The role of the family of origin in shaping inequality of opportunity in Chile

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Reducing inequality – the great challenge of our time

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This paper

- This paper investigates inequality of opportunity (IOp) theory and measures using data from Chile. It examines the evolution of IOp over an eleven-year period from 2006 to 2017.

- Investigating the role of the family of origin and other circumstances beyond individual control such as gender, region of birth, and ethnicity in shaping inequality of opportunity in Chile.

- In particular, to what extent circumstances determined at birth are associated with labour market outcomes.

- Grounded on the inequality of opportunity theory developed by Roemer (1993,98), this paper adopts a methodology called the ex-ante approach (Van de Gaer 1993), analysing secondary data sources from two waves of the household income survey CASEN.

Ethical justification for equality of opportunity

Economic outcomes are not only determined by individual effort, but also by the opportunity set that one starts with in life (Arneson 1989; Cohen 1989).

Whereas differential outcomes that can be traced to the individual effort are commonly accepted and even desired, those that arise from different opportunities beyond an individual's control are deemed unfair (Roemer 1998).

It is possible to disentangle the sources of inequality to distinguish between a 'fair' component due to differential preferences towards effort, and an 'unfair' portion derived from circumstances over which individuals cannot be held responsible.

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In a world with equal opportunities, the playing field is levelled before the race of life starts, to compensate for uneven circumstances over which individuals should not be held accountable (Roemer 1998).

It is an attractive concept as it holds individuals responsible for their actions and choices (Arneson 1989).

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Country context and motivation

- High income inequality, one of the highest Gini amongst all OECD countries at 0.454 (OECD 2018).

- High concentration at the top of the income distribution. In 2017 the top 10% concentrated 62.7% of total income (the average in Latin America is 54%). The top 1% concentrated 27.8% of the national income (World Inequality Database, 2020).

- Hight intergenerational persistence of income and educational attainments (a high measure implies a strong association between the outcomes of successive generations):

  - Income elasticity of 0.66 (market income), and an educational correlation coefficient of 0.54 (Gaentzsch and Zapata Roman, 2018).

  - Absolute mobility combined with relative persistence of educational attainment, particularly at the top of the distribution.

- High returns to higher education, although with a great dispersion depending on the quality and prestige of the academic institution and the student's background (Gaentzsch and Zapata Roman, 2020).

Measuring Inequality of Opportunity (IOp)

- Decomposes total inequality into an 'ethically acceptable' component (due to efforts) and an 'ethically unacceptable' part resulting from unequal opportunities expressed by exogenous circumstances.
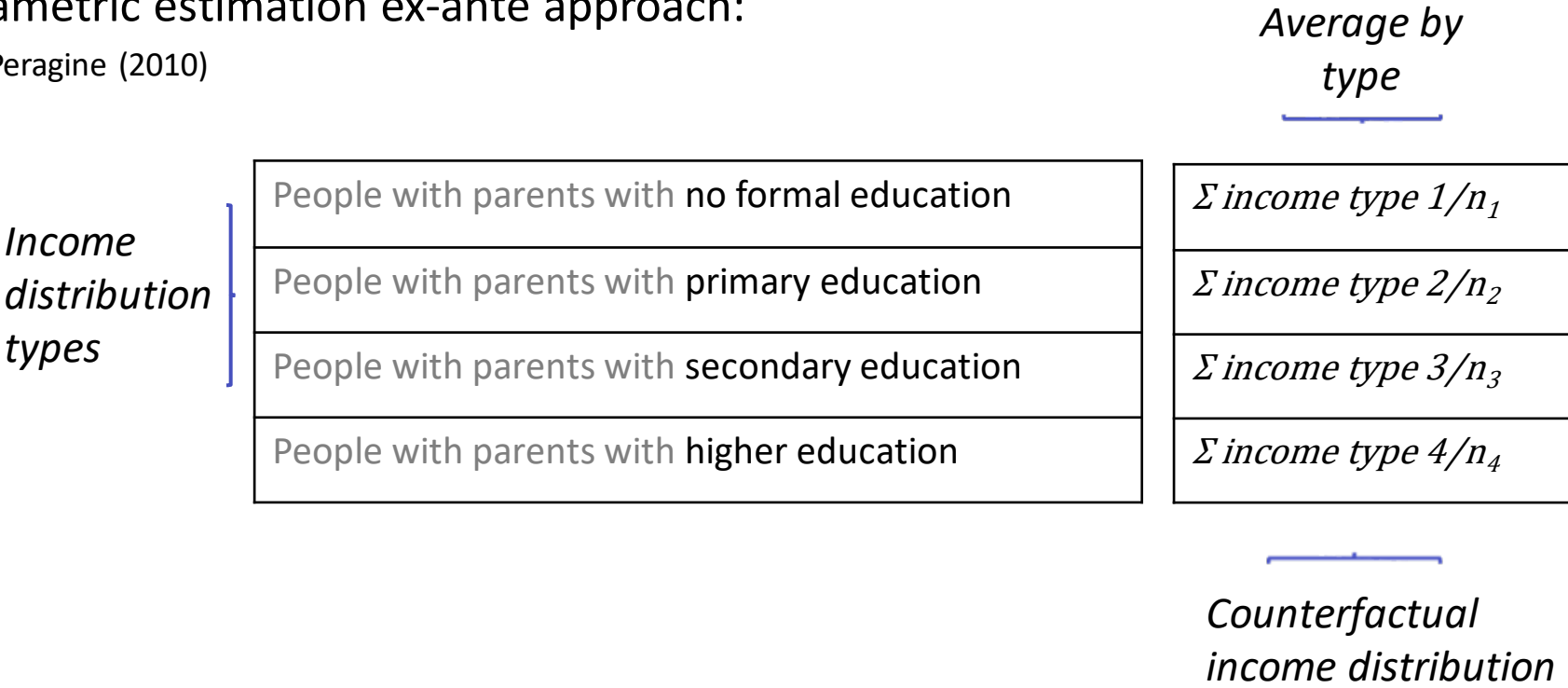
Total Inequality = Inequality due to opportunities + Inequality due to effort (+ luck)

