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**Towards a New Version  
of the IMPEC Model**

# Plan of the presentation



Problems of operationalization of IO models



Errors and structural changes



Polish data: hard, soft or ... liquid?



Danger! IMPEC



Conclusions



# Problems of operationalization of io models

Type of equation

output

$$\mathbf{X} = \mathbf{A}\mathbf{X} + \mathbf{Y}$$

price

$$\mathbf{p}^T = \mathbf{p}^T \mathbf{A} + \mathbf{d}^T$$

Type of problem

dynamization

$$\mathbf{X}_t^0 = \mathbf{A}_t^0 \mathbf{X}_t^0 + \mathbf{Y}_t^0$$

$$\mathbf{p}_t^T = \mathbf{p}_t^T \mathbf{A}_t^0 + \mathbf{d}_t^T$$

treatment of imports

$$\mathbf{X}_t^0 = \mathbf{A}_t^0 \mathbf{X}_t^0 + \mathbf{Y}_t^0 - \mathbf{M}_t^0$$

$$\mathbf{p}_t^T = \mathbf{p}_t^T \mathbf{A}_t^{d0} + \mathbf{p}_t^{mT} \mathbf{A}_t^{m0} + \mathbf{d}_t^T$$

classifications of Y & M categories

$$\mathbf{X}_t^0 = \mathbf{A}_t^0 \mathbf{X}_t^0 + \mathbf{B}_t^{C0} \mathbf{c}_t^0 + \mathbf{B}_t^{G0} \mathbf{g}_t^0 + \mathbf{B}_t^{I0} \mathbf{i}_t^0 + \mathbf{B}_t^{E0} \mathbf{e}_t^0 - \mathbf{B}_t^{M0} \mathbf{m}_t^0$$

$$\mathbf{X}_t^0 = \mathbf{A}_t^0 \mathbf{X}_t^0 + \mathbf{B}_t^{Y0} \mathbf{y}_t^0 - \mathbf{B}_t^{M0} \mathbf{m}_t^0$$



## ...continued

Type of problem

availability of **A** and **B** matrices

$$\hat{\mathbf{X}}_t^0 = \mathbf{A}_0 \mathbf{X}_t^0 + \mathbf{B}_0^Y \mathbf{y}_t^0 - \mathbf{B}_0^M \mathbf{m}_t \quad \hat{\mathbf{p}}_t^T = \mathbf{p}_t^T \mathbf{A}_0^d + \mathbf{p}_t^{mT} \mathbf{A}_0^m + \mathbf{d}_t^T$$

$$\mathbf{r}_t^X = \hat{\mathbf{X}}_t^0 - \mathbf{X}_t^0 \quad \mathbf{r}_t^p = \hat{\mathbf{X}}_t^0 - \mathbf{X}_t^0$$

