

Modeling Euro Area Industrial New Orders

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I. Motivation

- Eurostat **discontinued** industrial new order series in mid-2012
- Although, industrial new orders historically a relevant indicator for many users and uses!
- ECB **fills the emerged data gaps** at euro area level

I. Motivation (cont'd)

Target: Fill gap for euro area industrial new orders
(m-o-m % changes from seasonally adjusted data)

- For countries that continue the data collection: set-up of regular **data transmission** from NSIs to the ECB
- For countries that discontinue the data collection: **model-based proxy** for new orders
- Regular production at monthly frequency

2. ECB indicator on euro area new orders

- Euro area aggregates, if > **60% country coverage**
- **Country weights:** Eurostat's weighting scheme for industrial turnover for base year 2010 = 100
- Working-day and **seasonal adjustment** performed by NSIs, otherwise by ECB
- **Published monthly** (timeliness around $t+55$), e.g. in Monthly Bulletin, Statistical Data Warehouse

2. ECB indicator on euro area new orders (cont'd)

- **ECB Monthly Bulletin**

- July 2013 edition; **Box 9** (pages 65-68):
“Introducing the ECB Indicator on Euro Area Industrial New Orders”
<http://www.ecb.europa.eu/pub/pdf/mobu/mb201307en.pdf>
- Statistical Annex, Page S52, Table 5.2.4, col 1-2:

- **ECB Statistics Pocket Book**

- Page S52, Table 3.3
<http://www.ecb.europa.eu/pub/pdf/stapobo/spb201308en.pdf>

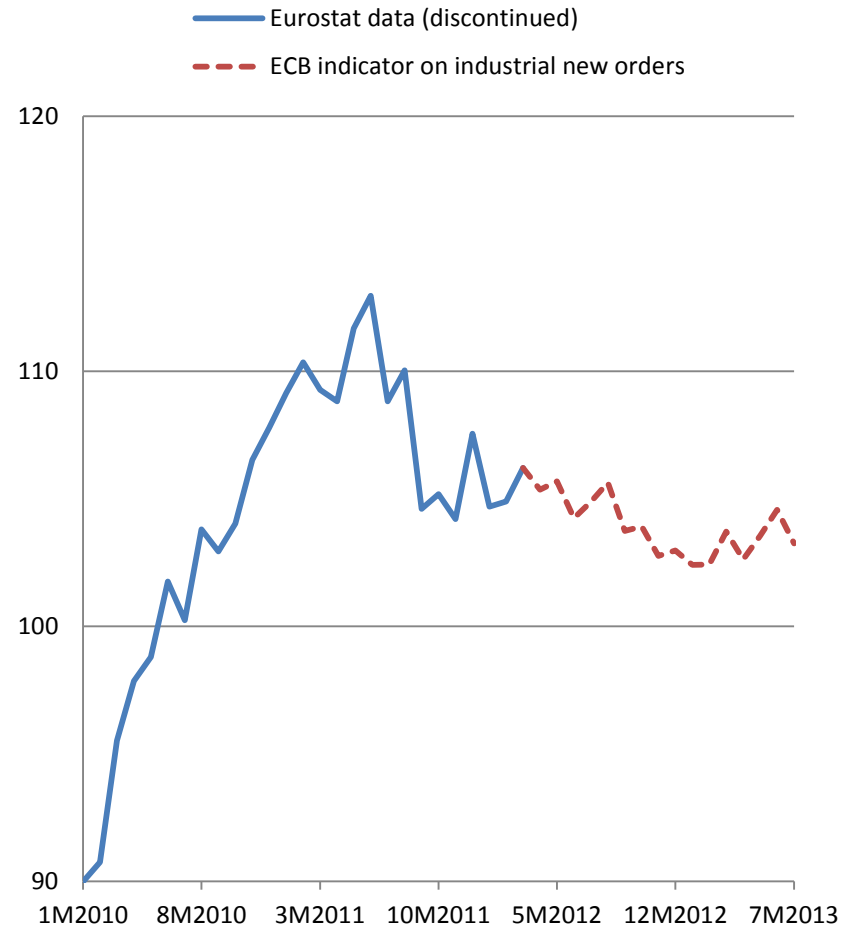
- **ECB Statistical Data Warehouse (SDW)**

