

Mechanisms of intergenerational inequality: evidence from PIAAC

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Outline

1. Research Question

- Which is the role of the family background?
- Previous Works

2. Empirical Strategy

- Direct and Indirect Associations
- Proxies of Unobservable Abilities

3. Data

4. Empirical findings

5. Summary

Why do we care about parental background?

- How does the association between the family background and offspring's earnings arise?
- Does the parental background correlate only through education?
- How is it possible to empirically distinguish the different components of human capital, i.e. soft skills, network... ?
- Which are the differences among the income distribution?

Previous Works:

- Hanushek et al., (2013)
 - Performing an international comparisons of earnings, they rely almost exclusively on school attainments measures of human capital, and the evidence incorporating direct measures of cognitive skills is mostly restricted to early-career workers in the United States. They use PIAAC;
 - on average, a one-standard-deviation increase in numeracy skills is associated with an 18 percent wage increase among prime-age workers. But this masks considerable heterogeneity across countries;
 - estimates are remarkably robust to different earnings and skill measures, additional controls, and various subgroups.
- Raitano & Vona, (2015)
 - distinguishes the effects that family background may have upon educational attainments and upon occupation and earnings, independently from education. They use EU-SIIC where there are not available measures of skills.

Previous Works (1):

- Jerrim & Macmillan, (2015)
 - examine the mechanisms thought to underpin the Great Gatsby Curve particularly with regard to the role of educational attainments. They use PIAAC;
 - educational attainment is an important driver of the relationship between intergenerational mobility and income inequality.
- Cappellari et al., (2016)
 - estimate the earnings effects of both years of education and of numerical skills. They use PIAAC;
 - results suggest that the same set of unobservable abilities drives the accumulation of both formal years of education and numeracy skills.

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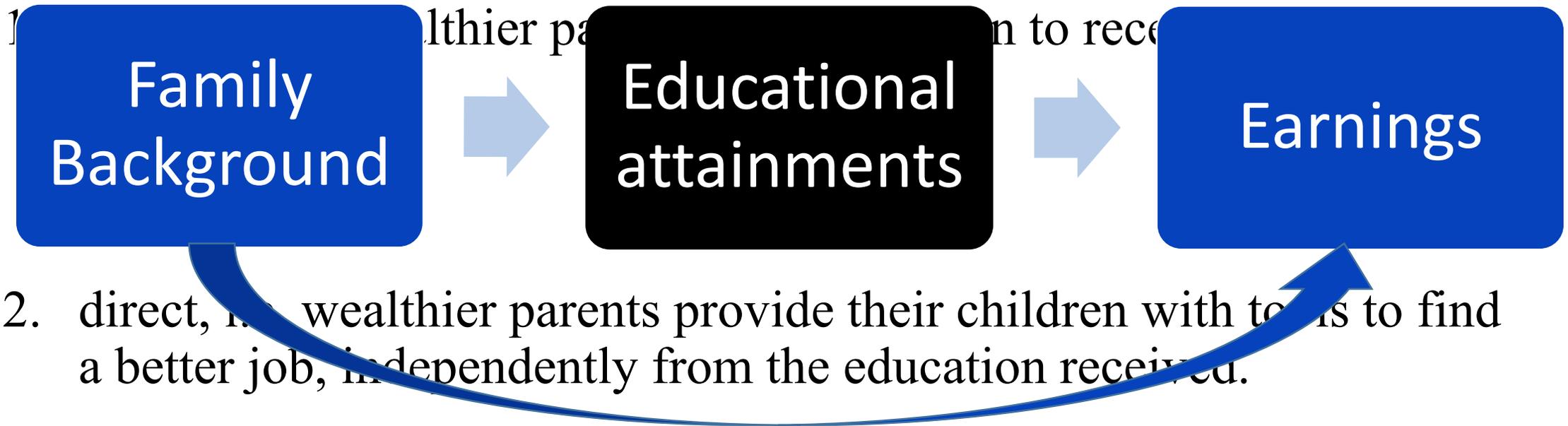
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Two different channels through which the family background affects offspring's earnings:



Parental background

- Family background can be identified in different ways, i.e. parental education, parental income, family wealth, grand parents education...
- In this paper we use the *number of books at parental home* which seems a more comparable measure of parental cultural capital in a cross-country analysis. (Wossmann 2003, 2004; Fuchs and Wossmann, 2004)
- Growing up with home libraries boosts adult literacy, numeracy and problem solving skills beyond the benefits accrued from parental education or own educational or occupational attainment. (Sikora et al., 2018)

The role of skills

- Parents influence children's human capital through investment in education and heritability of abilities (Becker & Tomes, 1979; 1986)
- Mincer (1970; 1974) showed how wage differentials could be significantly explained by school attainments. Mincer formulation assumes that schooling is the sole systematic source of skills differences.
- Barone and Van De Werfhost (2001) estimate a skill-augmented wage model and find that a large fraction of the education effect is attributable to cognitive skills.
- While assessments of the achievement of students are common, tested students are seldom followed from school into the labour market where the impact of differential skills can be observed.

"Achievement tests miss, or more accurately, do not adequately capture, soft skills—personality traits, goals, motivations, and preferences that are valued in the labor market, in school, and in many other domains.» Heckman & Kautz, (2012)

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OECD Program for the International Assessment of Adult Competencies (PIAAC)

- 250,000 adults, representing 815 million adults aged 16 to 65 surveyed in 33 countries from August 2011 to March 2012 and from April 2014 to April 2015;
- important novelty of PIAAC is the availability of a cross-country comparable measure of earnings and of literacy and numeracy scores which are a good tool to better capture unobservable abilities;
- it provides substantially larger sample sizes per country (more than twice the effective IALS sample sizes), allowing richer analyses in subgroups;
- PIAAC substantially extends the depth and range of measured skills.

Sample Selection

- People living in 7 OECD countries: France, Germany, Italy, Spain, Norway, UK, USA;
- born in the country where the interview is conducted;
- aged 30-54, i.e. in the central years of their working life;
- not in self-employment;
- trimming at top and bottom 0.5%;

14,971 observations.

Step-wise strategy, 4 steps

1. $\text{Log}(m_earnings)$ gender age books
2. $\text{Log}(m_earnings)$ gender age books education
3. $\text{Log}(m_earnings)$ gender age books education field_of_study
4. $\text{Log}(m_earnings)$ gender age books education field_of_study literacy numeracy

In this paper we will never consider as causal effects the significant links between background and outcomes.

It is very likely that the influence of genetic factors does not substantially differ across countries (Causa et al. 2009): hence, since we focus on cross-country comparisons, this identification problem is not an issue at stake here.

Skills variables

- Literacy: “ *the ability of understanding, evaluating, using and engaging with written text to participate in society, to achieve one’s goals and to develop one’s knowledge and potential*”(OECD 2013).
- Numeracy: “*the ability to access, use, interpret and communicate mathematical information and ideas, in order to engage in and manage the mathematical demands of a range of situations in adult life*”

Main Variables

- **Monthly Earnings:** monthly earnings including bonuses for wage and salary earners and self-employed, PPP corrected \$US.
- **Books at Parental Home:** categorical variable ranging from 1 (10 or less) to 6 (more than 500).

