



Indicators for evaluating  
international performance  
in service sectors



# **Measuring the productivity of the Healthcare sector: Theory and Implementation**

**Antonia Huttli (TARKI), Matilde Mas (IVIE), Agnes Nagy  
(TARKI), Guldem Okem (CEPS), Mary O'Mahony  
(BHAM), Erica Schulz (DIW) and Lucy Stokes (NIESR)**

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# Measuring the productivity of the Healthcare sector

- Approach consistent with:
  - OECD Handbook
  - Atkinson Review
  - Dawson et al. (2005)
- Quality adjusted volume measure of output relative to volume of inputs
- ‘The devil is in the detail’

# Implementation

Requires:

- data on volumes of activities
- data on unit costs of activities
- information to adjust for quality e.g. waiting times, survival rates
- Data on inputs by type

# Output Measures

Cost weighted output index:

$$I = \sum_{j=1}^J \frac{x_{jt+1} c_{jt}}{x_{jt} c_{jt}}$$

Where  $x_{jt}$  is the volume of output  $j$  in period  $t$ , and  $c_{jt}$  is the unit cost of output  $j$  in period  $t$ .

In practice use activities rather than complete treatments

# Types of health service

- inpatient care
- outpatient care
- mental health services
- community services
- primary care
- and other activities, such as accident and emergency and dialysis services.

## International Data Sources (OECD, Eurostat, WHO etc.)

- Use International Classification of Disease (ICD)
- Data on hospital discharges, length of stay, day cases (by age and gender)
- But no unit costs
- International sources more useful for inputs

# National Sources

Estimates for 4 countries, Germany, Hungary, Spain and UK

## Hospital Activity

- Diagnosis Related Groups (DRG)
  - List varies by country
- Estimates of unit costs
  - Methods vary by country
- Survival Rates (in hospital)

## Non-Hospital Activity

- Types vary by country

# Issues in Implementation

- Matching DRG data across time
  - Problem for all countries
  - usually division of existing groups but some changes in activities
  - Most acute for Germany, frequent changes in listed activities compounded by migration of patients across groups, even if no change in activity description



# DRG Migrations Germany

<b>DRG 2008</b>	<b>DRG2009</b>	<b>DRG 2008</b>	<b>DRG2009</b>
<b>A07A</b>	<b>A07A</b>	<b>A09C</b>	<b>A09C</b>
<b>A07A</b>	<b>A07B</b>	<b>A09C</b>	<b>A09E</b>
<b>A07A</b>	<b>A07C</b>	<b>A09C</b>	<b>A09F</b>
<b>A07A</b>	<b>A07D</b>	<b>A09C</b>	<b>A09G</b>
<b>A07A</b>	<b>A07E</b>	<b>A09C</b>	<b>B36A</b>
		<b>A09C</b>	<b>F36A</b>
		<b>A09C</b>	<b>G36Z</b>
		<b>A09C</b>	<b>R36Z</b>