- <http://sdw.ecb.europa.eu/browse.do?node=2120800>

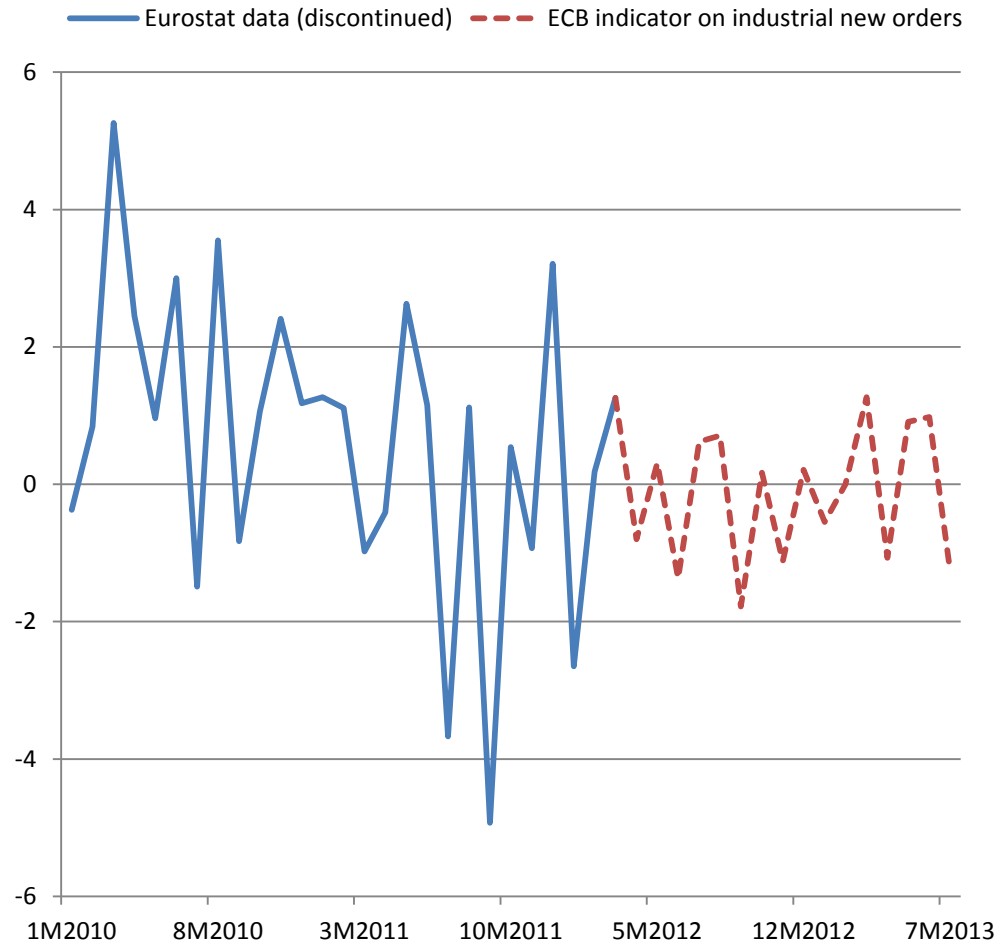
- **Haver Economics:** EUDATA database; code: S025OCNO@EUDATA

2. ECB indicator on euro area new orders (cont'd)

(index, 2010=100; seasonally and working day adjusted)



(month-on-month percentage changes)



