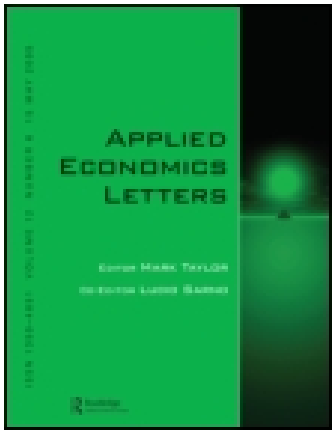

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The relationship between income inequality and inequality of opportunities in a high-inequality country: the case of Chile

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The relationship between income inequality and inequality of opportunities in a high-inequality country: the case of Chile

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Based on Bourguignon *et al.* (2005, 2007), we explore the extent to which income inequality in Chile is associated with inequality of 'opportunities', proxied by inequality in observed socioeconomic circumstances of origin. We found that equalizing a diverse set of observed circumstances across individuals reduces the Gini and the Theil coefficients by about 15 and 25%, respectively. Almost half of the effect of observed circumstances on incomes is transmitted directly to earnings, whereas the rest is indirectly transmitted through the accumulation of schooling. Further results suggest that the influence of unobserved circumstances on income inequality may be limited; hence aspects such as preferences, choices, transitory income shocks and income measurement errors may be important factors behind observed income inequality.

I. Introduction

There has been ongoing debate as to whether redistributive policies should promote equality of 'outcomes' across individuals (i.e. reduce income inequality) or attempt instead to equalize individuals' 'opportunities' to pursue the life plans of their choosing, regardless of the resulting income inequality.[1] This debate has benefited from various theoretical contributions in recent decades, yet limited insights have been gained from empirical research.[2] This article draws upon the methodology developed by Bourguignon *et al.* (2005, 2007) to provide empirical evidence on the relationship between income inequality and inequality of 'opportunities' proxied by inequality of inherited socioeconomic circumstances. Examining this relationship is relevant for various reasons. First, it sheds light on the extent to which income inequality indicators can be regarded as the measures of equality of opportunities. Second, the policy implications of this distinction would be less significant if both types of inequality were empirically associated. This would highlight the equalization of circumstances as a means of jointly promoting equality of outcomes and of opportunities in the long run.

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[1] The latter view has acquired some salience, as suggested, for example, by The World Bank in the 2005 Report on Equity and Development: 'By equity we mean that individuals should have equal opportunities to pursue a life of their choice and be spared from extreme deprivation in outcomes', (p. 2).

[2] See Roemer (1996, 1998, 2000) and Dworkin (1981) for descriptions of the notions of equality of opportunities and of outcomes. Also, Amartya Sen's Capability approach has a resemblance to the notion of equality of opportunities, as described for example in Sen (1999) and Nussbaum and Sen (2000). Alesina *et al.* (2004) discuss the different attitudes between Europeans and Americans towards both notions of equality. For a survey of empirical contributions on equality of opportunity, see Bourguignon *et al.* (2007), Guzman and Urzua (2009) and Contreras *et al.* (2009) for other evidence for Chile.

On the contrary, if the relationship between opportunities and outcomes is weak, then equal-opportunities advocates should expect and accept the substantial income inequality delivered by opportunities-equalizing policies, whereas equality-of-outcomes advocates should stress the need for pure redistribution policies in addition to equalizing opportunities.

The following section presents four circumstances-equalizing benchmarks and their effects on income inequality. The results and the data used are discussed in Section III, and Section IV concludes.

II. Four Circumstance-Equalizing Benchmarks

Bourguignon *et al*. (2005, 2007) proposed a model where individual earnings W_i depend on earnings-increasing actions that individuals perform throughout their lives ('efforts'), and inherited socioeconomic 'circumstances', as described in a linearized expression by

$$\mathrm{Ln}(W_i) = \alpha \cdot C_i + \beta \cdot E_i + U_i \qquad (1)$$

where circumstances C_i reflect individual i's socioeconomic background and effort E_i reflects his human capital attainment, α and β are coefficient vectors and residual U_i, includes the unobserved circumstances and efforts, measurement errors and deviations of measured income from permanent income, all of which are independent of C_i and E_i and have zero mean. However, inherited circumstances are expected to influence an individual's 'effort' (human capital), hence

$$E_i = B \cdot C_i + V_i \qquad (2)$$

where B is a coefficient matrix and V_i represents a nonobservable effort determinant vector. Introducing Equation 2 into 1 yields,

$$\mathrm{Ln}(W_i) = (\alpha + \beta \cdot B) \cdot C_i + \beta \cdot V_i + U_i \qquad (3)$$

