Inequality and welfare estimates using two alternative weighting schemes

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Abstract.

Income and expenditure surveys typically provide data on the household level, and household types may differ in needs. In order to make the standard measures of inequality and welfare applicable to such a heterogeneous population, researchers transform it into an artificial quasi-homogeneous population. The transformation requires besides the implementation of an 'appropriate' income concept the choice of an 'appropriate' weight assigned to each income receiving unit. Ebert and Moyes (2003) and Shorrocks (2004) suggest two alternative weighting schemes that satisfy different sets of principles. Using representative household-level income data for 20 European countries, we study the quantitative impacts of the two weighting schemes on two central measures, the Gini coefficient and mean equivalent income, respectively.

Key words: income distribution, inequality, Gini decomposition, living standards, equivalence scale.

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1 Introduction

If household types differ in size and needs, the 'raw' distribution of household incomes does not provide reliable information on the distribution of material comfort in the population. In order to make household incomes (*Y*) comparable, they can be converted into one-member household *equivalent incomes* (*EI*): an *EI* buys the same living standard for the one-member household, as *Y* buys for each person of the multi-member household. *EI*s can be obtained from *Y* by using *equivalence scales* (*ES*). Normalizing the one-member household's *ES* to 1.0, *ES*s give the percentage change in household income required to maintain the living standard of a household's members as further members are added, and capture household-size economies. If EI is assigned to each household member, and if all persons of the economy are considered as living in artificial one-member households, gives a distribution of one-member household EIs (*DOMHEI*). In the DOMHEI, each original income unit is weighted by the number of household members, *h*, ('*h*-weighting'). Alternatively, if income units are weighted by *ES*s ('*ES*-weighting'), this gives a distribution of equivalent-adult's *EI*s (*DEAEI*).

There is no silver bullet to transform a heterogeneous into an artificial-homogeneous population (see Shorrocks (2004)). On the contrary, a basic incompatibility between *equity preference* and the *compensation principle* exists. *Equity preference* requires that a distribution has a lower welfare and/or higher inequality than another if it is obtained from the latter by a regressive income transfer (see Shorrocks (2004), p. 201). According to the *compensation principle*, the level of social welfare should depend only on the utility level of the population's members and not on other individual non-income characteristics (see Shorrocks (2004), p. 202). Both concepts are incompatible with each other except for very specific circumstances. If one is willing to adopt the *compensation principle* (and discard *equity preference*), the appropriate candidate is *DOMHEI*, whereas it is *DEAEI* once *equity preference* is adopted (*compensation principle* discarded) (see also Ebert and Moyes (2003)). In both cases, admissible *ES*s must be constant, independent of the level of household income.

For 20 European countries, we provide inequality and welfare estimates based on *DOMHEI* and *DEAEI*. Inequality is measured by means of the Gini coefficient, and social welfare by average *EI*. Our results can be summarized as follows: (a) with the only two exceptions being Poland and Russia, Gini coefficients for *DEAEI* are always higher; (b) average *EI* per artificial one-member household (*DOMHEI*) and average *EI* per equivalent adult (*DEAEI*) do not differ systematically across countries; (c) country rankings by means of inequality/welfare estimates that are based on *DOMHEI* vs. *DEAEI* are different. A decomposition analysis by household types reveals some mechanics underlying our findings.

Here is a roadmap to our paper. Section 2 briefly outlines the theoretical pros and cons concerning the use of *DOMHEI* vs. *DEAEI*. In Section 3, we explain the LIS database, and how it is processed in this paper. The empirical results are provided in Section 4. Section 5 concludes the paper by summarizing its main findings.

2 Properties of *DOMHEI* and *DEAEI*

For populations that are homogeneous several tools for welfare and income-inequality analysis are established, and generalized Lorenz dominance and Lorenz dominance are considered as the adequate concepts for an „'unambiguous' welfare (or inequality) ordering" (Shorrocks (2004), p. 200). For the homogeneous case and for income distributions $\boldsymbol{x}$ and $\boldsymbol{z}$ with identical mean incomes $\mu(\boldsymbol{x}) = \mu(\boldsymbol{z})$, inequality and welfare are also inversely related: a distribution $\boldsymbol{x}$ generalized Lorenz dominates a distribution $\boldsymbol{z}$ if and only if $\boldsymbol{x}$ Lorenz dominates $\boldsymbol{z}$. Hence welfare considerations accompany inequality considerations. Shorrocks (2004) shows this typically not to be true for heterogeneous populations. Instead, he finds a basic incompatibility between *equity preference* and the *compensation principle*.[1]

Equity preference is an extension of the Pigou-Dalton condition to the heterogeneous framework. Let $(\boldsymbol{y};\ \boldsymbol{\theta})$ describe a heterogeneous distribution of per capita household incomes, $\boldsymbol{y}$, and non-income characteristics, $\boldsymbol{\theta}$, reflecting differences in needs across *persons*.[2] Then *equity preference* requires that a mean-preserving regressive transfer of income to a person κ with a higher standard of living $\upsilon(y_\kappa;\theta_\kappa)$ is followed by a distribution with lower welfare (and/or higher inequality). Since *equity preference* can only rank distributions with identical aggregate per capita household income and the same pattern of non-income characteristics, a decision rule is required for determining when a change of $\boldsymbol{\theta}$ leaves overall welfare (inequality) unaltered: according to the *compensation principle*, a heterogeneous distribution $(\boldsymbol{y};\ \boldsymbol{\theta})$ has the same level of welfare (and/or inequality) as $(\boldsymbol{y'};\ \boldsymbol{\theta'})$ whenever the standard of living stays the same for all persons, $\upsilon(y_\kappa;\theta_\kappa) = \upsilon(y'_\kappa;\theta'_\kappa)$. As an example, the *compensation principle* requires that aggregate welfare (inequality) is unchanged by a split of a multi-person household into several one-member households if it is ensured that the living standard of all persons involved is maintained.[3]

Both principles, as plausible and innocuous as they seem, turn out to be incompatible with each other. Loosely speaking, this incompatibility arises from the fact that equity preference ignores

[1] For the basic intuition behind the incompatibility of equity preference and the compensation principle see Shorrocks (2004), p. 203f.

[2] The analysis is based on persons as micro-unit and per capita household incomes for reasons explained in Shorrocks (2004, p. 195). As demonstrated in Shorrocks (2004, p. 214f.) the results also hold if the analysis refers to the household level.

efficiency considerations. Yet, persons that differ in their non-income characteristics, may also differ in their ability to convert income into units of living standard, and hence into units of social welfare. In order to maximize social welfare, for example, it thus may be preferable to transfer income units from 'inefficient' to 'efficient' income-to-welfare converting (household) units even if the living standard of the latter relative to the former is higher. Shorrocks (2004, p. 194f.), therefore, views *equity preference* as the more important principle in the context of inequality, the *compensation principle* in case of social-welfare evaluations.

When transforming a heterogeneous into an artificial quasi-homogeneous population, it has been an open question so far which income concept and household weighting scheme to use. Is the 'correct' income concept, for example, *household income*, *per capita household income*, the ratio of household income and the number of family members, or *EI*? And should the different household units be weighted equally, by their 'sizes,' or by their *ES*s? Shorrocks (2004) proves that once the *compensation principle* is adopted (and *equity preference* is discarded), *DOMHEI* is the appropriate concept. Once *equity preference* is adopted (and the *compensation principle* is discarded), it is *DEAEI* (see also Ebert and Moyes (2003)).[4] In both cases, *ES*s must be '*independent of base*' (*IB*) (Lewbel (1989)), inelastic with respect to the households' living standards. Otherwise, results will typically depend on the choice of the household that serves as the benchmark of comparison, called the reference household.[5] Moreover, incomes are assumed not to be negative.

3 Data and concepts

3.1 Data

The data underlying our analysis is taken from the Luxembourg Income Study (LIS), which provides representative micro-level information on private households' incomes and demographic characteristics (i.e., number, age and gender of each family member) for 30 European and non-European countries. The datasets involved in this study concern European countries which participated in the most recent wave (v) in the years 1999 and 2000, leaving us with 20 countries that can be taken from the first column of Table A1 in the Appendix.

The basic household-level income concept underlying the empirical analysis in Section 4 is the LIS variable "household disposable income" (*DPI*). *DPI* captures households' abilities to

[3] For further examples see Shorrocks (2004, p. 202).

[4] Albeit its appealing property, the economic content of the *DEAEI* is unclear. As O'Higgins, Schmaus and Smeeding (1990, p. 26) stress and Podder and Chatterjee (2002, p. 11) later re-echo: "Equivalent adults do not exist, unlike families or individuals, although a family or an individual may have an equivalent income."

[5] Under specific assumptions, Ebert and Moyes (2003) find that *reference-household independence* is also maintained when *ES*s satisfy *generalized equivalence scale exactness* (*GAESE*). *GAESE* postulates that the *ES* of a household type *k* relative to household type *r* is a constant plus a second term that may proportionally vary with income (see Donaldson and Pendakur (2006)).

consume, is harmonized across countries, and covers labor earnings, property income, and all government transfers in cash minus income and payroll taxes.[6] As *DPI*s are denoted in local currencies and prices, they are transformed into PPP adjusted Euros, normalized to the case of Germany. *DPI*s from year 1999 are also growth-adjusted and deflated by inter-temporal price indices to the year 2000. All deflators and conversion factors are summarized in Table A1. To meet the restrictions imposed on the income range by Ebert and Moyes (2003) and Shorrocks (2004), only households with positive *DPI*s are considered. In order to facilitate the empirical analysis only eight different household types are taken into account, namely 1- and 2-adult households with zero to three children.[7] Table 1 provides the resulting household-type specific mean *DPI*s per month (weighted), the number of observations (not weighted),[8] and the fractions of country-specific household populations (weighted) that are covered by these 8 household types. The coverage is satisfactorily well, especially in the Western European countries where it exceeds 80% of the total population.

[Table 1 about here]

3.2 Equivalence Scales

Let us assume that the *ES* of a reference household type, *r*, a one-member household, is 1.0, then the *ES*s of multi-member households give the percentage change in household income required to maintain the living standard of a household's members as further members are added. Controversial assumptions underlying the estimation of *ES*s from demand data have shed doubts on their reliability.[9] As in a number of previous empirical studies (e.g. Buhmann et al. (1988); Förster (1990); Jenkins (1991); Coulter et al. (1992); Jenkins and Cowell (1994); Burkhauser et al. (1996); Aaberge and Melby (1998)), we therefore provide welfare and inequality estimates for different sets of *ES*s: the original OECD *ES*, the OECD modified *ES*, and the square root (SQR) *ES*. All three *ES*s are *IB*. The original OECD *ES* (OECD, 1982) is 1.0 for the one-member household, and assigns person weights of 0.7 for each additional adult and 0.5 for each child. The OECD modified *ES*, proposed by Haagenars et al. (1994), and later adopted by the Statistical Office of the European

[6] For the exact *DPI* definition see http://www.lisproject.org/techdoc/summary.pdf, and for its cross-country comparability Burkhauser et al. (1996) and references therein.

[7] We use the LIS variables "d4" and "d27" to distinguish adults from children. "d27" is the LIS 'children variable' and gives the number of household members of age below 18, whereas "d4" gives the number of household members of age 18 and above.

[8] We provide the unweighted number of observations to give the reader a clear picture of the actual numbers of observations provided by LIS. Of course, all calculations are conducted to the base of weighted distributions.

[9] The most influential assumptions is that *ES*s are *IB* or 'exact,' i.e., the same for all levels of household well-being. The expression 'equivalence scale exactness' was introduced by Blackorby and Donaldson (1991, 1993). Recent studies (e.g. Donaldson and Pendakur (2004, 2006), and Koulovatianos et al. (2005, 2006)) have challenged the *IB* assumption.

Union in the late 1990s, assigns lower personal weights, in fact 0.5 for each additional adult and 0.3 for each child. The SQR *ES* is the number of household members to the power of 0.5. All three types of *ES*s imply 'within household-size economies of scale' (*WHSE*), as $h_i > ES_i$. Table A2 in the Appendix summarizes the levels of *WHSE*, expressed by h_i / ES_i, according to the three types of *ES*s.

3.3 Gini coefficient and its decomposition by population subgroups

In order to explore the impacts of the two weighting schemes on the Gini coefficient in more detail, we decompose the Gini index by population subgroups, defined by the eight household types introduced in Section 3.1. Following Pyatt (1976), the Gini can be decomposed into three components,

$$(1) \qquad G = \underbrace{\sum_{i=1}^{n} G_i p_i \pi_i}_{W} + \underbrace{\sum_{i=1}^{n}\sum_{j>i}^{n}\left(\frac{\mu_j - \mu_i}{\mu_i}\right)\pi_i p_j}_{B} + O,$$

where G is the Gini index over all population subgroups, G_i is the Gini index of group i, and μ_i is i's mean *EI*. The 'economic weight' of i is given by π_i, the *EI* share of household type i in total *EI*, whereas p_i is the fraction of the population of type i. Finally, O is the "overlap" term. The population subgroups are ranked by their average *EI* levels such that $\mu_j > \mu_i$.

The first term of equation (1),

$$(2) \qquad W = \sum_{i=1}^{n} G_i p_i \pi_i ,$$

measures the extent of inequality *within* each of the population subgroups. It is the weighted sum of the subgroup specific Gini coefficients. The second term of equation (1),

$$(3) \qquad B = \sum_{i=1}^{n}\sum_{j>i}^{n}\left(\frac{\mu_j - \mu_i}{\mu_i}\right)\pi_i p_j = \frac{1}{\mu}\sum_{i=1}^{n}\sum_{j>i}^{n}(\mu_j - \mu_i)p_i p_j = \frac{1}{2}\sum_{i=1}^{n}\sum_{j=1}^{n}\left|\frac{\mu_j - \mu_i}{\mu_i}\right|\pi_i p_j ,$$

is a weighted sum of the differences in the subgroup specific mean *EI* s. For each two subgroups, i and j, its value depends on the difference in the two subgroups' mean *EI*s, and on the weight $\pi_i p_j$. The largest inter- subgroup terms, ceteris paribus, are those that involve comparisons of "rich" subgroups with high average *EI* and "poor" subgroups with low average *EI*. The third term, the *overlap*, measures the overlap of the *EI* ranges of different population subgroups. The more mean

*EI*s of different subgroups differ, the smaller is the overlap term (see Lambert and Aranson (1993), p. 1226).[10]

Through which channels does a switch from *ES*- to *h*-weighting of income units affect the Gini coefficient? Obviously, mean *EI* of a subgroup, μ_i, the subgroups' Gini coefficients, G_i's, and the overlapping ranges of the *EI* distributions are the same under *ES*- and *h*-weighting. However, what is sensitive are the economic weights, π_i, and the population shares, p_i. For *h*-weighting, we obtain

$$(4) \qquad p_i^h = \frac{h_i m_i}{\sum_{i=1}^{n} h_i m_i} \text{ and } \pi_i^h = \frac{\mu_i h_i m_i}{\sum_{i=1}^{n} \mu_i h_i m_i},$$

where m_i is the number of households of type i; for *ES*-weighting we obtain

$$(5) \qquad p_i^{ES} = \frac{ES_i m_i}{\sum_{i=1}^{n} ES_i m_i} \text{ and } \pi_i^{ES} = \frac{\mu_i ES_i m_i}{\sum_{i=1}^{n} \mu_i ES_i m_i}.$$

Whether the ratio of population shares,

$$(6) \qquad \frac{p_i^h}{p_i^{ES}} = \underbrace{\frac{\sum_{i=1}^{n} ES_i m_i}{\sum_{i=1}^{n} h_i m_i}}_{\leq 1} \times \underbrace{\frac{h_i}{ES_i}}_{\geq 1} \lessgtr 1,$$

depends (a) on the size of the *ES*- relative to the *h*-weighted population, $\sum_{i=1}^{n} ES_i m_i / \sum_{i=1}^{n} h_i m_i$; and (b) on the level of *WHSE*, h_i / ES_i. The size of the (a)-effect is determined by the number of households of specific types in the overall population (the population structure) and by the level of *WHSE*.

