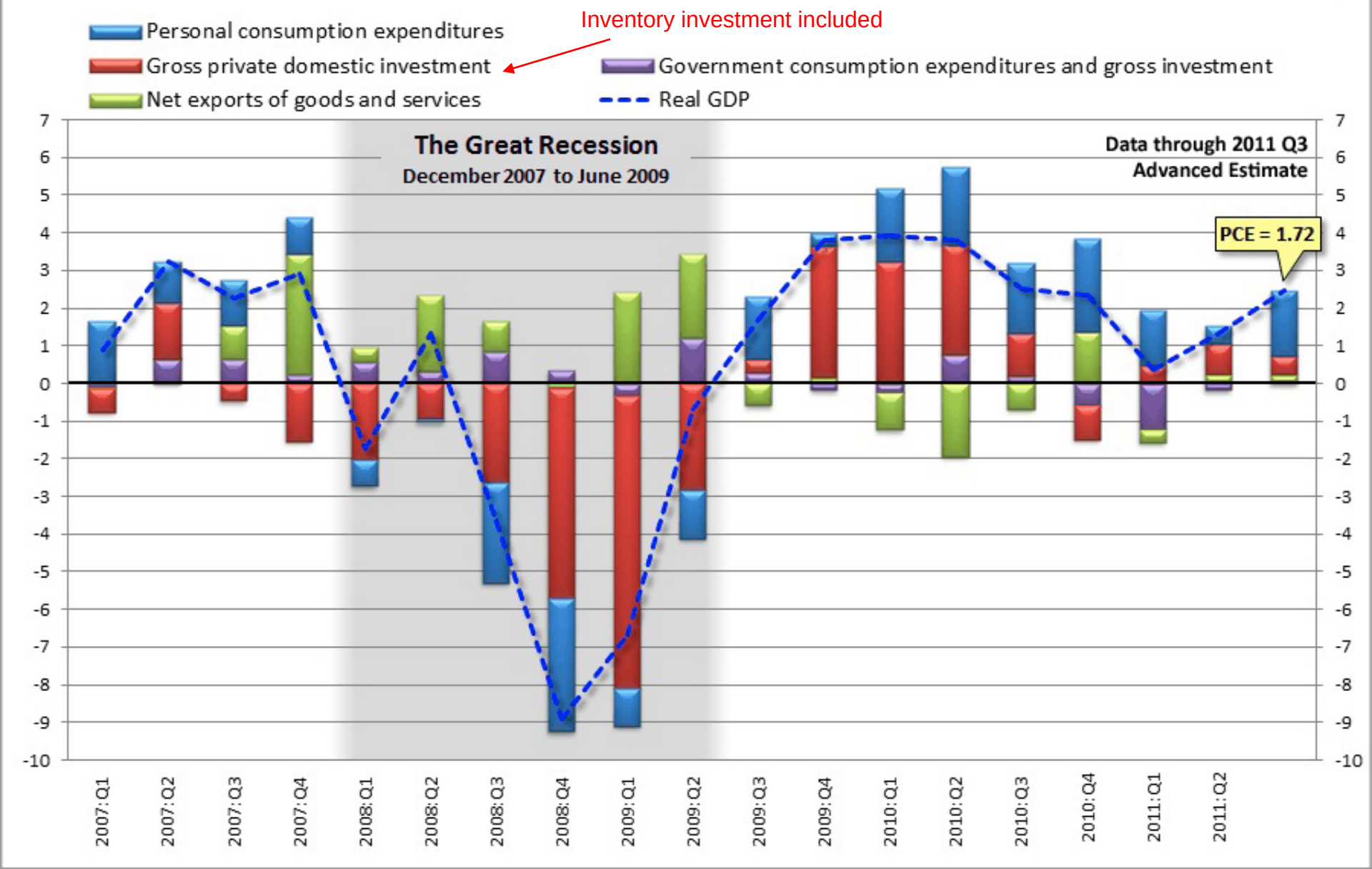
Read: 2009 Q1 total GDP -6.5% y/y (orange line), thereof consumers -1.1%



Data up to and including the First Quarter 2012

dshort.com
October 2011

The Components of Real GDP Since 2007



Cyclical downturns (i&i)

Internal cyclical downturn in industry begins without much noise. The origin is usually either financial-fiscal sector or inventory/bullwhip cycle, or both. If monetary tightening is made step by step, effects to real economy creep in. Industry continues to *plan* production according to the high growth rate of early upturn and at some stage production overshoots final demand. It leads to excess inventories, is not corrected smoothly but through instant stop of purchases. Inventory and production excesses in supply chain follow, amplifying at every upstream supplier level.