- As effort is private information, we attempt to measure the differences in outcomes due to different circumstances holding effort constant, based on the principle that mean outcomes should not be different just because of the initial endowments at birth (ex-ante approach).

- In practice, we estimate IOp by applying an inequality index to a counterfactual income distribution in which differences due to effort are removed.

Methodology

Non-Parametric estimation ex-ante approach:

Chechi and Peragine (2010)

Average by type

Income distribution types		Average by type
	People with parents with no formal education	Σ *income type 1/n_1*
	People with parents with primary education	Σ *income type 2/n_2*
	People with parents with secondary education	Σ *income type 3/n_3*
	People with parents with higher education	Σ *income type 4/n_4*

Counterfactual income distribution

Methodology

Parametric estimation:

(Bourguignon, Ferreira, and Menéndez 2007)

$$\ln y_i = C_i \alpha + E_i \beta + u_i \qquad (1)$$

$$E_i = C_i H + v_i \qquad (2)$$

$$\ln y_i = C_i(\alpha + \beta H) + v_i \beta + u_i \quad (2 \text{ in } 1)$$

$$\ln y_i = C_i \psi + \varepsilon_i \qquad (3)$$

Where $\psi = \alpha + \beta H$, and $\varepsilon_i = v_i \beta + u_i$

- Equation (3) is called the reduced form model. It comprises in ψ the direct effect of circumstances over the outcome variable, and the indirect effect through effort (Ferreira and Gignoux 2011).

- $\hat{y}$ estimated by OLS provides the counterfactual distribution y_B needed to measure inequality of opportunity.

- Applying and inequality index to y_B we obtain a lower bound estimate of the IOp level

$$\text{Level of IOp} = I(y_B) \text{ ; as a share of total inequality} = \frac{I(y_B)}{I(y)}$$

Selection of the inequality index

- Mean logarithmic deviation (MLD) preferred due to decomposability property.

- However the MLD index is more sensitive to the lower tail of the income distribution. Therefore, applying the index to a counterfactual distribution which only contains the mean values by type, would underestimate inequality (Brunori, Palmisano, and Peragine, 2015).

- The Gini index is not additively decomposable. This problem is solved by using the Shapley decomposition which allows the estimation of the marginal contribution of the within- and between-groups components of the overall inequality (see Gradín et al. (Forthcoming)).