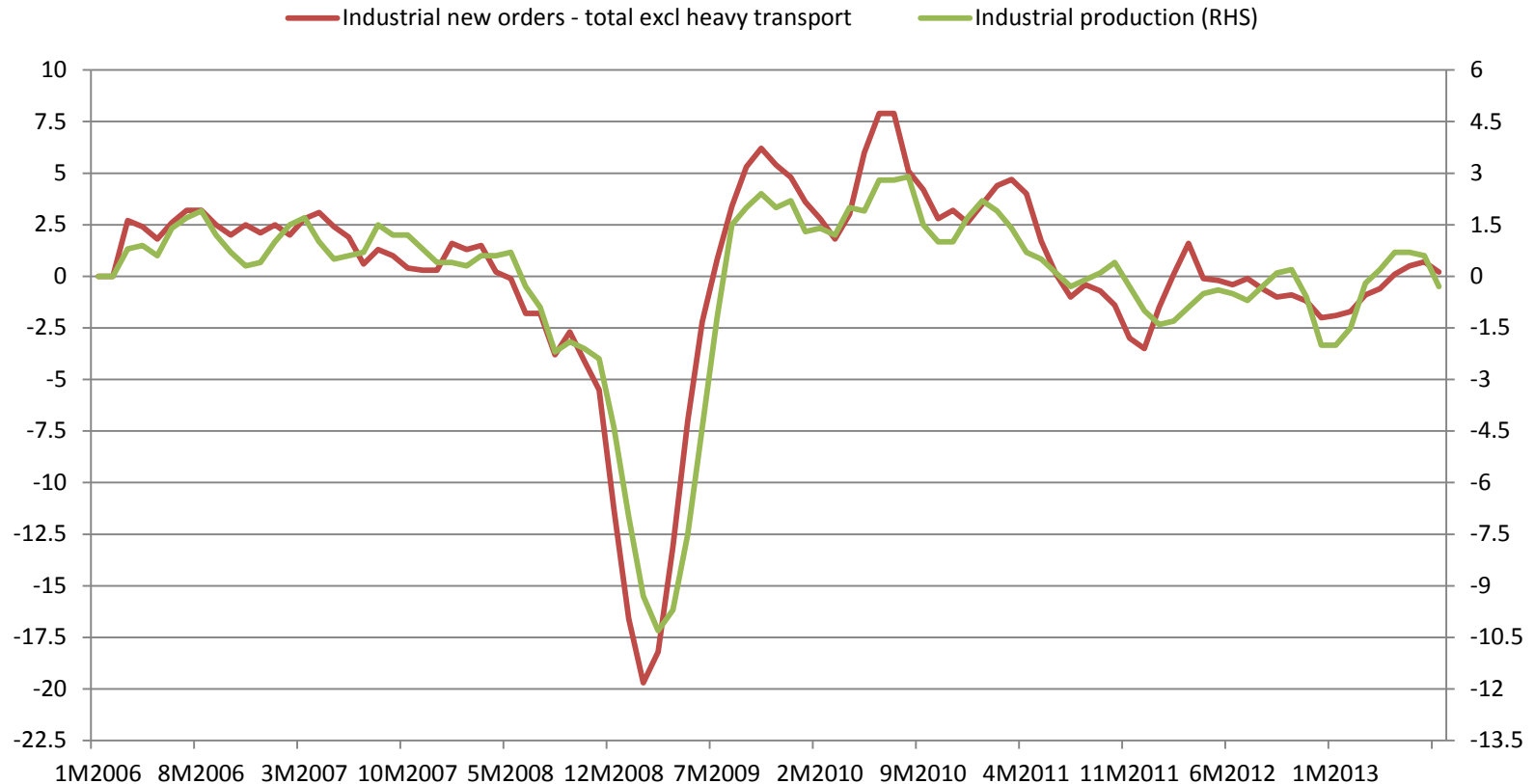
“ECB Experimental statistics based on national data”

2. ECB indicator on euro area new orders (cont'd)

Numerous breakdowns:

- **Total excluding heavy transport equipment**
(NACE Rev2 Division 30; e.g. ships, aircraft, railway)

(3 month-on-3 month percentage changes; seasonally and working day adjusted)