In model (1) α reflects the direct or 'partial effect' of observed circumstances on earnings. In model (3) the 'total effect' of observed circumstances on earnings is $\alpha + \beta B$, which also includes the indirect effect of circumstances on earnings through 'effort', βB. The total effect is larger than the partial effect if $\beta B > 0$, as expected.

Bourguignon *et al*. (2005, 2007) employed schooling as their measure of 'effort' E_i. We believe that describing schooling as an 'effort' variable is controversial, particularly in countries with glaring inequalities in educational opportunities. We therefore preferred to replace effort E_i by individual schooling level S_i. Under this interpretation, Equation 1 expresses earnings as a function of human capital (schooling) and circumstances of origin and residual U_i that captures unobserved circumstances, luck and effort-at-work, deviations from permanent income and income measurement errors. Parameter β would reflect the return to schooling and B the effect of observed circumstances on schooling (like parental investment in education and abilities acquired during childhood). Parameter α would reflect the direct effect of circumstances on earnings conditional on schooling, such as the effect of the quality of education, abilities acquired in the household of origin, social networks and 'class-discrimination' in labour markets.[3] In conclusion, our modified interpretation considers 'effort' to be a non-observable variable, which would be captured in term V_i in Equation 2.

An ordinary least squares estimation of α, β and B in Equations 1 and 2 enables performing two types of simulations of the income distribution obtained by equalizing observed circumstances. Let W^P denote the simulated income distribution associated with the partial effect obtained after equalizing circumstances across individuals in Equation 1. The resulting income distribution would reflect individual differences in schooling and in the residue U_i, and the hypothetical income distribution W^P would be derived from the simulated incomes W_i^P from

$$\mathrm{Ln}\left(W_i^P\right) = \hat{\alpha} \cdot \bar{C} + \hat{\beta} \cdot S_i + \hat{U}_i \qquad (4)$$

where $\bar{C}$ is the vector of population means of the circumstance variables.

An alternative earnings distribution W^T associated with the total effect of circumstances can be obtained by equalizing observed circumstances across individuals in Equation 3; the resulting income distribution W^T would thus be obtained from

$$\mathrm{Ln}\left(W_i^T\right) = \left(\hat{\alpha} + \hat{\beta} \cdot \hat{B}\right) \cdot \bar{C} + \hat{\beta} \cdot \hat{V}_i + \hat{U}_i \qquad (5)$$

The comparison between the actual (observed) distribution W and distribution W^P and W^T reflects the partial and the total effect of observed circumstances on the distribution of income, respectively.

The simulated income distribution obtained after equalizing observed circumstances may be caused by differences in unobserved circumstances. In particular, the latter can explain part of the diversity in

[3] Núñez and Gutiérrez (2004) provide evidence suggestive of class-discrimination in Chile.

schooling that is not associated with observed circumstances, βV_i. Following Núñez and Tartakowsky (2007), two additional circumstance-equalizing benchmarks are established. Assume a hypothetical situation where schooling levels were fully determined by circumstances of origin – either observed or unobserved – as if 'effort' played no role in the accumulation of schooling. This would be equivalent to setting term $V_i = 0$ (which includes unobserved effort) for all individuals. This is equivalent to simulating individuals' income by replacing C_i by $\bar{C}$ and $V_i = 0$ in Equation 3, or equivalently, replacing C_i and S_i in Equation 1 by $\bar{C}$ and the mean schooling $\bar{S}$, respectively.[4] Thus, the simulated income distribution after equalizing observed circumstances and schooling, W^{ES}, would be derived from the following equation:[5]

$$\mathrm{Ln}\left(W_i^{ES}\right) = \left(\hat{\alpha} + \hat{\beta} \cdot \hat{B}\right) \cdot \bar{C} + \hat{U}_i$$