$$G = G_{bewteen} + G_{within}$$

$$G_{bewteen} = G_{IOp} = \frac{1}{2}[I(y_b) + I - I(y_w)]$$

$$G_{bwithin} = G_{\text{effort-luck}} = \frac{1}{2}[I(y_w) + I - I(y_b)]$$
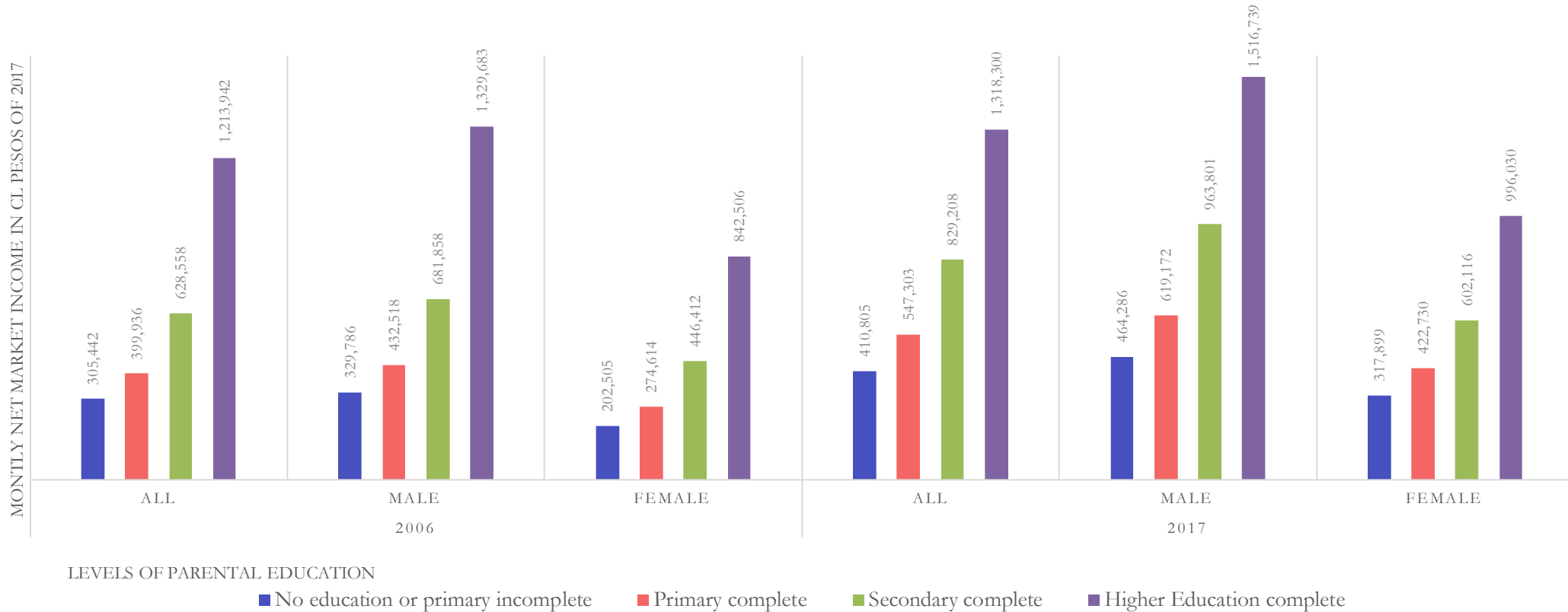
Data

- Data comes from the Chilean income survey CASEN 2006 and 2017, Encuesta de Caracterización Socioeconómica Nacional (Ministry of Social Development and Family).

- Sample: Household heads. People at working age. Men and women between 25 and 60, who are active in the labor market.

- Outcome variables: Individual net market income and individual hourly earnings in CL pesos of 2017.

- Circumstances: Parental education, gender, region of birth, ethnicity and family composition (if the person lived with the parents until the age 15).

Sample

	2006 %	2017 %
Gender		
Male	76.38	57.46
Female	23.62	42.54
Parental education		
No education or primary incomplete	30.76	33.34
Primary complete	47.02	29.75
Secondary complete	14.97	24.77
Higher Education	7.25	12.14
Plece of birth		
North	11.99	17.99
Centre	44.08	37.37
South	25.46	23.20
Metropolitan R.	18.47	21.44
Grew up with both parents	76.99	74.71
Indigenous backgoung	10.29	11.45
Total sample (n observations)	38,889	35,255

Descriptive: Monthly average net market income by level of parental education

MONTLY NET MARKET INCOME IN CL PESOS OF 2017

2006

- ALL: 305,442 / 399,936 / 628,558 / 1,213,942
- MALE: 329,786 / 432,518 / 681,858 / 1,329,683
- FEMALE: 202,505 / 274,614 / 446,412 / 842,506

2017

- ALL: 410,805 / 547,303 / 829,208 / 1,318,300
- MALE: 464,286 / 619,172 / 963,801 / 1,516,739
- FEMALE: 317,899 / 422,730 / 602,116 / 996,030

LEVELS OF PARENTAL EDUCATION

- No education or primary incomplete
- Primary complete
- Secondary complete
- Higher Education complete

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Decomposition of the Gini – between (IOp) and within components (market income)