valuation of output & flows

*basic vs. purchasers' prices*

classification of output and flows

*industry & commodity: M&U tables*

source of **A** matrix

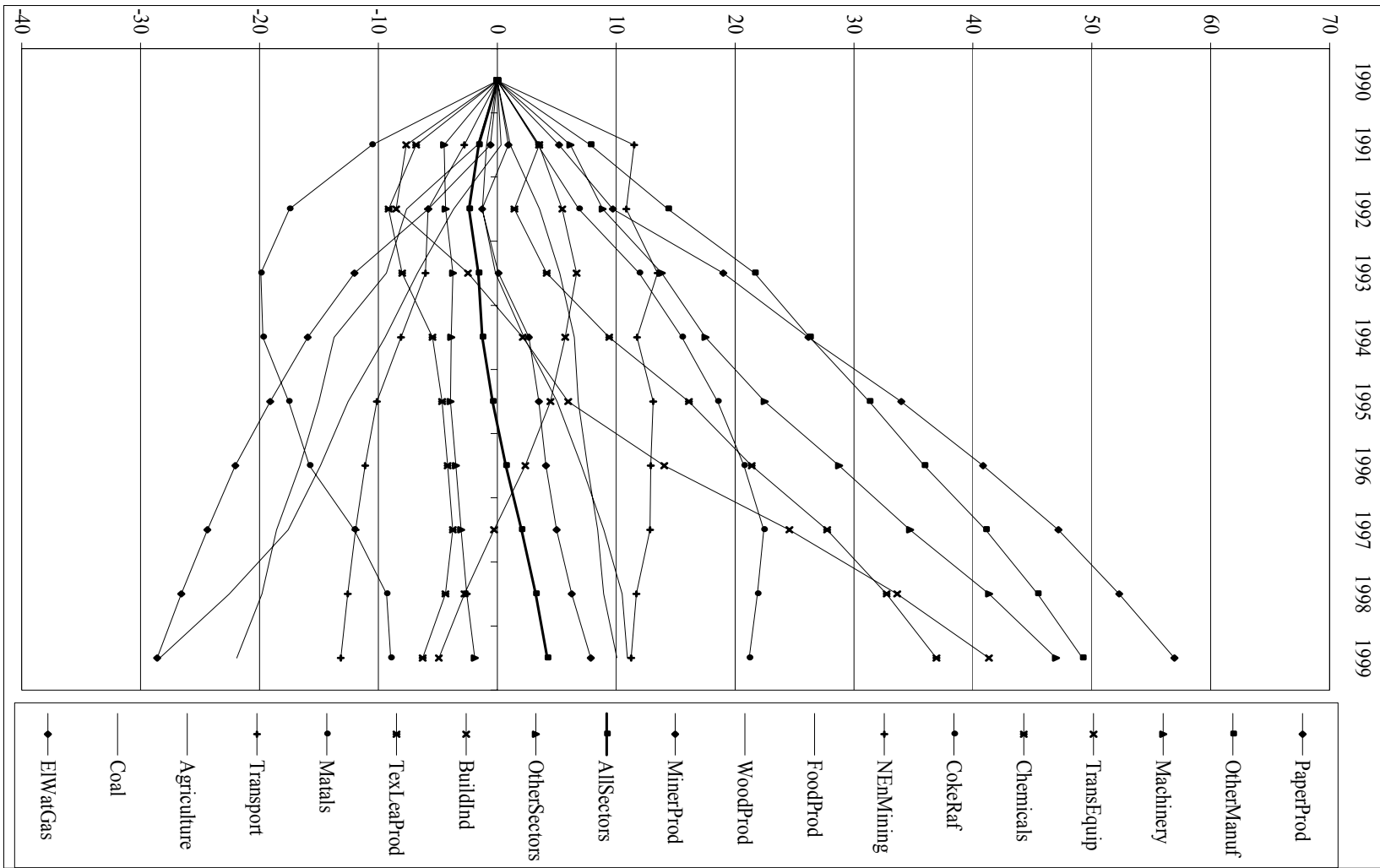
*IO or use table*

consistency of data

*within time series & cross section data*



# “r” as a measure of structural changes





# Polish data : hard, soft or ... liquid?

## IO tables

- 1995 (pp, 57 sectors)
- 2000 (bp, pp, imports, 54 sectors)

## M&U tables

- 1995 – 2004
- 54 industries & commodities

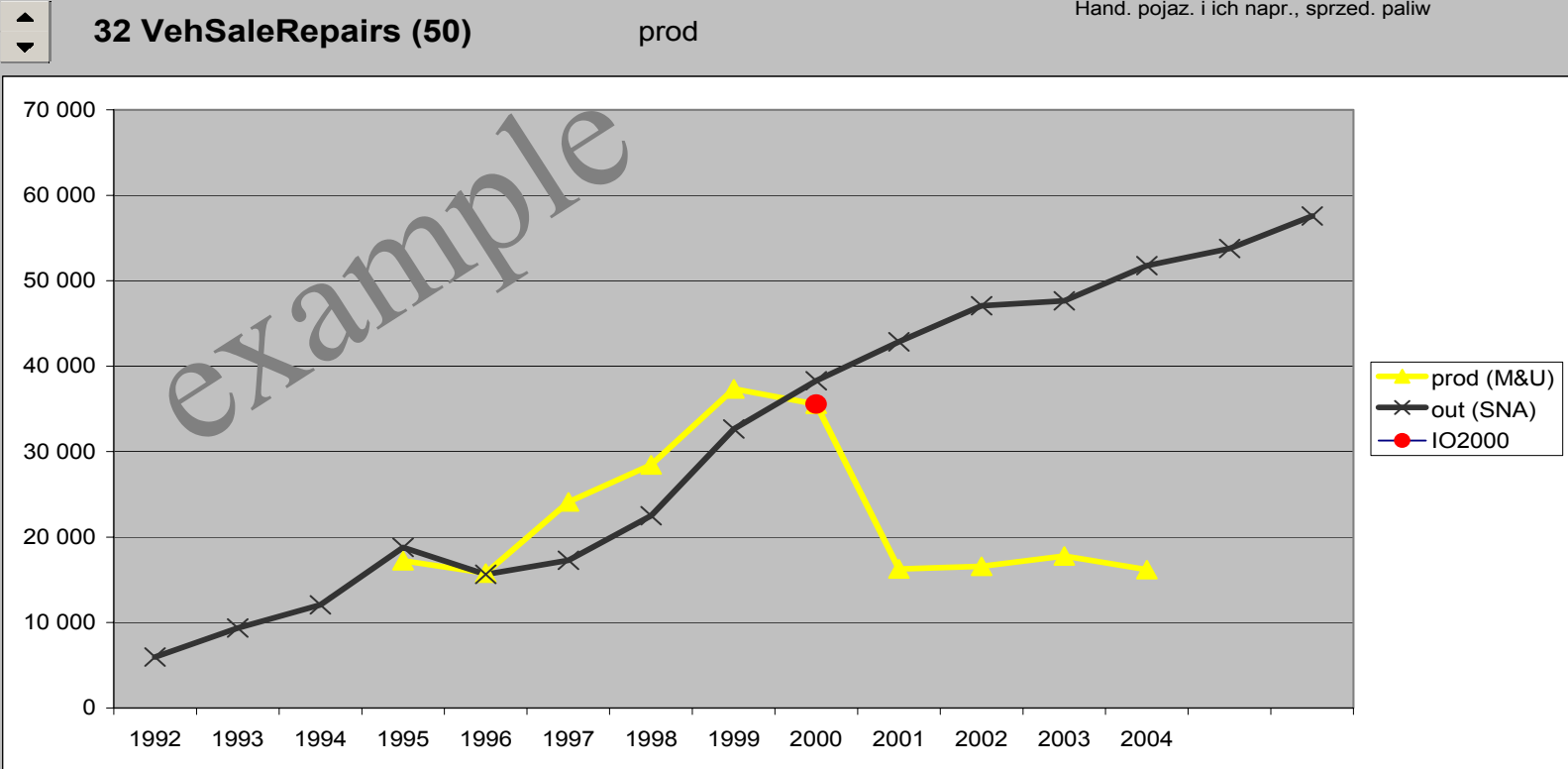
## SNA time series: 1992 - 2006

- output – sections & subsections, by industries, current and constant prices
- va – sections & subsections, by industries, sectors current prices
- fd – time series of totals of fd categories



