

Individual circumstances and income distribution in a changing labour market: Italy 2005-2019

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The paper in a nutshell

Object of study: Assess the dynamics of inequalities of opportunity in Italy in the labour market

The context:

- high labour income inequalities
- labour market reforms and liberalisations
- geographical disparities

The proposal:

- ① Measure and decompose the contribution of socioeconomic and demographic circumstances in the overall labour income inequalities
- ② Bring the labour market policies in the picture on the labour earnings IOp evolution
- ③ Assess IOp across geographical macro-areas

Social origin and demographic characteristics have a relevant role in determining income inequalities [Roemer, 1998, Breen, 2004, Bernardi and Ballarino, 2016].

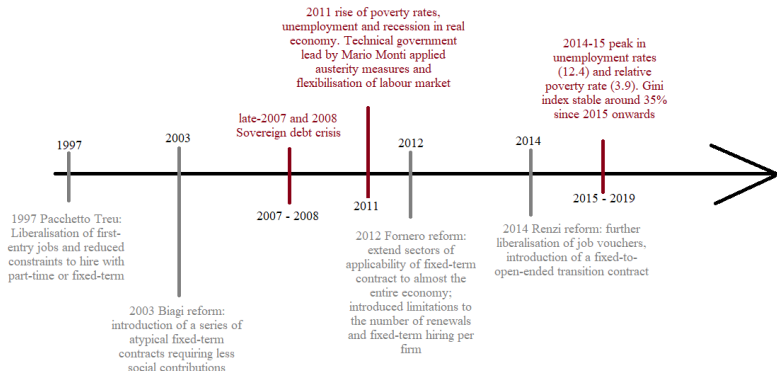
Occupational and earnings' opportunities in Italy are unevenly distributed across:

- Cohorts [Andreoli and Fusco, 2017]
- Geographical areas [Mogila et al., 2022]
- Gender [Piazzalunga and Di Tommaso, 2019, Triventi, 2013]

Labour market reforms in Italy have contributed to the rise of income inequalities [Hoffmann et al., 2021, Jessoula et al., 2019], and had the unintended effect of strengthening the social origin role for occupational outcomes [Barbieri and Gioachin, 2022].

Italian labour market reforms

Structural reforms were intended to boost employment growth and fight against shadow employment, following the Scandinavian *flexicurity* model



The threefold contribution:

- 1 Using labour market earnings instead of the equivalent household income, we provide a more complete view not neglecting gender disparities in IOp
- 2 Connect the labour market institutional framework evolution with the IOp analysis
- 3 Apply a novel data-driven technique to identify population clusters in income distribution based on individual circumstances → Transformation Trees [Hothorn and Zeileis, 2021]

Inequalities of Opportunity and the role of circumstances - 1

Equality of Opportunity theory [Roemer 1993, 1998] explains the sources of inequalities in incomes between different groups in the society as follows:

$$y_i = f(c_i, e_i, u_i)$$

- c_i : socioeconomic circumstances beyond individual control
- e_i : morally relevant responsibility or effort. Effort is as well a function of circumstances: $e_i = g(c_i)$
- u_i : genetic or luck factors not related with the socioeconomic background

Inequalities of Opportunity and the role of circumstances - 2

Inequality of Opportunity models identify population groups (*types*) according to the social background and demographic circumstances of the individuals

IOp is measured by computing an inequality index on a transformed income distribution which accounts for:

- inequality between mean incomes of each type \rightarrow *ex-ante IOp*
- inequality between type-specific income quantiles (relative effort) \rightarrow *ex-post IOp*

IOp measures: absolute inequality value or ratio between the absolute measure and the entire population inequality

Data-driven techniques to form population types - 1

Ex-ante IOp: **Mixture models** [Li Donni et al., 2015] and **Tree-based models** [Brunori et al., 2018]:

- 1 Assume the existence of non-linear and additive interactions between circumstances in shaping the relevant social groups
- 2 Derive the groups based on the most significant differences in mean outcomes across the possible partitions

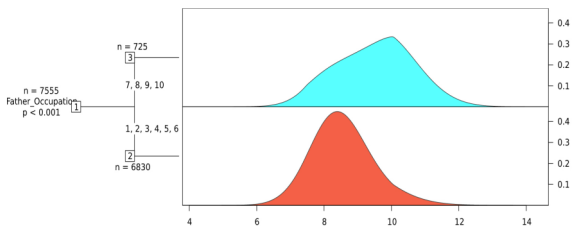
With these techniques circumstances do not take into account higher moments of the within-type distribution [Brunori and Neidhöfer, 2020] and they do not take into account effort ranks to generate types [Brunori et al., 2023] → Ex-post IOp

Data-driven techniques to form population types - 2

Ex-post IOp: **Transformation Trees** [Hothorn and Zeileis, 2021]

- First use in IOp measurement: Brunori, Salas-Rojo, Ferreira, 2023
- The algorithm detects the potential heterogeneity in a given distribution according to a set of possible partitions
 - The Bernstein polynomial is used to interpolate the shape of the distributions within partitions
 - If the shape of two resulting conditional dependent variable distributions is statistically significant the partition is allowed

Transformation Trees: the output - 1

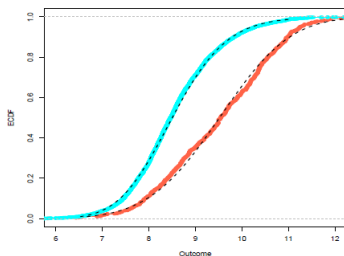


Source: Brunori, Salas-Rojo, Ferreira, 2023.

Figure 1: Inequality of Opportunity Tree

The IOp tree shows what are the splits performed by the algorithm which determine a statistically significant variation in the distribution of the dependent variable

Transformation Trees: the output - 2



Source: Brunori, Salas-Rojo, Ferreira, 2023

Figure 2: Empirical cumulative distribution functions for income

The IOP is calculated as the horizontal distance between these two distributions for given quantiles and not only around their mean value

Data

EU Statistics on Income and Living Conditions (EU-SILC) for Italy in 2005, 2011, 2019

Variable	Description
<i>Individual labour income:</i>	Sum of all individual incomes earned from employment and self-employment adjusted by age
<i>Circumstances:</i> Socio-economic conditions behind individual control	Gender, migration status, cohort, parental education, parental activity status, parental occupation, family type

Reference population: people aged 25-60 years old with a positive income from labour in the reference year

Labour market conditions across demographic characteristics



Figure 3: Incidence of unemployment, in-work poverty and temporary contracts by cohorts

IOp structure with transformation Trees

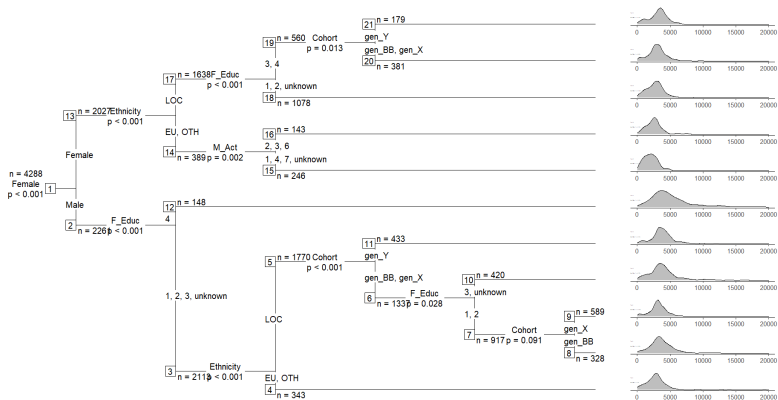


Figure 4: Transformation tree for centre Italy 2019 (Lazio, Tuscany, Marche, Umbria)