The fourth circumstance-equalizing benchmark that we perform guarantees all individuals the same amount of schooling up to a certain age, and then it employs the simulated level of schooling if it exceeds the guaranteed amount of schooling. More formally, let $S_i' = \hat{B}\bar{C} + \hat{V}_i$ denote the simulated schooling of individual i after equalizing observed circumstances in Equation 2. We claim that a low level of simulated schooling level S_i' (dropping out of school at an early age) can be safely attributed to some unobserved circumstances contained in $\hat{V}_i$. However, later in the life cycle, the value of simulated schooling S_i' will presumably reflect a combination of 'effort' and circumstances. We perform this benchmark by guaranteeing all individuals 10 years of schooling (achieved at about age 16) and employ the simulated value of schooling S_i' whenever $S_i' > 10$.[6] The simulated income distribution after guaranteeing 10 years of schooling, W_i^{GS}, is then derived from the following:

$$\mathrm{Ln}\left(W_i^{GS}\right) = \hat{\alpha}\bar{C} + \hat{\beta}S_i'' + \hat{U}_i$$

where $S_i'' = 10$ if $S_i' = \hat{B}\bar{C} + \hat{V}_i \leq 10$, and $S_i'' = S_i' = \hat{B}\bar{C} + \hat{V}_i$ if $S_i' = \hat{B}\bar{C} + \hat{V}_i > 10$.

Finally, let ψ denote an operator that computes an income inequality coefficient from income data (such as the Gini and Theil coefficients). Given the sources of variation in the simulated incomes, it can be expected that $\psi(W) > \psi(W^P) > \psi(W^T) > \psi(W^{GS}) > \psi(W^{ES})$.

III. Data and Results

We employ data from the 2006 National Socio-Economic Characterization Survey in Chile. In addition to the standard core of socioeconomic and labour market questions, in this survey several questions were added to the traditional questionnaire to obtain various measures of the respondents' socioeconomic circumstances of origin, which are presented in Tables 1–4.[7] The sample was delimited to individuals between 24 and 65 years to avoid selectivity problems. Unemployed individuals and

Table 1. Effects of equalizing circumstances on labour income inequality, men Gini coefficient

Gini coefficient	Age = 23–36	Age = 37–50	Age = 51–65	Age = 23–65
Total inequality (W)	0.481 [0.474–0.488]	0.511 [0.503–0.518]	0.608 [0.601–0.615]	0.535 [0.527–0.543]
Simulated models				
Partial effect (W^P)	0.436 [0.429–0.442]	0.47 [0.463–0.477]	0.557 [0.550–0.563]	0.491 [0.483–0.499]
Total effect (W^T)	0.395 [0.389–0.401]	0.441 [0.433–0.451]	0.503 [0.496–0.511]	0.455 [0.447–0.464]
10 years of schooling guaranteed (W^{GS})	0.389 [0.384–0.395]	0.434 [0.426–0.443]	0.487 [0.479–0.495]	0.447 [0.439–0.456]
Equalized schooling (W^{ES})	0.353 [0.347–0.358]	0.396 [0.388–0.403]	0.436 [0.429–0.442]	0.406 [0.399–0.414]

Note: Bootstrap-generated 95% confidence intervals in brackets.

[4] Note that estimating Equation 2 by ordinary lease squares yields $\bar{K} = B\bar{C}$.
[5] Note, however, that term U_i can still include the direct effect of unobserved circumstances on earnings; However, in the earnings regressions we include potential experience as an independent variable, which adds another source of variation in the simulated incomes.
[6] Using alternative age thresholds yields similar results to those reported below.
[7] Average income and rural percentage of Municipalities were obtained from the 1994 National Socio-Economic Characterization Survey, the oldest one with an important number of municipalities with representative data.