# Polish data : hard, soft or ... liquid?

- prod – output (make&use tables), current prices, commodity classification
- out – output (SNA time series), current prices, industry classification
- IO2000 – output (IO table 2000), commodity classification





# Polish data : hard, soft or ... liquid?

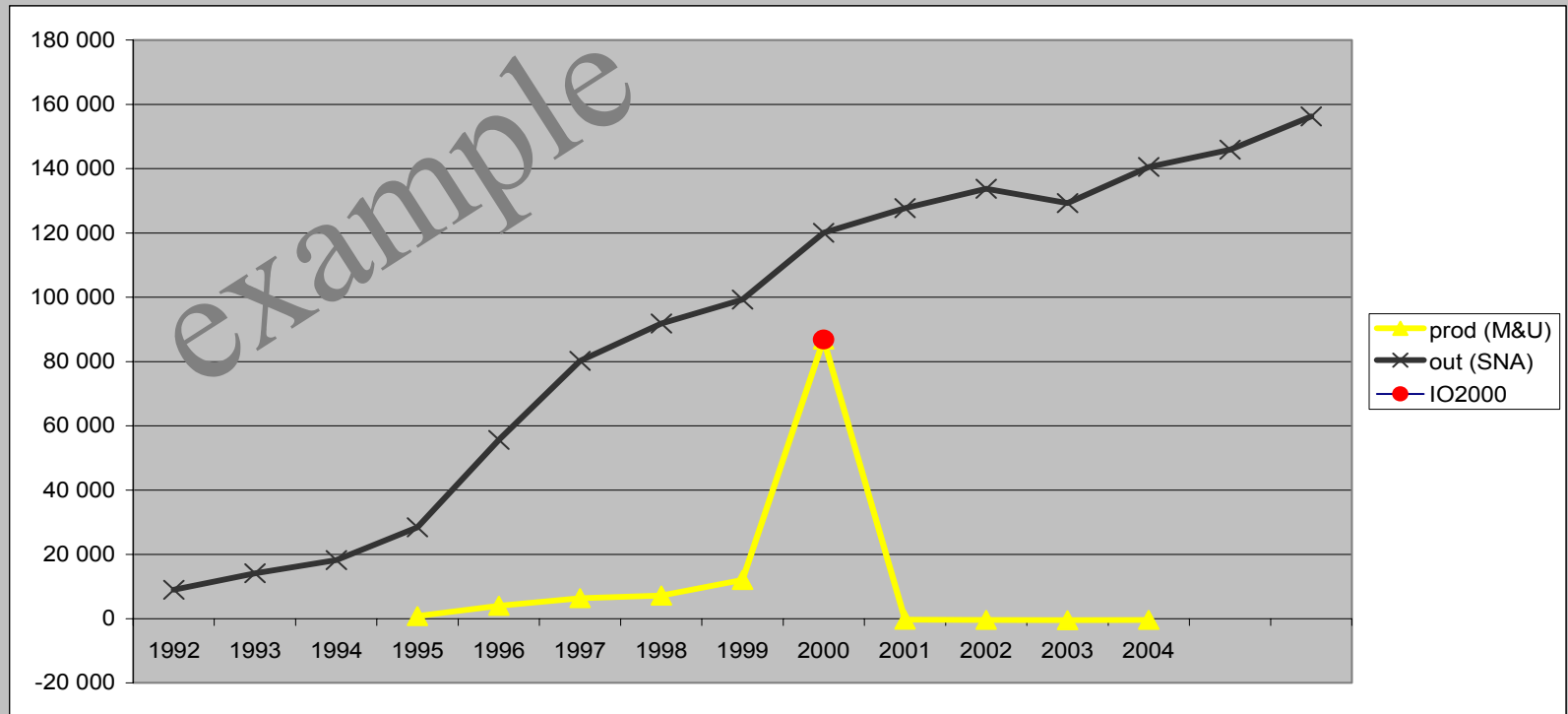
- prod – output (make&use tables), current prices, commodity classification
- out – output (SNA time series), current prices, industry classification
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33 Wholesale (51)

