

Measurement of gender inequalities in the French labour market using efficiency measures

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Motivation

Labour market discrimination

The existence of wage gaps between men and women could be justified because women:

- work fewer hours;
- have less work experience;
- are engaged in low paying job (sectoral and occupational segregation).

However, when isolating these factors, wage gaps does not disappear (Carillo *et al.*, 2014).

Motivation

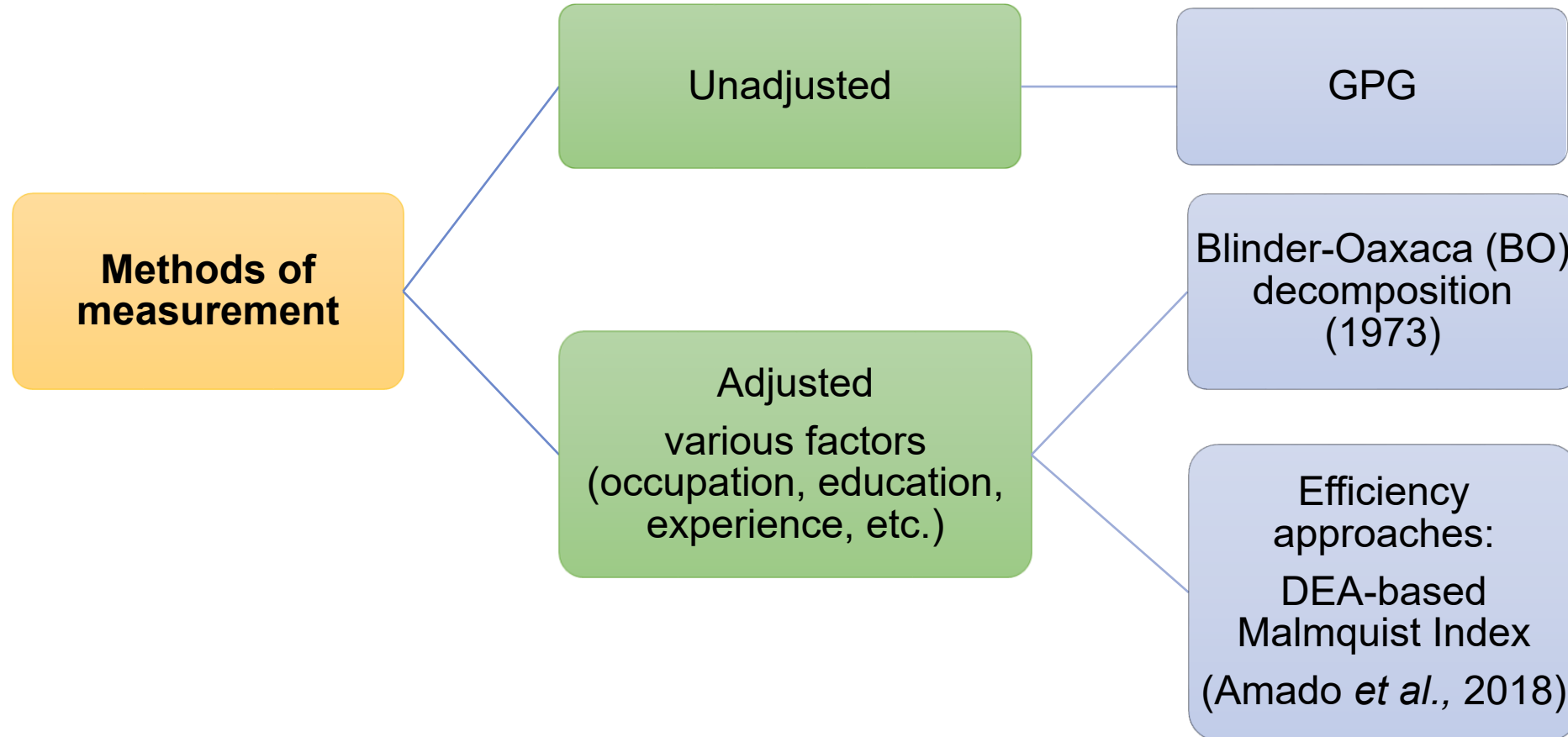
Labour market discrimination

Two related but distinct concepts in the realm of gender workplace inequality:

- **Glass ceiling:** prevents women from advancing to senior leadership positions, despite their qualifications and achievements.
 - Systemic bias
- **Sticky floor:** women stuck in low-paying, low-status jobs, with limited opportunities for advancement.
 - Lack of access to training and education, and social expectations about gender roles

Motivation

Methods of measuring the gender pay gap



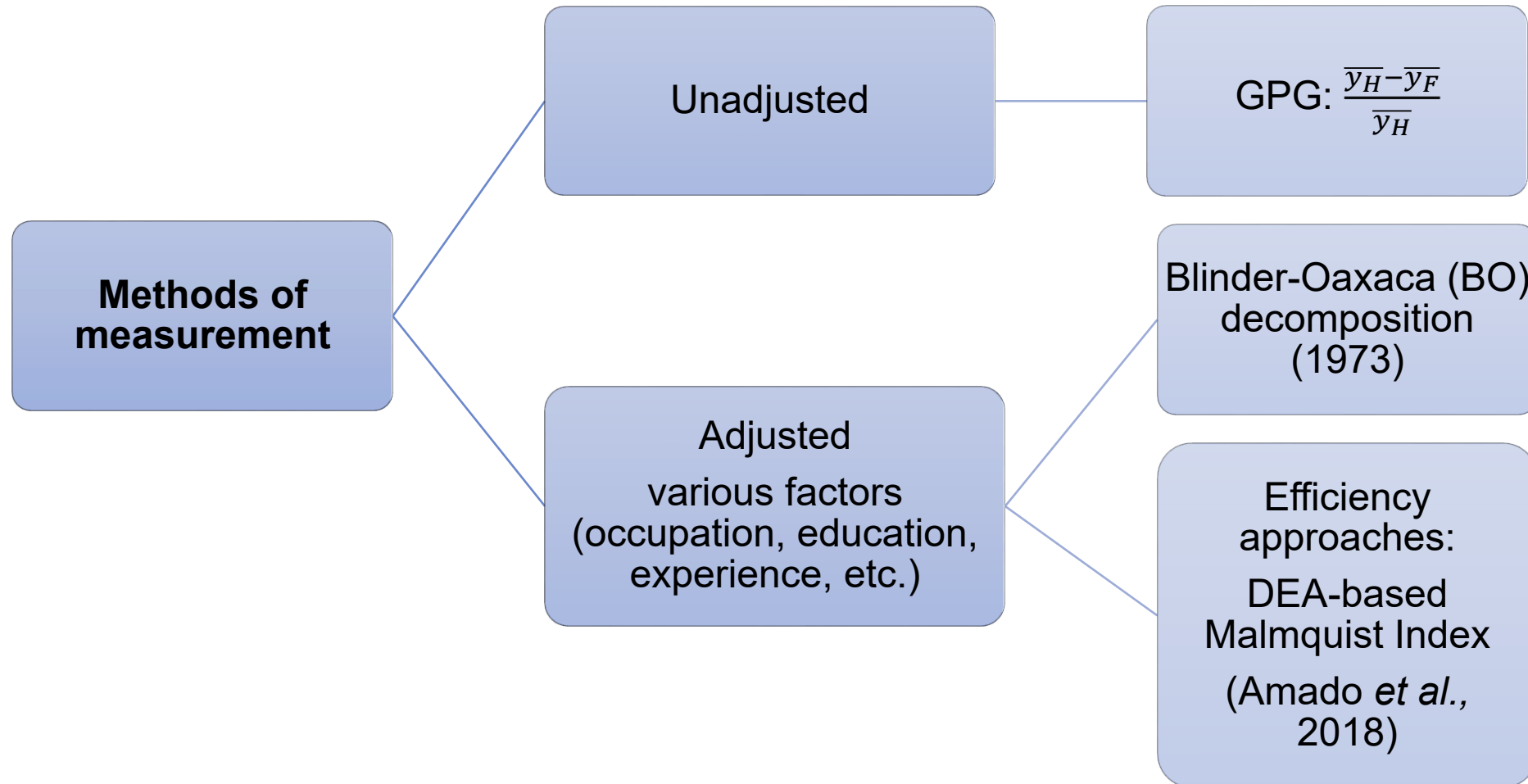
Motivation

Research objectives