Literacy correlations

Literacy																					
	FR	DE	IT	ES	NO	UK	USA	FR	DE	IT	ES	NO	UK	USA	FR	DE	IT	ES	NO	UK	USA
Books at Parental Home	12.4 ***	14.4 ***	12.3 ***	13.4 ***	12.6 ***	11.2 ***	16.2 ***	7.0 ***	8.0 ***	6.6 ***	7.9 ***	9.0 ***	8.0 ***	8.8 ***	7.8 ***	8.2 ***	7.2 ***	8.4 ***	8.6 ***	8.6 ***	9.7 ***
SD	0.616	0.702	1.037	0.778	0.684	0.832	0.879	0.600	0.716	1.011	0.770	0.654	0.781	0.795	0.697	0.801	1.129	0.898	0.747	0.950	1.029
Educ. 5	NO	YES																			
Field of Study 5	NO	NO	NO	NO	NO	NO	NO	NO	YES												

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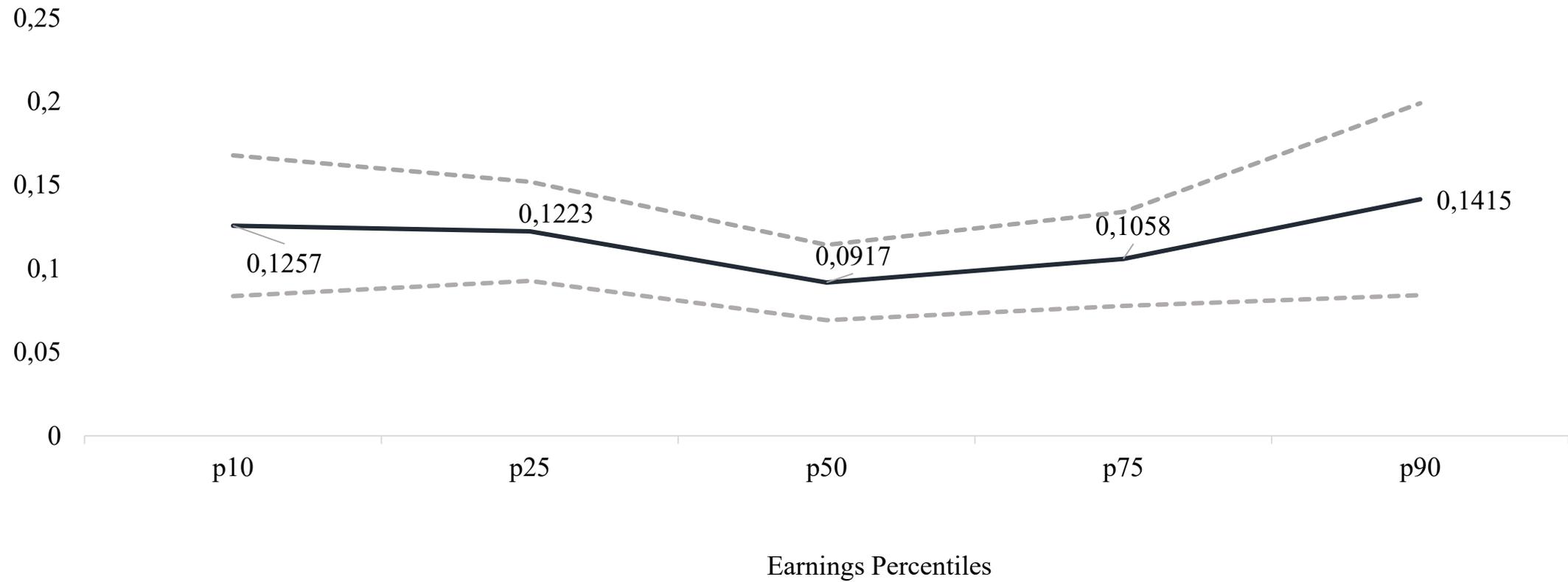
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OLS, Effect on Earnings, 30-54 years