prod

Handel hurtowy i komisowy

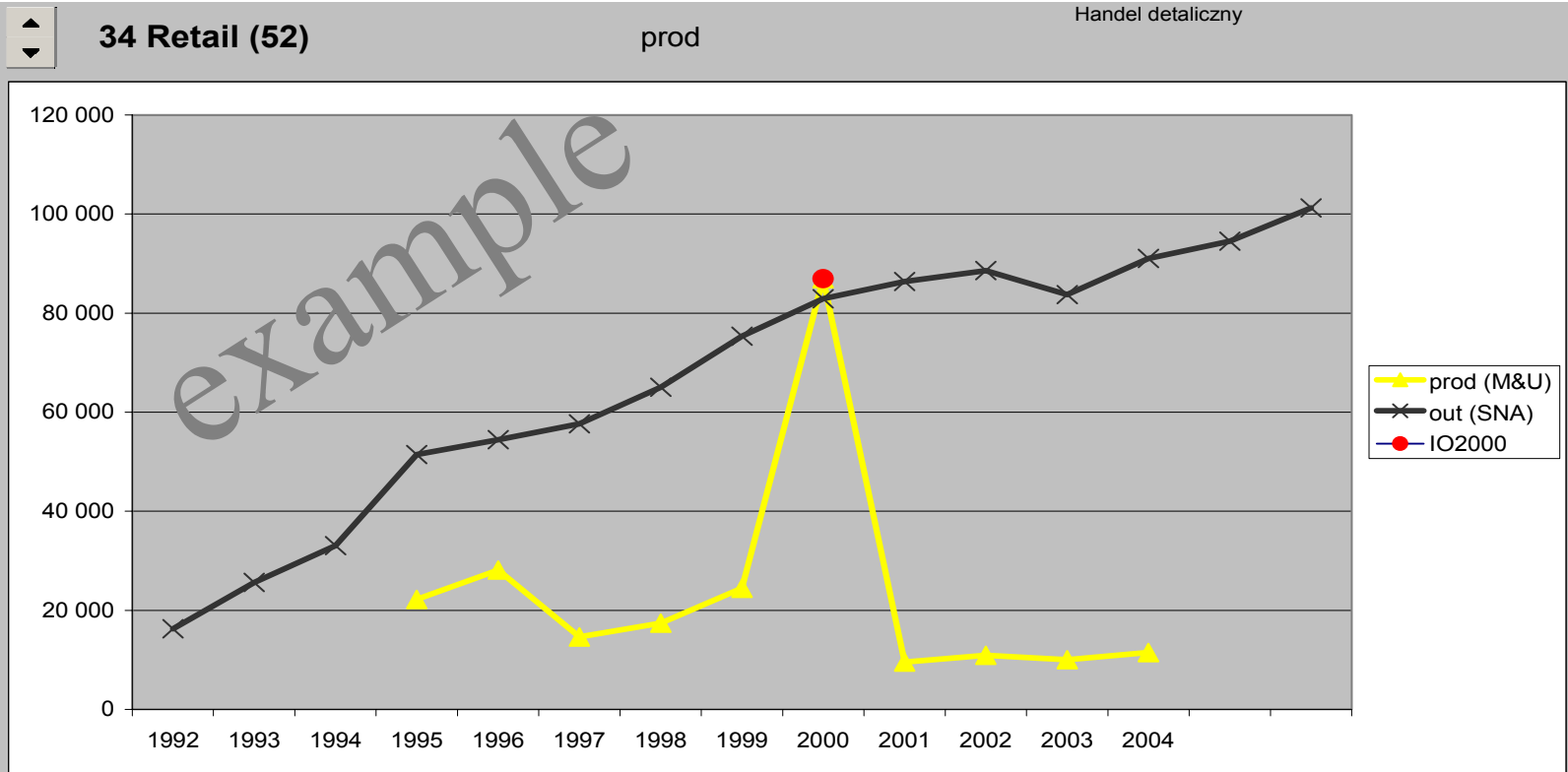






# Polish data : hard, soft or ... liquid?

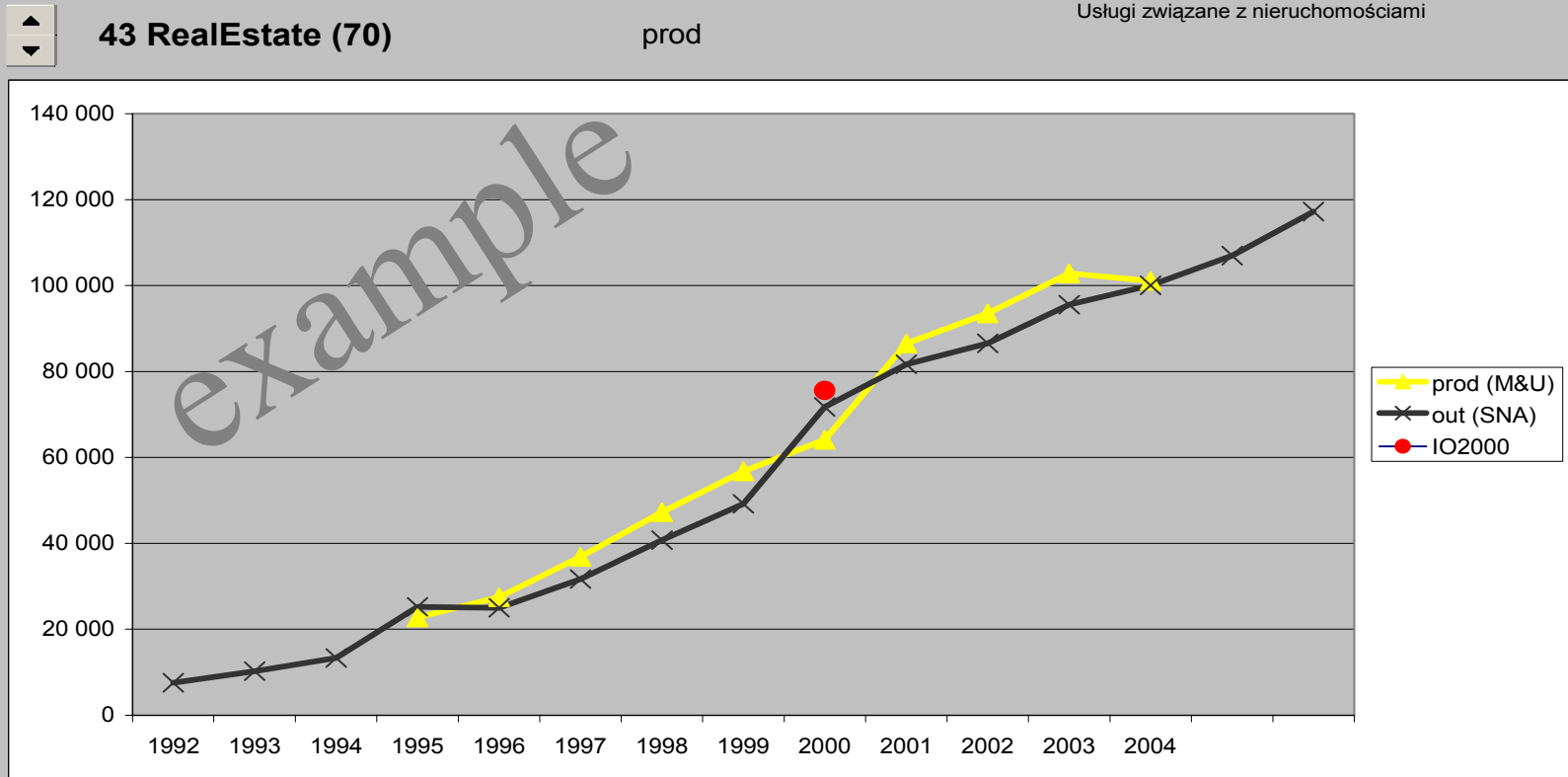