A similar reasoning holds for the change in the economic weights. Whether the ratio of economic weights,

$$(7) \qquad \frac{\pi_i^h}{\pi_i^{ES}} = \underbrace{\frac{\sum_{i=1}^{n} ES_i m_i \mu_i}{\sum_{i=1}^{n} h_i m_i \mu_i}}_{\leq 1} \times \underbrace{\frac{h_i}{ES_i}}_{\geq 1} \lessgtr 1,$$

depends on the ratio of *ES*-weighted relative to overall *h*-weighted total *EI*, and again on the level of *WHSE* assigned to the respective household types, the (b)-effect. The effect of switching from *ES*- to *h*-weighting on the overall weight assigned to household type *i* can be captured by

[10] For a more detailed discussion on the decomposability of the Gini and the properties of its different components see, for example, Lambert and Decoster (2005) and references cited therein.

$$(8) \qquad w_i = \frac{p_i^h}{p_i^{ES}} \times \frac{\pi_i^h}{\pi_i^{ES}} \gtreqless 1.$$

If $w_i > 1$ ($w_i < 1$), households of type *i* have a higher (lower) weight under *h*- relative to *ES*-weighting. The impact of the two weighting schemes on the overall Gini is ambiguous. Switching from *ES*- to *h*-weighting leads to: (a) a smaller *W* if $w_i > 1$ for household types whose *EI*s are rather equally distributed within the subgroup; (b) a decrease in *B* if $\left(\pi_i^h p_j^h\right)/\left(\pi_i^{ES} p_j^{ES}\right) > 1$ for types i and j whose mean *EI*s are close; (c) a decline in *O* if $w_i > 1$ and if i's *EI* distribution does not overlap much with the *EI* distributions of the other subgroups.

4 Empirical findings

4.1 Inequality estimates at the country level

For each country and each *ES*, Table 2 reports four numbers. The upper left cell gives the Gini coefficient for DEAEI, G^{ES}, whereas the cell underneath contains the Gini for DOMHEI, G^h. The upper right cell is the absolute difference, $\Delta G = G^h - G^{ES}$, whereas, underneath and in brackets, the difference is given in percent. Figure 1 provides an overview of the Gini estimates by means of a box plot delivering the smallest non-outlier, lower quartile, median, upper quartile, and largest non-outlier value of the country specific G^h / G^{ES}-ratios.

[Table 2 about here]

With the only two exceptions being Poland and Russia, G^hs are always smaller compared to the corresponding G^{ES}s, but differences are quantitatively small. Taking the United Kingdom in case of the SQR *ES* as an example, the difference between G^h and G^{ES} is -0.0042. Apart from Poland and Russia, the differences between G^hs and G^{ES}s are smallest in case of the original OECD *ES*, as it is implied by the lowest level of *WHSE* (see Table A2 in the Appendix). Then, household-type specific weighting factors are relatively mildly affected by the weighting scheme, so that w_is are close to 1.0.[11]

[Figure 1 about here]

[11] The difference between the *ES*- and the *h*-weighted Gini coefficient in case of the original OECD *ES* is the highest. This result is consistent with the theoretical and empirical findings in Coulter et al. (1992). The authors show the

Although Gini coefficients for *DOMHEI* and *DEAEI* differ only slightly, differences are sufficiently large to affect a ranking of the countries by means of the Gini, the '*inequality parade*',[12] as given in Table 3. Indicating *RI* as a country's rank, '1' ('2') is assigned to the country with the (second) smallest Gini coefficient, and so on. For example, in case of the OECD modified *ES*, the *DOMHEI* of Switzerland is ranked better than its *DEAEI* ($RI(G^{ES})=11 > RI(G^{h})=10$).

[Table 3 about here]

Out of all countries, the *DOMHEI* and the *DEAEI* of Russia turn out to be the most unequal. Once the OECD modified *ES* or the SQR *ES* is applied, the parade is headed by The Netherlands, and by Finland in case of the original OECD *ES*. 'Low-inequality' countries are the Scandinavian countries (Finland, Norway, and Sweden), several Benelux countries (The Netherlands and Luxembourg), and some Central European countries (Austria, France, Germany and Switzerland) plus Poland and Slovenia; 'high-inequality' countries are the South and South-East European countries (Greece, Hungary, Italy and Spain), Estonia, Belgium, Ireland and The United Kingdom.[13] This finding holds for both *DOMHEI* and *DEAEI*. Yet, several countries interchange ranks depending on whether *DOMHEI* or *DEAEI* is analyzed: Ireland and Spain change ranks in case of the original OECD *ES*; Ireland and Spain, Slovenia and Norway, as well as Switzerland and Poland in case of the OECD modified *ES*; Belgium and Italy, Greece and United Kingdom, Ireland and Spain, Norway and Italy, Slovenia and Sweden, and Switzerland and Poland change ranks when the SQR *ES* is applied.[14]

4.2 Welfare estimates on the country level

Table 4 provides average country-specific *EI*s. For each *ES* separately, the first (second) row, denoted *ES* (h), shows the mean *EI* per equivalent adult (per one-member household), denoted μ^{ES} (μ^{h}). Next to these two numbers the difference $\Delta\mu = \mu^{h} - \mu^{ES}$ is given and, underneath in parentheses, the difference in percent. Due to the smallest level of *WHSE* implied by the original OECD *ES*, the *EI*s obtained by deploying this *ES* are always lowest.

existence of a U-shaped relationship between inequality and the steepness of *ES*s. The *ES*s underlying our investigation fall into the range where the relationship is positive.

[12] A ranking that is solely based on the size of the Gini coefficient ignores the possibility of intersecting Lorenz curves. Differences in the equivalent-income levels across countries are also ignored.

[13] We define "high-inequality" countries as those where the Gini coefficient exceeds a level of 0.30. All other countries are referred to as "low-inequality" countries.

[14] It might be worth mentioning that the parades are much more sensitive with respect to the chosen equivalence scales, then with respect to *ES*- vs. *h*-weighting. This is in line with the results provided, for example by Coulter et al. (1992, p. 1081) who conclude that "the changes induced by changing scale relativities are not 'small' whichever measure is used."

[Table 4 about here]

Although PPP adjustments typically reduce the income gap between rich and poor countries,[15] average *EI*s differ substantially across countries: μ^{ES} and μ^{h} for Luxembourg, the richest country, are about nine times higher then the corresponding values for Russia, the poorest country. For each country, μ^{ES} and μ^{h} differ only slightly. Taking the United Kingdom in case of the OECD modified *ES* as an example, the two estimates are μ^{ES} = €1,809.4 compared to μ^{h} = €1,806.3. Figure 2 gives a summary of mean *EI* ratios, μ^{h} / μ^{ES}, by means of box plots. Average *EI* per equivalent adult is typically lower compared to average *EI* per one-member household when the original OECD *ES* is applied (the median across the 20 countries is less than 1.0). As disposable incomes of 'large' households are typically higher compared to disposable incomes of 'small' households, the opposite is true for the two other *ES*s, which both imply higher *WHSE* levels.

[Figure 2 about here]

In Table 5, two "welfare parades" are provided. Countries are ranked by μ^{ES} and μ^{h} in decreasing order. Hence, the richest country heads the parade and is assigned the rank *R=1*.[16] ΔRW gives the rank difference in the two welfare rankings, $R(\mu^{ES})$-$R(\mu^{h})$. The group of the seven 'richest' countries comprises Luxembourg, Switzerland, Norway, The United Kingdom, Belgium, Austria and The Netherlands. It is chased by a group of countries with rather similar average *EI*s, differing not more than 15%. This group consists of France, followed by Ireland, Sweden, Germany, and Finland. The group of 'poor' countries comprises Spain and Italy, Greece, Slovenia, Poland, Hungary, Estonia, and Russia. This classification holds for both ranking criteria, μ^{ES} and μ^{h}. Yet, several countries' interchange positions when comparing the two welfare parades: Finland and Germany, and Italy and Spain in case of the OECD modified *ES*; Spain and Italy in case of the original OECD *ES*; Finland and Germany, Ireland and France, as well as Spain and Italy in case of the SQR *ES*.

[Table 5 about here]

[15] Kravis et al. (1982) show that PPP adjustments reduce the gap between rich and poor countries, since rising price levels accompany GDP per capita growth.
[16] Thus, welfare parades focus solely on efficiency considerations.

4.3 Decomposition analysis by household types

4.3.1 Gini decomposition

Within-group component

As outlined in Section 3.2.2, the weighting scheme affects the overall Gini coefficient through different channels. A key determinant for strength and direction of this effect are the w_i s. If $w_i > 1$ ($w_i < 1$), then subgroup i is assigned a higher (lower) weight relative to the remaining other seven subgroups when switching from *ES*- to *h*-weighting. The size of w_i again depends on the size and the direction of the changes of π_i and of p_i provided in Tables 6a-6c.

[Tables 6a-6c about here]

In comparison to *ES*-weighting, *h*-weighting gives higher economic weights, π_i, and population shares, p_i, for all household types with at least one child (A1C1-A1C3 and A2C1-A2C3). These household types are 'undervalued' in case of *ES*-weighting since their *ES* values are substantially lower than their numbers of household members. The interaction of the changes in π_i and p_i, as expressed by w_i, can be taken from the box plots provided by Figure 3a-3c.[17] The w_i s of household types with at least one child exceed the threshold level 1.0, and increase in the presence of more children. On the other hand, w_{A1C0} and w_{A2C0} are less than 1.0, with w_{A1C0} being the lowest.

[Figures 3a-3c about here]

If $w_i > 1$ and $G_i < 1/8 \sum_{i=1}^{8} G_i \equiv \bar{G}$, than the within-group component of the Gini coefficient, *W*, is lower for *h*- compared to *ES*-weighting, hence is lowering G ceteris paribus. Thus, the final necessary piece for assessing the impact of the weighting scheme on the within-group component is the size of the G_i s relative to $\bar{G}$.

[Figure 4 about here]

[17] For each country, household type, and equivalence scale, the original numbers are presented in Table A3 in the Appendix.

For each household type and country, Figure 4 contains a $G_i / \overline{G}$-ratio box plot.[18] Relative to the incomes of other household types, incomes of household types A1C0 and A2C0 are distributed rather unequally in most countries.[19] On the other hand, inequality is rather small among single-parents, and this tendency intensifies as the number of children increases. Since, at the same time, w_{A1C0} and w_{A2C0} are smaller than 1.0 whereas w_{A1C3} is higher, *W* is higher in case of *ES*-weighting (see Figure 5 and Table A4). The only two exceptions are Poland and Russia, where G_{A1C0}, G_{A1C3} and G_{A2C0} are rather similar compared to $\overline{G}$, such that $\frac{W^h}{W^{ES}} \approx 1$.

[Figure 5 about here]

Between-group component

Changes of the population shares in interaction with those of the economic weights are also the crucial element for the size of the "between" group component of the Gini. If $\left(p_i^h \pi_i^h\right) / \left(p_i^{ES} \pi_i^{ES}\right) > 1$ (<1) and mean *EI* of i is rather different compared to mean *EI* over the household types, than *h*-relative to *ES*-weighting increases (decreases) the between-group component. Table 7 summarizes household-type specific mean *EI*s. Typically, average *EI*s of 1- relative to 2-adult households are rather low compared to the country average, and are the lowest for single parents.

[Table 7 about here]

In Figures 6a-6c, we provide cross-country box plots of the ratio

$$(9) \qquad \beta_i = \frac{\sum_{j=1}^{8} \left| \frac{\mu_j - \mu_i}{\mu_i} \right| \pi_i^h p_j^h}{\sum_{j=1}^{8} \left| \frac{\mu_j - \mu_i}{\mu_i} \right| \pi_i^{ES} p_j^{ES}}.$$

[18] All numbers are calculated from the household-type specific Gini coefficients that can be taken from Table A5 in the Appendix.

[19] A plausible explanation is that out of all household types, those of type *A1C0* and *A2C0* receive the smallest social security benefits, and at the same time they might be rather heterogeneous with respect to their participation rates in the labor market. For example, *A2C0* contains double-income households as well as households that live on social-welfare.

The ratio quantifies, in relative terms, the change of household type *i*'s impact on the between-group component when switching from *h*- to *ES*-weighting.[20] Since $\left|\frac{\mu_j - \mu_i}{\mu_i}\right|$ is the same for both weighting schemes, $\beta_i > 1$ (<1) if $\left(p_i^h \pi_i^h\right) / \left(p_i^{ES} \pi_i^{ES}\right) > 1$ (<1). In accordance with the results of Tables 6a-c, β_is of childless single-adults and childless couples are always smaller than 1.0, whereas all other β_is are above the 1.0-threshold for most of the countries.

[Figure 6a-6c about here]

As it is shown in Figure 7, the sum of the β_is,

$$(10) \qquad \frac{B^h}{B^{ES}} = \frac{\sum_{i=1}^{8}\sum_{j=1}^{8}\left|\frac{\mu_j - \mu_i}{\mu_i}\right| \pi_i^h p_j^h}{\sum_{i=1}^{8}\sum_{j=1}^{8}\left|\frac{\mu_j - \mu_i}{\mu_i}\right| \pi_i^{ES} p_j^{ES}},$$

is close to the 1.0-threshold in most countries, indicating that the between-group component is about the same for *ES*- and *h*-weighting. Yet, $\mathrm{B}^h / \mathrm{B}^{ES}$ tends to decrease as *WHSE* go up, as the weight attached to *EI* differences of 'poor' and 'rich' household types under *ES*-weighting becomes relative smaller compared to the weight of these differences under *h*-weighting, lowering $\mathrm{B}^h / \mathrm{B}^{ES}$ (the two exceptions are Poland and Russia, where *EI*s of one- and two-adult households are rather similar).

[Figure 7 about here]

Overlap component

The spreads of household-type specific *EI*s, per se, is insensitive to the underlying weighting scheme. What is affected are the weights attached to the overlap of any two household types. In Table 8 we provide the differences in the overlap terms, $\Delta O \equiv \Delta O^h - \Delta O^{ES}$, whereas Figure 8 gives the O^h / O^{ES}-box plots. In all 20×3 cases, ΔO is quantitatively small and is never the decisive factor for the direction in which the overall Gini changes as a reaction to a change of the weighting scheme. Instead, it is the within-group components that is most affected by a switch from *ES*- to *h*-

[20] In Table A6 we report the difference in the between group component for each household type, $\Delta b_i = \frac{1}{2}\left[\sum_{j=1}^{n}\left|\frac{\mu_j - \mu_i}{\mu_i}\right| \pi_i^h p_j^h - \sum_{j=1}^{n}\left|\frac{\mu_j - \mu_i}{\mu_i}\right| \pi_i^{ES} p_j^{ES}\right]$, which gives the change of household type *i*'s contribution to the

weighting. As it is typically smaller under *h*-weighting, the Gini coefficient for the *DOMHEI* is smaller than for *DEAEI*. The only two exceptions are Russia and Poland, where the change of the within-group component is atypically small.