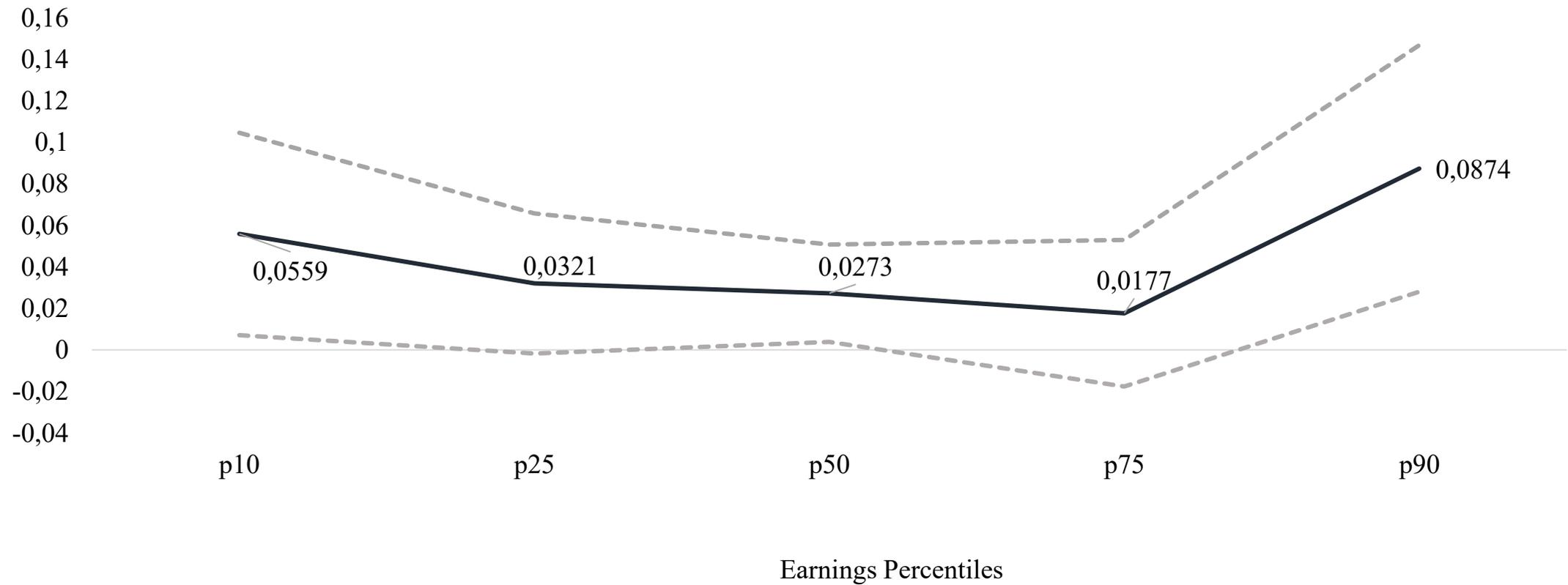
Model 1, Log(m_earnings) gender age books							
	France	Germany	Italy	Spain	Norway	UK	USA
books	0.0895***	0.1163***	0.1142***	0.1354***	0.0653***	0.0692***	0.1089***
SE	[0.0075]	[0.0141]	[0.0138]	[0.0112]	[0.0083]	[0.0127]	[0.0145]
CI	0.0771,0.1019	0.0930,0.1396	0.0915,0.1369	0.1171,0.1538	0.0517,0.0789	0.0483,0.0900	0.0850,0.1328
N	2,134	1,825	1,210	1,488	1,827	2,673	1,601
Model 2, Log(m_earnings) gender age books education							
	France	Germany	Italy	Spain	Norway	UK	USA
books	0.0309***	0.0253*	0.0539***	0.0534***	0.0271***	0.0140	0.0209
SE	[0.0073]	[0.0135]	[0.0146]	[0.0110]	[0.0084]	[0.0117]	[0.0142]
CI	0.0188,0.0430	0.0031,0.0475	0.0299,0.0779	0.0353,0.0715	0.0133,0.0409	-0.0053,0.0333	-0.0026,0.0443
N	2,134	1,825	1,210	1,488	1,827	2,673	1,601
Model 3, Log(m_earnings) gender age books education field_of_study							
	France	Germany	Italy	Spain	Norway	UK	USA
books	0.0307***	0.0254*	0.0518***	0.0532***	0.0231***	0.0181	0.0228
SE	[0.0073]	[0.0134]	[0.0147]	[0.0111]	[0.0082]	[0.0120]	[0.0141]
CI	0.0186,0.0427	0.0034,0.0474	0.0276,0.0761	0.0350,0.0714	0.0096,0.0367	-0.0017,0.0379	-0.0004,0.0460
N	2,134	1,825	1,210	1,488	1,827	2,673	1,601
Model 4, Log(m_earnings) gender age books education field_of_study literacy numeracy							
	France	Germany	Italy	Spain	Norway	UK	USA
books	0.0138*	0.0018	0.0400***	0.0454***	0.0120	-0.0055	-0.0073
SE	[0.0072]	[0.0133]	[0.0155]	[0.0112]	[0.0081]	[0.0121]	[0.0143]
CI	0.0020,0.0256	-0.0201,0.0238	0.0145,0.0655	0.0270,0.0639	-0.0013,0.0252	-0.0254,0.0144	-0.0308,0.0163
N	2,134	1,825	1,210	1,488	1,827	2,673	1,601