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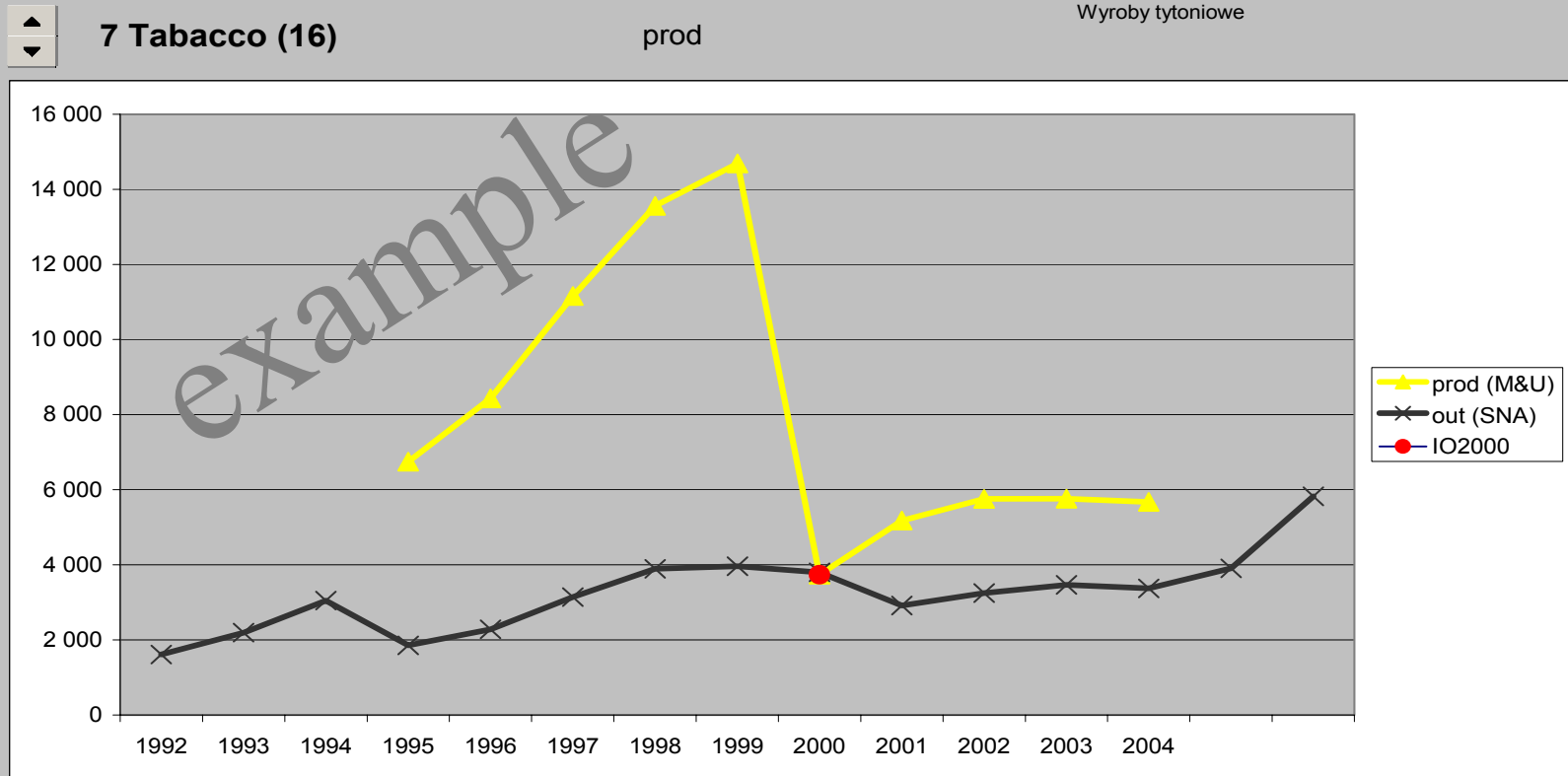
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# Polish data : hard, soft or ... liquid?