[Table 8 and Figure 8 about here]

4.3.2 Welfare decomposition

Two interacting components determine the size of μ^h relative to μ^{ES}, namely the household-type specific *EI* levels and the household-type specific population shares p_i^h versus p_i^{ES}. Figures 9a-c show the box plots of average household-type specific *EI* relative to the unweighted average of *EI* over all household types, $\mu_i / \bar{\mu}$ where $\bar{\mu} \equiv 1/8 \sum_{i=1}^{8} \mu_i$. It turns out that two-parent households are typically better of relative to single parents, and likewise childless 2-adult households relative to childless single adults. *EI*s in households with children are typically smaller compared to childless households, and this effect becomes more pronounced in the presence of more children and also if *WHSE* levels for children are assumed to be low (see especially two-adult households with children once the SQR *ES* is applied).

[Figures 9a-9c about here]

Tables 6a-6c summarizes the ratios of household-type specific population shares, p_i^h / p_i^{ES}. This ratio is increasing in the number of children living in household type i. Hence, if *EI*s of households with children are higher (lower) then average *EI* in the country, μ^h is also higher (lower) than μ^{ES}. Yet, only average *EI*s of two-parent households with one and two children are typically higher than the average country-wide *EI*. Average *EI* of childless couples is also higher than average country-wide *EI*, but $p_i^h / p_i^{ES} < 1$ applies for childless couples. Contradictory effects also arise for household types that are typically poor (A1C0, A1C1-A1C3, and A2C3): whereas $p_i^h / p_i^{ES} < 1$ for A1C0, $p_i^h / p_i^{ES} > 1$ for A1C1-A1C3 and A2C3.

5 Conclusion

Transforming a heterogeneous population into a quasi-homogeneous requires the choice of an 'appropriate' adjustment of incomes and income receiving units. It is shown in Shorrocks (2004)

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between-group component when switching from *h*- to *ES*-weighting.

that once the *compensation principle* is adopted, equivalent income is the appropriate income concept and income units should be weighted by the number of their members (‘*h*-weighting’). If *equity preference* is adopted, equivalent income is the appropriate income concept and income units must be weighted by the units’ equivalence scales (‘*ES*-weighting’) (see also Ebert and Moyes (2003)).

We provide Gini coefficients and equivalent incomes for both weighting schemes for a set of 20 European countries. The Gini coefficient in the typical Western society is lower under *h*-weighting, since the population weight of ‘large’ household types, whose incomes are rather equally distributed, is higher under *h*- compared to *ES*-weighting. As a measure of social welfare, we also provide country-specific mean equivalent incomes per equivalent adult and per artificial one-member household, and find a systematic pattern: the flatter the *ES*, the higher the mean equivalent income per one-member household compared to mean equivalent income per equivalent adult. Rankings of the two countries by means of their Gini coefficient (mean equivalent income) turn out to be sensitive to whether income receiving units are *h*- or *ES*-weighted. As our findings are restricted to two measures and three different *ES*s only, it might be informative to extend the analysis to further inequality measures and to a broader range of *ES*s in future work.

Table 1. Sample description and coverage

Country		Overall sample	Household type							
			A1C0	A1C1	A1C2	A1C3	A2C0	A2C1	A2C2	A2C3
AU	Av. Income	2440	1579	1685	2015	1810	2908	3198	3301	3431
	N	1782	584	48	22	2	679	164	223	60
	Coverage	82.82	31.34	2.70	0.97	0.08	27.80	8.89	9.25	1.81
BE	Av. Income	2528	1403	1610	2101	1928	3072	3482	3746	4112
	N	2088	708	41	33	10	707	198	290	101
	Coverage	89.21	34.71	1.99	1.24	0.40	29.32	6.79	11.30	3.46
EE	Av. Income	711	381	552	549	525	769	1053	1165	1142
	N	4387	1102	180	82	24	1636	641	569	153
	Coverage	82.22	28.03	3.74	1.15	0.31	27.20	11.81	8.24	1.74
FI	Av. Income	2066	1178	1625	1863	2185	2501	2987	3355	3572
	N	8628	2047	157	89	26	3524	1032	1221	532
	Coverage	90.75	37.87	2.34	1.15	0.37	30.98	7.10	7.70	3.23
FR	Av. Income	2320	1451	1620	1739	1989	2581	2975	3243	3480
	N	8679	2640	219	125	35	3278	879	1086	417
	Coverage	85.80	28.83	2.13	1.25	0.32	30.69	9.00	9.83	3.75
GE	Av. Income	2016	1312	1309	1254	1562	2520	2865	3106	3088
	N	9346	3014	220	104	21	3572	1029	1082	304
	Coverage	89.24	40.53	2.06	0.79	0.13	29.73	7.43	6.84	1.74
GR	Av. Income	1621	957	1338	1298	3525	1458	2390	2586	2026
	N	2551	676	13	14	1	1074	280	425	68
	Coverage	67.29	19.18	0.44	0.41	0.03	26.98	6.76	11.88	1.60
HU	Av. Income	738	432	461	780	451	788	1107	1098	1050
	N	1411	416	20	7	2	578	160	187	41
	Coverage	72.53	25.38	0.99	0.25	0.10	27.07	8.05	8.84	1.84
IE	Av. Income	2377	1409	1185	1337	1206	2455	3519	3475	3990
	N	1652	482	34	25	7	574	147	227	156
	Coverage	75.21	24.74	3.00	1.54	0.72	22.35	7.27	10.16	5.44
IT	Av. Income	2060	1291	1805	1682	1584	2265	2610	2555	2515
	N	5256	1454	53	19	6	2157	667	759	141
	Coverage	70.08	20.75	0.77	0.24	0.12	27.43	9.56	9.41	1.78
LX	Av. Income	3666	2553	2550	2636	1474	4028	4288	4803	4858
	N	1986	584	30	13	2	736	270	255	96
	Coverage	83.51	27.90	1.07	0.59	0.04	30.24	9.94	10.01	3.70
NL	Av. Income	2482	1589	1605	1488	2183	2884	3152	3126	3420
	N	4140	1263	58	52	10	1502	359	686	210
	Coverage	91.43	31.61	1.16	0.97	0.30	32.93	7.06	13.60	3.80
NW	Av. Income	2695	1559	2274	2429	2734	3360	4034	4509	4946
	N	10271	2811	299	128	32	3670	1114	1514	703
	Coverage	90.12	41.27	3.45	1.51	0.33	25.09	6.42	8.42	3.64
PL	Av. Income	926	525	746	766	744	951	1140	1195	1146
	N	21168	4324	545	300	114	7277	3459	3769	1380
	Coverage	68.88	15.84	1.71	0.87	0.34	23.98	10.53	11.39	4.23
RL	Av. Income	392	187	358	311	163	393	559	574	815
	N	2240	611	125	29	2	774	428	240	31
	Coverage	72.54	20.05	3.84	0.92	0.07	24.11	13.58	8.96	1.02
SI	Av. Income	1226	623	892	991	---	1214	1587	1779	1674
	N	2000	366	29	11	0	844	304	389	57
	Coverage	62.02	15.98	1.09	0.42	0.00	22.36	8.92	11.70	1.56
ES	Av. Income	2098	1185	1278	1583	2261	2126	2617	2911	3284
	N	3240	819	22	11	3	1369	462	474	80
	Coverage	67.80	16.85	0.45	0.29	0.06	28.95	9.57	9.90	1.72
SW	Av. Income	2003	1210	1646	1948	2123	2640	3027	3516	3555
	N	12653	4694	237	150	43	4772	979	1332	446
	Coverage	92.87	46.45	2.81	1.78	0.51	24.96	5.80	7.91	2.65
CH	Av. Income	3237	2247	2402	2623	2507	3805	3787	3889	4070
	N	3169	895	45	40	9	1192	307	509	172
	Coverage	87.35	31.33	0.89	0.82	0.15	33.35	7.10	10.43	3.27
UK	Av. Income	2617	1597	1556	1737	1791	3033	3463	4015	3799
	N	21955	7182	804	659	268	8035	1851	2354	802
	Coverage	85.32	28.61	2.67	2.14	0.89	32.91	6.74	8.47	2.89

Note. Disposable household incomes per month (weighted), PPP adjusted in €. *N*s are unweighted numbers of observations. Coverage in column "overall sample" gives the percentage of the total weighted population that is covered by the 8 household types. The numbers to the right decompose the coverage by household types.

Table 2. Country specific Gini coefficients

Country	Weighting	OECD		OECD mod.		SQR	
		Gini	ΔG [ΔG in %]	Gini	ΔG [ΔG in %]	Gini	ΔG [ΔG in %]
AT	*ES*	0.2727	-0.0010	0.2670	-0.0033	0.2709	-0.0036
	h	0.2717	[-0.3667]	0.2637	[-1.2360]	0.2673	[-1.3289]
BE	*ES*	0.3290	-0.0054	0.3349	-0.0094	0.3390	-0.0090
	h	0.3236	[-1.6413]	0.3255	[-2.8068]	0.3300	[-2.6549]
EE	*ES*	0.3597	-0.0009	0.3665	-0.0028	0.3702	-0.0034
	h	0.3588	[-0.2502]	0.3637	[-0.7640]	0.3668	[-0.9184]
FI	*ES*	0.2515	-0.0027	0.2582	-0.0072	0.2643	-0.0082
	h	0.2488	[-1.0736]	0.2510	[-2.7885]	0.2561	[-3.1025]
FR	*ES*	0.2849	-0.0024	0.2815	-0.0051	0.2849	-0.0058
	h	0.2825	[-0.8424]	0.2764	[-1.8117]	0.2791	[-2.0358]
GE	*ES*	0.2740	-0.0017	0.2736	-0.0051	0.2787	-0.0063
	h	0.2723	[-0.6204]	0.2685	[-1.8640]	0.2724	[-2.2605]
GR	*ES*	0.3518	-0.0041	0.3565	-0.0070	0.3571	-0.0077
	h	0.3477	[-1.1654]	0.3495	[-1.9635]	0.3494	[-2.1563]
HU	*ES*	0.3071	-0.0005	0.3112	-0.0027	0.3143	-0.0041
	h	0.3066	[-0.1628]	0.3085	[-0.8676]	0.3102	[-1.3045]
IE	*ES*	0.3592	-0.0080	0.3636	-0.0140	0.3694	-0.0154
	h	0.3512	[-2.2272]	0.3496	[-3.8504]	0.3540	[-4.1689]
IT	*ES*	0.3396	-0.0002	0.3350	-0.0015	0.3359	-0.0016
	h	0.3394	[-0.0589]	0.3335	[-0.4478]	0.3343	[-0.4763]
LX	*ES*	0.2769	-0.0011	0.2672	-0.0024	0.2684	-0.0028
	h	0.2758	[-0.3973]	0.2648	[-0.8982]	0.2656	[-1.0432]
NL	*ES*	0.2589	-0.0004	0.2488	-0.0027	0.2522	-0.0034
	h	0.2585	[-0.1545]	0.2461	[-1.0852]	0.2488	[-1.3481]
NW	*ES*	0.2568	-0.0030	0.2627	-0.0075	0.2691	-0.0082
	h	0.2538	[-1.1682]	0.2552	[-2.8550]	0.2609	[-3.0472]
PL	*ES*	0.2972	0.0027	0.2916	0.0031	0.2933	0.0026
	h	0.2999	[0.9085]	0.2947	[1.0631]	0.2959	[0.8865]
RL	*ES*	0.4675	0.0019	0.4733	0.0015	0.4752	0.0009
	h	0.4694	[0.4064]	0.4748	[0.3169]	0.4761	[0.1894]
SI	*ES*	0.2587	-0.0040	0.2631	-0.0081	0.2658	-0.0092
	h	0.2547	[-1.5462]	0.2550	[-3.0787]	0.2566	[-3.4612]
ES	*ES*	0.3580	-0.0011	0.3592	-0.0027	0.3608	-0.0032
	h	0.3569	[-0.3073]	0.3565	[-0.7517]	0.3576	[-0.8869]
SW	*ES*	0.2524	-0.0022	0.2582	-0.0065	0.2655	-0.0071
	h	0.2502	[-0.8716]	0.2517	[-2.5174]	0.2584	[-2.6742]
CH	*ES*	0.3030	-0.0019	0.2916	-0.0051	0.2933	-0.0055
	h	0.3011	[-0.6271]	0.2865	[-1.7490]	0.2878	[-1.8752]
UK	*ES*	0.3522	-0.0014	0.3510	-0.0039	0.3562	-0.0042
	h	0.3508	[-0.3975]	0.3471	[-1.1111]	0.3520	[-1.1791]

Note. ΔG is the difference between the *h*- and the *ES* -weighted Gini coefficient.

Table 3. Inequality - Parade

Country	OECD			OECD mod.			SQR		
	RI(ES)	*RI(h)*	Δ*RI*	*RI(ES)*	*RI(h)*	Δ*RI*	*RI(ES)*	*RI(h)*	Δ*IR*
AT	6	6	0	6	6	0	7	7	0
BE	13	13	0	13	13	0	14	13	1
EE	19	19	0	19	19	0	19	19	0
FI	1	1	0	2	2	0	2	2	0
FR	9	9	0	9	9	0	9	9	0
GE	7	7	0	8	8	0	8	8	0
GR	15	15	0	16	16	0	16	15	1
HU	12	12	0	12	12	0	12	12	0
IE	18	17	1	18	17	1	18	17	1
IT	14	14	0	14	14	0	13	14	-1
LX	8	8	0	7	7	0	5	6	-1
NL	5	5	0	1	1	0	1	1	0
NW	3	3	0	4	5	-1	6	5	1
PL	10	10	0	10	11	-1	10	11	-1
RL	20	20	0	20	20	0	20	20	0
SI	4	4	0	5	4	1	4	3	1
ES	17	18	-1	17	18	-1	17	18	-1
SW	2	2	0	3	3	0	3	4	-1
CH	11	11	0	11	10	1	11	10	1
UK	16	16	0	15	15	0	15	16	-1

Note. RI(ES) is the rank of the country when countries are ranked according to the Gini in increasing order and households are *ES*-weighted. *RI(h)* is the same number in the case of *h*-weighting. *ΔRI* is the rank difference, Δ*R= R(ES)- R(h).*