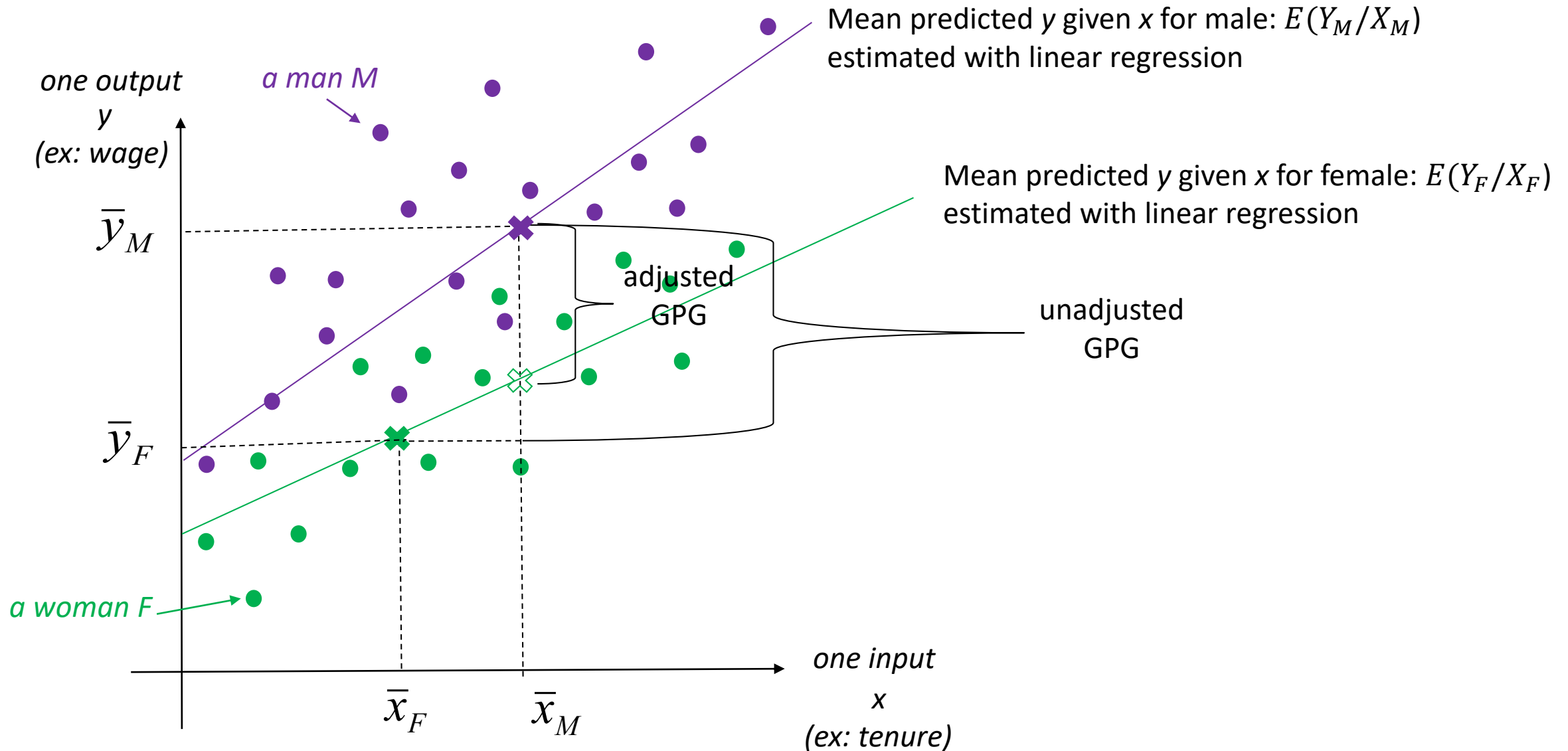
1. Better understand the differences between the traditional measures of GPG and the Malmquist Index (MI).
2. Measure “glass ceilings” and “sticky floors” using a new methodology based on MIs.
3. Contribute to the empirical work by measuring the GPG in the French labour market with an efficiency approach.
4. Show “glass ceilings” and “sticky floors” by economic activity and occupation to propose recommendations.