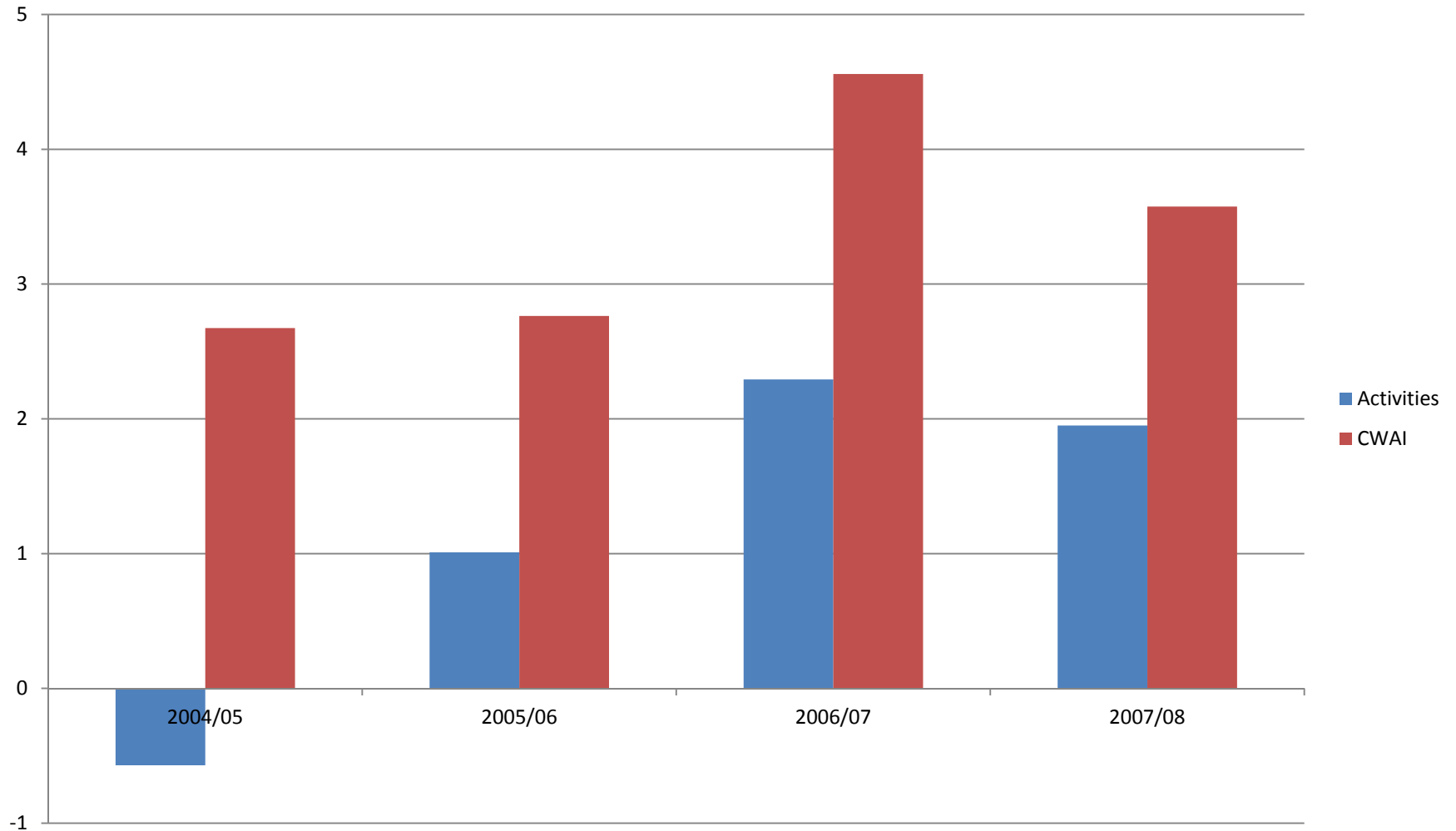
# Issues in Implementation

- Method
  - For Germany had access to microdata to allow reclassification
  - Other countries, aggregations for adjacent years to achieve match
- Missing unit costs for many activities
  - Especially non-hospital
  - Important to cover all activity

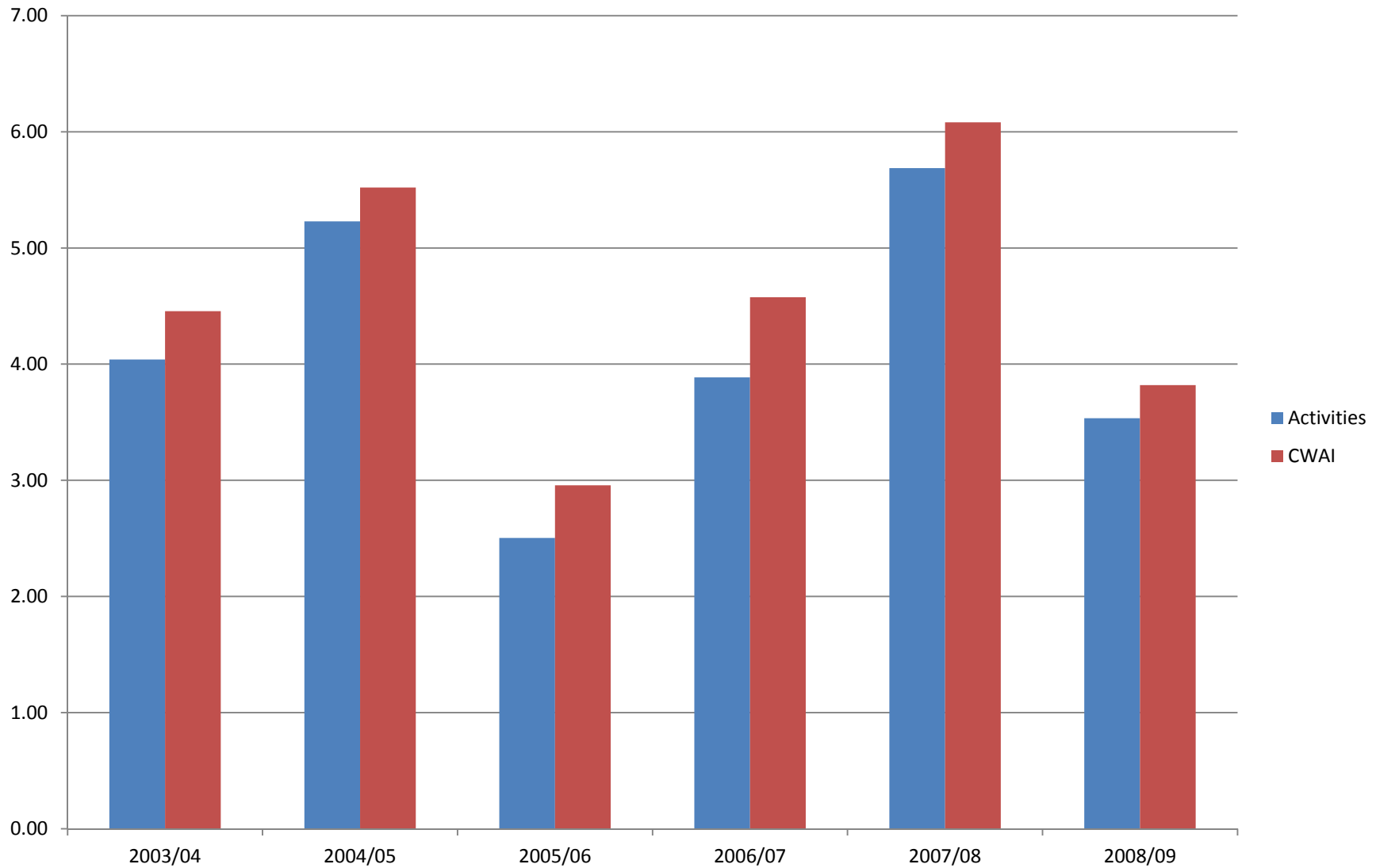
Some preliminary results:

**Not for citation**

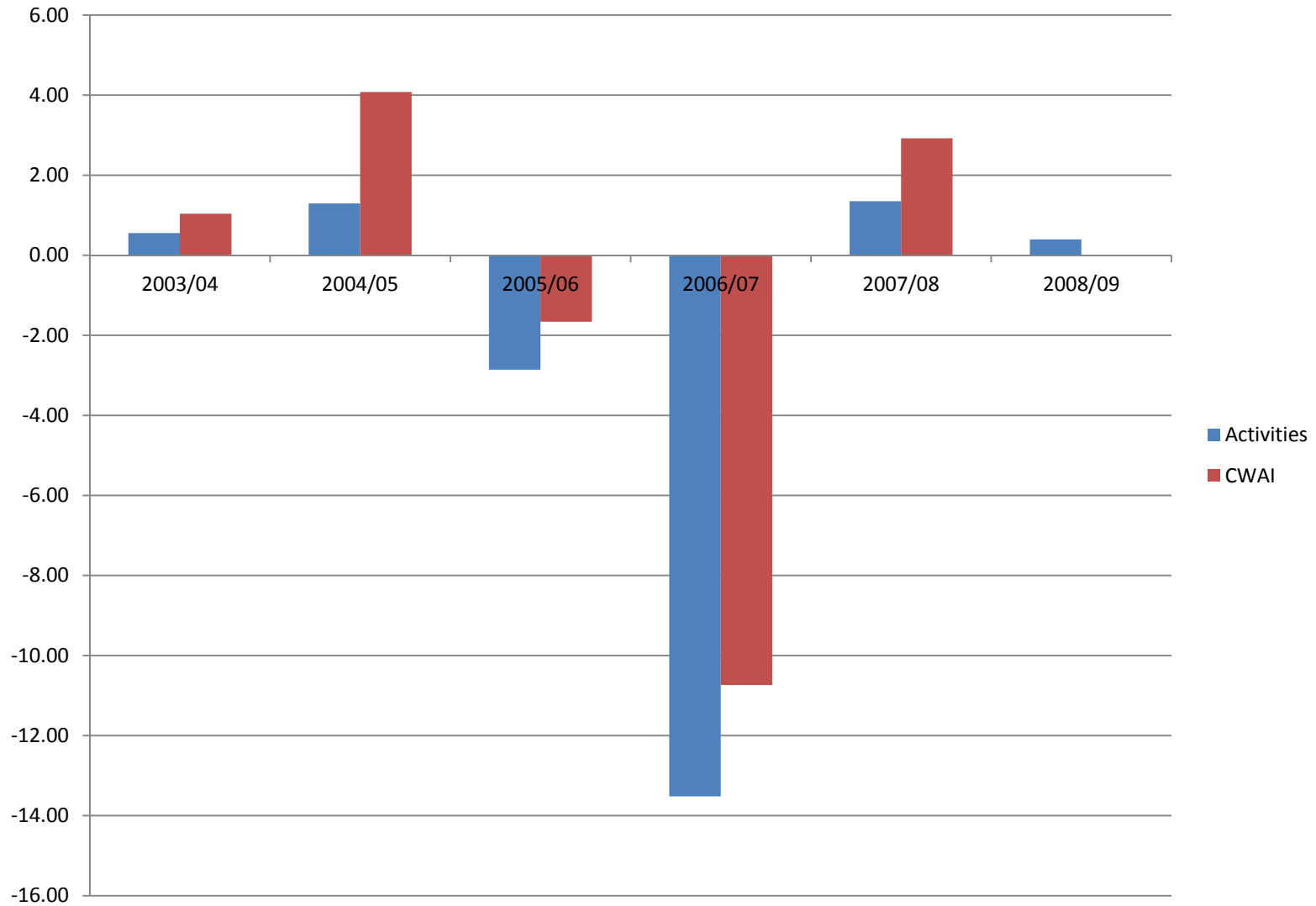
# Hospital inpatient growth: Germany



# Hospital inpatient growth: UK



# Hospital inpatient growth: Hungary



# Output measures: quality adjusted

Cost weighted output index adjusted for survival:

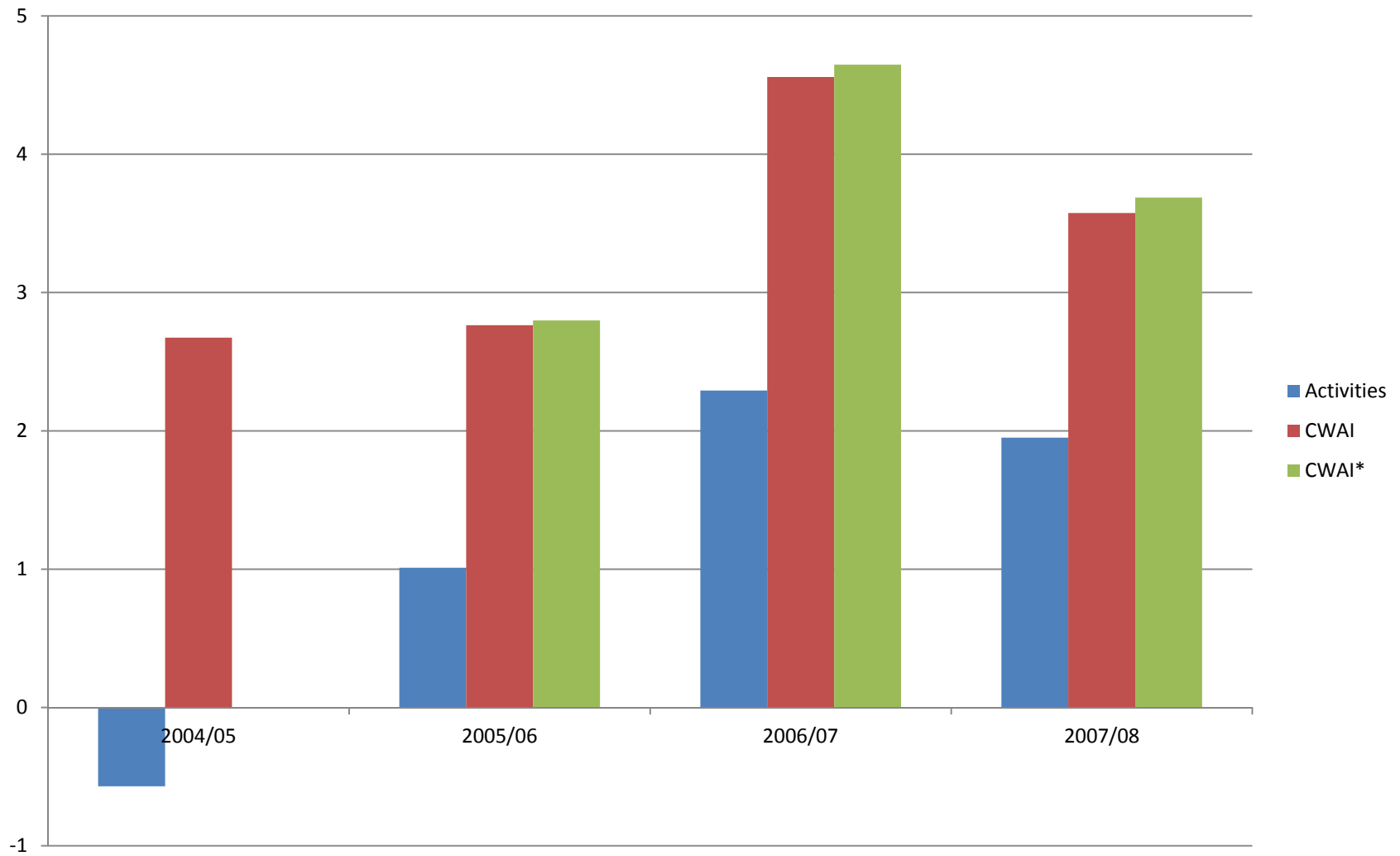
$$\frac{\sum_j x_{jt+1} \left( \frac{a_{jt+1}}{a_{jt}} \right) c_{jt}}{\sum_j x_{jt} c_{jt}}$$