Table 4. Mean equivalent income

Country	Weighting	OECD		OECD mod.		SQR	
		μ	$\Delta\mu$ [$\Delta\mu$ in %]	μ	$\Delta\mu$ [$\Delta\mu$ in %]	μ	$\Delta\mu$ [$\Delta\mu$ in %]
AT	*ES*	1495.9	-25.2	1712.7	-9	1769.1	2.3
	h	1470.7	[-1.68]	1703.7	[-0.53]	1771.4	[0.13]
BE	*ES*	1528.7	-12.7	1758.2	20	1818.4	36.3
	h	1516.0	[-0.83]	1778.2	[1.14]	1854.7	[2.00]
EE	*ES*	427.5	0.7	491.9	11.4	507.4	15.4
	h	428.2	[0.16]	503.3	[2.32]	522.8	[3.04]
FI	*ES*	1301.5	-3.8	1480.3	28.5	1528.4	42.4
	h	1297.7	[-0.29]	1508.8	[1.93]	1570.8	[2.77]
FR	*ES*	1364.5	-20.7	1578.3	-3.3	1635.4	6.7
	h	1343.8	[-1.52]	1575.0	[-0.21]	1642.1	[0.41]
GE	*ES*	1318.5	-14.4	1484.0	7.7	1530.3	20.7
	h	1304.1	[-1.09]	1491.7	[0.52]	1551.0	[1.35]
GR	*ES*	919.0	0.7	1070.3	22.2	1115.3	26.8
	h	919.7	[0.08]	1092.5	[2.07]	1142.1	[2.40]
HU	*ES*	442.1	-2.2	508.3	6.6	527.8	9.8
	h	439.9	[-0.50]	514.9	[1.30]	537.6	[1.86]
IE	*ES*	1345.0	-13.8	1575.8	13.5	1628.9	29.7
	h	1331.2	[-1.03]	1589.3	[0.86]	1658.6	[1.82]
IT	*ES*	1188.5	-21.3	1378.1	-13.3	1434.2	-8.3
	h	1167.2	[-1.79]	1364.8	[-0.97]	1425.9	[-0.58]
LX	*ES*	2141.2	-50.5	2478.8	-40.2	2576.3	-30.5
	h	2090.7	[-2.36]	2438.6	[-1.62]	2545.8	[-1.18]
NL	*ES*	1450.5	-33.4	1680.5	-23.3	1745.0	-14
	h	1417.1	[-2.30]	1657.2	[-1.39]	1731.0	[-0.80]
NW	*ES*	1717.3	-2.9	1952.6	46.8	2007.5	67.6
	h	1714.4	[-0.17]	1999.4	[2.40]	2075.1	[3.37]
PL	*ES*	493.5	-7.7	584.5	-3.5	608.2	-1.3
	h	485.8	[-1.56]	581.0	[-0.60]	606.9	[-0.21]
RL	*ES*	225.5	1.2	262.1	6.8	270.8	8.5
	h	226.7	[0.53]	268.9	[2.59]	279.3	[3.14]
SI	*ES*	675.3	-1.4	792.7	12.3	825.1	16.5
	h	673.9	[-0.21]	805.0	[1.55]	841.6	[2.00]
ES	*ES*	1177.4	-8	1372.7	9.8	1432.3	15.7
	h	1169.4	[-0.68]	1382.5	[0.71]	1448.0	[1.10]
SW	*ES*	1323.9	-3.4	1491.1	34.1	1529.8	50
	h	1320.5	[-0.26]	1525.2	[2.29]	1579.8	[3.27]
CH	*ES*	1941.5	-54.4	2232.5	-51.3	2318.5	-42.4
	h	1887.1	[-2.80]	2181.2	[-2.30]	2276.1	[-1.83]
UK	*ES*	1572.2	-23.3	1809.4	-3.1	1868.8	12.1
	h	1548.9	[-1.48]	1806.3	[-0.17]	1880.9	[0.65]

Note. μ is mean equivalent income. It is mean equivalent income per equivalent adult in case of *ES*-weighting, and it is mean equivalent income per capita in case of *h*-weighting. $\Delta\mu$ is the difference between these two numbers.

Table 5. Welfare parade

Country	OECD			OECD mod.			SQR		
	RW(ES)	*RW(h)*	ΔRW	*RW(ES)*	*RW(h)*	ΔRW	*RW(ES)*	*RW(h)*	ΔRW
AT	6	6	0	6	6	0	6	6	0
BE	5	5	0	5	5	0	5	5	0
EE	19	19	0	19	19	0	19	19	0
FI	12	12	0	12	11	1	12	11	1
FR	8	8	0	9	9	0	8	9	-1
GE	11	11	0	11	12	-1	11	12	-1
GR	15	15	0	15	15	0	15	15	0
HU	18	18	0	18	18	0	18	18	0
IE	9	9	0	8	8	0	9	8	1
IT	13	14	-1	13	14	1	13	14	-1
LX	1	1	0	1	1	0	1	1	0
NL	7	7	0	7	7	0	7	7	0
NW	3	3	0	3	3	0	3	3	0
PL	17	17	0	17	17	0	17	17	0
RL	20	20	0	20	20	0	20	20	0
SI	16	16	0	16	16	0	16	16	0
ES	14	13	1	14	13	-1	14	13	1
SW	10	10	0	10	10	0	10	10	0
CH	2	2	0	2	2	0	2	2	0
UK	4	4	0	4	4	0	4	4	0

Note. *RW(ES)* is the rank of the country when countries are ranked according to equivalent average income (μ^{ES}) in decreasing order and when households are *ES*-weighted. *RW(h)* is the same number when countries are ordered by μ^{h}. ΔRW is the rank difference, ΔRW= *RW(ES)- RW(h)*.

Table 6a. Changes in equivalent income and population shares [OECD]

Country	Difference	Household type							
		A1C0	A1C1	A1C2	A1C3	A2C0	A2C1	A2C2	A2C3
AT	Δp_i	-0.046	0.002	0.003	0.000	-0.019	0.014	0.035	0.011
	$\Delta \pi_i$	-0.045	0.002	0.002	0.000	-0.016	0.016	0.032	0.009
BE	Δp_i	-0.048	0.001	0.003	0.002	-0.022	0.009	0.037	0.018
	$\Delta \pi_i$	-0.043	0.001	0.002	0.001	-0.023	0.010	0.035	0.016
EE	Δp_i	-0.042	0.003	0.003	0.002	-0.021	0.016	0.029	0.010
	$\Delta \pi_i$	-0.037	0.002	0.002	0.001	-0.023	0.018	0.029	0.008
FI	Δp_i	-0.050	0.002	0.003	0.002	-0.017	0.011	0.029	0.019
	$\Delta \pi_i$	-0.045	0.002	0.003	0.001	-0.018	0.012	0.028	0.017
FR	Δp_i	-0.041	0.001	0.003	0.001	-0.025	0.011	0.031	0.019
	$\Delta \pi_i$	-0.042	0.001	0.002	0.001	-0.022	0.013	0.030	0.017
GE	Δp_i	-0.052	0.002	0.003	0.001	-0.011	0.015	0.030	0.012
	$\Delta \pi_i$	-0.049	0.002	0.001	0.000	-0.008	0.016	0.028	0.009
GR	Δp_i	-0.035	0.000	0.001	0.000	-0.030	0.009	0.044	0.010
	$\Delta \pi_i$	-0.036	0.000	0.001	0.000	-0.028	0.010	0.046	0.007
HU	Δp_i	-0.042	0.001	0.001	0.001	-0.022	0.013	0.036	0.012
	$\Delta \pi_i$	-0.040	0.001	0.001	0.000	-0.022	0.016	0.035	0.009
IE	Δp_i	-0.043	0.001	0.004	0.003	-0.027	0.006	0.029	0.027
	$\Delta \pi_i$	-0.043	0.001	0.002	0.001	-0.026	0.009	0.030	0.026
IT	Δp_i	-0.036	0.001	0.001	0.001	-0.027	0.014	0.036	0.011
	$\Delta \pi_i$	-0.036	0.001	0.001	0.000	-0.023	0.017	0.032	0.008
LX	Δp_i	-0.041	0.001	0.002	0.000	-0.025	0.012	0.032	0.019
	$\Delta \pi_i$	-0.044	0.001	0.001	0.000	-0.019	0.014	0.031	0.016
NL	Δp_i	-0.043	0.001	0.002	0.001	-0.026	0.007	0.039	0.018
	$\Delta \pi_i$	-0.043	0.001	0.001	0.001	-0.021	0.010	0.037	0.015
NW	Δp_i	-0.056	0.003	0.004	0.002	-0.015	0.010	0.031	0.021
	$\Delta \pi_i$	-0.051	0.003	0.003	0.001	-0.017	0.011	0.031	0.019
PL	Δp_i	-0.029	0.000	0.002	0.001	-0.033	0.007	0.031	0.020
	$\Delta \pi_i$	-0.029	0.001	0.002	0.001	-0.032	0.011	0.031	0.016
RL	Δp_i	-0.034	0.002	0.003	0.000	-0.025	0.017	0.031	0.006
	$\Delta \pi_i$	-0.029	0.002	0.002	0.000	-0.027	0.017	0.028	0.006
SI	Δp_i	-0.032	0.000	0.001	0.000	-0.030	0.010	0.041	0.009
	$\Delta \pi_i$	-0.029	0.000	0.001	0.000	-0.031	0.011	0.041	0.007
ES	Δp_i	-0.030	0.000	0.001	0.000	-0.031	0.012	0.036	0.010
	$\Delta \pi_i$	-0.029	0.000	0.001	0.000	-0.030	0.014	0.035	0.009
SW	Δp_i	-0.060	0.003	0.006	0.003	-0.011	0.011	0.032	0.017
	$\Delta \pi_i$	-0.054	0.002	0.004	0.002	-0.012	0.011	0.032	0.014
CH	Δp_i	-0.043	0.001	0.002	0.001	-0.023	0.010	0.036	0.018
	$\Delta \pi_i$	-0.044	0.001	0.002	0.000	-0.015	0.012	0.031	0.013
UK	Δp_i	-0.041	0.002	0.006	0.004	-0.025	0.009	0.029	0.016
	$\Delta \pi_i$	-0.039	0.001	0.004	0.002	-0.022	0.011	0.030	0.013

Note. Numbers are differences in population and income shares when switching from weighting by *ES*s to weighting by the number of household members, $\Delta p_i = p_i^h - p_i^{ES}$ and $\Delta \pi_i = \pi_i^h - \pi_i^{ES}$.

Table 6b. Changes in equivalent income and population shares [OECD mod.]

Country	Difference	Household type							
		A1C0	A1C1	A1C2	A1C3	A2C0	A2C1	A2C2	A2C3
AT	Δp_i	-0.079	0.002	0.004	0.001	-0.023	0.023	0.055	0.017
	$\Delta \pi_i$	-0.072	0.002	0.003	0.000	-0.024	0.025	0.052	0.014
BE	Δp_i	-0.083	0.001	0.005	0.003	-0.027	0.015	0.059	0.029
	$\Delta \pi_i$	-0.068	0.001	0.003	0.002	-0.035	0.015	0.057	0.027
EE	Δp_i	-0.073	0.003	0.005	0.002	-0.026	0.028	0.046	0.016
	$\Delta \pi_i$	-0.059	0.001	0.003	0.001	-0.035	0.027	0.047	0.014
FI	Δp_i	-0.086	0.002	0.005	0.003	-0.018	0.019	0.046	0.030
	$\Delta \pi_i$	-0.072	0.002	0.004	0.002	-0.028	0.019	0.046	0.028
FR	Δp_i	-0.072	0.001	0.004	0.002	-0.033	0.018	0.049	0.030
	$\Delta \pi_i$	-0.066	0.001	0.003	0.001	-0.035	0.019	0.049	0.028
GE	Δp_i	-0.089	0.003	0.004	0.001	-0.008	0.024	0.047	0.018
	$\Delta \pi_i$	-0.080	0.002	0.002	0.001	-0.011	0.026	0.046	0.015
GR	Δp_i	-0.061	0.000	0.002	0.000	-0.040	0.015	0.070	0.015
	$\Delta \pi_i$	-0.057	0.000	0.001	0.000	-0.043	0.015	0.073	0.011
HU	Δp_i	-0.073	0.001	0.001	0.001	-0.028	0.022	0.057	0.019
	$\Delta \pi_i$	-0.064	0.000	0.001	0.000	-0.033	0.024	0.056	0.016
IE	Δp_i	-0.075	0.000	0.005	0.005	-0.036	0.011	0.047	0.043
	$\Delta \pi_i$	-0.068	0.000	0.003	0.002	-0.040	0.012	0.048	0.043
IT	Δp_i	-0.063	0.000	0.001	0.001	-0.036	0.022	0.056	0.017
	$\Delta \pi_i$	-0.058	0.001	0.001	0.001	-0.035	0.026	0.052	0.013
LX	Δp_i	-0.072	0.001	0.002	0.000	-0.033	0.020	0.051	0.030
	$\Delta \pi_i$	-0.071	0.001	0.002	0.000	-0.030	0.022	0.051	0.026
NL	Δp_i	-0.075	0.001	0.003	0.002	-0.034	0.013	0.063	0.028
	$\Delta \pi_i$	-0.069	0.001	0.002	0.001	-0.034	0.015	0.059	0.025
NW	Δp_i	-0.096	0.003	0.006	0.002	-0.016	0.017	0.050	0.034
	$\Delta \pi_i$	-0.081	0.002	0.005	0.002	-0.026	0.017	0.050	0.033
PL	Δp_i	-0.052	0.000	0.003	0.002	-0.047	0.013	0.050	0.032
	$\Delta \pi_i$	-0.046	0.000	0.002	0.001	-0.049	0.015	0.050	0.027
RL	Δp_i	-0.060	0.002	0.004	0.001	-0.033	0.028	0.050	0.009
	$\Delta \pi_i$	-0.045	0.001	0.002	0.000	-0.041	0.026	0.046	0.011
SI	Δp_i	-0.057	0.000	0.002	---	-0.042	0.017	0.066	0.014
	$\Delta \pi_i$	-0.046	0.000	0.001	---	-0.048	0.015	0.065	0.012
ES	Δp_i	-0.053	0.000	0.001	0.001	-0.042	0.021	0.057	0.016
	$\Delta \pi_i$	-0.046	0.000	0.001	0.000	-0.047	0.020	0.056	0.016
SW	Δp_i	-0.102	0.004	0.008	0.004	-0.009	0.018	0.051	0.026
	$\Delta \pi_i$	-0.087	0.002	0.006	0.003	-0.019	0.017	0.053	0.024
CH	Δp_i	-0.075	0.001	0.003	0.001	-0.029	0.016	0.056	0.028
	$\Delta \pi_i$	-0.072	0.001	0.003	0.001	-0.023	0.018	0.051	0.023
UK	Δp_i	-0.071	0.002	0.008	0.006	-0.031	0.015	0.046	0.025
	$\Delta \pi_i$	-0.063	0.001	0.005	0.003	-0.034	0.016	0.049	0.022

Note. Numbers are differences in population and income shares when switching from weighting by *ES*s to weighting by the number of household members, $\Delta p_i = p_i^h - p_i^{ES}$ and $\Delta \pi_i = \pi_i^h - \pi_i^{ES}$.