Literature

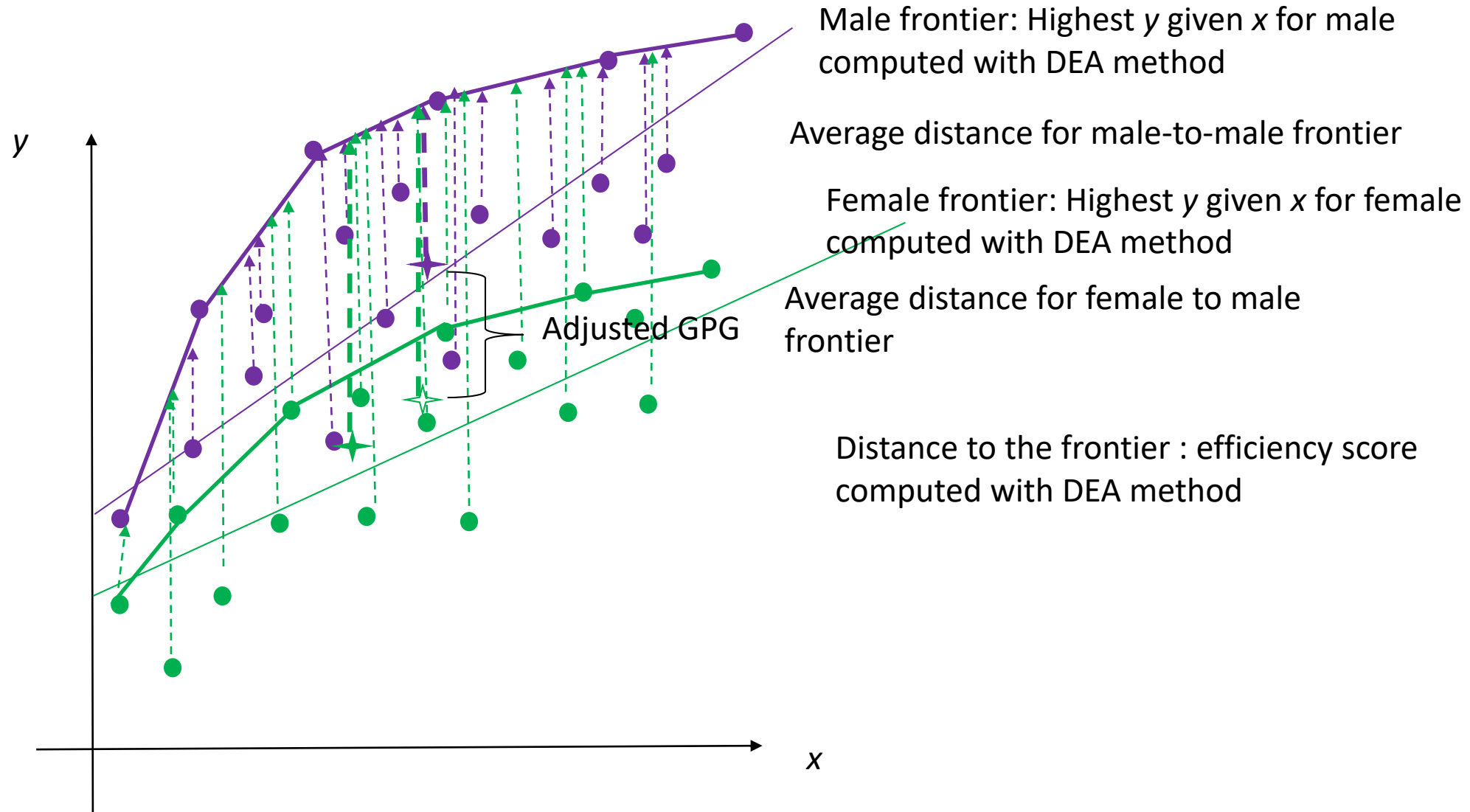
Methods of measuring the gender pay gap

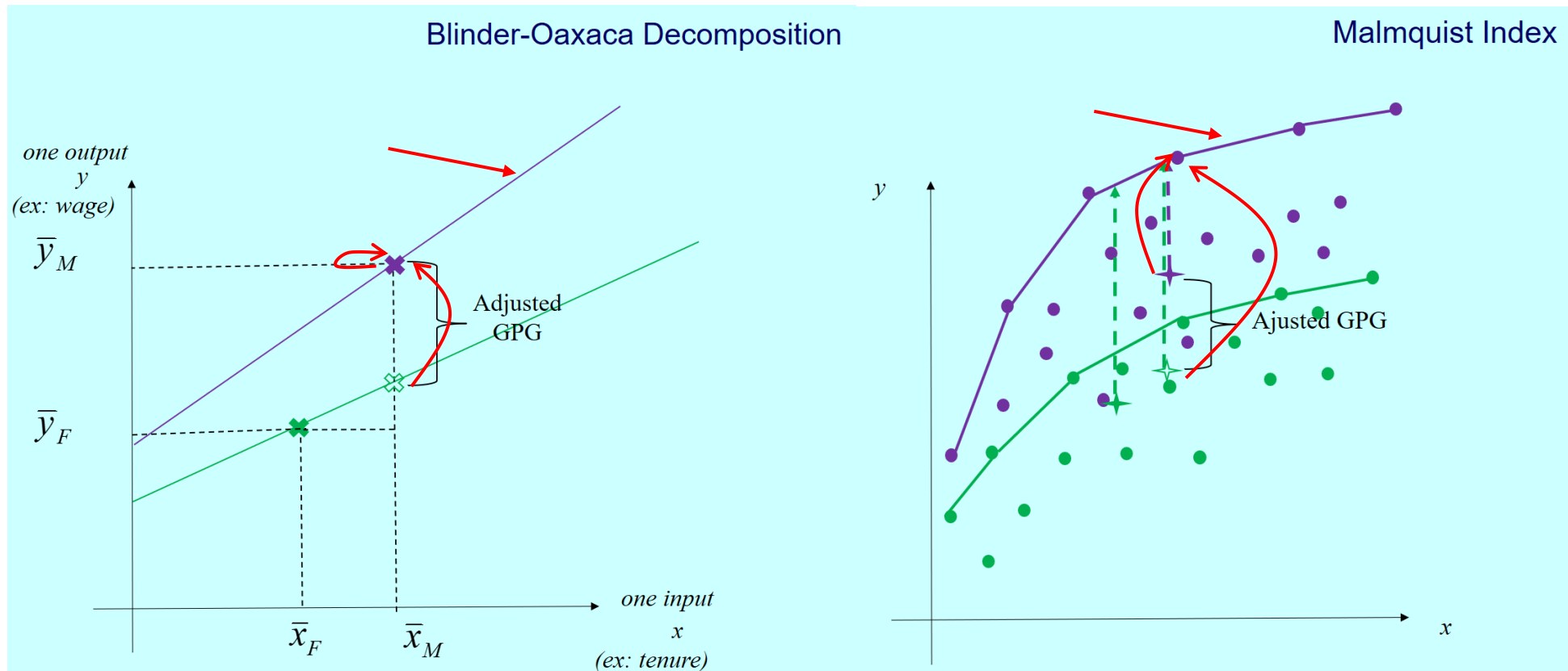


Blinder-Oaxaca Decomposition



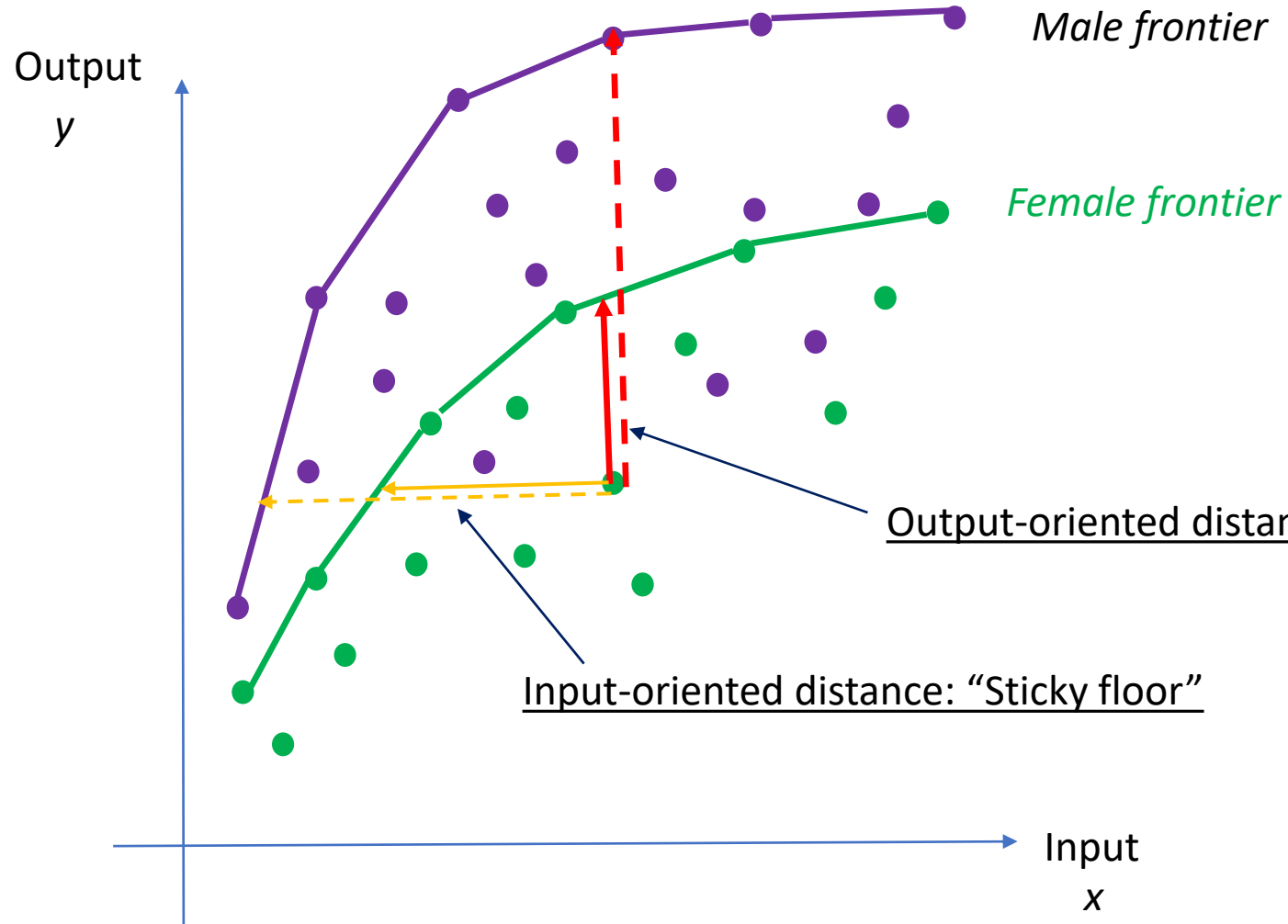
Malmquist Index





| | Blinder-Oaxaca Decomposition | Malmquist Index |
|--|-------------------------------------|--|
| Definition of “average” point | Average characteristics (x) | Average efficiency score |
| Definition of the “reference” situation | Average predicted wage given x | Max wage given x |
| Computation of the “line” or “frontier” | Assumption on the functional forms | No assumption on functional forms ⇒ non-parametric method |
| Number of outputs “y” | One | Multi-output |