Ex-post IOp estimates across time and territory

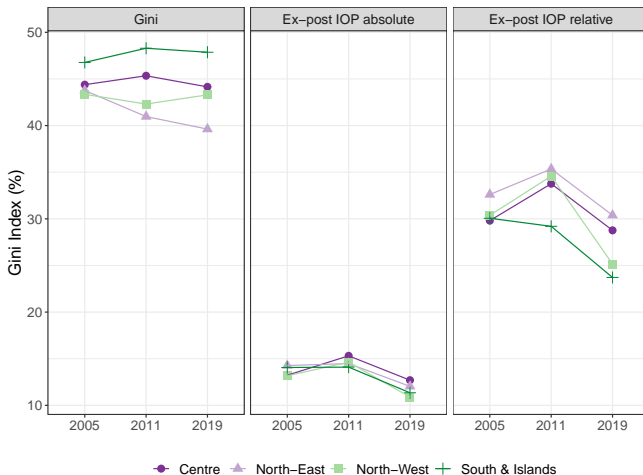


Figure 5: Inequality of Opportunity measures on individual incomes

Inequality of Opportunity decomposition

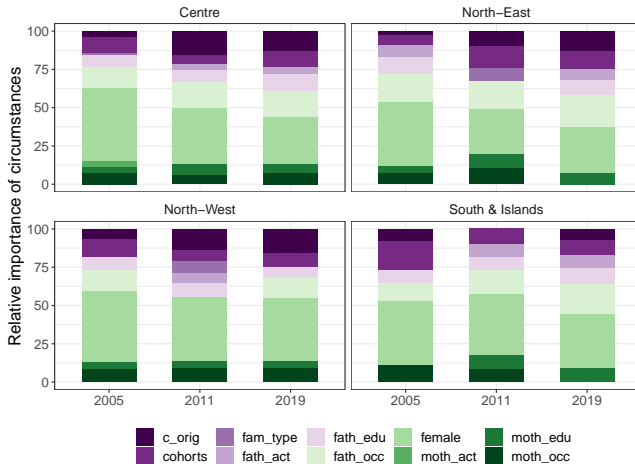


Figure 6: Shapley decomposition of IOp among circumstances

Concluding remarks: methodology and empirical findings - 1

- New methodology robust to many limitations in more traditional IOp measurement approaches
- Overall labour income inequality in Italy shows high level and trend heterogeneity across geographical areas
- Ex-post IOp explains between 25 and 30% of total inequality in every region considered
- IOp weight over total inequality decreases across time
- Higher overall inequalities do not necessarily correspond to higher IOp in the considered geographical areas

Concluding remarks: methodology and empirical findings - 2

- gender is relatively the most important circumstance determining IOp across years and territory but at a decreasing rate → market composition effect? ▶ stat
- cohorts have high relevance over total IOp across all geographical areas
- origin country is gaining relevance across all the territory except of the south and islands ▶ stat
- parental background variables are uniformly relevant on IOp over time

Thank You

Labour market participation across Italy

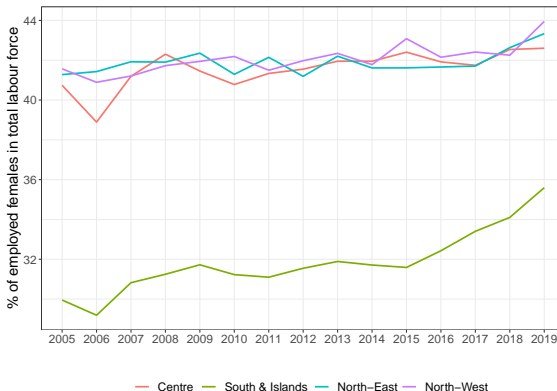


Figure 7: Female labour market participation

▶ back



Labour market participation across Italy



Figure 8: Non-European workers in labour force

▶ back