Table 6c. Changes in equivalent income and population shares [SQR]

Country	Difference	Household type							
		A1C0	A1C1	A1C2	A1C3	A2C0	A2C1	A2C2	A2C3
AT	Δp_i	-0.088	-0.001	0.003	0.000	-0.014	0.024	0.058	0.018
	$\Delta \pi_i$	-0.079	-0.001	0.002	0.000	-0.016	0.025	0.054	0.016
BE	Δp_i	-0.093	-0.001	0.003	0.002	-0.018	0.015	0.061	0.031
	$\Delta \pi_i$	-0.074	-0.001	0.002	0.001	-0.029	0.014	0.058	0.029
EE	Δp_i	-0.080	-0.002	0.003	0.002	-0.017	0.029	0.049	0.017
	$\Delta \pi_i$	-0.064	-0.003	0.001	0.001	-0.028	0.027	0.050	0.015
FI	Δp_i	-0.096	-0.001	0.003	0.002	-0.009	0.020	0.048	0.032
	$\Delta \pi_i$	-0.078	-0.001	0.002	0.001	-0.021	0.018	0.047	0.031
FR	Δp_i	-0.081	-0.002	0.003	0.002	-0.024	0.018	0.051	0.033
	$\Delta \pi_i$	-0.072	-0.001	0.002	0.001	-0.028	0.018	0.050	0.031
GE	Δp_i	-0.100	0.000	0.003	0.001	0.002	0.025	0.049	0.019
	$\Delta \pi_i$	-0.088	0.000	0.001	0.000	-0.003	0.025	0.048	0.017
GR	Δp_i	-0.069	-0.001	0.001	0.000	-0.033	0.014	0.071	0.016
	$\Delta \pi_i$	-0.062	-0.001	0.000	0.000	-0.038	0.014	0.074	0.012
HU	Δp_i	-0.083	-0.001	0.001	0.001	-0.020	0.022	0.059	0.020
	$\Delta \pi_i$	-0.070	-0.001	0.001	0.000	-0.028	0.023	0.057	0.017
IE	Δp_i	-0.082	-0.004	0.002	0.004	-0.029	0.012	0.050	0.047
	$\Delta \pi_i$	-0.073	-0.002	0.001	0.001	-0.036	0.012	0.049	0.048
IT	Δp_i	-0.071	-0.001	0.001	0.001	-0.028	0.022	0.058	0.018
	$\Delta \pi_i$	-0.063	-0.001	0.000	0.000	-0.029	0.025	0.053	0.015
LX	Δp_i	-0.081	-0.001	0.001	0.000	-0.026	0.020	0.053	0.033
	$\Delta \pi_i$	-0.078	-0.001	0.001	0.000	-0.024	0.021	0.052	0.029
NL	Δp_i	-0.084	-0.001	0.002	0.001	-0.026	0.013	0.065	0.030
	$\Delta \pi_i$	-0.075	-0.001	0.001	0.001	-0.028	0.014	0.060	0.027
NW	Δp_i	-0.106	-0.001	0.004	0.002	-0.007	0.018	0.053	0.037
	$\Delta \pi_i$	-0.088	-0.002	0.002	0.001	-0.019	0.017	0.052	0.037
PL	Δp_i	-0.058	-0.003	0.001	0.002	-0.041	0.012	0.052	0.035
	$\Delta \pi_i$	-0.050	-0.002	0.001	0.001	-0.044	0.014	0.051	0.029
RL	Δp_i	-0.066	-0.004	0.002	0.000	-0.025	0.030	0.052	0.010
	$\Delta \pi_i$	-0.048	-0.005	0.001	0.000	-0.035	0.026	0.048	0.012
SI	Δp_i	-0.064	-0.002	0.001	0.000	-0.036	0.016	0.068	0.016
	$\Delta \pi_i$	-0.050	-0.002	0.000	0.000	-0.043	0.014	0.066	0.013
ES	Δp_i	-0.060	-0.001	0.001	0.000	-0.036	0.020	0.058	0.017
	$\Delta \pi_i$	-0.051	0.000	0.000	0.000	-0.042	0.019	0.056	0.017
SW	Δp_i	-0.111	0.000	0.006	0.004	0.001	0.019	0.054	0.028
	$\Delta \pi_i$	-0.095	-0.001	0.004	0.002	-0.011	0.018	0.056	0.027
CH	Δp_i	-0.085	-0.001	0.002	0.001	-0.021	0.016	0.058	0.030
	$\Delta \pi_i$	-0.079	0.000	0.001	0.000	-0.016	0.017	0.052	0.025
UK	Δp_i	-0.079	-0.002	0.005	0.005	-0.020	0.016	0.048	0.027
	$\Delta \pi_i$	-0.068	-0.001	0.003	0.002	-0.026	0.016	0.051	0.024

Note. Numbers are differences in population and income shares when switching from weighting by *ES*s to weighting by the number of household members, $\Delta p_i = p_i^h - p_i^{ES}$ and $\Delta \pi_i = \pi_i^h - \pi_i^{ES}$.

Table 7. Mean equivalent incomes for each household type

Country	*ES*	μ_{A1C0}	μ_{A1C1}	μ_{A1C2}	μ_{A1C3}	μ_{A2C0}	μ_{A2C1}	μ_{A2C2}	μ_{A2C3}
AT	OECD	1578.6	1123.2	1007.3	724.0	1710.8	1453.7	1222.4	1072.1
	OECD mod.	1578.6	1296.0	1259.1	952.6	1938.9	1776.7	1571.7	1429.5
	SQR	1578.6	1191.3	1163.1	905.0	2056.5	1846.4	1650.3	1534.3
BE	OECD	1402.7	1073.6	1050.3	771.2	1807.0	1582.9	1387.5	1285.1
	OECD mod.	1402.7	1238.8	1312.9	1014.7	2047.9	1934.7	1784.0	1713.5
	SQR	1402.7	1138.8	1212.8	964.0	2172.1	2010.6	1873.2	1839.1
EE	OECD	381.0	368.3	274.3	210.1	452.1	478.5	431.6	356.8
	OECD mod.	381.0	425.0	342.8	276.4	512.4	584.8	554.9	475.7
	SQR	381.0	390.7	316.7	262.6	543.4	607.8	582.6	510.6
FI	OECD	1178.3	1083.6	931.7	873.9	1471.3	1357.7	1242.6	1116.2
	OECD mod.	1178.3	1250.3	1164.6	1149.9	1667.4	1659.4	1597.7	1488.3
	SQR	1178.3	1149.3	1075.9	1092.4	1768.6	1724.5	1677.5	1597.4
FR	OECD	1451.1	1079.8	869.6	795.6	1518.2	1352.3	1201.1	1087.5
	OECD mod.	1451.1	1245.9	1087.0	1046.9	1720.6	1652.8	1544.3	1450.0
	SQR	1451.1	1145.3	1004.1	994.5	1825.0	1717.6	1621.5	1556.3
GE	OECD	1312.1	872.5	627.2	624.9	1482.4	1302.0	1150.5	965.0
	OECD mod.	1312.1	1006.7	784.0	822.2	1680.1	1591.4	1479.2	1286.6
	SQR	1312.1	925.4	724.3	781.1	1782.0	1653.8	1553.1	1381.0
GR	OECD	956.8	892.1	649.3	1704.2	857.7	1086.6	957.7	633.3
	OECD mod.	956.8	1029.3	811.6	2242.4	972.1	1328.1	1231.3	844.4
	SQR	956.8	946.2	749.8	2130.3	1031.1	1380.2	1292.9	906.3
HU	OECD	431.8	307.6	389.8	180.3	463.6	503.1	406.9	328.0
	OECD mod.	431.8	355.0	487.3	237.2	525.4	614.9	523.1	437.4
	SQR	431.8	326.3	450.2	255.3	557.3	639.0	549.3	469.4
IE	OECD	1408.9	790.1	668.7	482.4	1444.0	1599.4	1287.0	1247.0
	OECD mod.	1408.9	911.6	835.9	634.8	1636.6	1954.8	1654.7	1662.7
	SQR	1408.9	838.0	772.2	603.0	1735.8	2031.5	1737.4	1784.6
IT	OECD	1290.9	1203.4	841.2	633.8	1332.2	1186.2	946.2	786.0
	OECD mod.	1290.9	1388.6	1051.5	833.9	1509.9	1449.7	1216.5	1048.0
	SQR	1290.9	1276.4	971.3	792.2	1601.5	1506.6	1277.4	1124.8
LX	OECD	2552.9	1700.0	1317.9	589.8	2369.6	1949.2	1778.9	1518.1
	OECD mod.	2552.9	1961.6	1647.4	776.0	2685.6	2382.3	2287.2	2024.1
	SQR	2552.9	1803.1	1521.8	737.2	2848.5	2475.8	2401.5	2172.5
NL	OECD	1589.0	1070.3	744.0	873.3	1696.3	1432.7	1157.7	1068.8
	OECD mod.	1589.0	1235.0	930.0	1149.1	1922.5	1751.1	1488.5	1425.0
	SQR	1589.0	1135.2	859.1	1091.7	2039.1	1819.8	1563.0	1529.5
NW	OECD	1558.6	1515.7	1214.7	1093.6	1976.7	1833.5	1669.8	1545.8
	OECD mod.	1558.6	1748.9	1518.3	1438.9	2240.2	2241.0	2146.9	2061.0
	SQR	1558.6	1607.6	1402.6	1367.0	2376.1	2328.9	2254.3	2212.1
PL	OECD	525.0	497.2	382.8	297.7	559.2	518.1	442.5	358.1
	OECD mod.	525.0	573.7	478.5	391.7	633.7	633.3	568.9	477.3
	SQR	525.0	527.4	442.0	372.1	672.2	658.1	697.4	512.4
RL	OECD	186.6	238.4	155.4	65.2	231.0	253.9	212.6	254.7
	OECD mod.	186.6	275.1	194.2	85.8	261.8	310.4	273.3	339.6
	SQR	186.6	252.9	179.4	81.5	277.6	322.5	287.0	364.5
SI	OECD	623.2	594.5	495.6	---	714.4	721.3	658.8	523.1
	OECD mod.	623.2	686.0	619.5	---	809.6	881.6	847.0	697.5
	SQR	623.2	630.6	572.3	---	858.7	916.2	889.4	748.6
ES	OECD	1184.9	852.1	791.7	904.2	1250.5	1189.7	1078.1	1026.3
	OECD mod.	1184.9	983.2	989.6	1189.8	1417.2	1454.1	1386.1	1368.3
	SQR	1184.9	903.8	914.2	1130.3	1503.1	1511.1	1455.5	1468.7
SW	OECD	1209.9	1097.4	974.4	849.1	1552.9	1375.8	1302.2	1110.9
	OECD mod.	1209.9	1266.3	1218.0	1117.2	1759.9	1681.5	1674.3	1481.2
	SQR	1209.9	1164.0	1125.2	1061.4	1866.7	1747.4	1758.0	1589.8
CH	OECD	2247.4	1601.5	1311.5	1002.8	2238.3	1721.6	1440.3	1272.0
	OECD mod.	2247.4	1847.9	1639.4	1319.5	2536.7	2104.1	1851.8	1696.0
	SQR	2247.4	1698.7	1514.4	1253.5	2690.6	2186.7	1944.4	1820.3
UK	OECD	1597.5	1037.3	868.5	716.5	1783.3	1574.1	1487.2	1187.3
	OECD mod.	1597.5	1196.9	1085.6	942.7	2021.7	1923.9	1912.1	1513.1
	SQR	1597.5	1100.2	1002.9	895.6	2144.3	1999.4	2007.7	1699.1

Table 8. Relative change of residual component

Country	$\Delta O = O^h - O^{ES}$		
	OECD	OECD mod.	SQR
AT	-0.0023	0.0017	0.0032
BE	-0.0003	0.0080	0.0108
EE	0.0024	0.0096	0.0115
FI	0.0021	0.0103	0.0119
FR	-0.0024	0.0022	0.0042
GE	-0.0012	0.0055	0.0071
GR	-0.0051	-0.0088	-0.0076
HU	-0.0015	0.0048	0.0065
IE	-0.0079	-0.0054	-0.0016
IT	-0.0029	0.0005	0.0012
LX	-0.0011	-0.0013	-0.0005
NL	-0.0032	-0.0004	0.0008
NW	0.0027	0.0113	0.0131
PL	-0.0014	0.0018	0.0031
RL	0.0038	0.0108	0.0108
SI	-0.0032	0.0010	0.0028
ES	0.0008	0.0079	0.0096
SW	0.0030	0.0108	0.0120
CH	-0.0055	-0.0035	-0.0030
UK	-0.0017	0.0044	0.0068

Figure 1. Change in overall Gini

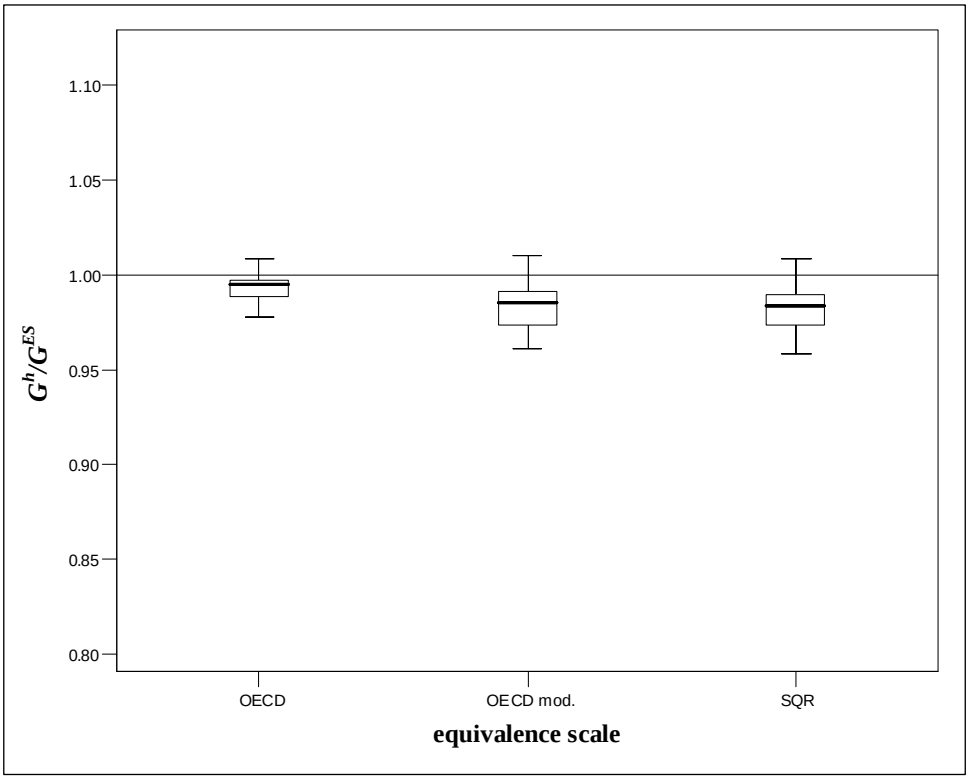


Figure 2. Change in overall mean equivalent income (μ)

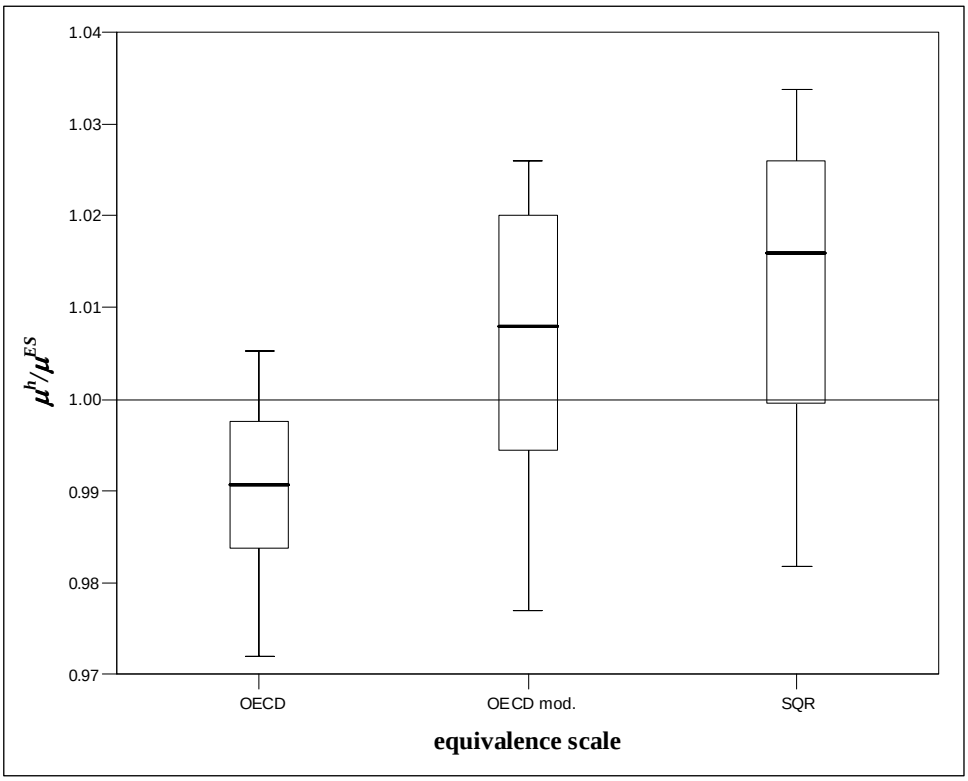


Figure 3a. Household-type specific change in w_i[OECD]