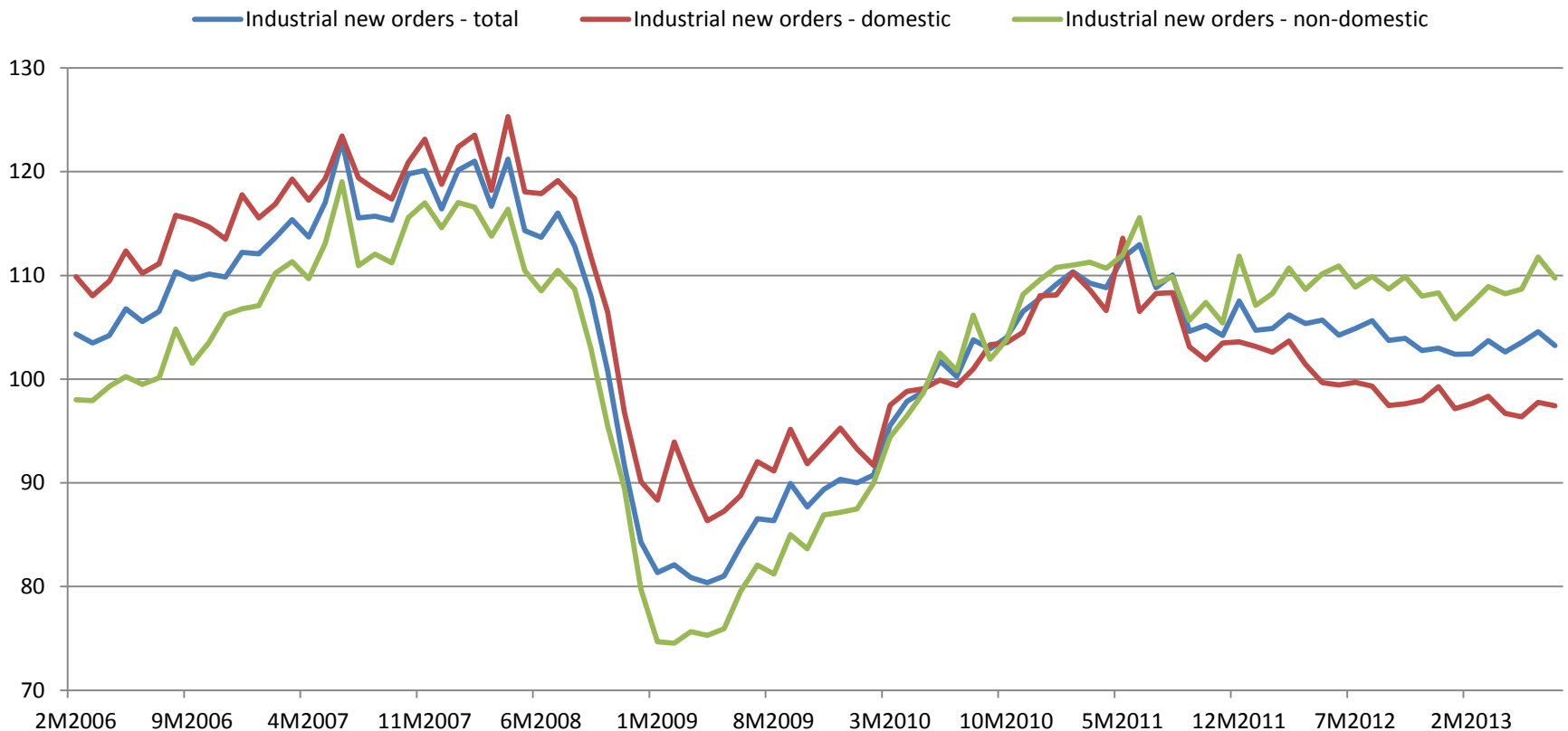


2. ECB indicator on euro area new orders (cont'd)

Numerous breakdowns:

- **By origin of order**
 - **Domestic and non-domestic**

(index 2010=100; seasonally and working day adjusted)

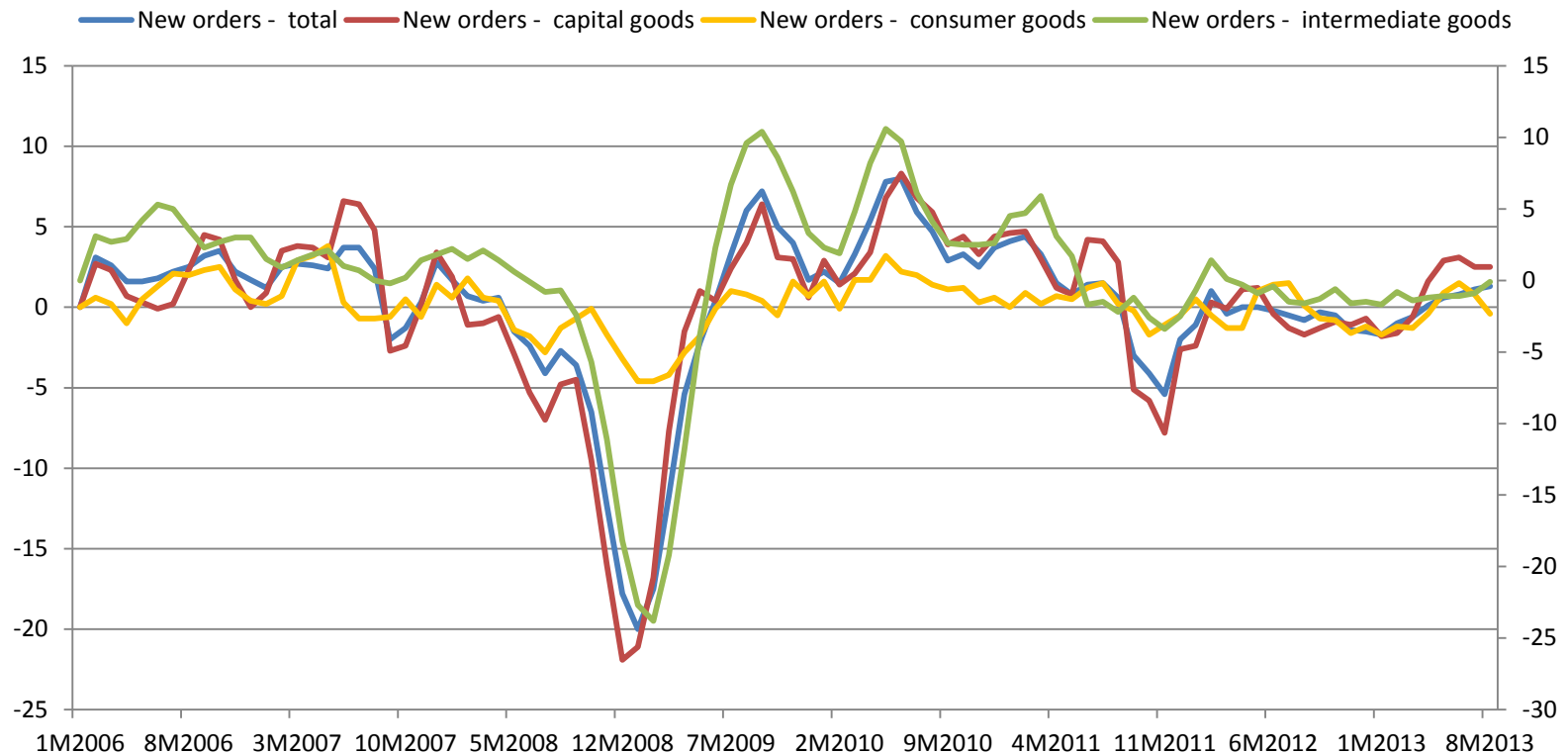


2. ECB indicator on euro area new orders (cont'd)

Numerous breakdowns:

- **By “Main Industrial Groupings”**
 - **Capital Goods, Consumer Goods, Intermediate Goods,**

(3 month-on-3 month percentage changes; seasonally and working day adjusted)



3. Model

- **Lack of theoretical/empirical underpinning:**
agnostic approach
- **Draw from a variety of data sources:** surveys and hard statistics
- **Ensure robustness** across countries and new order subgroupings

3. Model (cont'd)

- **DG ECFIN's survey in manufacturing**
 - “Do you consider your overall order books to be *above normal – normal - below normal?*”
 - Stock concept
- **Purchasing Managers' Survey in manufacturing**
 - “Level of total orders this month compared with one month ago?” *higher – same - lower*
 - Flow concept
- **Eurostat data on industrial turnover**
 - Seasonally adjusted monthly data from all Member States
 - Δ Order books = new orders – sales – ~~cancelled orders~~

3. Model (cont'd)

- **DG ECFIN's survey in manufacturing**

- **Headline survey indicator**
- **Available for all countries**
- **In levels and delta**

- **PMI surveys in manufacturing**

- **Auxiliary survey indicator**
- **Data gap (available only for DE, IE, GR, ES, FR, IT, NL, AT)**
- **In residual levels and delta**
 - $PMI_t = \beta_0 + \beta_1(\Delta_3 ECFIN_t) + \varepsilon_t \rightarrow$ extract residuals
 - $\Delta PMI_t = \beta_0 + \beta_1(\Delta\Delta_3 ECFIN_t) + \varepsilon_t \rightarrow$ extract residuals
- **Capitalise only additional information on top of ECFIN surveys**

3. Model (cont'd)

New orders model:

$$\begin{aligned} NO_t \text{ m-o-m growth} = & \beta_0 + \beta_1 (\Delta_3 ECFIN_t) + \beta_2 (\Delta \Delta_3 ECFIN_t) + \beta_3 (PMI_t \text{ residuals}) + \beta_4 (\Delta PMI_t \text{ residuals}) \\ & + \beta_5 (TO_t \text{ m-o-m growth}) + \beta_6 (TO_{t-1} \text{ m-o-m growth}) + \beta_7 (NO_{t-1} / TO_{t-1}) \\ & + \beta_8 (NO_{t-1} \text{ m-o-m growth}) + \beta_9 (NO_{t-2} \text{ m-o-m growth}) + \varepsilon_t \end{aligned}$$

...where the variables are represented by monthly series:

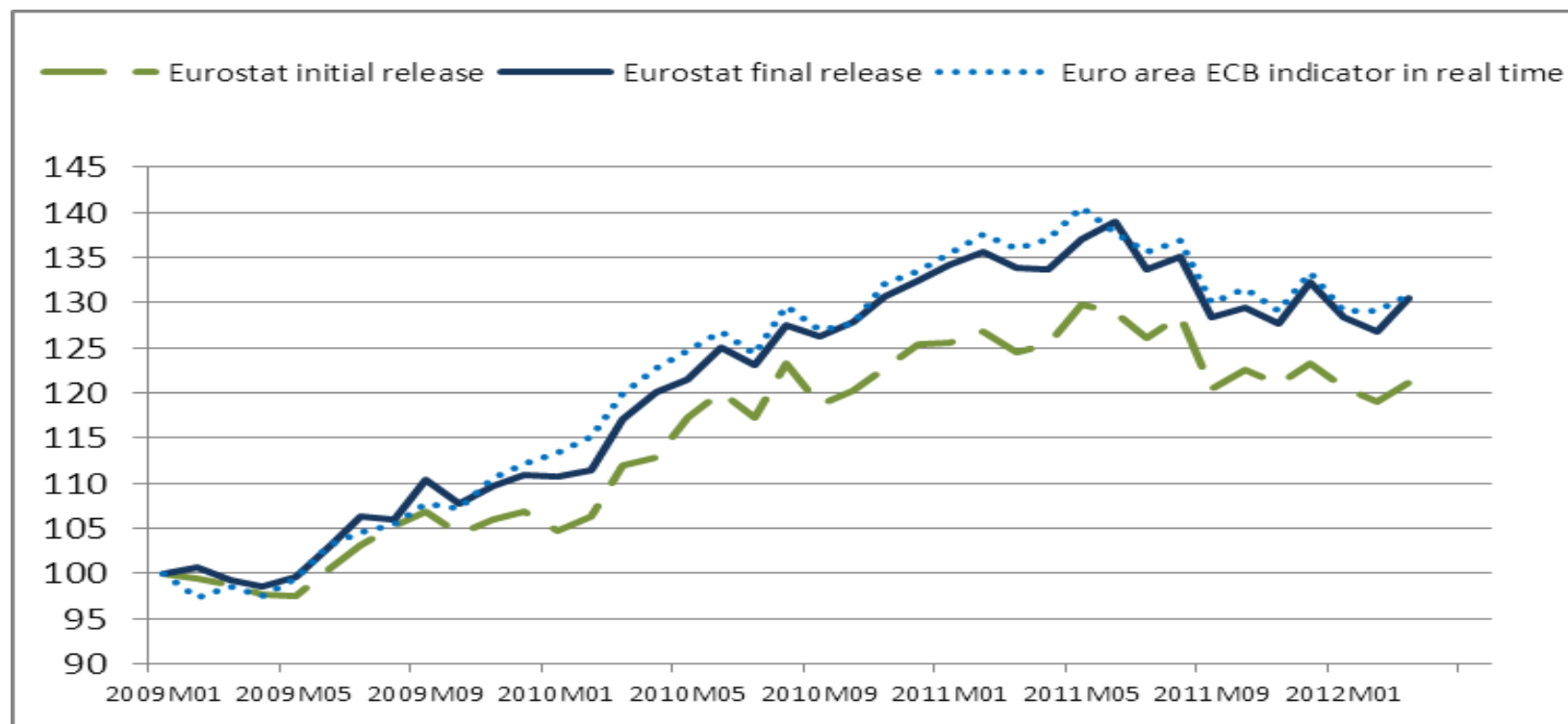
- **NO** – Total manufacturing working to order
- **ECFIN** – Total order book levels
- **PMI** – Purchasing manager index surveys in manufacturing
- **TO** – Total turnover index – manufacturing

4. Results

- All three cohorts of model determinants matter for explaining euro area m-o-m new order growth
- Economically sound coefficients and healthy residual behaviour
- Tailored restriction sets stemming from free estimations
 - *Insignificants at 0*
 - *The sum of turnover variables cannot exceed 1*
- Restrictions jointly tested by the Wald test for statistical viability
- Total new orders: 50% of **m-o-m growth** explained
- Other subgroupings: 30% for capital goods to 70% for intermediate goods
- **Index level:** model explains 98% of variation in new orders
- Out-of-sample forecasts, i.e. model estimated over 5 years to dynamically forecast 10 years, explain 97% of variation

4. Results (cont'd)

- **Real-time exercise** from 2009 onwards (limited real-time data availability)
- **Model re-estimated** once up to Jan. 2009 for all countries that have discontinued the collection of new orders, using historical data vintages instead of final releases
- **Generate one-period ahead forecasts** for Feb.2009-Mar.2012
- **Forecasts aggregated with real-time hard data** of continuing countries
- **ECB indicator** clearly closer to final data than Eurostat initial release



5. Conclusions

- Model proves **robust** across countries, new order subgroupings, frequencies as well as *out-of-sample*
 - Formal checks show that the **ECB indicator leads industrial production** but not vice versa
 - **Important for cross-checking production data**, especially during times with heightened uncertainty
 - ECB indicator provides invaluable information on the **origin of demand**
- ➔ All in all, ECB indicator **important for conjunctural analysis** of the euro area economy

Thanks a lot for your attention!

Questions?