Industry, on average, does not react to slowing orders, only to rising inventories. Orders warn, but inventories is the proof (next page).

For a steel producer, depending on supply chain length and complexity, chain effects are magnified by a factor of up to 5-7 (pp 10-11). Similar to motorway queue effect. When in a long convoy of vehicles, the first slows speed by 10%, the last must make emergency braking to slow by 50%.

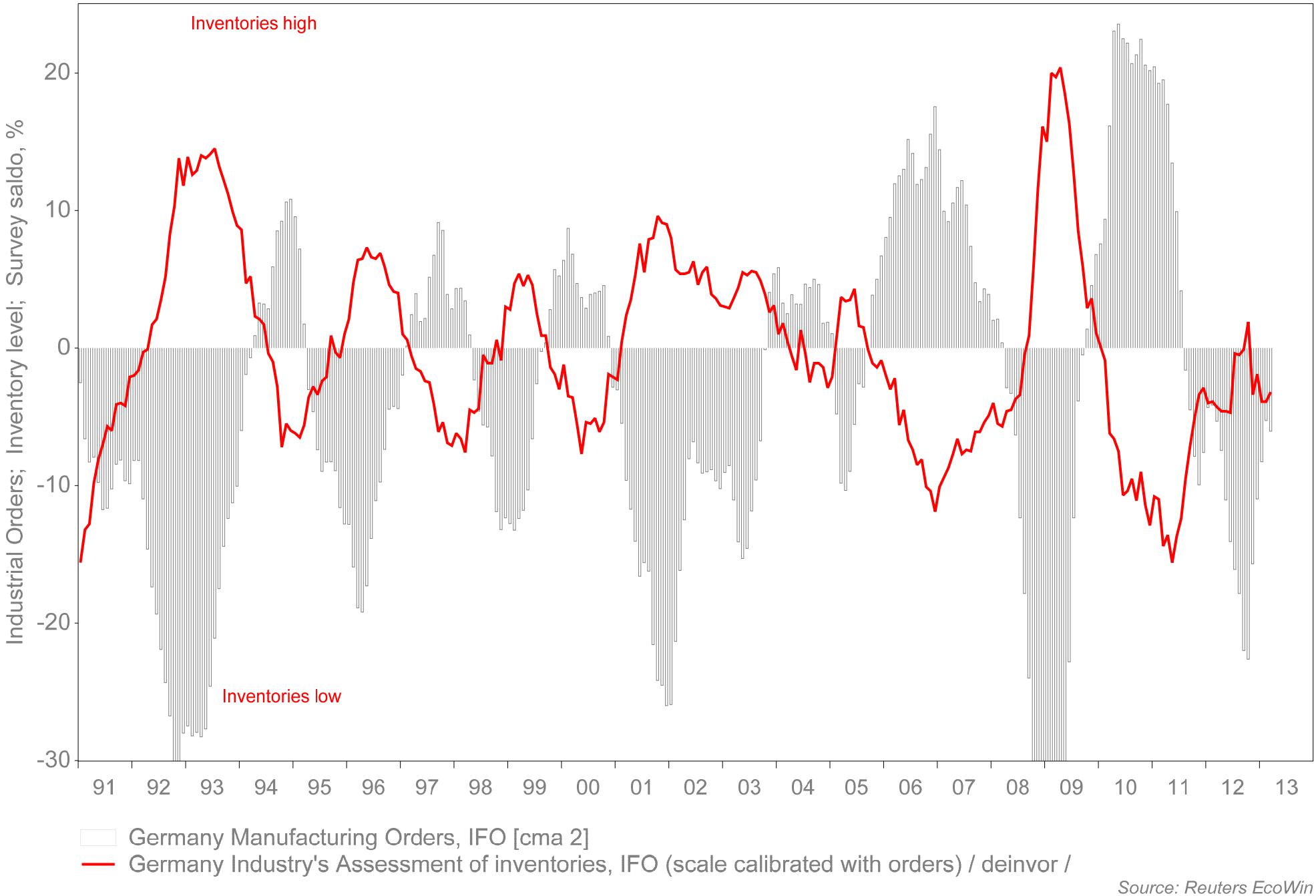
Rising inventory is the start of the downturn for industry. Investments follow. Most big industrial investment decisions are made when upturn matures. New capacity comes on stream at the beginning of downturn, amidst production cuts. No new big greenfield investments are made until next upturn when liquidity is good and confidence high. Not optimal timing but very common (page 12).