Methodology

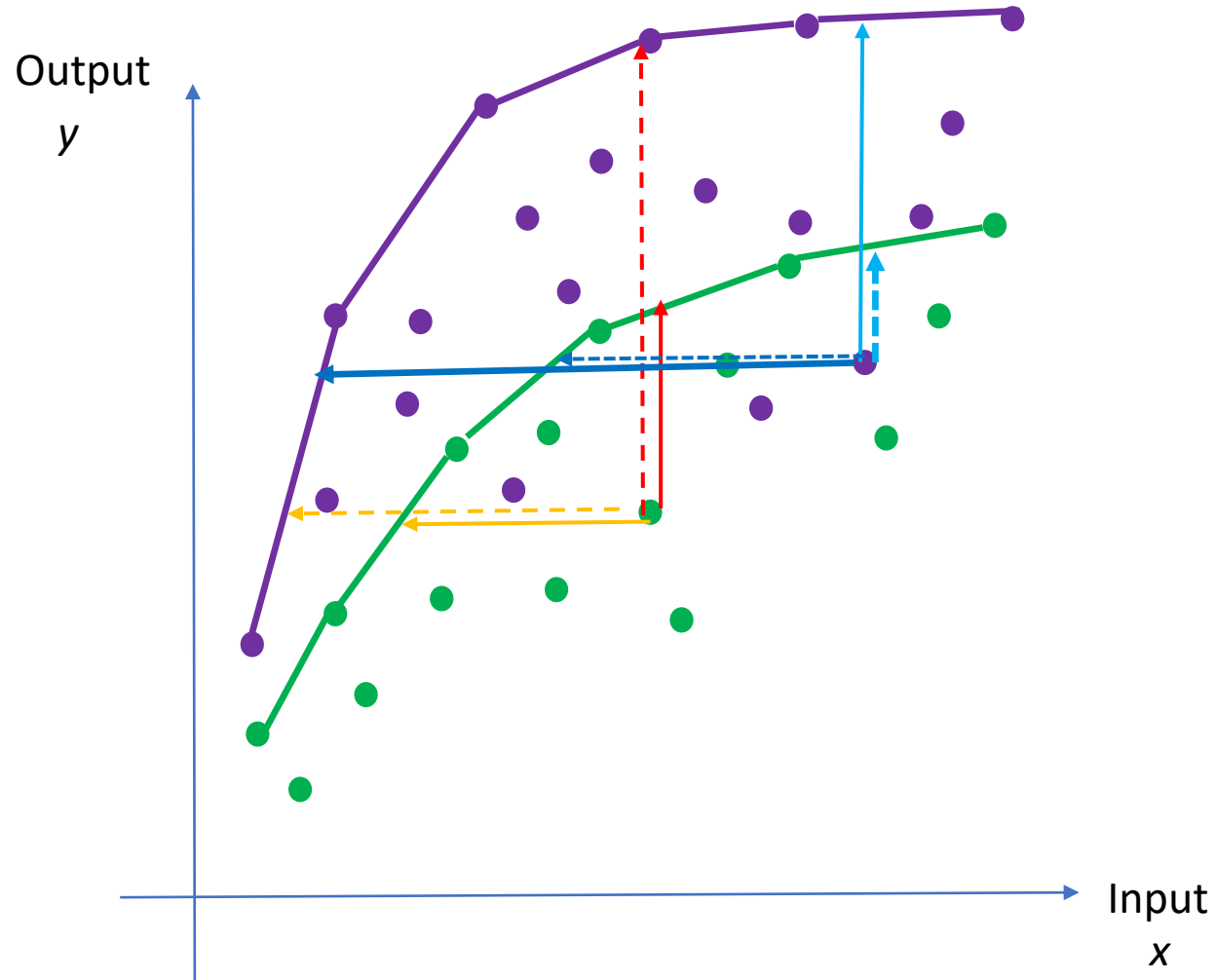


- To measure a MI
- an output-oriented MI
- an input-oriented MI

Output-oriented distance: "Glass ceiling"

Input-oriented distance: "Sticky floor"

Methodology



$$MI_O = \left[\frac{D_O^M(X_O^F, Y_O^F)}{D_O^M(X_O^M, Y_O^M)} \cdot \frac{D_O^F(X_O^F, Y_O^F)}{D_O^F(X_O^M, Y_O^M)} \right]^{1/2}$$

$$MI_I = \left[\frac{D_I^M(X_I^F, Y_I^F)}{D_I^M(X_I^M, Y_I^M)} \cdot \frac{D_I^F(X_I^F, Y_I^F)}{D_I^F(X_I^M, Y_I^M)} \right]^{1/2}$$

$$pseudo\ HMI = \left[\frac{MI_O}{MI_I} \right]^{1/2}$$

⇒ adjusted GPG

Data

- **2019 Labour Force Survey (LFS)** from **France** (before Covid): Cross-sectional survey of over 50,000 households
- **Sample:** working age individuals (15 years and older) employed in formal economy, only one job.
- **Input variables:** Measures of human capital investment:
 - Theoretical number of years of education of the highest diploma obtained
 - Number of work seniority
- **Output variables:**
 - Hourly earnings in euros
- **Final sample:** 40,978 workers; 19,294 men and 21,684 women
- **Disaggregation:** 18 economic activities and 9 occupations