Table 2. Effects of equalizing circumstances on labour income inequality, women Gini coefficient

Gini coefficient	Age = 23–36	Age = 37–50	Age = 51–65	Age = 23–65
Total inequality (W)	0.435 [0.429–0.441]	0.526 [0.516–0.536]	0.547 [0.537–0.557]	0.502 [0.494–0.511]
Simulated models				
Partial effect (W^P)	0.395 [0.389–0.400]	0.486 [0.477–0.495]	0.517 [0.507–0.529]	0.466 [0.457–0.475]
Total effect (W^T)	0.362 [0.355–0.369]	0.442 [0.433–0.453]	0.488 [0.475–0.503]	0.434 [0.424–0.445]
10 years of schooling guaranteed (W^{GS})	0.356 [0.349–0.363]	0.436 [0.426–0.446]	0.470 [0.455–0.489]	0.428 [0.416–0.439]
Equalized schooling (W^{ES})	0.317 [0.308–0.324]	0.401 [0.391–0.409]	0.456 [0.433–0.481]	0.397 [0.384–0.411]

Note: Bootstrap-generated 95% confidence intervals in brackets.

Table 3. Effects of equalizing circumstances on labour income inequality, men and women Gini coefficient

Gini coefficient	Age = 23–36	Age = 37–50	Age = 51–65	Age = 23–65
Total inequality (W)	0.468 [0.463–0.473]	0.522 [0.517–0.527]	0.599 [0.593–0.605]	0.529 [0.523–0.536]
Simulated models				
Partial effect (W^P)	0.425 [0.420–0.430]	0.483 [0.478–0.488]	0.553 [0.547–0.559]	0.489 [0.483–0.496]
Total effect (W^T)	0.391 [0.387–0.395]	0.451 [0.445–0.458]	0.505 [0.498–0.512]	0.457 [0.450–0.464]
10 years of schooling guaranteed (W^{GS})	0.386 [0.382–0.390]	0.444 [0.438–0.451]	0.488 [0.481–0.496]	0.450 [0.443–0.457]
Equalized schooling (W^{ES})	0.346 [0.342–0.351]	0.404 [0.399–0.410]	0.446 [0.439–0.445]	0.410 [0.404–0.416]

Note: Bootstrap-generated 95% confidence intervals in brackets.

Table 4. Effects on income inequality of equalizing parental education only versus equalizing all circumstances Gini coefficient

Gini coefficient	Men, ages 23–65		Women, ages 23–65	
Total inequality (W)	0.535 [0.527–0.543]		0.502 [0.494–0.511]	
Simulated models	Employing all circumstances	Employing only parental education	Employing all circumstances	Employing only parental education
Partial effect (W^P)	0.491 [0.483–0.499]	0.494	0.466 [0.457–0.475]	0.468
Total effect (W^T)	0.455 [0.447–0.464]	0.459	0.434 [0.424–0.445]	0.441
10 years of schooling guaranteed (W^{GS})	0.447 [0.439–0.456]	0.45	0.428 [0.416–0.439]	0.434
Equalized schooling (W^{ES})	0.406 [0.399–0.414]	0.408	0.397 [0.384–0.411]	0.401

Note: Bootstrap-generated 95% confidence intervals in brackets.

those who did not report positive incomes or sufficient information about their parents were not considered. Finally, we considered individuals working between 30 and 72 hours per week.

Tables 1–3 report the simulated Gini coefficients associated with each of the four circumstance-equalizing benchmarks described earlier, using the estimated coefficients of specification 2 in Tables A1

and A2 and of specification 3 in Tables A3 and A4 of the Appendix. (The selection equation for women is provided in Table A5.)

Tables 1–3 indicate that the partial effect of observed circumstances explains about 4 and 5 points of the Gini coefficients for men and women, respectively, representing drops of about 8–10%. The total effect, in turn, yields a drop of about 7–8 points of the Gini coefficient, a drop of about 14–16% for men and women, respectively. Tables 1–3 also indicate a similar order of magnitude of the partial effect and the effect of observed circumstances on income through schooling. Guaranteeing 10 years of schooling yields income inequality similar to the total effect, a drop of about 7–9 points in the Gini coefficient. Also, equalizing schooling across individuals at complete secondary education (close to Chile's average schooling of 10.5 years for adults aged 23–65) reduces the Gini coefficient by about 11–13 points, a drop of about 22–25%. These results suggest that observed circumstances explain a limited share of the Gini coefficient. Table A6 reports the results for the Theil index, which yields higher but still limited effects of circumstances on observed inequality.