RIF, Italy, Model 1

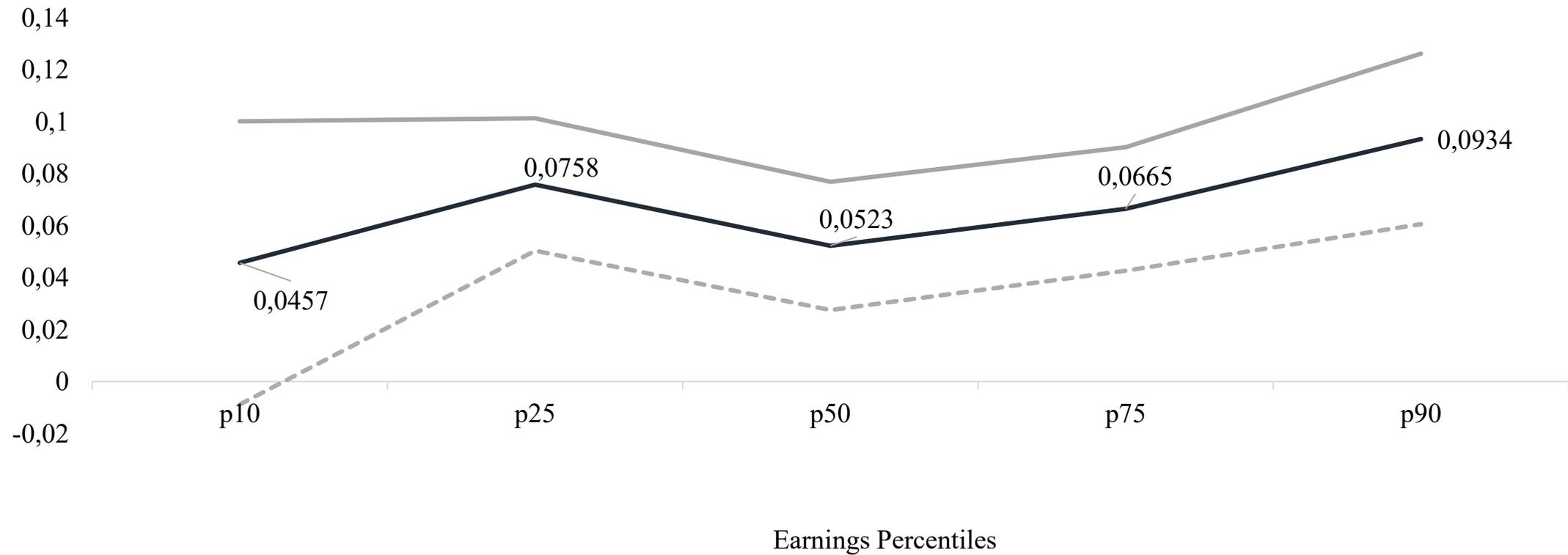
Beta books at home and 95% Confidence Intervals