A producer has machinery's life span on average for 15 years' production. By investing or not investing he regulates the inventory of this input resource.

Typical EU industry i&i downturns: 1995-96, 1998-99. Short duration, only modest growth slowing, consumer goods not affected, government and central bank actions not needed.

Germany Industry Orders vs Inventories (IFO) / Mar

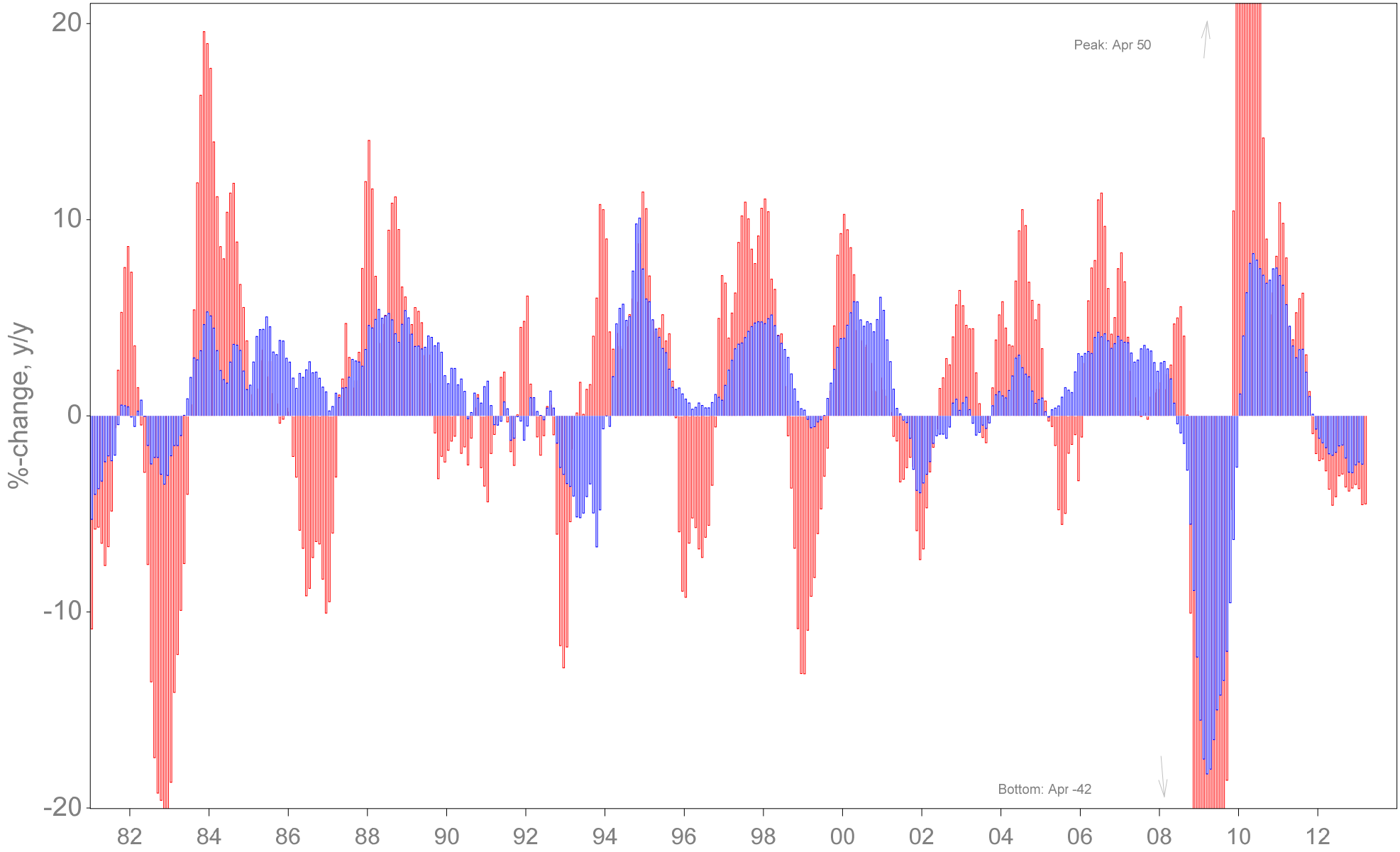
Correlation 0.90. Inventories lag 3 months.