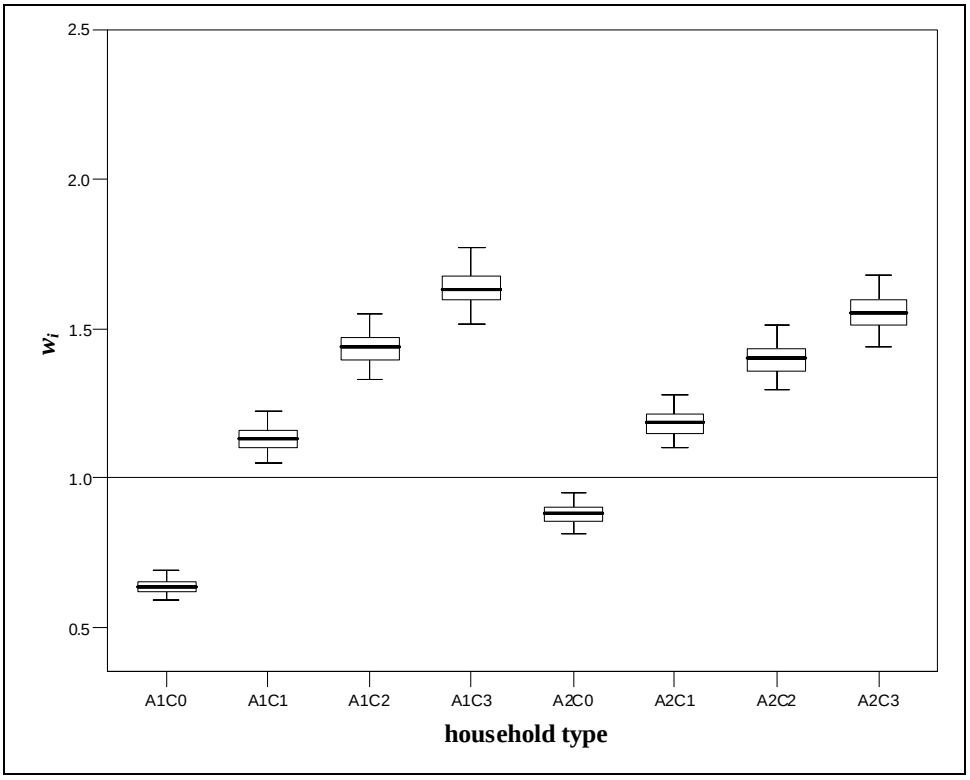


Figure 3b. Household-type specific change in w_i [OECD mod.]

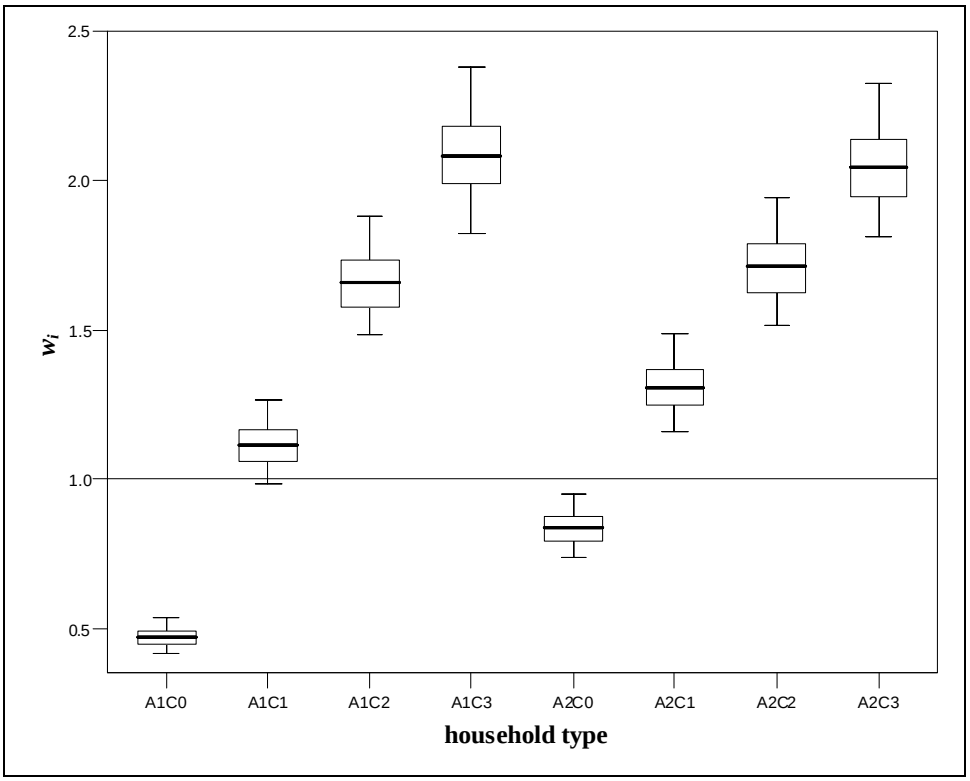


Figure 3c. Household-type specific change in w_i [SQR]

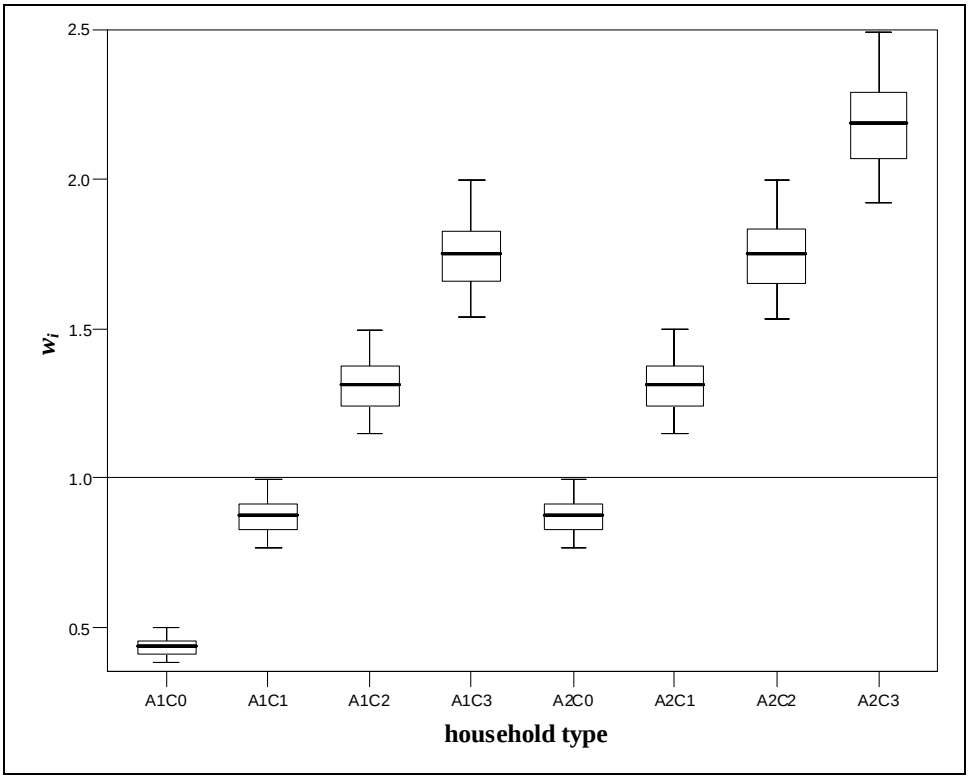


Figure 4. Relative deviation of Gini-within from unweighted mean

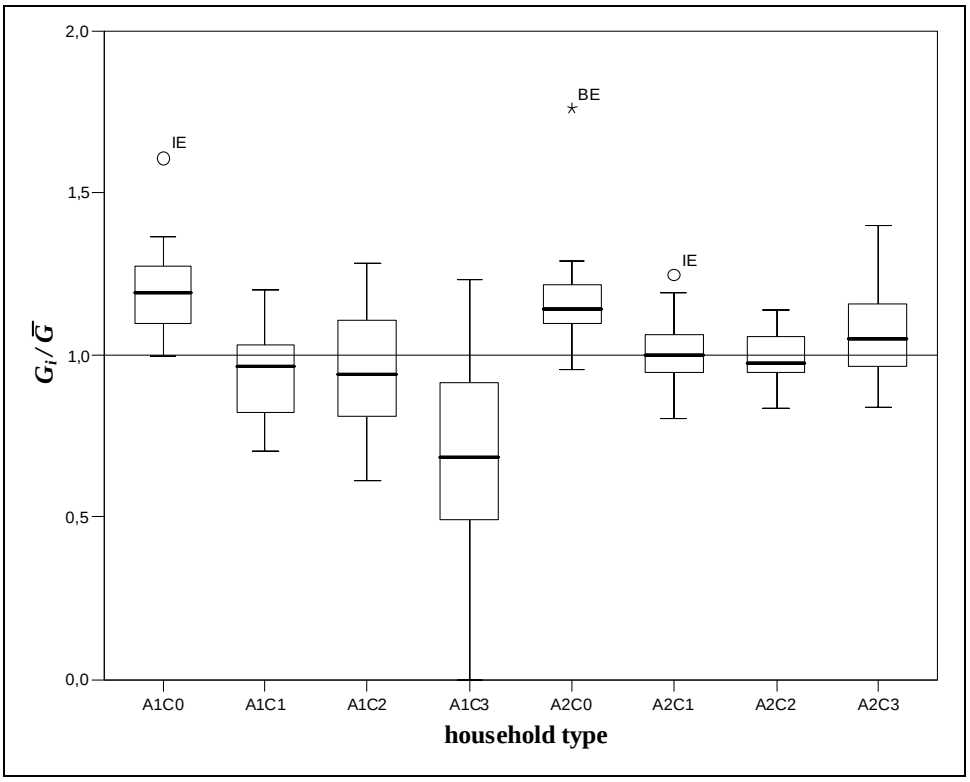


Figure 5. Relative change in within group component *W*

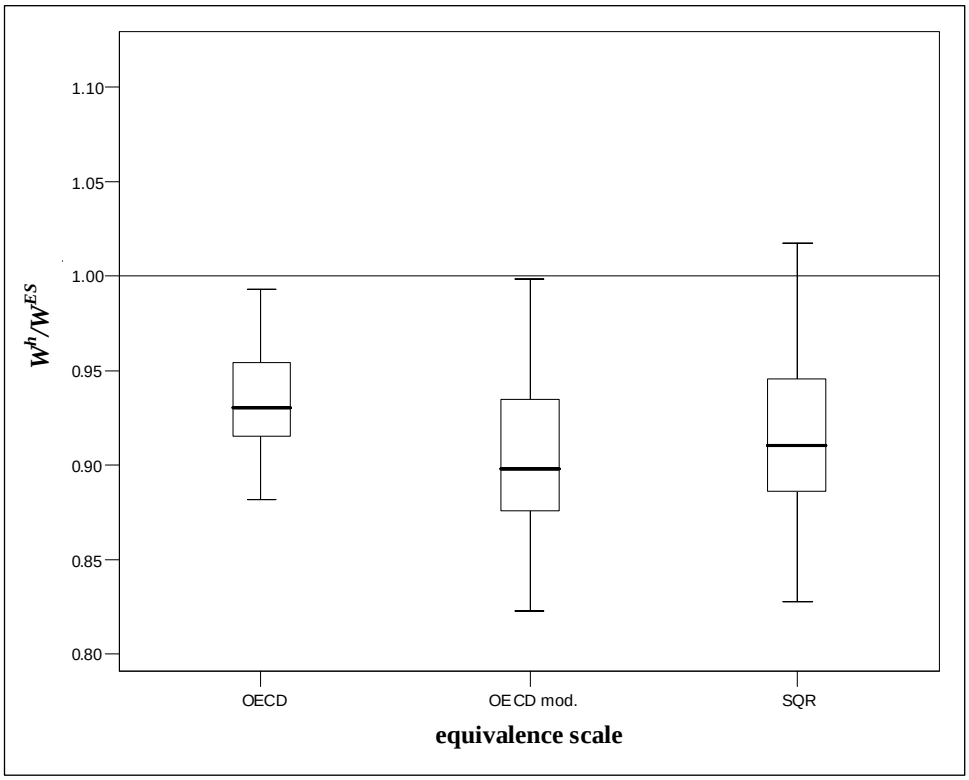


Figure 6a. Relative change in household-type specific contribution to between component [OECD]

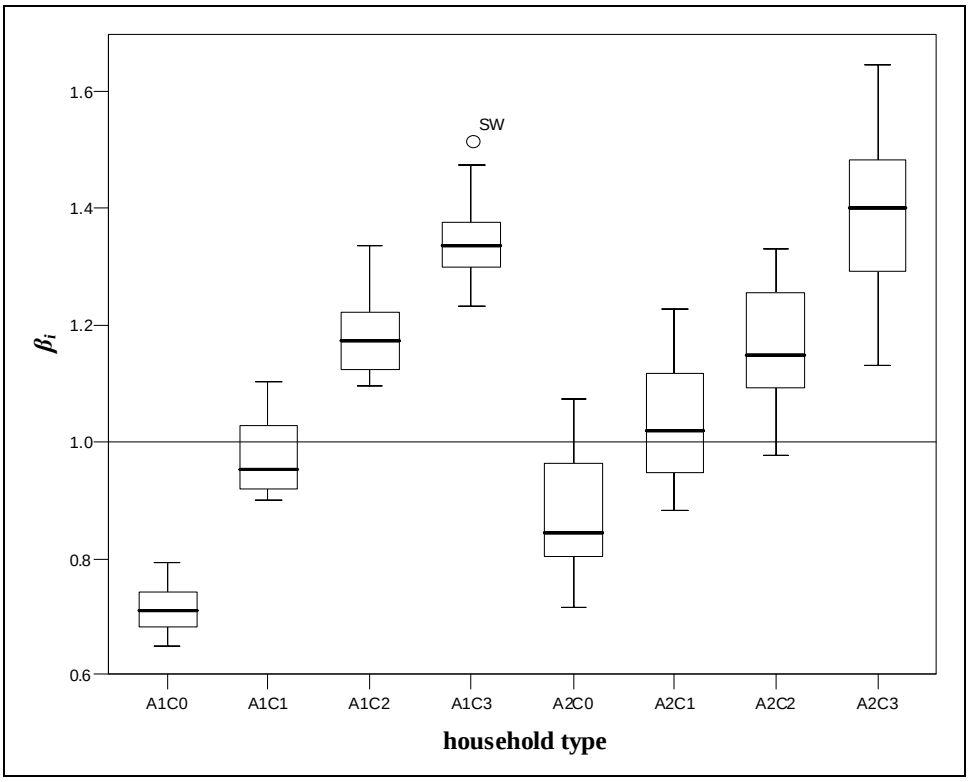


Figure 6b. Relative change in household-type specific contribution to between component [OECD mod.]