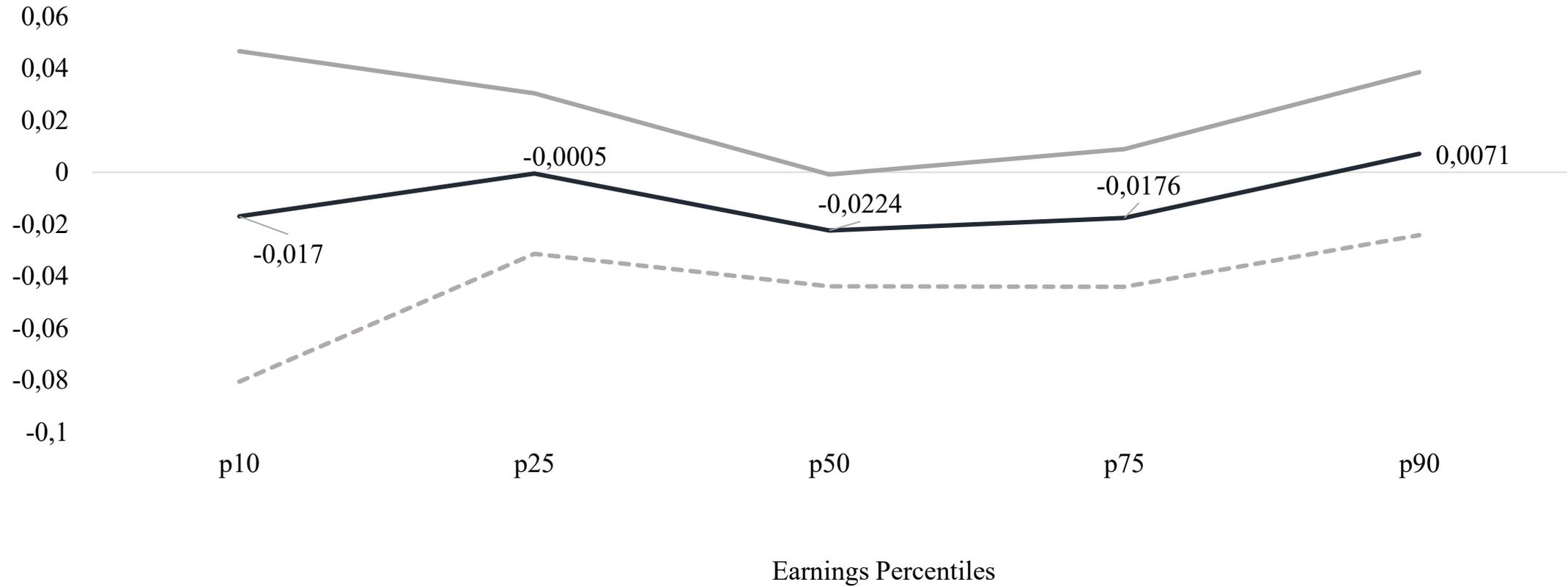
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Conclusions:

- the estimated relationships between parental background and children's earnings differ widely across countries;
- major differences about the residual association between family background and earnings point to the existence of a 'direct' intergenerational effect not mediated by other factors in Italy, Spain and France, while in the UK and in the USA background effects are almost entirely mediated by the "quantity" of education and in Germany and Norway they disappear once the "quality" is accounted for;
- improving educational equality of opportunity would not be enough to foster social mobility in all countries;
- differences across the earning distribution in Italy suggest that at the two extremes of the distribution the effects are larger, meaning that there may be polarization tendencies.

Outlook

- How to further improve the ability to capture the different components of Human Capital?
- Which is the effect of soft skills not captured by assessment scores?
- Network effects may play a major role in the labour market of countries (like Italy and Spain, Pellizzari *et al.*, 2011) where informal relationships are crucial to obtaining good jobs. Which are the best policies to eliminate the “direct” effect?



Thank you!



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