Where  $a_{jt}$  is the survival rate

Dawson et al. also included a refinement for patients who died to account for positive expected quality of life had they not received treatment

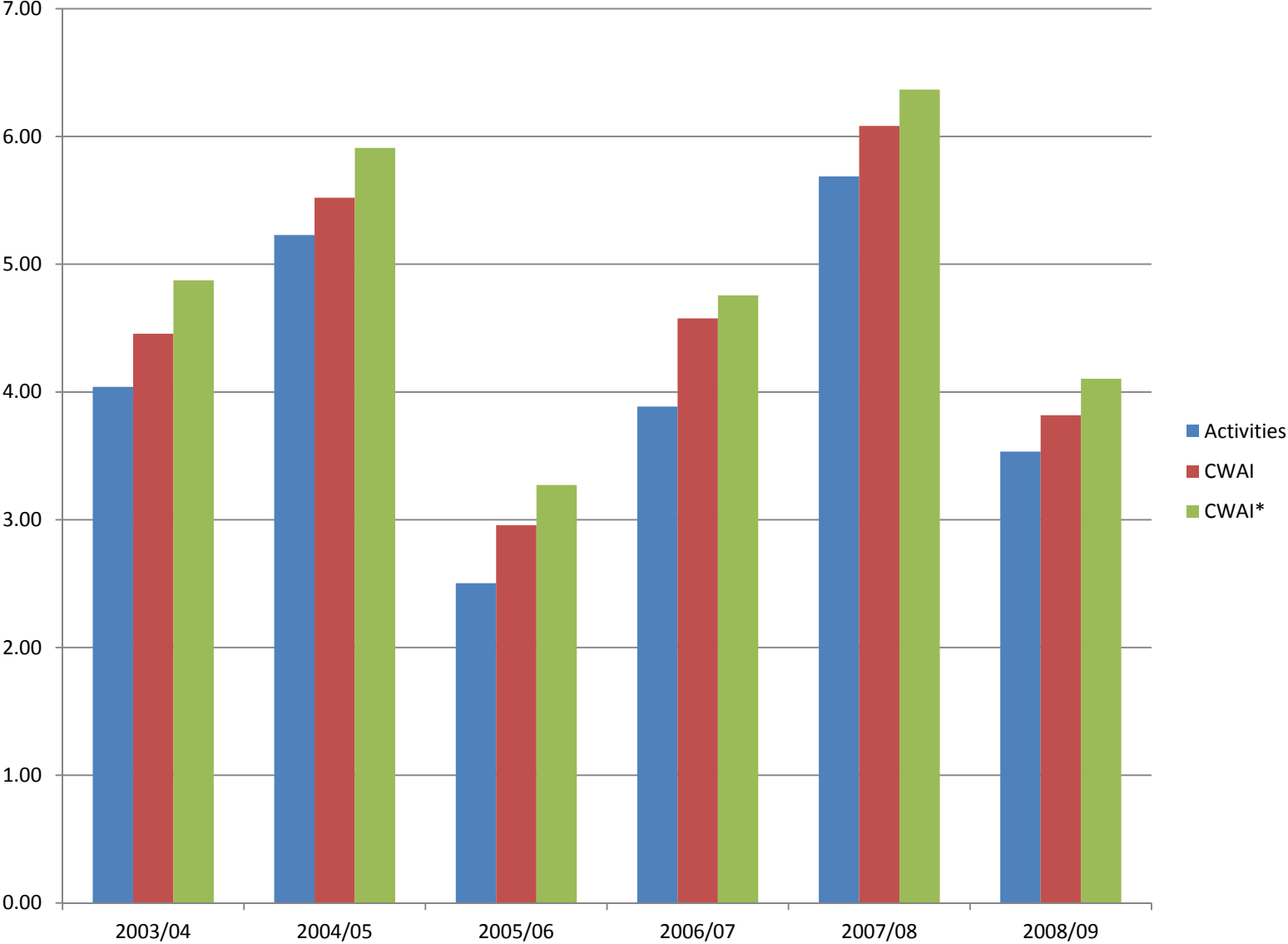
And an adjustment for reduced waiting times