Source: Reuters EcoWin

EU Steel production vs Industrial Production

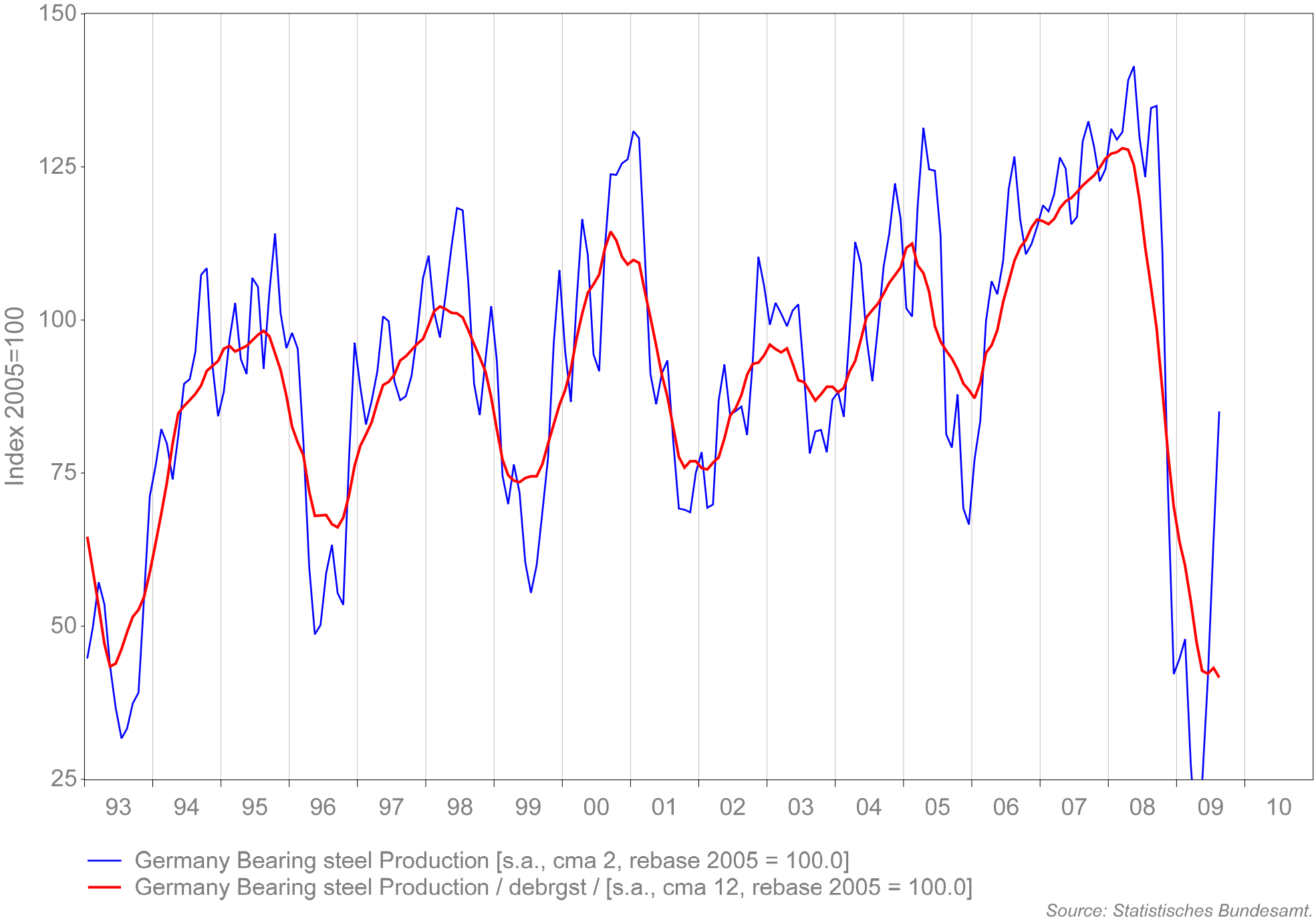
Correlation 0.75 (1971-2012). Steel leads 1 month.