Market income	2006				2017			
	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Overall Gini	0.515	0.515	0.515	0.515	0.490	0.490	0.490	0.490
Gini Between (IOP)	0.154	0.167	0.178	0.183	0.140	0.157	0.165	0.171
Gini Within	0.361	0.348	0.337	0.332	0.350	0.333	0.325	0.319
IOP/Oveall Gini	**29.9%**	**32.5%**	**34.6%**	**35.5%**	**28.6%**	**32.1%**	**33.6%**	**34.8%**
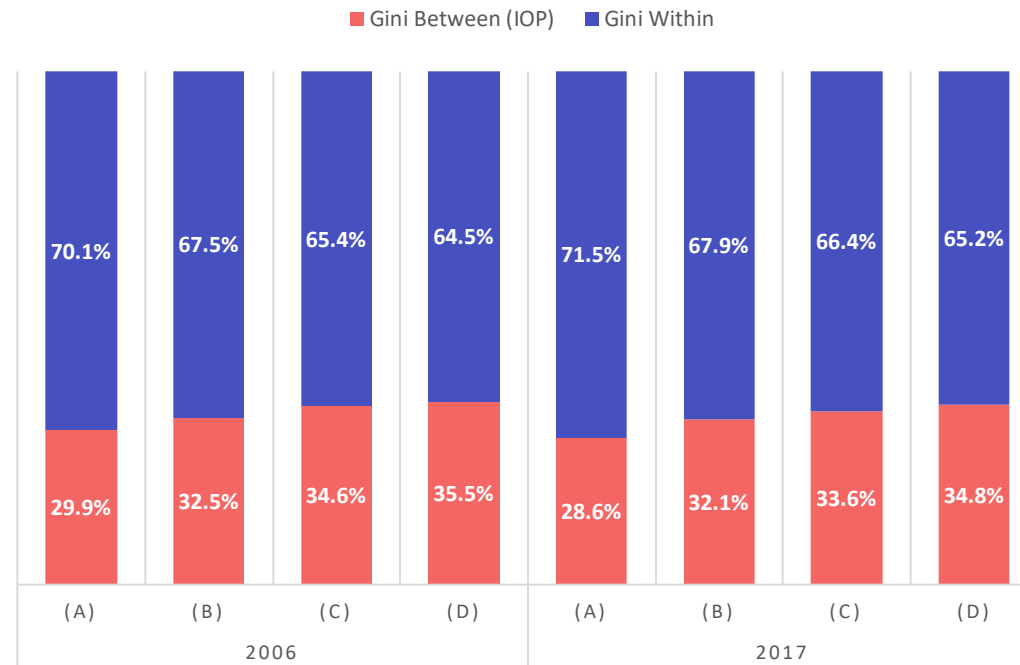
(a): Parental education; (b): a + gender; (c): a+ b + region of birth; (d): a+ b+ c+ family composition + ethnicity
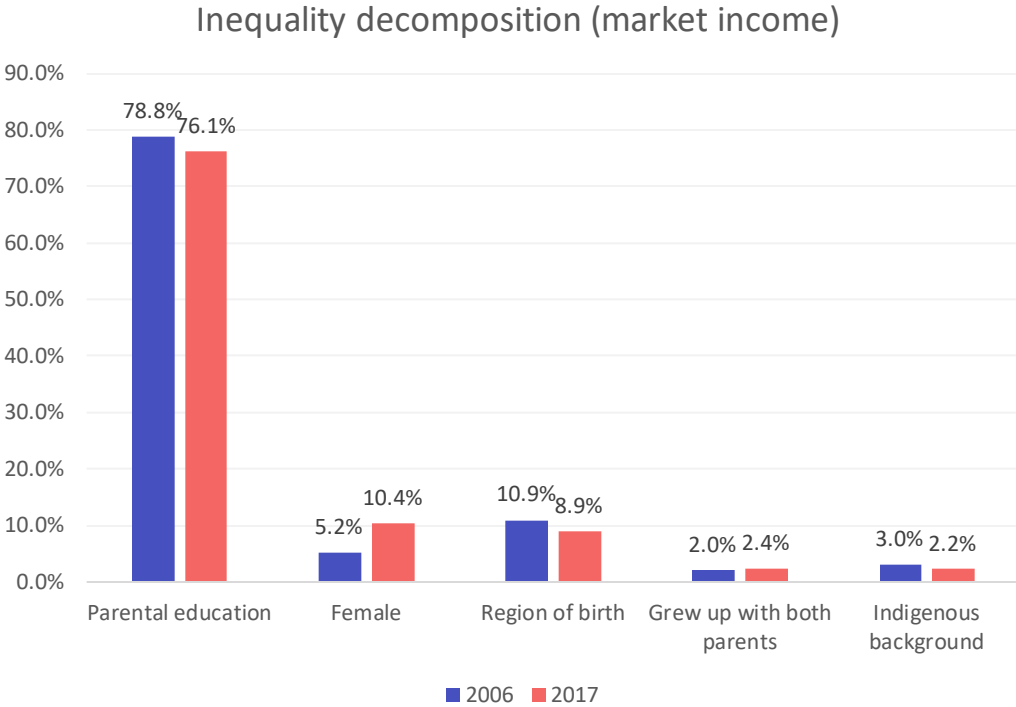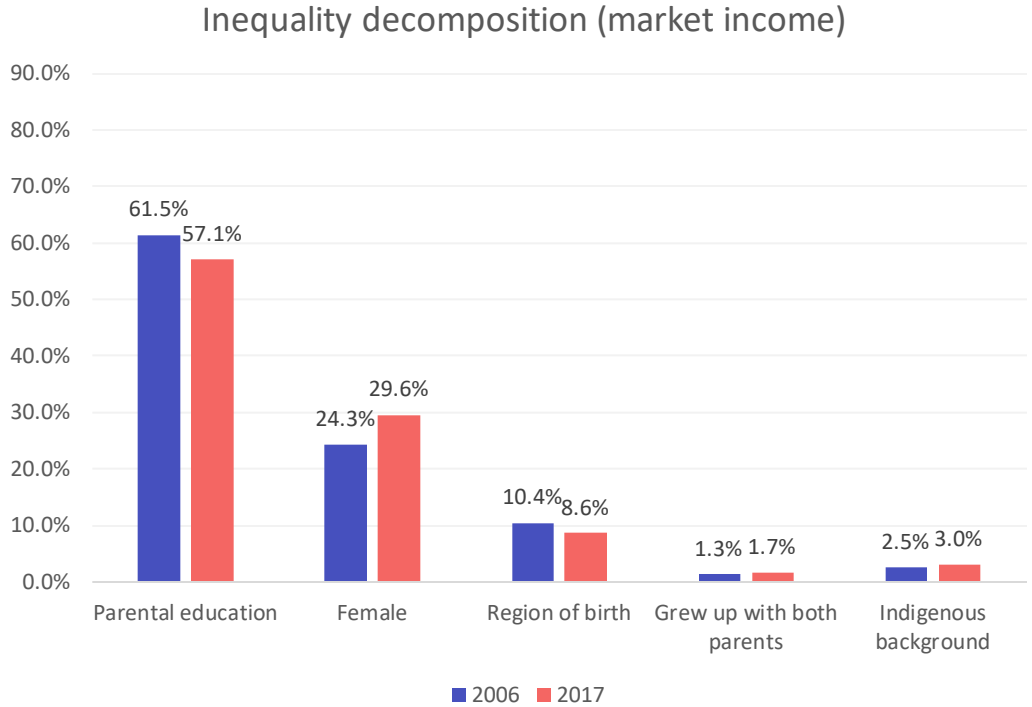
Decomposition of the Gini – between (IOp) and within components (hourly earning)