# Hospital inpatient growth: Germany

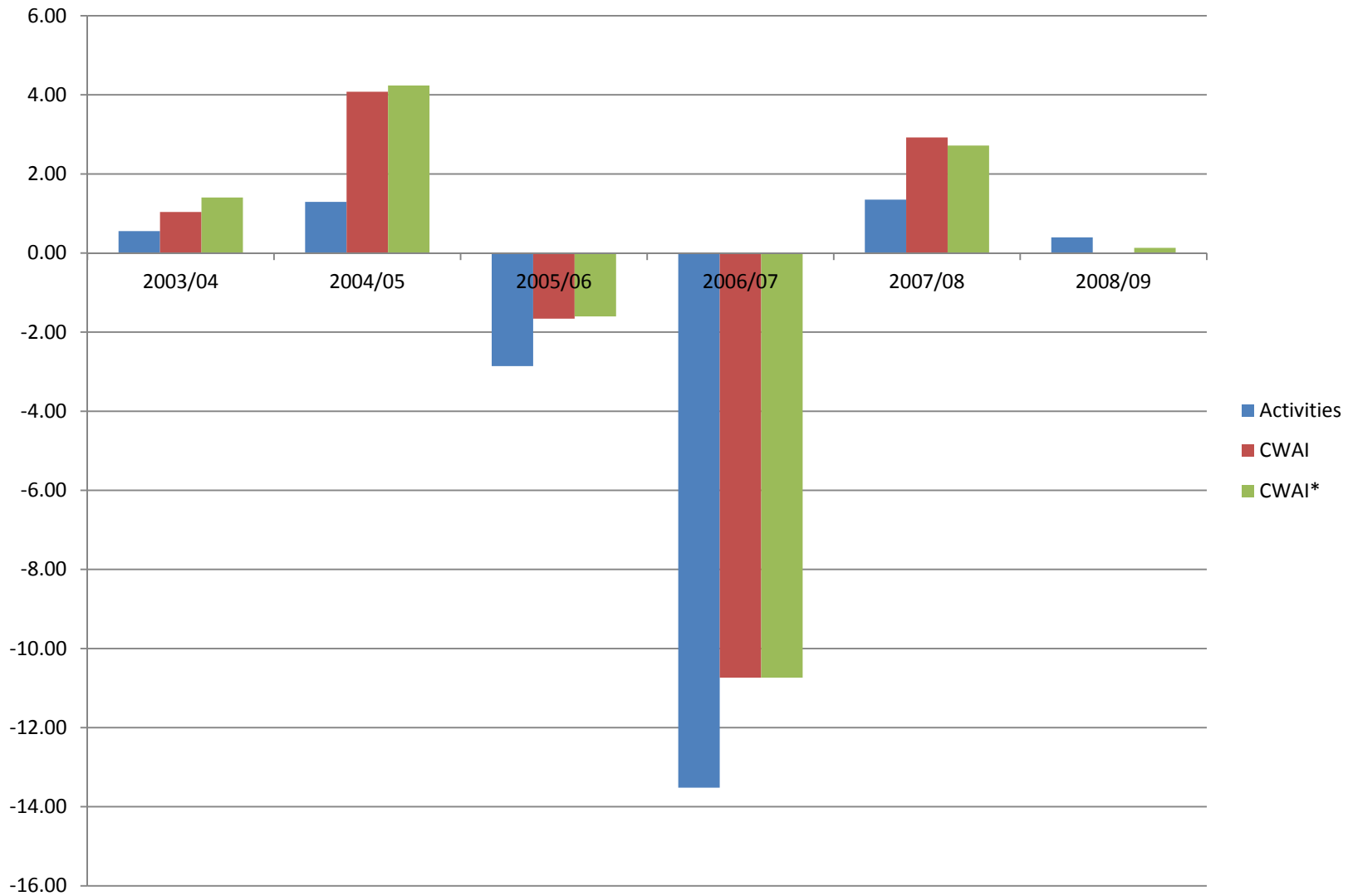




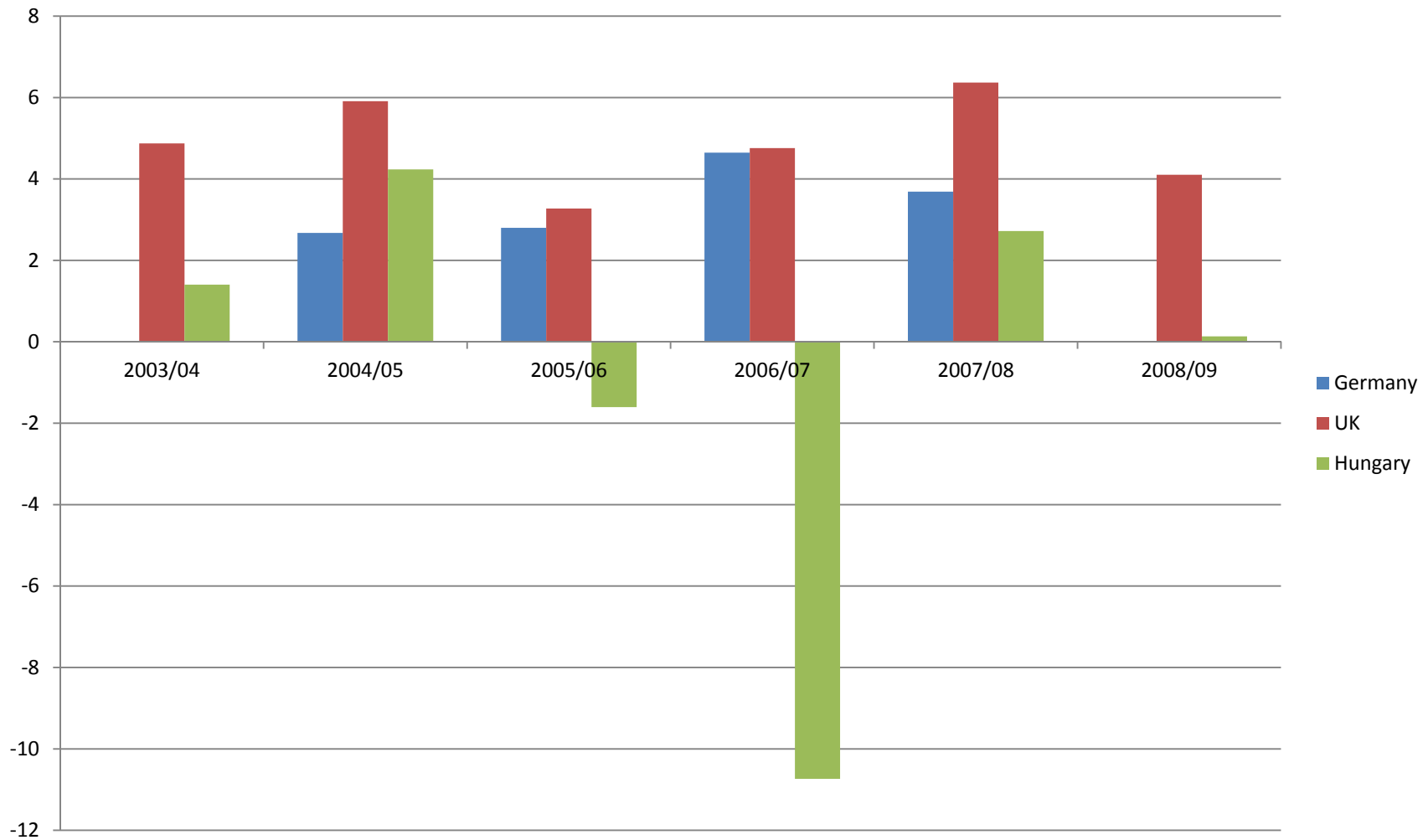
# Hospital inpatient growth: UK



# Hospital inpatient growth: Hungary



# Hospital Inpatient growth



# Input Measures

KLEMS approach

Labour input

distinguish occupations and characteristics (gender, age, skill)