Sources: WSA, Eurostat

Germany Bearing steel Production / Aug

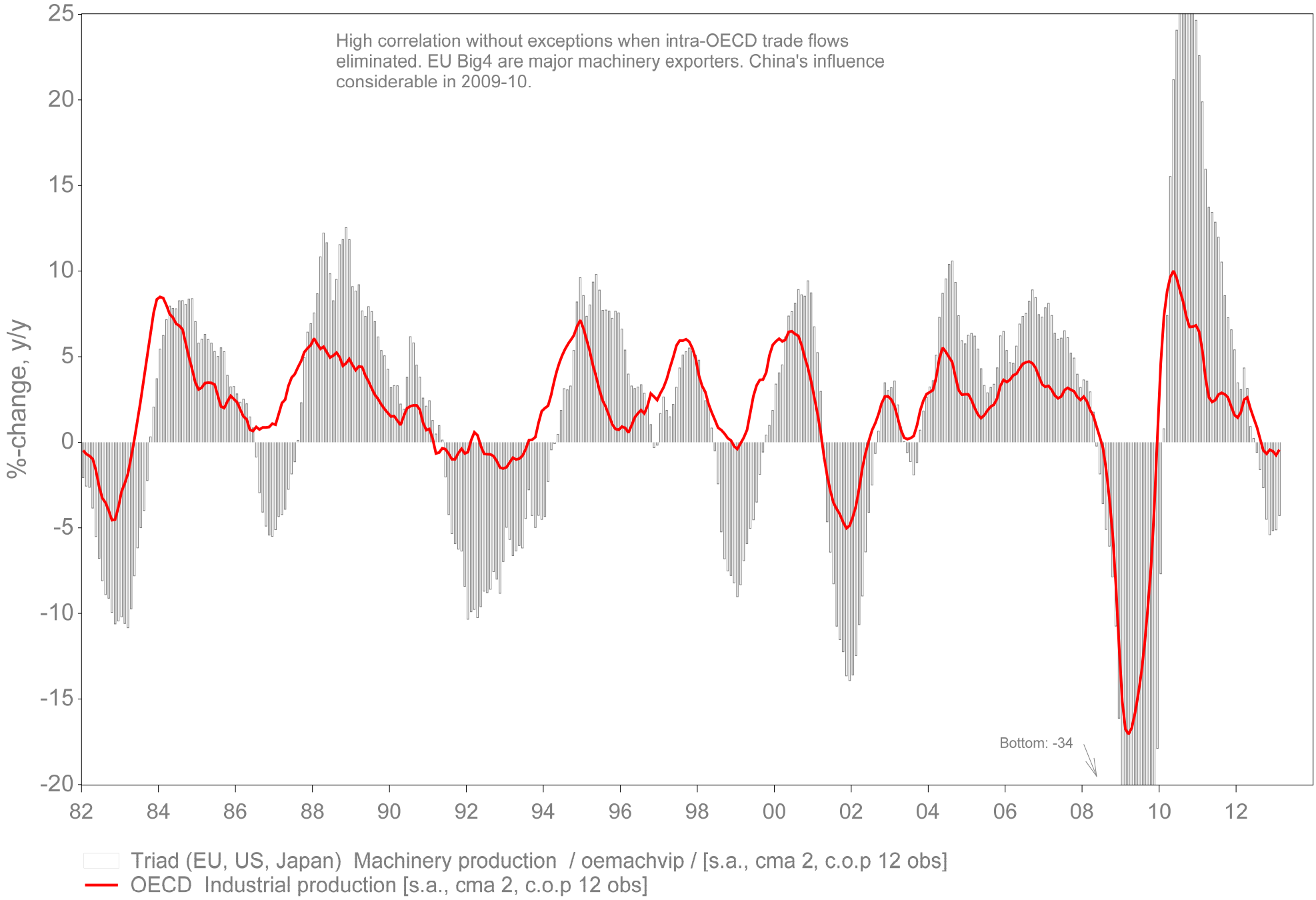
Source: Statistisches Bundesamt. Publication discontinued.