The results in Tables 1–3 are similar to those obtained by Bourguignon *et al.* (2005, 2007) for Brazil (using parental schooling and race as circumstances) and by Núñez and Tartakowsky (2007) for adult men in Greater Santiago (Chile's capital city). This suggests that the larger set of observed circumstances used here does not yield higher orders of magnitude of the partial and total effects. To explore this issue further, Table 4 reports the effects on income inequality of equalizing only parental education (columns 3 and 5) versus equalizing all the observed circumstances in addition to parental education (columns 2 and 4). This reveals the marginal effect on income inequality of equalizing further circumstances other than parental education, 'as if' all circumstances other than parental education remained 'unobserved'.

Table 4 shows that the marginal effect of circumstances other than parental schooling on simulated income inequality is minimal, about half a point of the Gini coefficient for the total effect. In addition, the simulated inequality obtained from employing all circumstances versus employing parental education only are statistically similar, suggesting that adding more circumstances to parental education contributes little to explaining income inequality and that the effect of unobserved circumstances on inequality may be limited.

This finding seems coherent with some evidence in the related literature. Behrman and Rosenzweig (2004) suggested that the influence of unobserved circumstances (fixed family background) on the offspring's performance is certainly important, indicating that a part of the income inequality obtained after equalizing observed circumstances may indeed be associated with unobserved circumstances. However, in an earlier related study, Behrman and Rosenzweig (2002) also suggested that maternal schooling proxies some important unobserved factors associated with family background. This would suggest that the observed circumstances used in this work are likely to capture an important part of other unobserved circumstances associated with family background.

IV. Conclusions

This article has examined the extent to which income inequality is associated to inequalities in a diverse set of observed socioeconomic circumstances of origin, which we take as proxies of 'inequality of opportunities'. We found that equalizing the observed circumstances to the mean values of the population reduces Gini coefficients by about 5–10 points (drops of about 10–20%), indicating that most of the measured inequality is unrelated to heterogeneity in observed circumstances. About half of the effect of observed circumstances on income inequality is transmitted directly to earnings, whereas the other half is transmitted indirectly through the accumulation of schooling. This article also finds a low marginal effect on the income inequality of additional observed circumstances in addition to parental schooling, suggesting a limited role for unobserved circumstances in explaining the residual income inequality.

These results suggest that, as long as the exercise of equalizing observed circumstances is an approximation of the notion of 'equality of opportunities', income inequality indicators may not necessarily adequately reflect a country's degree of inequality of opportunity, and factors such as individual preferences, effort, transitory income shocks and income measurement errors may instead be important. Equality of opportunity is thus likely to coexist with a significant amount of observed income inequality, which suggests that promoting equality of outcomes would demand not only equalizing circumstances and opportunities across individuals, but also a dose of pure redistributive policies. Nonetheless, further research must be undertaken to empirically distinguish more precisely the roles played by unobserved circumstances and by individual choices and preferences, as well as by other sources of variation in measured incomes.

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Appendix

Table A1. Schooling determinants; men

	Specifications[a]	
Variable	1	2[b]
Personal characteristics		
Age	–0.0551***	–0.0544***
	[0.0030]	[0.0030]
Birth handicap = 1 dummy	–1.0665***	–1.2412***
	[0.3639]	[0.3496]
Amerindian ethnic group = 1 dummy	–0.6554***	–0.6337***
	[0.1706]	[0.1696]
Parental schooling		
Father's primary education = 1 dummy	1.1927***	1.1560***
	[0.1260]	[0.1249]
Father's secondary schooling = 1 dummy	2.5465***	2.5443***
	[0.1408]	[0.1397]
Father's technical education = 1 dummy	4.1030***	4.0781***
	[0.1884]	[0.1874]
Father's university education = 1 dummy	4.8102***	4.8245***
	[0.1801]	[0.1788]
Mother's primary education = 1 dummy	0.8596***	0.8778***
	[0.1212]	[0.1203]
Mother's secondary education = 1 dummy	1.9119***	1.9330***
	[0.1382]	[0.1374]
Mother's technical education = 1 dummy	1.8882***	1.9410***
	[0.2154]	[0.2135]
Mother's university education = 1 dummy	2.0429***	2.0634***
	[0.1855]	[0.1839]