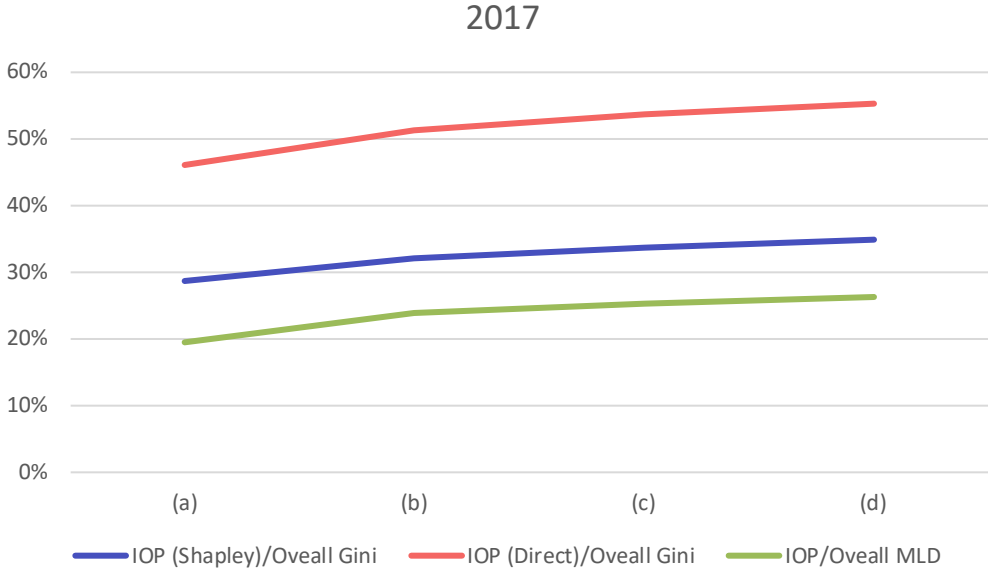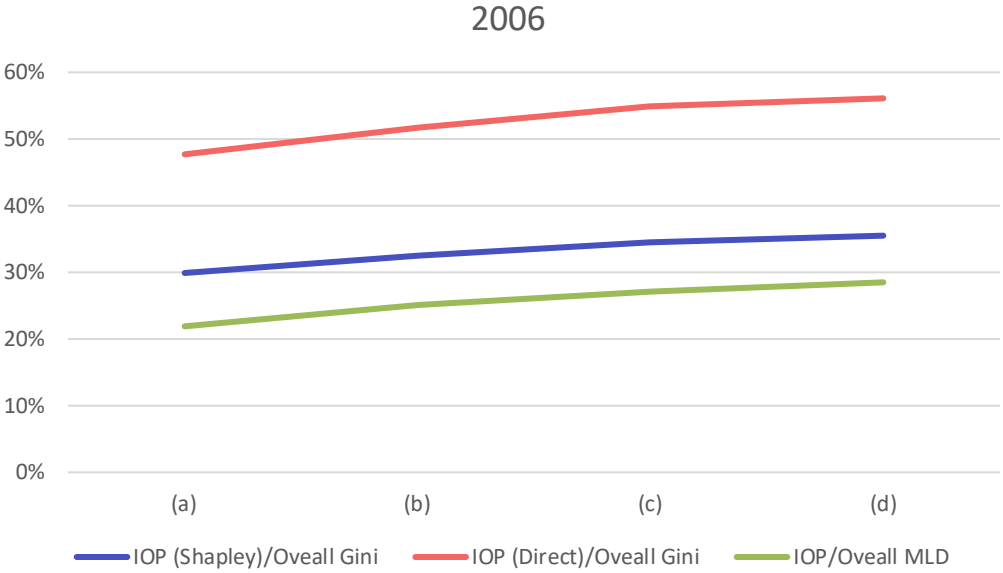| Hourly earnings	2006				2017			
	(a)	(b)	(c)	(d)	(a)	(b)	(c)	(d)
Overall Gini	0.522	0.522	0.522	0.522	0.498	0.498	0.498	0.498
Gini Between (IOP)	**0.141**	**0.146**	**0.160**	**0.167**	**0.128**	**0.139**	**0.150**	**0.157**
Gini Within	0.381	0.376	0.362	0.355	0.370	0.359	0.348	0.341
IOP/Oveall Gini	**27.0%**	**28.0%**	**30.6%**	**32.0%**	**25.7%**	**27.9%**	**30.1%**	**31.5%**
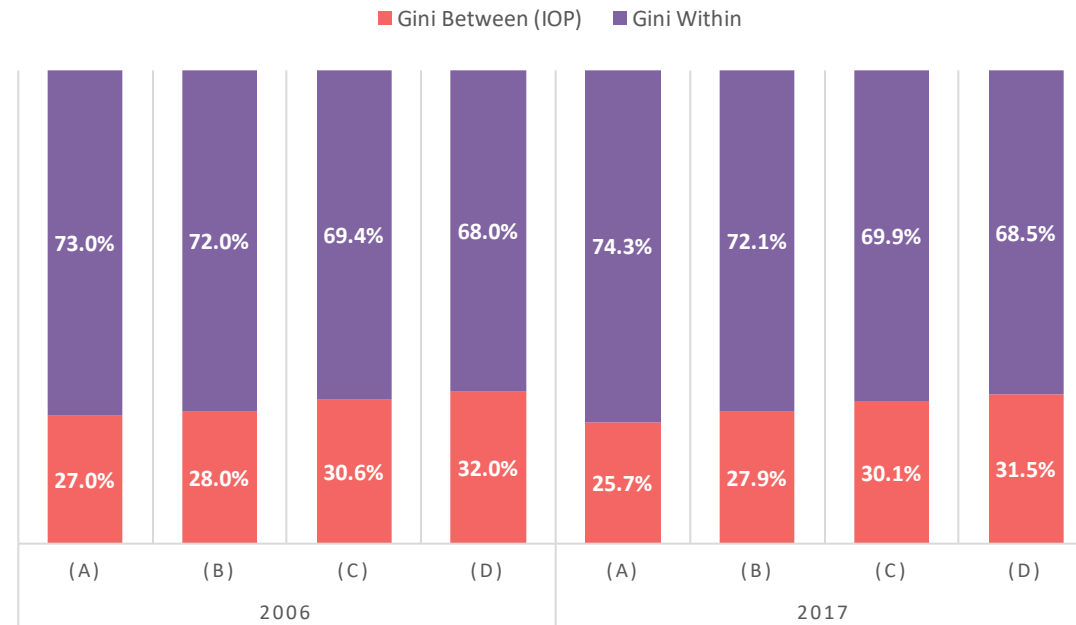
(a): Parental education; (b): a + gender; (c): a+ b + region of birth; (d): a+ b+ c+ family composition + ethnicity