Capital Input

Distinguish high tech medical equipment

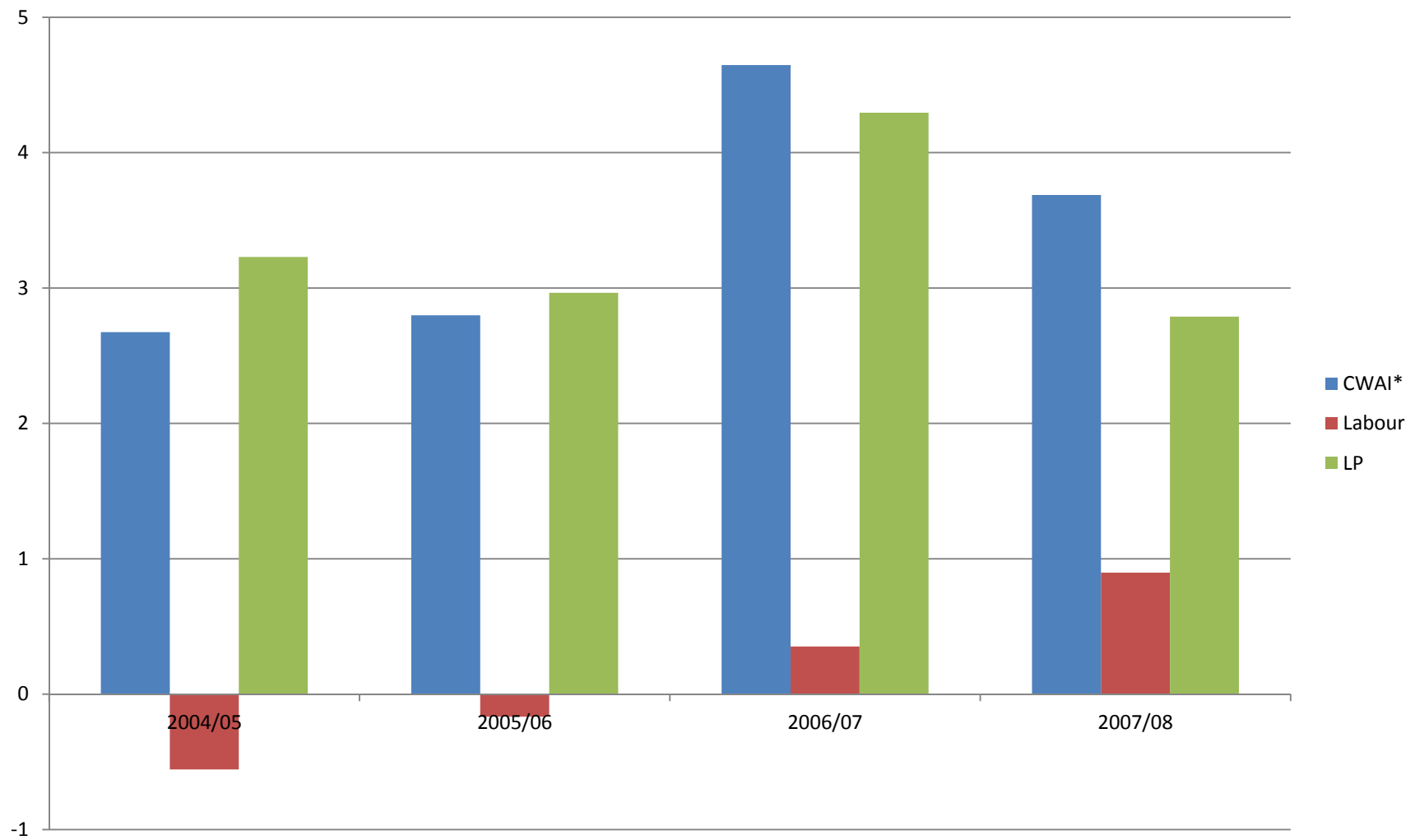
Intermediate Input

Distinguish drugs from other intermediates

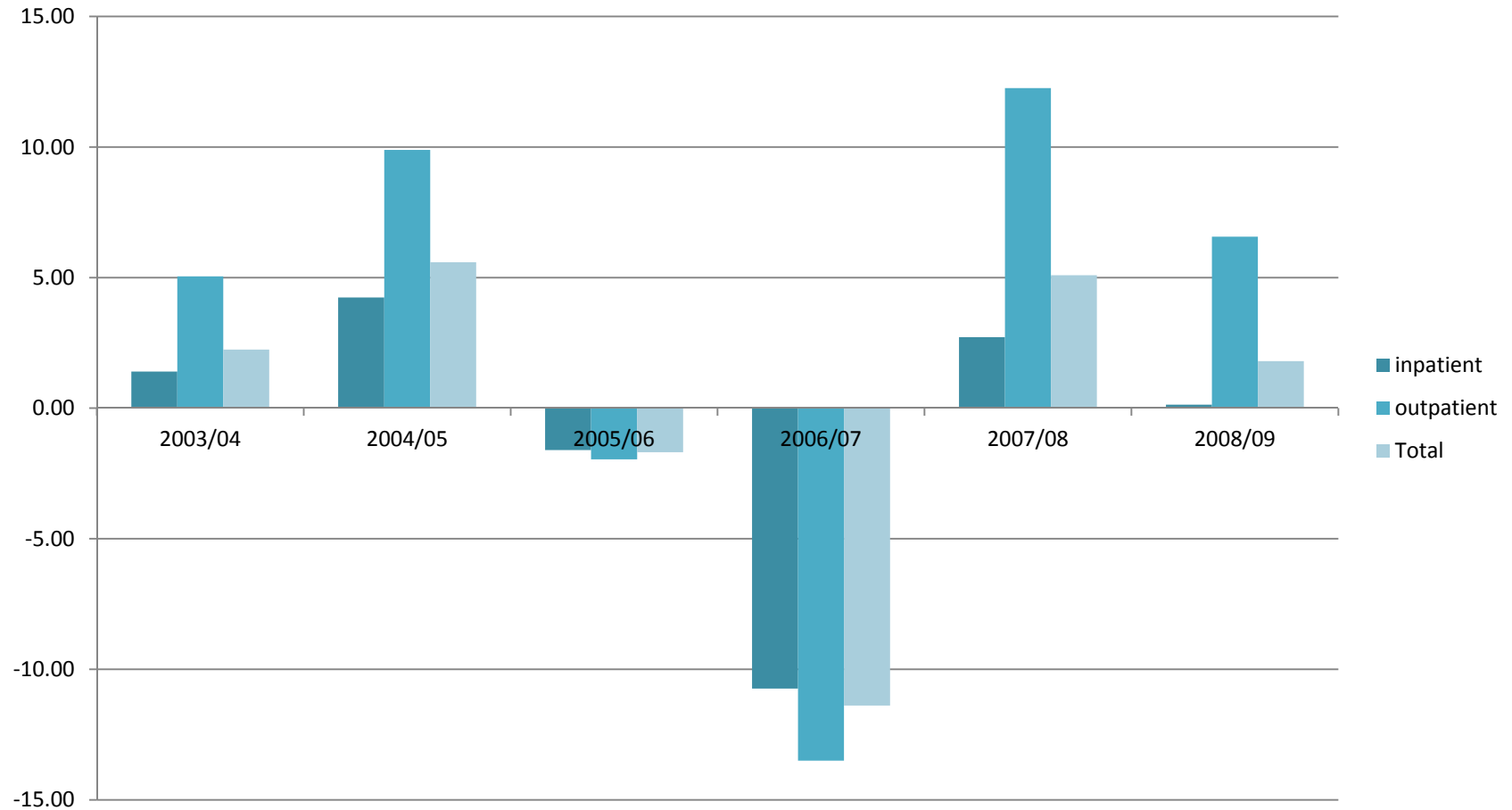
# Issues in Implementation

- Reasonable data on labour input, numbers employed and earnings by occupation