Descriptive statistics

Summary statistics of the inputs and outputs (LFS, 2019)

| | Male | | | Female | | |
|------------------|--------------------------------|-------------------------------------|--------------------------|--------------------------------|-------------------------------------|--------------------------|
| | Mean no. of years of education | Mean no. of years of work seniority | Mean hourly earnings (€) | Mean no. of years of education | Mean no. of years of work seniority | Mean hourly earnings (€) |
| Mean | 12.8 | 11.9 | 14.3 | 13.2 | 12.6 | 13.0 |
| Variation | 0.2 | 0.9 | 0.4 | 0.2 | 0.9 | 0.4 |
| Min | 5 | 0 | 2.2 | 5 | 0 | 2.4 |
| Max | 20 | 48 | 58.8 | 20 | 47 | 65.6 |

Unadjusted gender pay gap : 13.4%

Results

Values of the Malmquist index by economic activity (in percentage)

| Economic Activity | Unadjusted GPG | Output-oriented MI | Input-oriented MI | Pseudo HMI |
|--|----------------|-----------------------|----------------------|------------|
| | | <i>Glass ceilings</i> | <i>Sticky-floors</i> | |
| Agriculture, forestry and fishing | 0.9 | 3.1 | 0.8 | 1.9 |
| Manufacturing | 10.1 | 10.5 | 6.4 | 8.5 |
| Electricity, gas, steam and air conditioning supply | 14.1 | 12.3 | 2.7 | 7.4 |
| Water supply; sewerage, waste management | 8.0 | 14.0 | 16.5 | 15.3 |
| Construction | 2.0 | 9.9 | 13.0 | 11.4 |
| Wholesale and retail trade; repair of motor vehicles | 7.7 | 7.7 | 4.5 | 6.1 |
| Transportation and storage | 1.6 | 11.0 | 9.5 | 10.3 |
| Accommodation and food service activities | 4.6 | 6.1 | 6.6 | 6.4 |
| Information and communication | 10.3 | 12.2 | 4.2 | 8.1 |
| Financial and insurance activities | 11.6 | 11.9 | 2.6 | 7.2 |
| Real state activities | 4.8 | 5.0 | 5.5 | 5.3 |
| Professional, scientific and technical activities | 9.3 | 10.0 | 3.8 | 6.8 |
| Administrative and support service activities | 6.3 | 5.7 | 4.9 | 5.3 |
| Public administration and defence; social security | 6.1 | 9.5 | 6.7 | 8.1 |
| Education | 15.3 | 14.3 | 4.5 | 9.2 |
| Human health and social work activities | 8.5 | 9.0 | 1.1 | 5.0 |
| Arts, entertainment and recreation | 7.1 | 10.6 | 6.2 | 8.4 |
| Other service activities | 11.2 | 10.3 | 1.6 | 5.9 |

Results

Values of the Malmquist index by occupation (in percentage)

| Occupation | Unadjusted GPG | Output-oriented MI | Input-oriented MI | Pseudo HMI |
|--|----------------|-----------------------|----------------------|------------|
| | | <i>Glass ceilings</i> | <i>Sticky-floors</i> | |
| Managers | 10.4 | 13.2 | 2.5 | 7.7 |
| Professionals | 7.8 | 13.0 | 5.1 | 9.0 |
| Technicians and associate professionals | 8.2 | 9.6 | 7.4 | 8.5 |
| Clerical support workers | 5.9 | 7.5 | 4.5 | 6.0 |
| Service and sales workers | 11.4 | 14.0 | 0.8 | 7.2 |
| Skilled agricultural, forestry and fishery workers | 14.5 | 11.0 | 8.6 | 9.8 |
| Craft and related trades workers | 11.3 | 10.6 | 2.0 | 6.2 |
| Plant and machine operators, and assemblers | 10.7 | 11.9 | 4.3 | 8.0 |
| Elementary occupations | 11.9 | 10.0 | -1.8 | 3.9 |

Conclusion

- Original methodology based on efficiency approach that bring complementary results of traditional measures of the GPG.
- **Limitations:**
The MI is computed on the “average” distance of male and female to the frontier. The “average” is still not always representative of the sample.
- **Future research:**
New measure based on the Hicks-Moorsteen Index.

Thank you for your attention

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