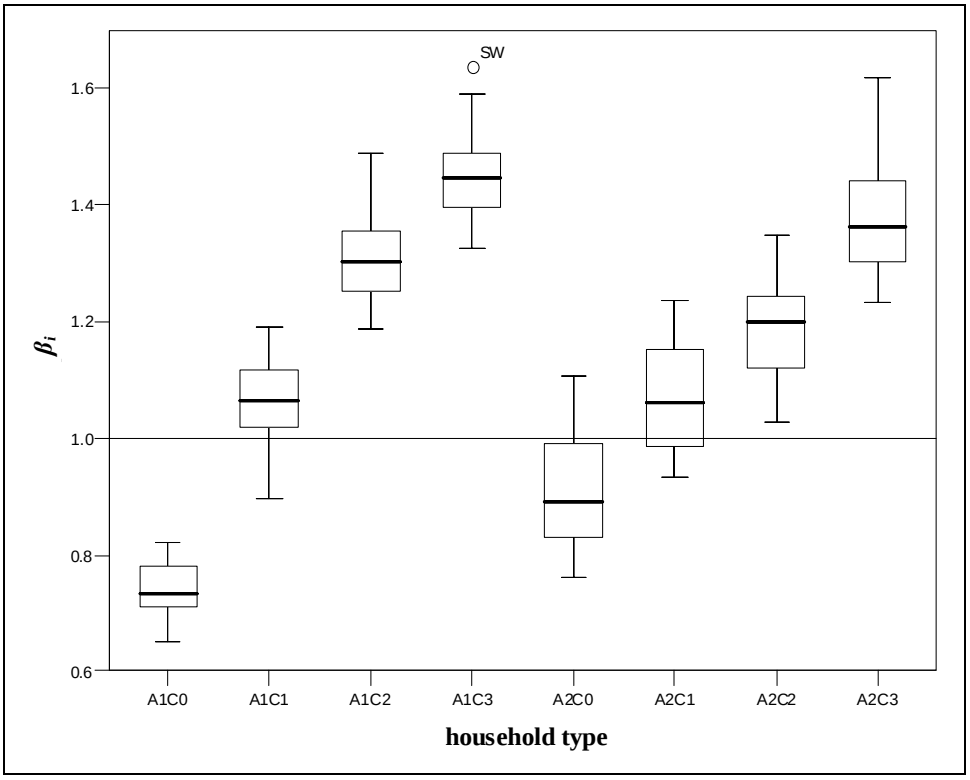


Figure 6c. Relative change in household-type specific contribution to between component [SQR]

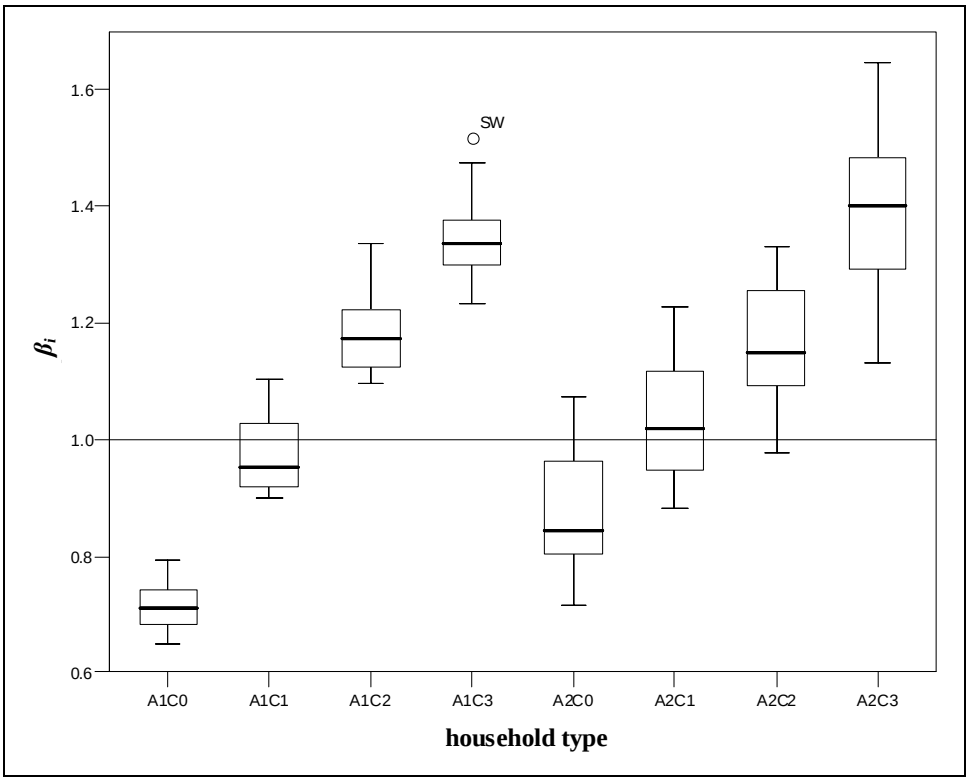


Figure 7. Relative change in between group component *B*

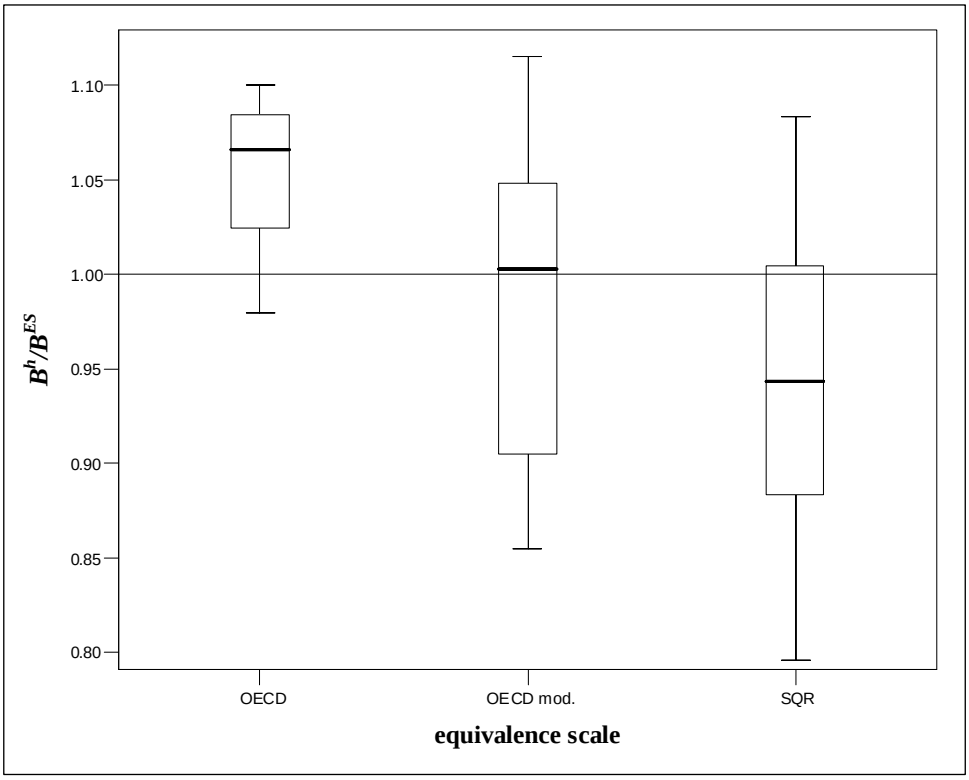


Figure 8. Relative change in overlap component *O*

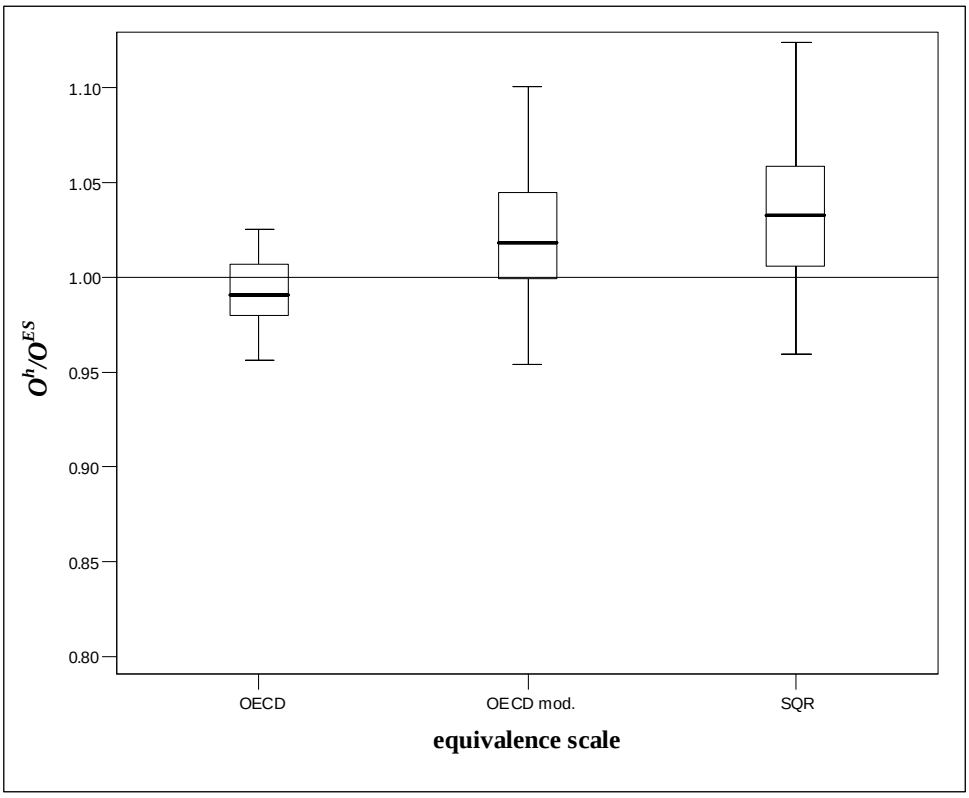


Figure 9a. Relative deviation of mean equivalent income from unweighted mean [OECD]

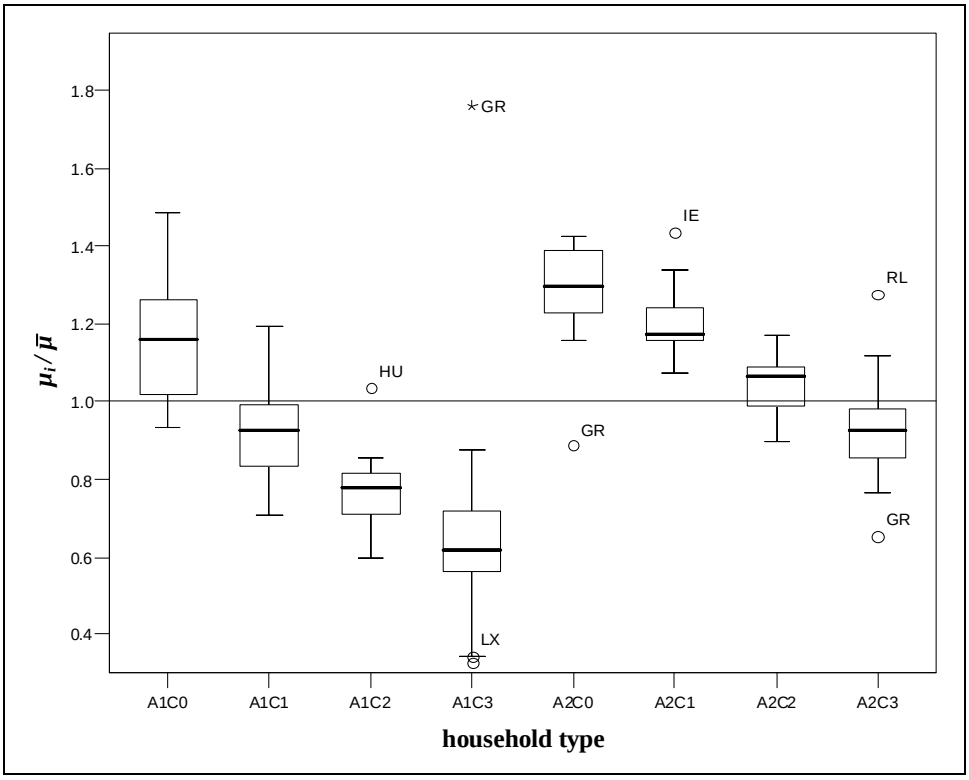


Figure 9b. Relative deviation of mean equivalent income from unweighted mean [OECD mod.]

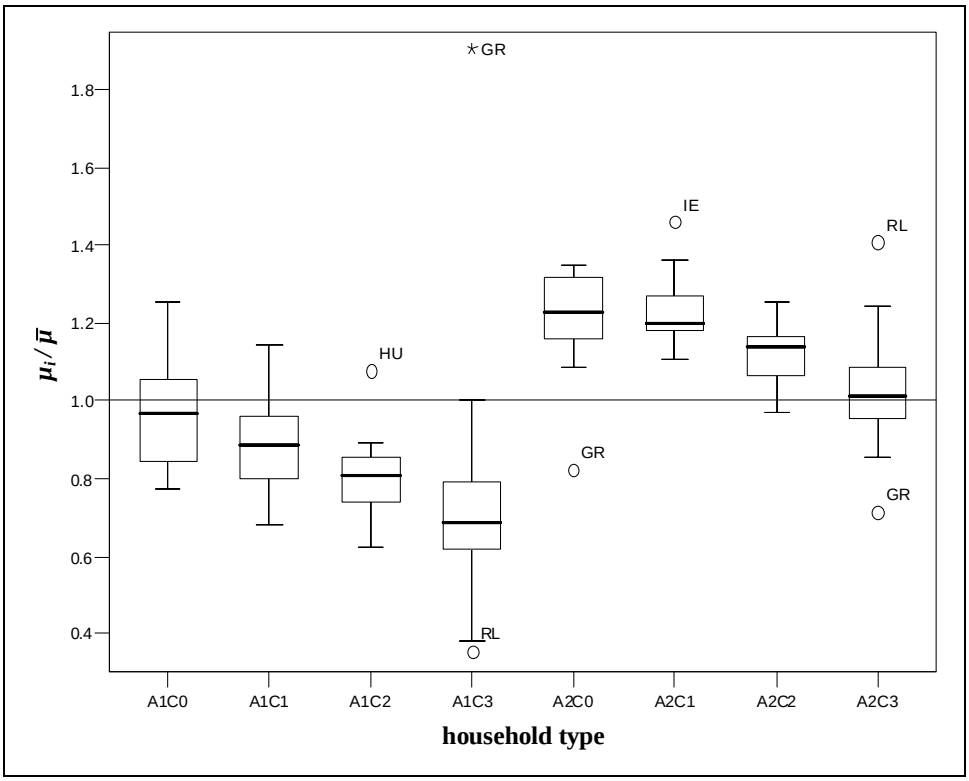
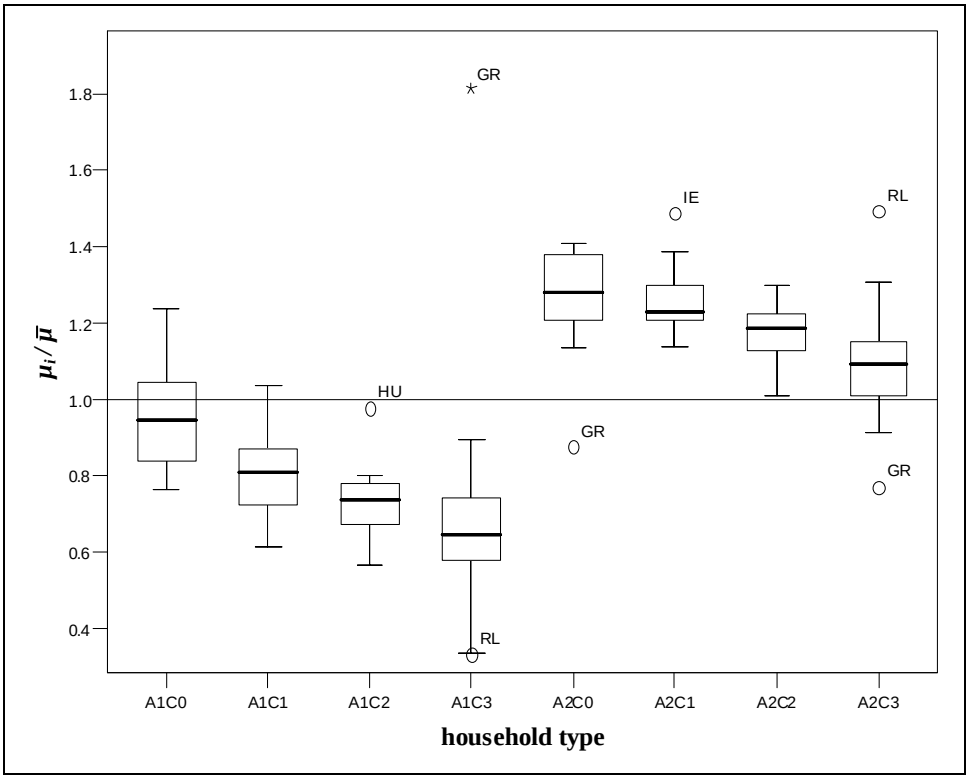