- Capital and intermediate inputs more problematic
  - Varies by country
- Less of an issue with NACE rev 2 but countries slow to implement

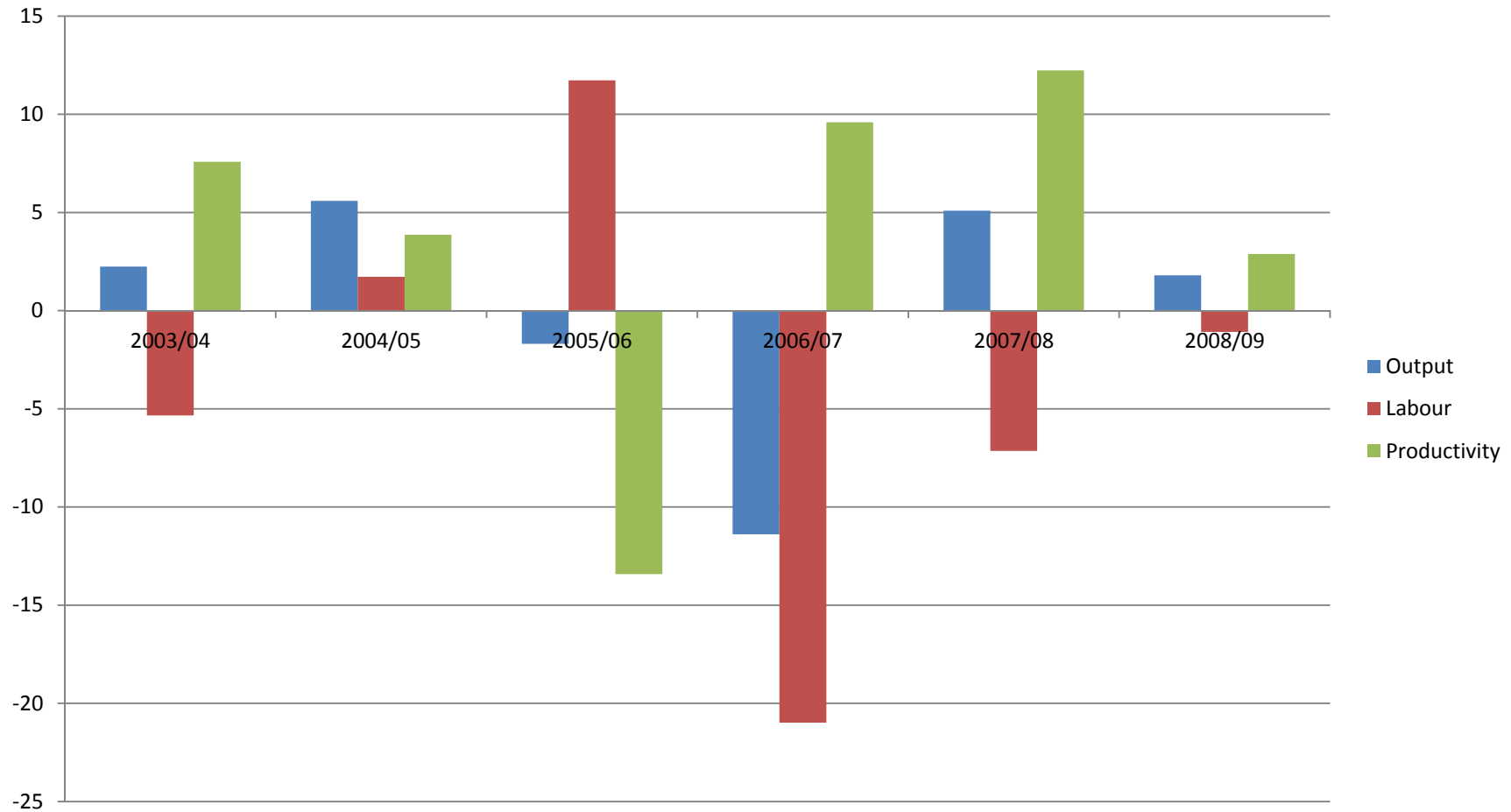
# Labour Productivity growth, German hospitals