- prod – output (make&use tables), current prices, commodity classification
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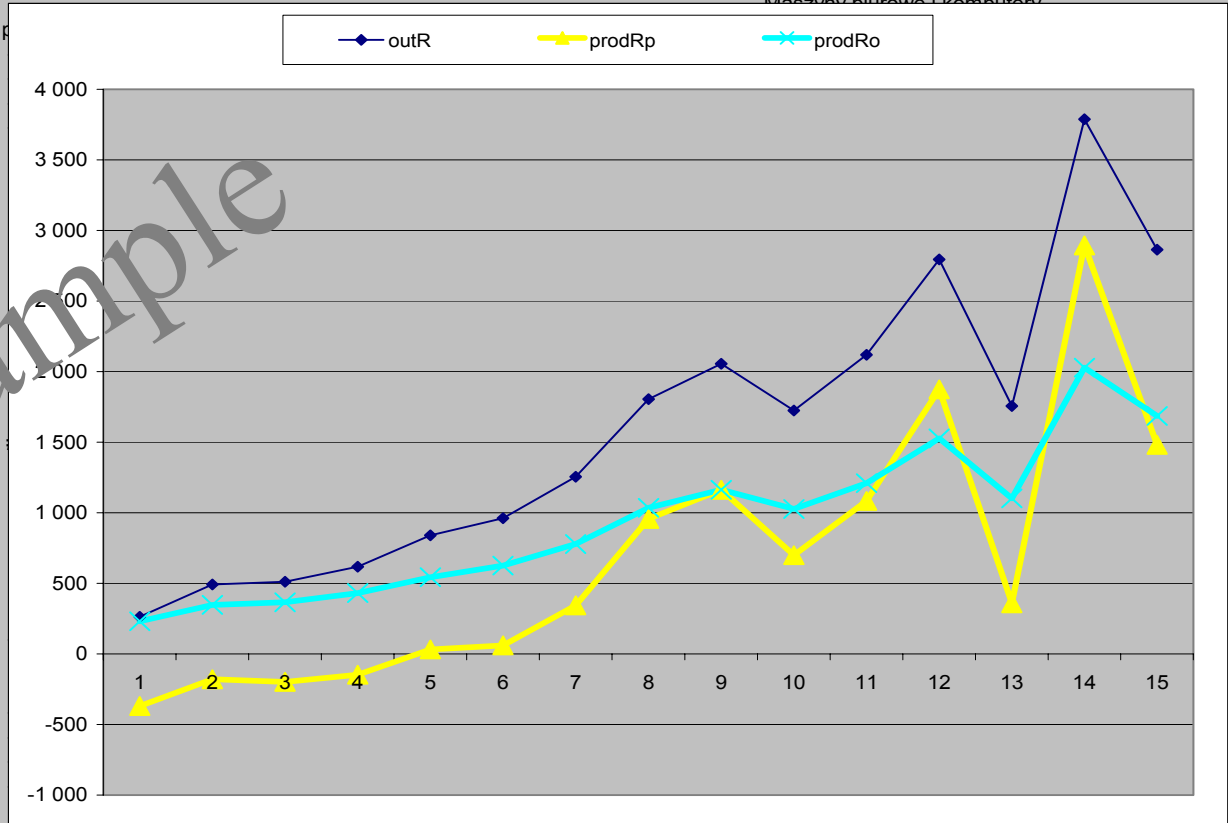
# IMPEC



outR – output, constant prices, industry classification  
 prodRp – estimated output (with use of make matrix – method I), constant prices, commodity classification  
 prodRo – estimated output (with use of make matrix – method II), constant prices, commodity classification

## 21 OffMachComp (30)

| 21   | outR  | outVR | prodRp | prodRo |
|------|-------|-------|--------|--------|
| 1992 | 264   | 264   | -368   | 231    |
| 1993 | 492   | 492   | -179   | 348    |
| 1994 | 512   | 512   | -198   | 365    |
| 1995 | 618   | 618   | -147   | 430    |
| 1996 | 840   | 840   | 31     | 544    |
| 1997 | 962   | 962   | 61     | 625    |
| 1998 | 1 255 | 1 255 | 344    | 778    |
| 1999 | 1 805 | 1 805 | 956    | 1 035  |
| 2000 | 2 056 | 2 056 | 1 163  | 1 163  |
| 2001 | 1 725 | 1 725 | 700    | 1 027  |
| 2002 | 2 120 | 2 120 | 1 085  | 1 210  |
| 2003 | 2 796 | 2 796 | 1 874  | 1 526  |
| 2004 | 1 756 | 1 756 | 359    | 1 100  |
| 2005 | 3 789 | 3 789 | 2 894  | 2 029  |
| 2006 | 2 865 | 2 865 | 1 820  | 1 636  |