(*Continued*)

Table A1. Continued

	Specifications[a]	
Variable	1	2[b]
Childhood household attributes		
Household size	–0.1244***	–0.1218***
	[0.0108]	[0.0107]
Biparental household = 1 dummy	0.6122***	0.6333***
	[0.0899]	[0.0860]
Father employer dummy	0.1219	
	[0.1483]	
Mother employer = 1 dummy	1.1680***	1.2447***
	[0.2572]	[0.2365]
Childhood household location characteristics		
Income of municipality of origin	0.0000***	
	[0.0000]	
Rural population in municipality of origin	–1.6350***	–1.6118***
	[0.1642]	[0.1619]
Constant	11.4796***	11.4108***
	[0.1851]	[0.1814]
Sample size	10.737	10.988
R-squared	0.3743	0.3746
Adjusted *R*-squared	0.3733	0.3737

Notes: Dependent variable is years of schooling.
[a] OLS estimates SE in brackets.
[b] Specification used in simulations.
*** significant at the 1% prob. level.

Table A2. Schooling determinants; women

	Specifications[a]	
Variable	1	2[b]
Personal Charasteristics		
Age	–0.0782***	–0.0780***
	[0.0026]	[0.0025]
Birth handicap = 1 dummy	–1.3973***	–1.3746***
	[0.2268]	[0.2204]
Amerindian ethnic group = 1 dummy	–0.3775***	–0.3547**
	[0.1447]	[0.1424]
Parental schooling		
Father's primary education = 1 dummy	0.6966***	0.7109***
	[0.0988]	[0.0968]
Father's secondary schooling = 1 dummy	1.8407***	1.8726***
	[0.1123]	[0.1099]
Father's technical education = 1 dummy	2.7614***	2.7864***
	[0.1557]	[0.1536]
Father's university education = 1 dummy	3.2474***	3.3033***
	[0.1462]	[0.1437]
Mother's primary education = 1 dummy	1.1225***	1.1259***
	[0.0966]	[0.0946]
Mother's secondary education = 1 dummy	2.3641***	2.3450***
	[0.1118]	[0.1095]
Mother's technical education = 1 dummy	2.5997***	2.6091***
	[0.1776]	[0.1749]
Mother's university education = 1 dummy	3.0483***	3.0465***
	[0.1556]	[0.1530]
Childhood household attributes		
Household size	–0.1114***	–0.1111***
	[0.0090]	[0.0089]
Biparental household = 1 dummy	0.9123***	0.9458***
	[0.0766]	[0.0731]
Father employer dummy	–0.0652	
	[0.1229]	
Mother employer = 1 dummy	0.9167***	0.7660***
	[0.2235]	[0.2104]
Childhood household location characteristics		
Income of municipality of origin	0.0000****	
	[0.0000]	
Rural population in municipality of origin	–1.1733***	–1.2006***
	[0.1375]	[0.1351]
Constant	11.7688***	11.7163***
	[0.1549]	[0.1509]
Sample size	14.27	14.653
R-squared	0.3588	0.3611
Adjusted *R*-squared	0.3580	0.3604

Notes: Dependent variable is years of schooling.
[a] OLS estimates SE in brackets.
[b] Specification used in simulations.
** Significant at the 5% prob. level; *** Significant at the 1% prob. level.