# Hungary, Inpatient and outpatient

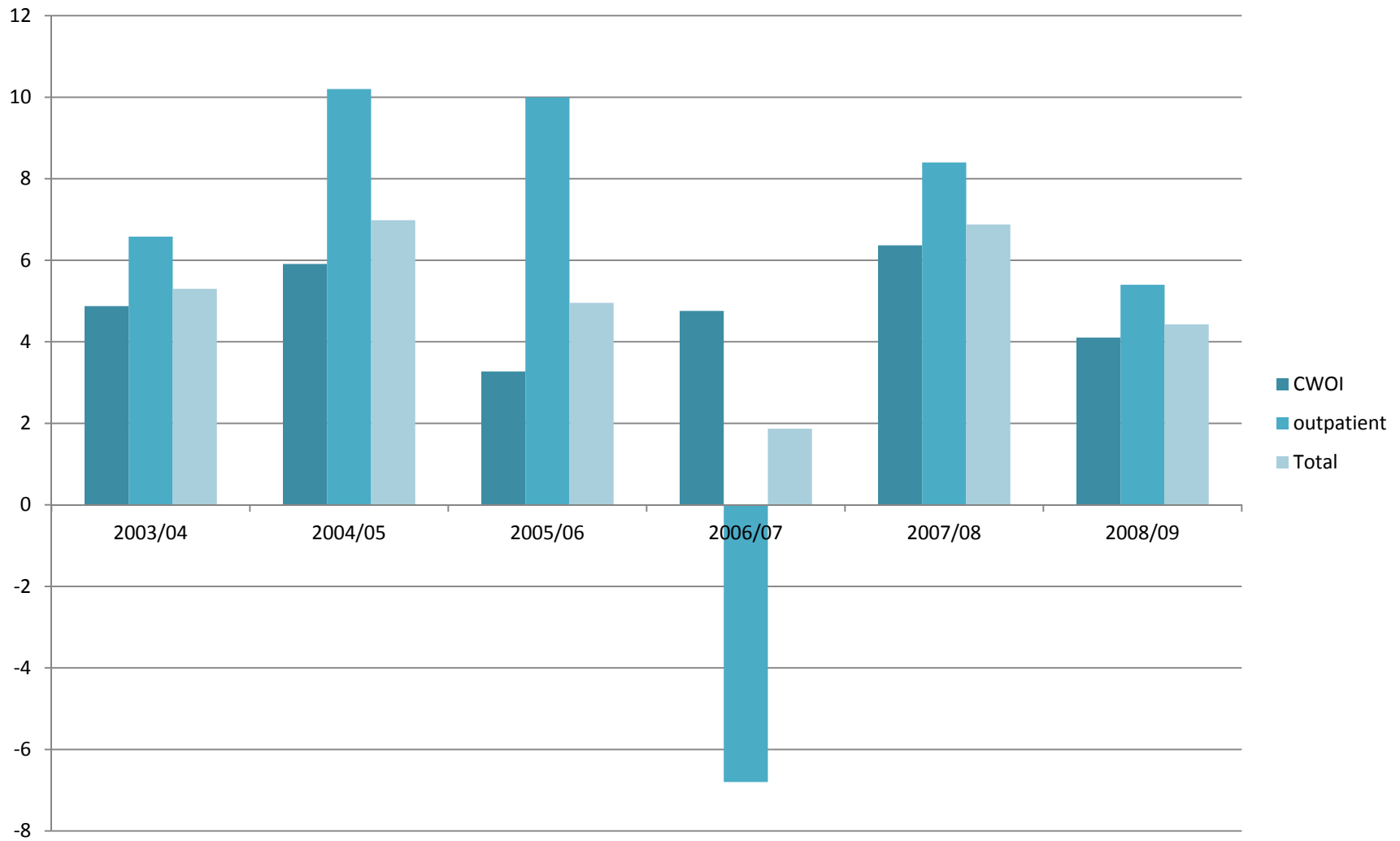


# Labour productivity growth, Hungary, hospitals





# UK, inpatient and outpatient



# Next steps

- Include non-hospital output
- Refine input measures