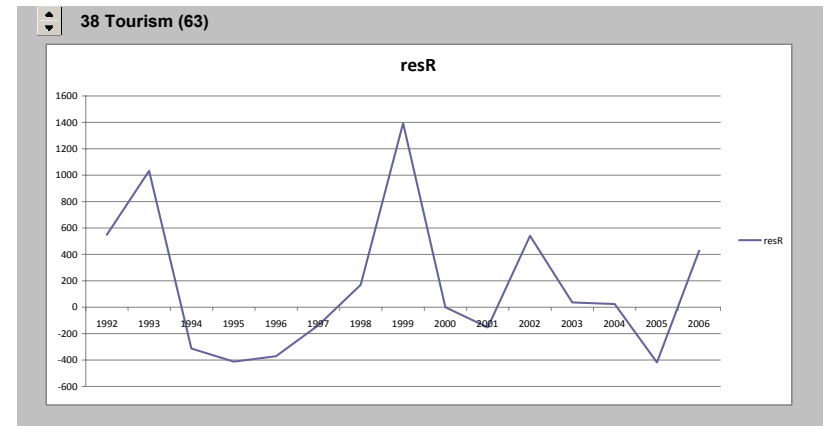
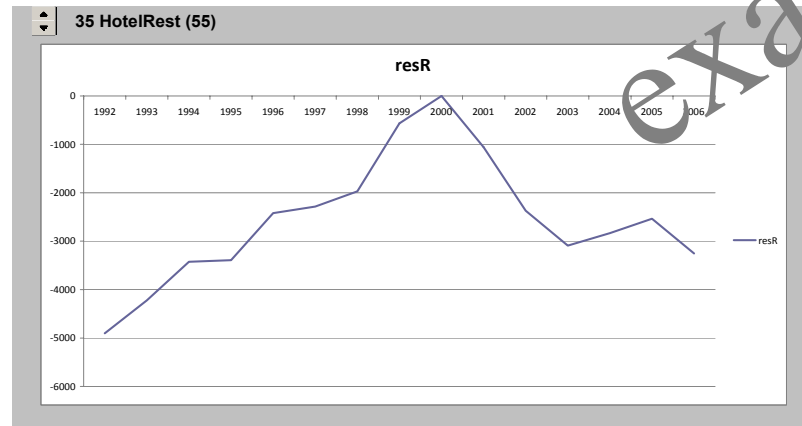
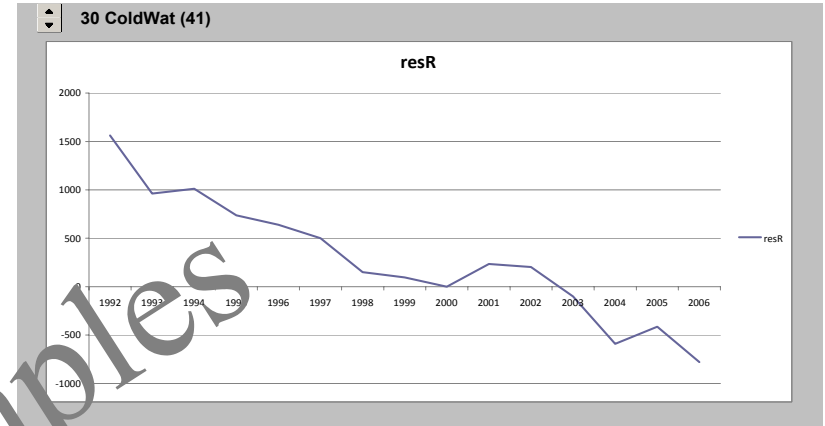
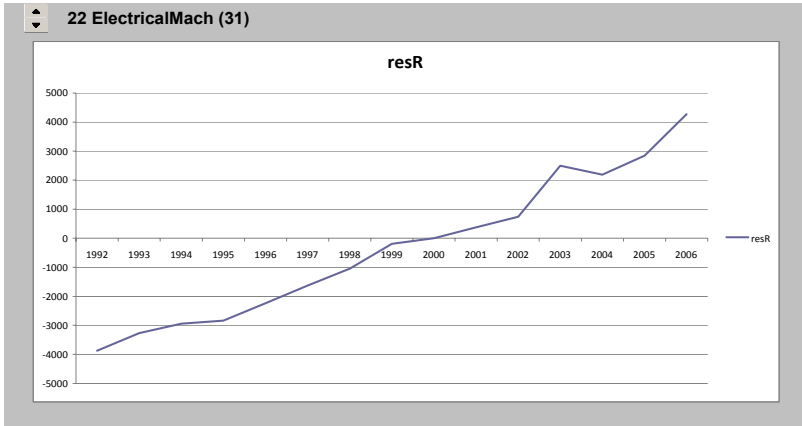


