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# Adding fields to imbalance indicators

## Interim results

**Forecasting skill supply and demand in Europe:  
*Skillsnet* Technical Workshop**

**May 10<sup>th</sup>-11<sup>th</sup>, 2012 in Venice**

**Ben Kriechel & Martin Humburg**

**Research Centre for Education and the Labour Market  
Maastricht University, the Netherlands**

# Imbalance indicators

Imbalance indicators are useful in skills forecasting to:

- summarize the degree of imbalances;
- compare across occupations / education;
- compare across countries.

# RAS based indicators:

## Measure of total change (MC) and Indicator of constraint (IC)

### ***Indicator of constraint (IC)***

Measures total adjustment across education level to reach the level of constraint demand ( $D_c$ ) from the unconstraint demand ( $D_u$ ). High levels of the indicator of change indicate significant adjustment processes necessary.

### ***Measure of change (MC)***

Measures total adjustment between constraint demand ( $D_c$ ) to the base year counts ( $D_1$ ). It gives the adjustment that is necessary from base year to the forecast.

## Indicator of future hiring problems

The indicator takes imbalance of supply and demand of the underlying education types in an occupation to determine a measure of “difficulties” in hiring workers of a specific type in the future.

$$p_i = \min\left(1, \frac{\text{supply}_i}{\text{demand}_i}\right)$$

$$IFIOD_j = \frac{\sum_i p_i x_{ij,t-1}}{\sum_i x_{ij,t-1}}$$

$$0 \leq IFIOD_j \leq 1$$

# What do our current imbalance indicators show?

- Adjustment needed to solve imbalances by numbers;
- RAS procedure gives (implicit) weights to status quo in order to solve future imbalances;
- Indicator of future imbalances by occupation (IFIOD) 'distributes' shortages by skill (level) across occupations by the weight they use.

# What do our current imbalance indicators hide?

- Adjustments might not be feasible;
- Substitution processes can run across levels or within levels;
- Having sufficiently high educated might not solve a shortage in teachers, medical personnel, engineers.

**Combining fields and education level might overcome some of this. But:**

- No consistent estimate of supply by fields

# Our approach: extrapolating fields

- Using supply forecast by education level (2020)
- Determine shares of fields by education level:
  - fixed-coefficient / status-quo
  - based on EU-LFS data (now: 2009)

$$supply_{if} = supply_i \cdot k_{if, t-1}$$

- Using demand forecast by occupation (2020)
- Determine shares of fields by education level:

$$demand_{if} = \sum_j demand_{ij} \cdot h_{ifj, t-1}$$

## Indicator of future hiring problems: including fields

As before, the indicator takes imbalance of supply and demand of the underlying education types in an occupation to determine a measure of “difficulties” in hiring workers of a specific type in the future.

The  $p_i$  is and  $x$  is now defined by the combination of field and level of an education.

$$p_{if} = \min \left( 1, \frac{\text{supply}_{if}}{\text{demand}_{if}} \right)$$