# Shapley decomposition: Relevance of each circumstance

Inequality decomposition (market income)

Inequality decomposition (market income)

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Comparison of inequality of opportunity estimates depending on the inequality index

2006

2017

IOP (Shapley)/Oveall Gini   IOP (Direct)/Oveall Gini   IOP/Oveall MLD

Gini index and MLD applied directly to the counterfactual income distribution

RIF-regression decomposition of the change in log-market earnings by quantile (Firpo et al., 2011, 2018)
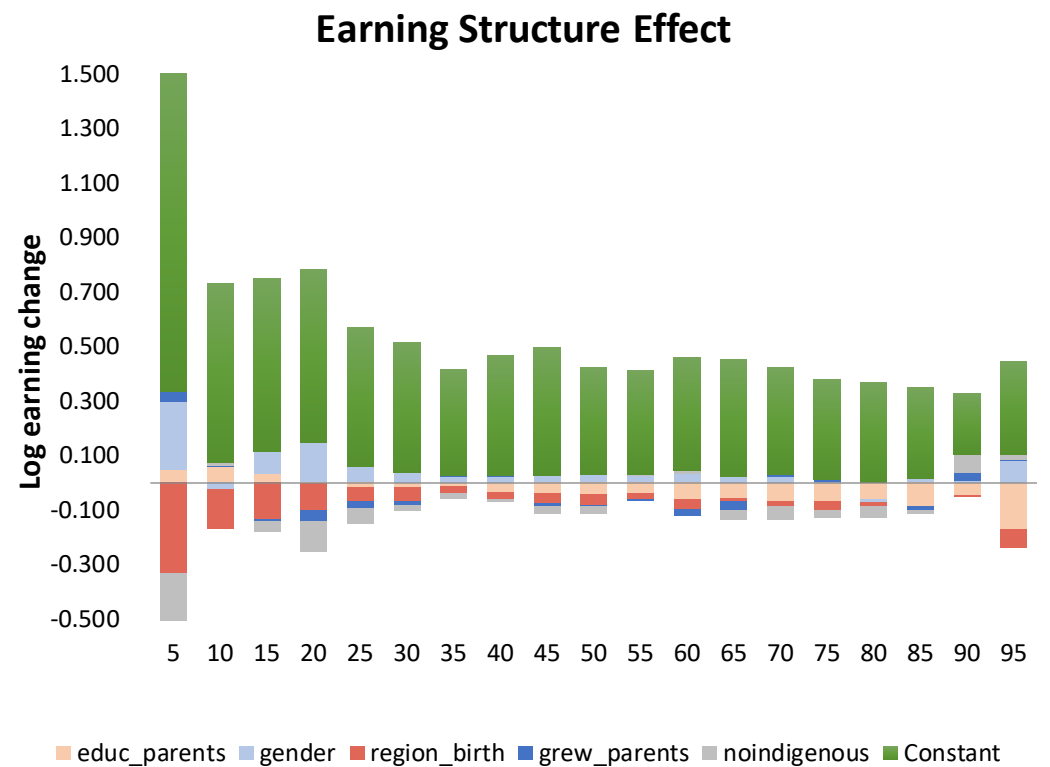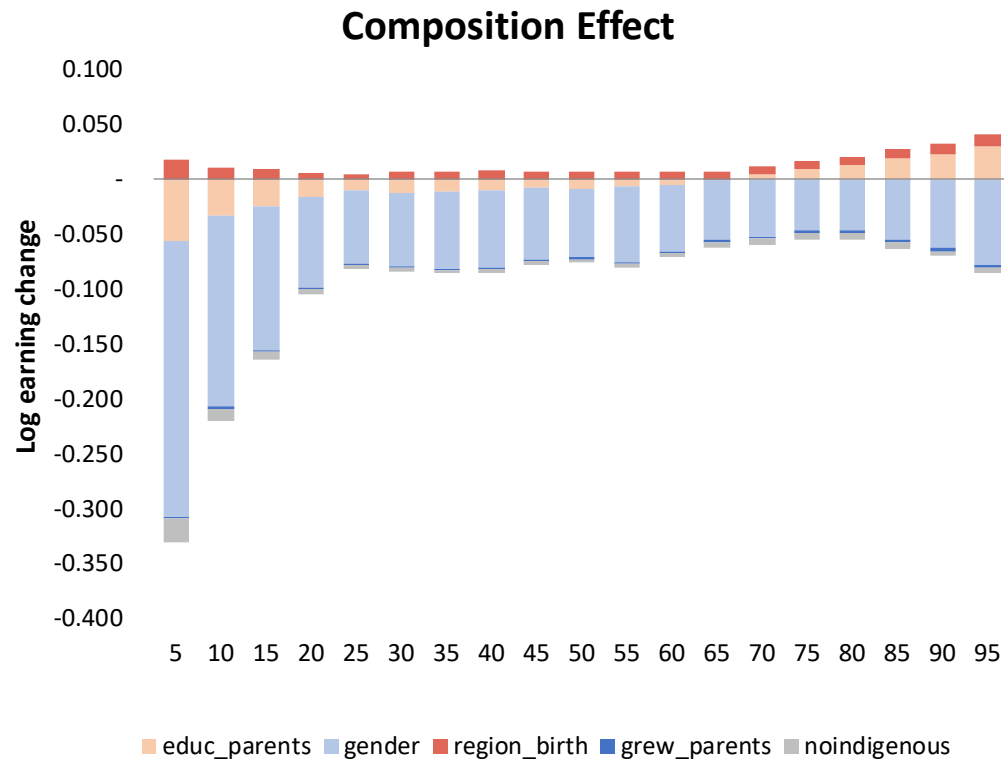
Extension of the Oaxaca-Blinder (OB) decomposition.
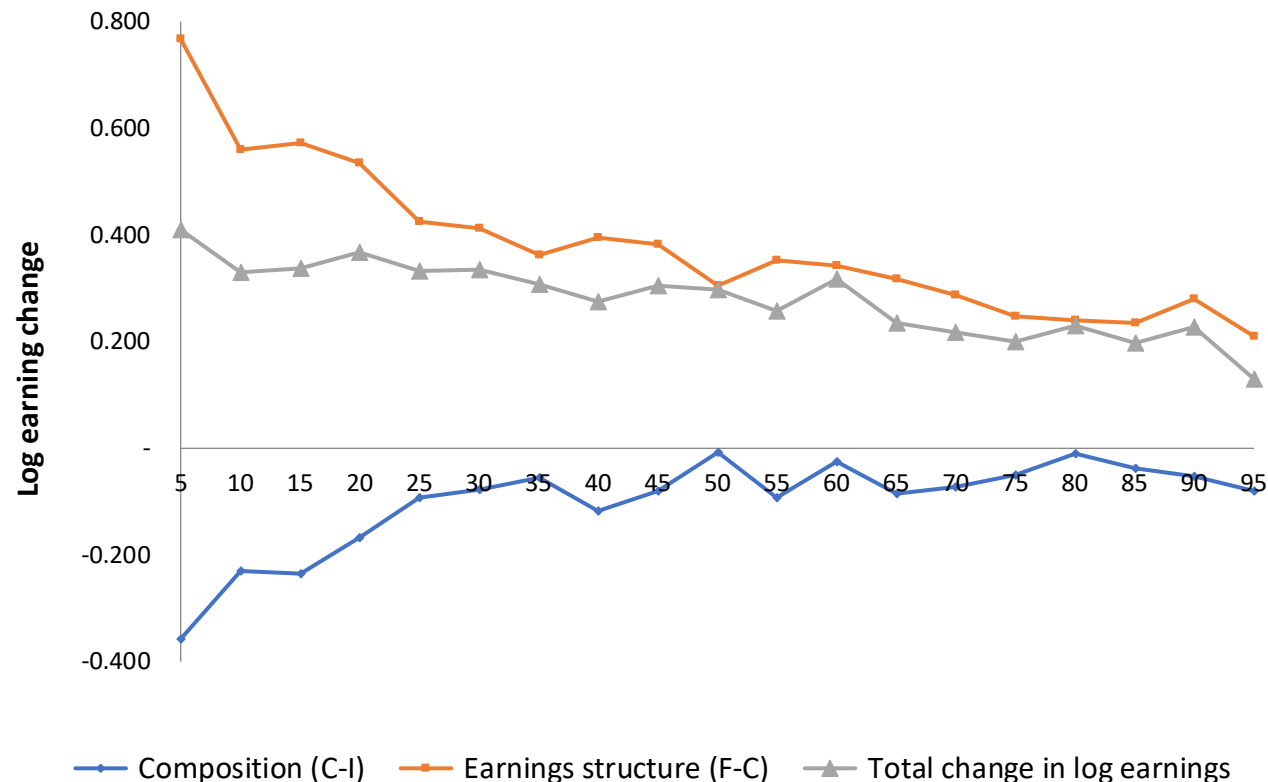
Composition effect: changes due to varying worker circumstances, such as more women as household heads in 2017 and increasing level of parental education (secondary and HE).