Table A3. Earnings equations; men

Variable	Specifications[a] 1	2	3[b]
Schooling return			
Primary education	0.0391***	0.0396***	0.0422***
	[0.0080]	[0.0080]	[0.0039]
Secondary education	0.0390***	0.0403***	0.0486***
	[0.0120]	[0.0120]	[0.0060]
Tertiary education	0.1148***	0.1166***	0.1001***
	[0.0087]	[0.0087]	[0.0048]
Experience variables			
Potential experience	0.0339***	0.0344***	0.0311***
	[0.0028]	[0.0028]	[0.0015]
Potential experience – squared	–0.0004***	–0.0004***	–0.0003***
	[0.0001]	[0.0001]	[0.0000]
Personal characteristics			
Birth handicap = 1 dummy	–0.1633*	–0.1694*	–0.2468***
	[0.0935]	[0.0937]	[0.0477]
Amerindian ethnic group = 1 dummy	–0.1005**	–0.1066***	–0.1441***
	[0.0403]	[0.0403]	[0.0186]
Parental schooling			
Father's primary education = 1 dummy	0.0122		0.0341**
	[0.0305]		[0.0159]
Father's secondary schooling = 1 dummy	0.0052		0.0901***
	[0.0341]		[0.0188]
Father's technical education = 1 dummy	0.073		0.1549***
	[0.0459]		[0.0275]
Father's university education = 1 dummy	0.2792***	0.2778***	0.3711***
	[0.0445]	[0.0323]	[0.0262]
Mother's primary education = 1 dummy	–0.01		0.0479***
	[0.0291]		[0.0153]
Mother's secondary education = 1 dummy	0.1896***	0.2059***	0.1916***
	[0.0331]	[0.0187]	[0.0187]
Mother's technical education = 1 dummy	0.2010***	0.2362***	0.2417***
	[0.0509]	[0.0418]	[0.0309]
Mother's university education = 1 dummy	0.1506***	0.1808***	0.2236***
	[0.0442]	[0.0362]	[0.0265]
Childhood household attributes			
Household size	–0.004		–0.0060***
	[0.0027]		[0.0015]
Biparental household = 1 dummy	0.0779***	0.0724***	0.0484***
	[0.0218]	[0.0211]	[0.0127]
Father employer dummy	0.1113***	0.1194***	0.0989***
	[0.0354]	[0.0355]	[0.0203]
Mother employer = 1 dummy	0.2092***	0.2101***	0.2533***
	[0.0618]	[0.0618]	[0.0363]
Childhood household location characteristics			
Income of municipality of origin	0.0000***		
	[0.0000]		
Rural population in municipality of origin	–0.0891**	–0.1724***	
	[0.0398]	[0.0381]	
Constant	5.8547***	5.8885***	5.779***
	[0.0666]	[0.0650]	[0.0339]
Sample size	8452	8452	24 891
R-squared	0.4293	0.4255	0.4312
Adjusted *R*-squared	0.4279	0.4245	0.4308

Notes: Dependent variable is log of hourly wage rate.
[a] OLS estimates SE in brackets.
[b] Specification used in simulations.
* Significant at the 10% prob. level; ** Significant at the 5% prob. level; *** Significant at the 1% prob. level.

Table A4. Earnings equation; women

	Specifications[a]		
Variable	1	2	3[b]
Schooling return			
Primary education	0.0863***	0.0863***	0.0647***
	[0.0277]	[0.0272]	[0.0128]
Secondary education	–0.0156	–0.0047	0.0261
	[0.0356]	[0.0356]	[0.0179]
Tertiary education	0.1421***	0.1394***	0.1053***
	[0.0188]	[0.0188]	[0.0113]
Experience variables			
Potential experience	0.0254***	0.0232***	0.0228***
	[0.0062]	[0.0061]	[0.0037]
Potential experience – squared	–0.0003**	–0.0003**	–0.0003***
	[0.0001]	[0.0001]	[0.0001]
Personal charasteristics			
Birth handicap = 1 dummy	–0.2073**	–0.1883**	–0.1789***
	[0.0848]	[0.0827]	[0.0591]
Amerindian ethnic group = 1 dummy	–0.1561***	–0.1799***	–0.1222***
	[0.0607]	[0.0620]	[0.0322]
Parental schooling			
Father's primary education = 1 dummy	0.0145		0.0492**
	[0.0525]		[0.0242]
Father's secondary schooling = 1 dummy	0.0682		0.1050***
	[0.0672]		[0.0347]
Father's technical education = 1 dummy	0.0706		0.1563***
	[0.0837]		[0.0533]
Father's university education = 1 dummy	0.2070***	0.1770***	0.3051***
	[0.0811]	[0.0568]	[0.0534]
Mother's primary education = 1 dummy	0.02		
	[0.0542]		
Mother's secondary education = 1 dummy	0.1354***		0.1353***
	[0.0697]		[0.0316]
Mother's technical education = 1 dummy	0.0616		0.0746
	[0.0904]		[0.0533]
Mother's university education = 1 dummy	0.275	0.1940***	0.2895***
	[0.0961]	[0.0736]	[0.0603]
Childhood household attributes			
Household size	0.0005		
	[0.0053]		
Biparental household = 1 dummy	–0.0101		
	[0.0446]		
Father employer dummy	0.2060***	0.2353***	0.1975***
	[0.0661]	[0.0656]	[0.0439]
Mother employer = 1 dummy	0.0889		
	[0.1221]		
Childhood household location characteristics			
Income of municipality of origin	0.0000****		
	[0.0000]		
Rural population in municipality of origin	–0.1333*	–0.1769***	
	[0.0688]	[0.0664]	
Constant	5.1827***	5.2504	5.3409***
	[0.2541]	[0.2639]	[0.1187]