$$IFIOD_j = \frac{\sum_i p_i x_{ij,t-1}}{\sum_i x_{ij,t-1}}$$

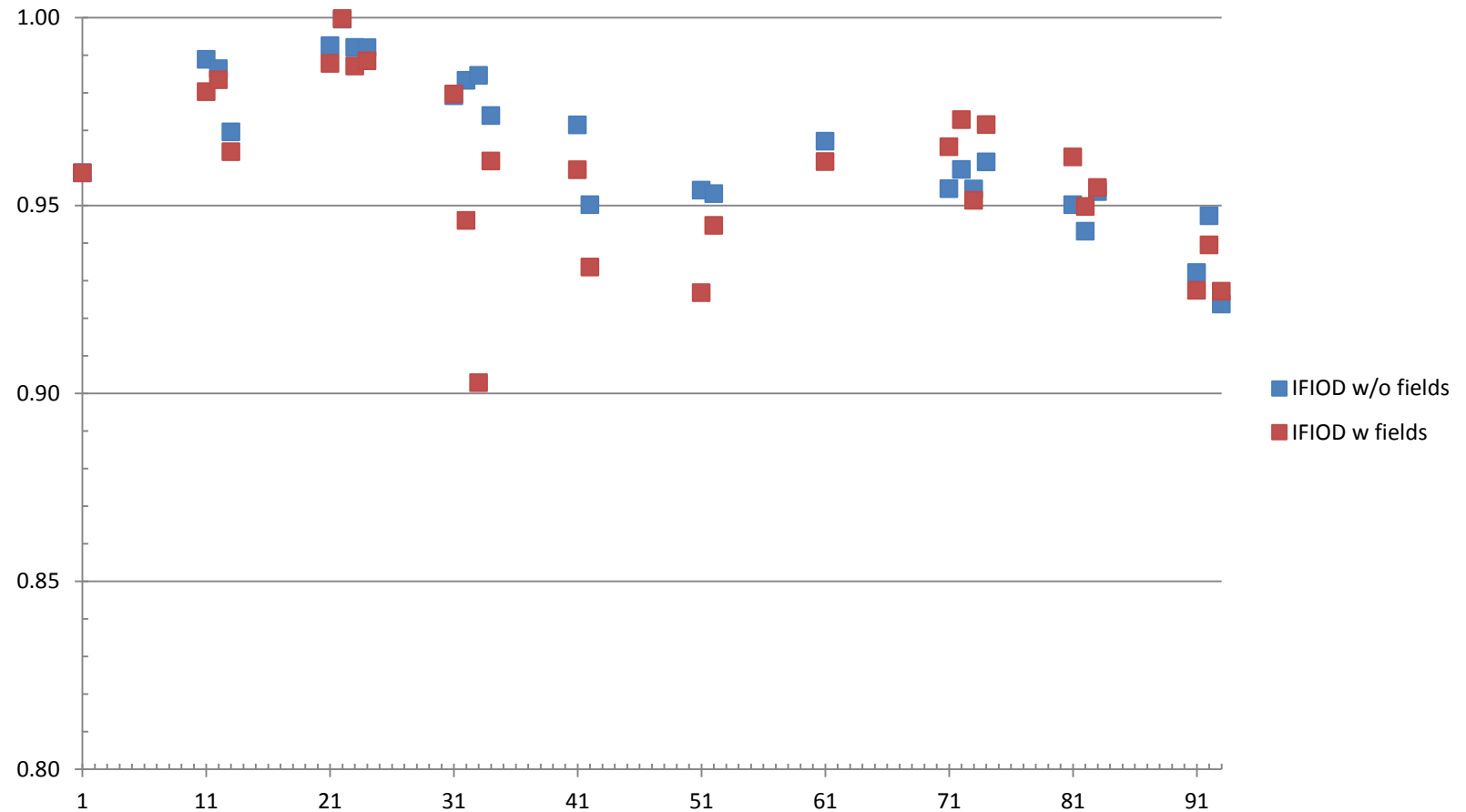
$$0 \leq IFIOD_j \leq 1$$

$$IFIOD_j = \frac{\sum_i \sum_f p_{if} x_{ijf,t-1}}{\sum_i \sum_f x_{ijf,t-1}}$$

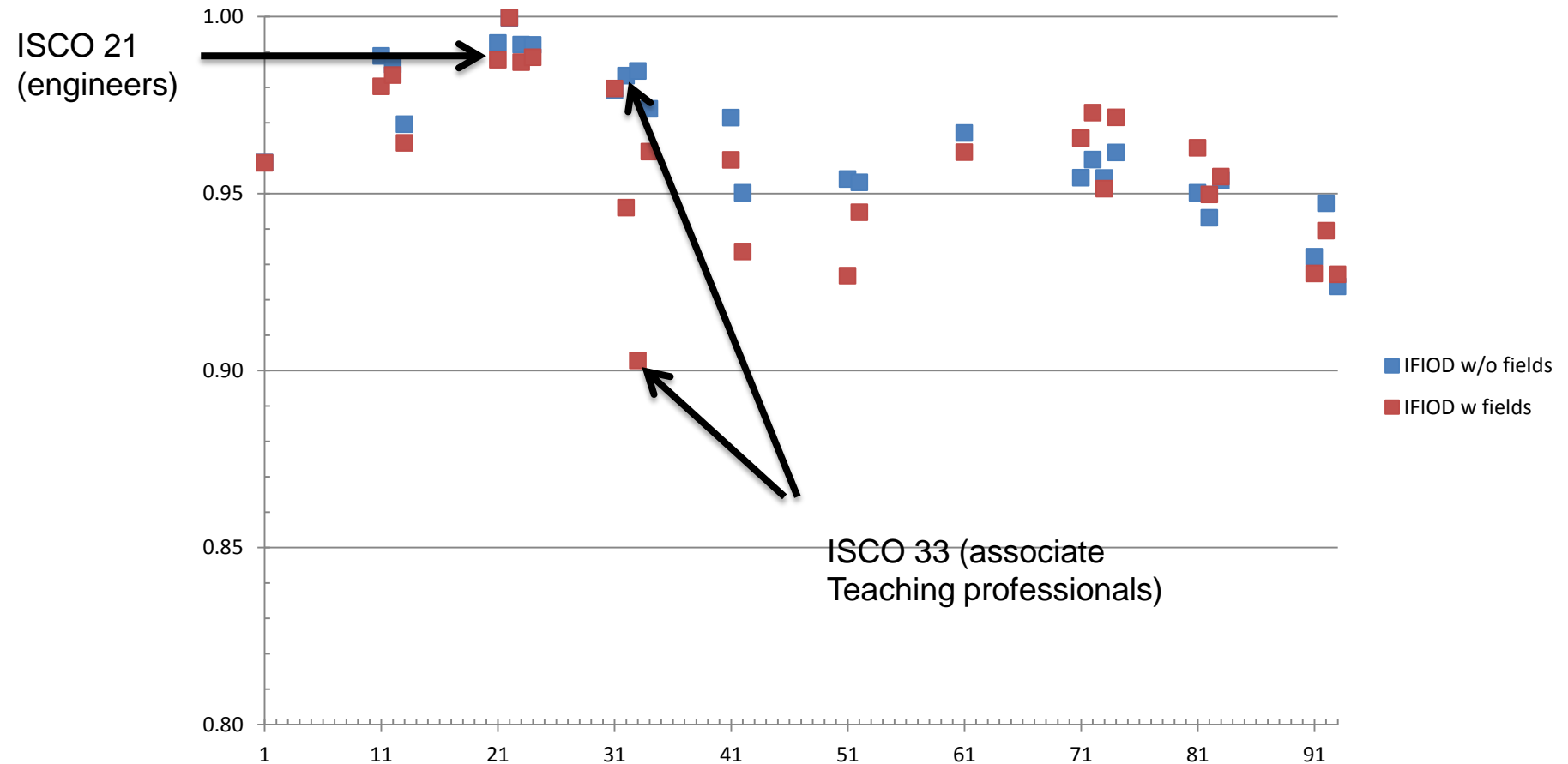


# Example 1: Germany

# IFIOD with versus without fields

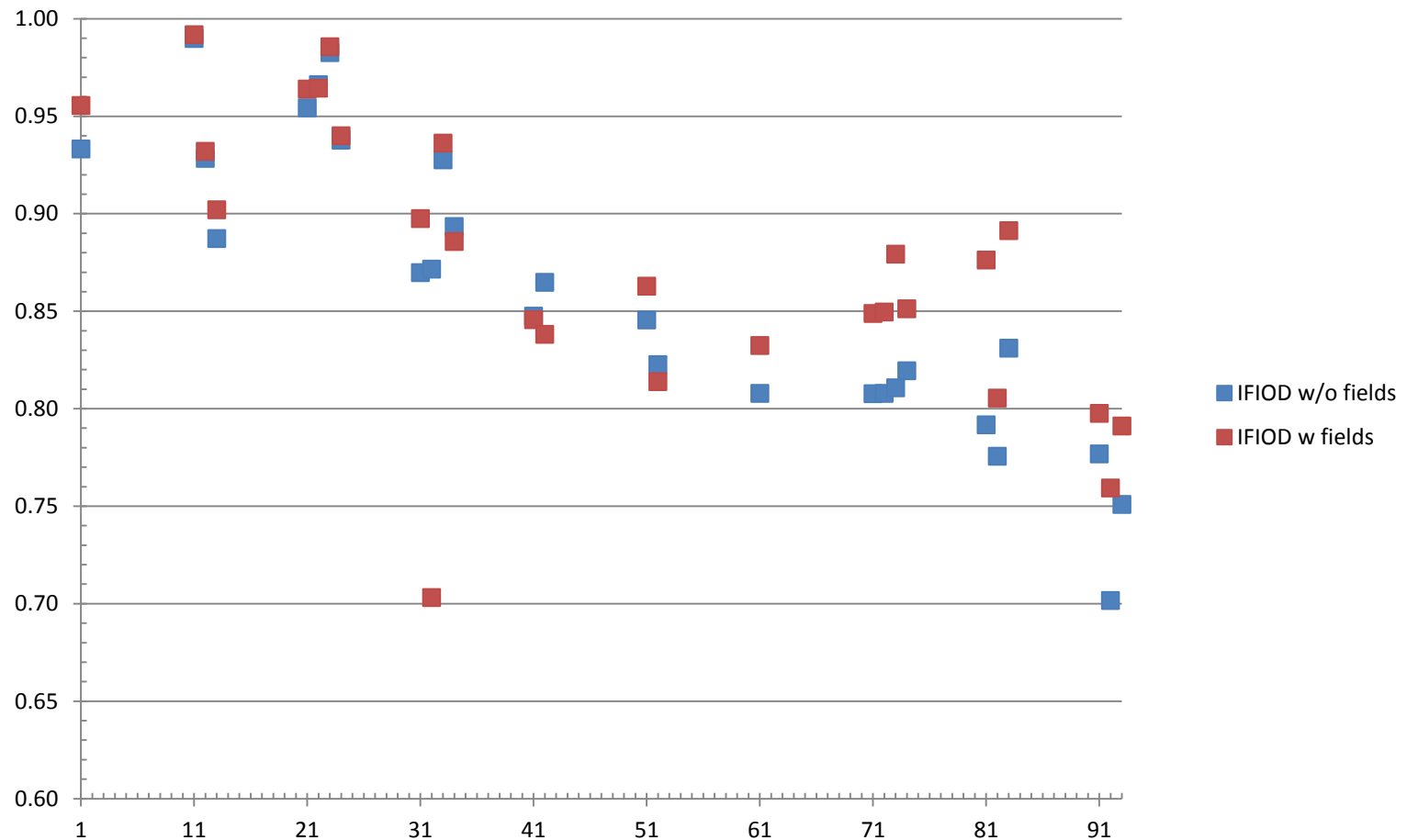


# IFIOD with versus without fields



# Example 2: Lithuania

# IFIOD with versus without fields: Lithuania



# Concluding remarks

- Summarizing imbalances should include all the information that is needed for policy action;
- Fields of education can be a crucial information in measuring imbalances;
- Future work should include fields and extrapolate future field-related trends in recruitment and enrolment.

# Contact Details

**Ben Kriechel & Martin Humburg**

**Research Centre for Education and the Labour Market**

**Maastricht University**

**NL-6200MD Maastricht**

**Tel:   +(31) 43-388 3647**

**[Ben@kriechel.eu](mailto:Ben@kriechel.eu)**

**<http://www.roa.nl/>**