Earnings structure effect: changes in the return to those circumstances.

Legend: Composition (C-I) — Earnings structure (F-C) — Total change in log earnings

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RIF-regression decomposition

Composition Effect

Earning Structure Effect

Concluding Remarks

- Considering all available circumstances, inequality of opportunity as a proportion of total inequality has only slightly decreased between 2006 and 2017 from 35.5% to 34.8%.

- Parental education is the circumstance variable that explains most of the income variability. Its relevance has slightly decreased in 11 years.

- Gender is highly relevant in explaining the variability of income, particularly market income.

- IOp estimates obtained using the Shapley decomposition are higher than those obtained with the MLD index and smaller than applying the Gini index directly to the counterfactual income distribution that eliminates fair inequality. The difference might be explained by the MLD index's sensitivity to the distribution's lower tail.

- Applying the Gini index directly to the counterfactual income distribution might overestimate inequality of opportunity.

- The RIF decomposition shows that changes in the earnings structure mostly drive the variation in earnings along the distribution, which affects more strongly the bottom of the distribution.

- Among the circumstances, we observe a positive effect of gender on increasing earnings in the lower part of the distribution, and parental education.

- From the covariates, region of birth and gender dominates the earnings structure effect, but with opposite sign. Returns of parental background have an inequality-diminishing effect, reducing wages mainly above the median.

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¡Gracias!
Thanks!

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