Source: Statistisches Bundesamt.

OECD (Triad) Machinery vs Industrial Production

Correlation 0.92. Machinery lags 2 mths.



Sources: Reuters EcoWin, Eurostat + Own est.

Why downturns end

Sources: IMF (2002), NBER working papers, IIE, Own estimates

In downturn, production slows down or falls and negative news lead to increased caution creating more negative sentiments. How can a severe downturn ever come to an end?

1. Interest rate and money supply

Interest rates are usually cut early in downturn and conditions in credit market progressively eased. Several consecutive moderate rate cuts follow. Some effects are seen after a half year of the first, stronger boost comes after 3-4 quarters.

In early downturn, interest rate and bullwhip effects proceed parallel.

2. Inventories

Upward bullwhip momentum starts to work when downturn has lasted on average 4-5 quarters - provided demand at the end of the chain, consumer sales, is not continuously falling. Motorway queue effect in accelerations. There is research based evidence inventories is a transmission mechanism from downturn to upturn (Chapter 9).

Would production fall seem severe:

3. Stimulus & Incentive

- Government reduces income taxes, VAT.
- Tax relief for corporate investments, start of public works programs, incentives for housing production and maintenance.
- Car sales: incentives to scrap old vehicles, tax rebates on environmental reasons.

Compared to e.g. recession 1990-93, EU governments are now better prepared, react faster and more efficiently.

4. Pent up demand in cars, trucks and machinery.
After 2-3 years of rapidly falling vehicle sales, rebound can be considerable - as in 2014-16. Certain machinery investments are planned to be made in low demand periods.

5. Weaken the currency - devalue. Helps the country but worsens neighbors' situation.

6. Financial investors enter early

When 'downturn' is becoming the mood of the markets, investors flee from seemingly risky placements and move to safer, low yielding assets. When the beginning of recovery seems likely, *some* of investors' money returns to commodities and cyclical industries. Confidence is improved through higher stock valuations and eventually rising raw material prices.

7. Finally: so many want better times and the obstacles can be overcome. 'Jobs' is on the top of the agenda of political parties in most countries. Ultimate measure to start recovery - not minding fiscal deficit - is to print more money and 'scatter it from a helicopter' to people (Milton Friedman). There is also a digital alternative for fiat money distribution.

In the mainstream economic models, downturn ends when profit maximising companies and utility maximising consumers start to take advantage of downturn's imbalances. Prices clear the markets and economy starts to move towards equilibrium. Economy is a self-stabilising system according to one school; not at all according to another.

The crucial moment in downturn is when you are *convinced* the bottom is, or will be, past. Or do uncertainties linger on to next quarter?

How upturns begin

93 macro cycles in 21 OECD economies 1973-2000

Sources: IMF (2002), NBER working papers, IIE, Own estimates

Contribution to upturn (once started), first 4 quarters:

- 50% Consumers; do not necessarily increase spending but keep it steady when others' contribution is low or negative.
- 20% Inventories*; after mild and modest downturns. After severe recessions: 50%.
- 20% between Government and Private investment. After severe recessions, no contribution from private investment in first year of upturn.
- For countries with suddenly weakened currency, exports becomes a major contributor.

* In national accounts, inventories are often combined with 'balancing items', the slack in accounts. Inventories are probably understated when considering 'all material in the tube', i.e. total material stock&flow. See Chapter 3.