Notes: Dependent variable is log of hourly wage rate.
[a] Heckman selection model estimates. Robust SE in brackets.
[b] Specification used in simulations.
* Significant at the 10% prob. level; ** significant at the 5% prob. level; *** significant at the 1% prob. level.

Table A5. Selection equation; women

	Specifications[a]		
Variable	1	2	3[b]
Age	0.1345***	0.1344***	0.1157***
	[0.0047]	[0.0047]	[0.0033]
Age – squared	0.1421***	0.1413***	0.1414***
	[0.0119]	[0.0118]	[0.0087]
Schooling	–0.0017***	–0.0016***	–0.0017***
	[0.0001]	[0.0001]	[0.0001]
Birth handicap = 1 dummy	–0.3435***	–0.3441***	–0.4040***
	[0.1235]	[0.1235]	[0.0996]
Number of children	–0.0982***	–0.0989***	–0.1140***
	[0.0144]	[0.0143]	[0.0109]
Lives with partner = 1	–0.5950***	–0.5934***	–0.6891***
	[0.0315]	[0.0315]	[0.0244]
Mother employer = 1 dummy	0.2723**	0.2629**	0.2054**
	[0.1149]	[0.1141]	[0.0961]
Constant	–4.5127***	–4.4928***	–3.6125**
	[0.2554]	[0.2545]	[0.1824]
Censored observations	33 741	33 741	33 741
Uncensored observations	4798	4805	12 988
Wald χ^2	741.14	671.16	1972.29
Prob > χ^2	0.0000	0.0000	0.0000
ρ	0.2476	0.2513	0.2439
	[0.1074]	[0.1128]	[0.0707]
Likelihood ratio test ($\rho = 0$) $\chi^2(1)$	4.88	4.55	10.95
Prob > χ^2	0.0272	0.0329	0.0009

Notes: Dependent variable is log of hourly wage rate.
[a] Heckman selection model estimates. Robust SE in brackets.
[b] Specification used in simulations.
* Significant at the 10% prob. level; ** Significant at the 5% prob. level; *** Significant at the 1% prob. level.

Table A6. Effects of equalizing circumstances on labour income inequality, men and women Theil index

Theil coefficient	Age = 23–36	Age = 37–50	Age = 51–65	Age = 23–65
Total inequality (W)	0.417	0.543	0.749	0.574
	[0.402–0.432]	[0.523–0.567]	[0.720–0.776]	[0.550–0.601]
Simulated models				
Partial effect(W^P)	0.344	0.454	0.617	0.481
	[0.330–0.357]	[0.437–0.478]	[0.597–0.639]	[0.460–0.503]
Total effect (W^T)	0.287	0.397	0.531	0.423
	[0.278–0.296]	[0.375–0.426]	[0.507–0.558]	[0.400–0.449]
10 years of schooling guaranteed (W^{GS})	0.280	0.388	0.504	0.414
	[0.271–0.289]	[0.366–0.416]	[0.478–0.534]	[0.390–0.440]
Equalized schooling (W^{ES})	0.227	0.327	0.425	0.348
	[0.218–0.236]	[0.312–0.343]	[0.397–0.460]	[0.38–0.373]

Note: 95% confidence intervals in brackets, obtained by bootstrapping.