# IMPEC



## Illustration of resR time series

resR – deviations - „r” - real side, commodity classification, actual output estimated with method II



examples



# IMPEC



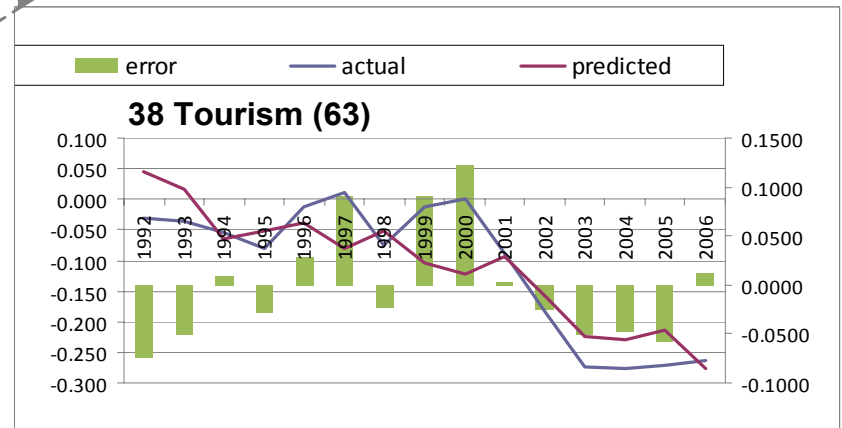
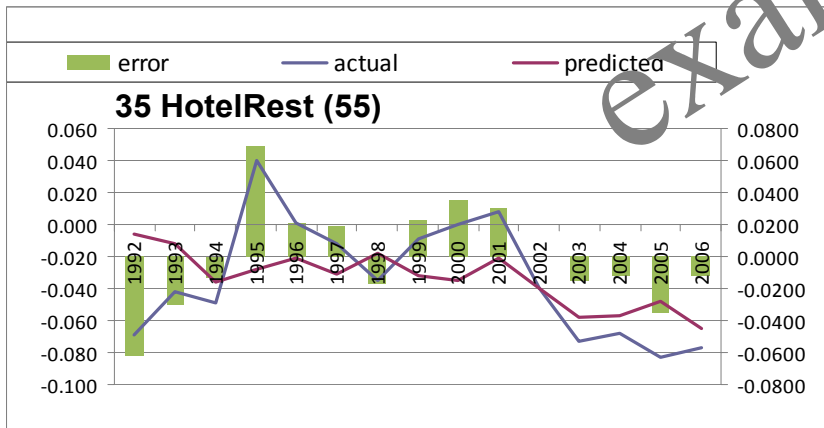
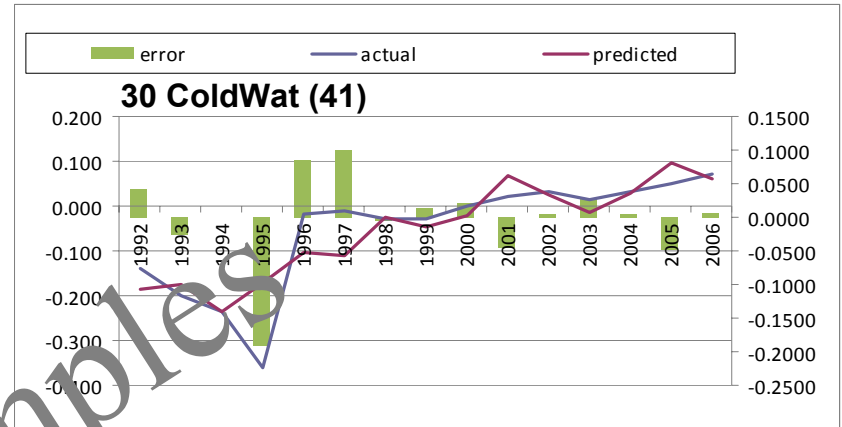
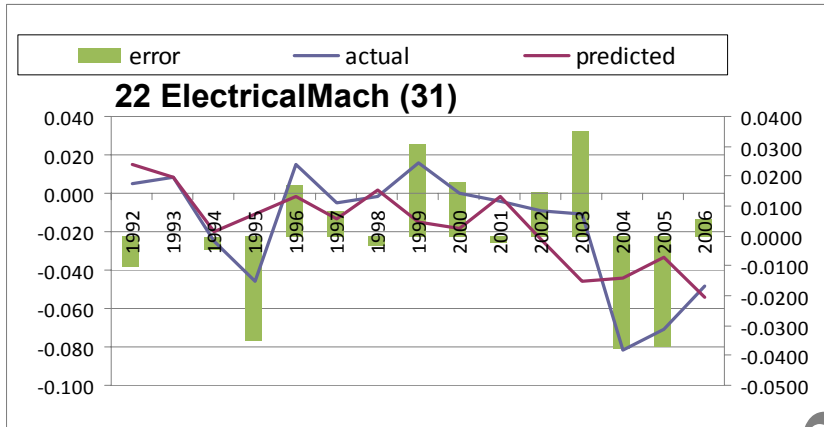
## Illustration of of resP regression results

resP

– deviations - „r” – price side, commodity classification, actual prices estimated with method II

Regressors

– time trend and relative imprt price for a given sector





# Conclusions

- Problems of operationalization of IO models are connected with the framework of national accounts and data availability
- Deviations („r”) deliver useful information on structural changes which can be used in models to lessen forecast errors
- Polish data include most information necessary to build fairly disaggregated, sophisticated model but...
- quality of some of the data is questionable
- Mathematical methods used to transform data from one classification to another should be used carefully, because they can produce senseless results