Figure 9c. Relative deviation of mean equivalent income from unweighted mean [SQR]



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Appendix

Table A1. Data processing

Country	Country code	LIS-File	Local currency/EUR exchange rates [EMU countries only] [c]	Growth and inflation adjustment 1999-2000 [d]	PPP in US$ 2000 [e]	PPP normalized
Austria[a]	AT	at00h	13.760	1.000	0.914	0.931
Belgium[a]	BE	be00h	40.340	1.000	0.921	0.939
Estonia	EE	ee00h	---	1.000	7.045	7.180
Finland[a]	FI	fi00h	5.946	1.000	0.979	0.998
France[a]	FR	fr00h	6.560	1.000	0.915	0.933
Germany[a]	GE	ge00h	1.956	1.000	0.981	1.000
Greece[a]	GR	gr00h	339.170	1.000	0.684	0.698
Hungary	HU	hu99h	---	1.053	107.337	109.393
Ireland[a]	IE	ie00h	0.788	1.000	0.953	0.972
Italy[a]	IT	it00h	1936.330	1.000	0.808	0.823
Luxembourg[a]	LX	lx00h	40.340	1.000	0.988	1.007
Netherlands[a,b]	NL	nl99h	2.203	1.056	0.926	0.943
Norway	NW	nw00h	---	1.000	9.010	9.183
Poland	PL	pl99h	---	1.026	1.820	1.855
Russia	RL	rl00h	---	1.000	7.351	7.491
Slovenia	SI	si99h	---	1.017	141.385	144.093
Spain[a]	ES	es00h	166.368	1.000	0.742	0.756
Sweden	SW	sw00h	---	1.000	9.190	9.366
Switzerland	CH	ch00h	---	1.000	1.897	1.933
UK	UK	uk99h	---	1.046	0.632	0.645

Note. a) Countries where the PPP conversion factor is normalized with respect to the EUR. For all other countries, the PPP conversion factor refers to the country-specific currencies. b) the file nl99 contains incomplete household data. For correct calculation of household-level characteristics, data are filtered by the LIS-variable HSLOT1. Exchange rate EUR/US$ in 2000 is 0.924. c) Exchange rates com from the European Central Bank. d) Data from 99 has been adjusted for growth in disposable income (national accounts data) and time adjusted (for details see Hoffmeister 2006, Table A1, p 29. e) PPPs are taken from the OECD (http:/www.oecd.org) and also from the United Nations Development Programme (http://www.undp.org).

Table A2. Within-household-size economies (*WHSE*)

Household type					
h_i	Number of adults	Number of children	h_i / ES_i^{OECD}	$h_i / ES_i^{OECD\ mod.}$	h_i / ES_i^{SQR}
1	1	0	1.00	1.00	1.00
2	1	1	1.33	1.54	1.41
3	1	2	1.50	1.87	1.73
4	1	3	1.60	2.11	2.00
2	2	0	1.18	1.33	1.41
3	2	1	1.36	1.67	1.73
4	2	2	1.48	1.90	2.00
5	2	3	1.56	2.08	2.24

Note. i is the household type; h_i is the number of household members; ES_i is the equivalence scale of *i*.

Table A3. Changes in household-type specific weights

Country	*ES*	Δw_{A1C0}	Δw_{A1C1}	Δw_{A1C2}	Δw_{A1C3}	Δw_{A2C0}	Δw_{A2C1}	Δw_{A2C2}	Δw_{A2C3}
AT	OECD	-0.344	0.166	0.476	0.686	-0.093	0.219	0.439	0.600
	OECD mod.	-0.506	0.170	0.738	1.193	-0.121	0.373	0.793	1.145
	SQR	-0.540	-0.079	0.382	0.843	-0.080	0.381	0.841	1.301
BE	OECD	-0.362	0.134	0.436	0.633	-0.117	0.186	0.400	0.557
	OECD mod.	-0.527	0.119	0.663	1.097	-0.160	0.313	0.715	1.052
	SQR	-0.562	-0.124	0.315	0.754	-0.124	0.315	0.753	1.191
EE	OECD	-0.367	0.126	0.426	0.620	-0.123	0.178	0.390	0.546
	OECD mod.	-0.532	0.108	0.646	1.077	-0.167	0.301	0.699	1.033
	SQR	-0.563	-0.126	0.311	0.749	-0.126	0.311	0.748	1.185
FI	OECD	-0.341	0.172	0.482	0.689	-0.088	0.225	0.446	0.608
	OECD mod.	-0.502	0.176	0.740	1.184	-0.114	0.383	0.809	1.159
	SQR	-0.536	-0.073	0.390	0.857	-0.073	0.390	0.854	1.318
FR	OECD	-0.366	0.127	0.426	0.622	-0.123	0.179	0.391	0.548
	OECD mod.	-0.532	0.107	0.644	1.073	-0.169	0.299	0.697	1.030
	SQR	-0.567	-0.134	0.299	0.728	-0.134	0.299	0.731	1.164
GE	OECD	-0.311	0.224	0.549	0.770	-0.047	0.280	0.511	0.681
	OECD mod.	-0.465	0.266	0.879	1.378	-0.049	0.486	0.940	1.322
	SQR	-0.501	-0.002	0.494	0.994	-0.002	0.497	0.995	1.494
GR	OECD	-0.384	0.096	0.385	0.602	-0.148	0.145	0.352	0.504
	OECD mod.	-0.555	0.054	0.566	0.992	-0.209	0.237	0.615	0.933
	SQR	-0.591	-0.183	0.226	0.639	-0.183	0.226	0.635	1.043
HU	OECD	-0.357	0.143	0.446	0.649	-0.110	0.196	0.412	0.570
	OECD mod.	-0.522	0.131	0.678	1.110	-0.150	0.328	0.734	1.075
	SQR	-0.559	-0.118	0.321	0.762	-0.118	0.323	0.764	1.205
IE	OECD	-0.400	0.066	0.350	0.536	-0.170	0.115	0.316	0.464
	OECD mod.	-0.571	0.015	0.508	0.902	-0.238	0.191	0.555	0.861
	SQR	-0.603	-0.205	0.193	0.590	-0.205	0.192	0.589	0.987
IT	OECD	-0.363	0.132	0.436	0.633	-0.119	0.184	0.398	0.555
	OECD mod.	-0.530	0.111	0.650	1.090	-0.165	0.305	0.704	1.038
	SQR	-0.568	-0.135	0.299	0.731	-0.136	0.296	0.728	1.160
LX	OECD	-0.360	0.138	0.440	0.629	-0.114	0.190	0.405	0.562
	OECD mod.	-0.526	0.122	0.668	1.056	-0.157	0.317	0.720	1.057
	SQR	-0.563	-0.126	0.310	0.759	-0.126	0.310	0.747	1.184
NL	OECD	-0.364	0.131	0.429	0.627	-0.120	0.182	0.395	0.552
	OECD mod.	-0.531	0.111	0.651	1.080	-0.166	0.303	0.702	1.037
	SQR	-0.567	-0.134	0.298	0.728	-0.135	0.298	0.730	1.163
NW	OECD	-0.348	0.159	0.467	0.666	-0.098	0.212	0.431	0.592
	OECD mod.	-0.508	0.164	0.729	1.177	-0.126	0.366	0.784	1.134
	SQR	-0.539	-0.078	0.383	0.842	-0.078	0.382	0.843	1.304
PL	OECD	-0.410	0.049	0.328	0.514	-0.183	0.098	0.296	0.441
	OECD mod.	-0.583	-0.015	0.481	0.823	-0.259	0.158	0.513	0.808
	SQR	-0.617	-0.233	0.150	0.535	-0.233	0.150	0.534	0.917
RL	OECD	-0.387	0.090	0.379	0.588	-0.151	0.140	0.346	0.496
	OECD mod.	-0.555	0.052	0.564	0.975	-0.210	0.235	0.613	0.930
	SQR	-0.586	-0.171	0.243	0.657	-0.171	0.243	0.657	1.072
SI	OECD	-0.399	0.070	0.353	---	-0.168	0.118	0.319	0.468
	OECD mod.	-0.571	0.015	0.509	---	-0.238	0.191	0.555	0.861
	SQR	-0.606	-0.212	0.182	---	-0.212	0.182	0.576	0.970
ES	OECD	-0.378	0.104	0.403	0.585	-0.140	0.156	0.364	0.518
	OECD mod.	-0.549	0.067	0.588	0.987	-0.198	0.253	0.636	0.958
	SQR	-0.587	-0.174	0.241	0.654	-0.175	0.238	0.651	1.064
SW	OECD	-0.328	0.195	0.512	0.720	-0.070	0.249	0.475	0.640
	OECD mod.	-0.483	0.223	0.816	1.288	-0.082	0.435	0.875	1.242
	SQR	-0.514	-0.028	0.458	0.942	-0.028	0.458	0.944	1.430
CH	OECD	-0.343	0.167	0.479	0.676	-0.091	0.221	0.442	0.603
	OECD mod.	-0.506	0.168	0.738	1.189	-0.121	0.373	0.793	1.145
	SQR	-0.544	-0.089	0.369	0.814	-0.088	0.368	0.824	1.280
UK	OECD	-0.356	0.145	0.449	0.649	-0.109	0.198	0.414	0.572
	OECD mod.	-0.520	0.136	0.687	1.128	-0.147	0.333	0.741	1.083
	SQR	-0.554	-0.108	0.339	0.785	-0.107	0.339	0.785	1.231

Note. Definition: $\Delta w_i = p_i^h \pi_i^h - p_i^{ES} \pi_i^{ES}$

Table A4. Changes of the within-group component

Country	$\Delta W = W^h - W^{ES}$		
	OECD	OECD mod.	SQR
AT	-0.0048	-0.0071	-0.0060
BE	-0.0070	-0.0101	-0.0084
EE	-0.0046	-0.0065	-0.0050
FI	-0.0060	-0.0090	-0.0081
FR	-0.0053	-0.0078	-0.0069
GE	-0.0070	-0.0107	-0.0102
GR	-0.0021	-0.0028	-0.0018
HU	-0.0037	-0.0054	-0.0046
IE	-0.0058	-0.0089	-0.0080
IT	-0.0045	-0.0064	-0.0052
LX	-0.0044	-0.0066	-0.0059
NL	-0.0040	-0.0060	-0.0053
NW	-0.0064	-0.0098	-0.0093
PL	-0.0008	-0.0008	0.0001
RL	-0.0007	-0.0002	0.0018
SI	-0.0017	-0.0022	-0.0013
ES	-0.0042	-0.0060	-0.0047
SW	-0.0071	-0.0111	-0.0108
CH	-0.0065	-0.0099	-0.0090
UK	-0.0075	-0.0109	-0.0089

Table A5. Household-type specific Gini coefficients

Country	G_{A1C0}	G_{A1C1}	G_{A1C2}	G_{A1C3}	G_{A2C0}	G_{A2C1}	G_{A2C2}	G_{A2C3}
AT	0.2665	0.1807	0.2387	0.1109	0.2845	0.2231	0.2309	0.2509
BE	0.2722	0.2058	0.2382	0.1184	0.4362	0.2368	0.2424	0.2324
EE	0.3584	0.3260	0.2689	0.2920	0.3612	0.2556	0.3406	0.3382
FI	0.2649	0.2047	0.1587	0.1457	0.2556	0.2095	0.2008	0.2404
FR	0.3091	0.2665	0.2403	0.2383	0.2854	0.2453	0.2496	0.2476
GE	0.2933	0.2300	0.2861	0.1277	0.2628	0.2378	0.2215	0.2304
GR	0.4043	0.3313	0.3811	0.000	0.3597	0.3129	0.3177	0.2690
HU	0.3220	0.3235	0.1811	0.3643	0.2904	0.3387	0.2828	0.2625
IE	0.4516	0.1973	0.1937	0.1337	0.3618	0.3502	0.2397	0.3191
IT	0.3427	0.2635	0.2784	0.2870	0.3434	0.2970	0.3043	0.3986
LX	0.2794	0.2168	0.2590	0.1123	0.2717	0.2321	0.2515	0.2410
NL	0.2526	0.1666	0.2346	0.1534	0.2441	0.2557	0.2000	0.2164
NW	0.2746	0.2196	0.1728	0.1198	0.2623	0.1915	0.2084	0.2550
PL	0.2797	0.2921	0.2497	0.2400	0.2677	0.2966	0.2921	0.3275
RL	0.4192	0.5035	0.4634	0.000	0.4471	0.4995	0.4365	0.5864
SI	0.2933	0.2464	0.3072	---	0.2845	0.2337	0.2135	0.2156
ES	0.3900	0.3040	0.4075	0.3447	0.3599	0.3062	0.3443	0.4456
SW	0.2663	0.2100	0.1687	0.1408	0.2400	0.2071	0.2280	0.2125
CH	0.3166	0.1874	0.2674	0.1804	0.2877	0.2644	0.2225	0.2563
UK	0.3699	0.2344	0.2210	0.1775	0.3498	0.3033	0.3271	0.3212
Note. G_i denotes the Gini coefficient within subgroup i.								

Table A6. Changes in the between-group Gini component

Country	*ES*	Δb_{A1C0}	Δb_{A1C1}	Δb_{A1C2}	Δb_{A1C3}	Δb_{A2C0}	Δb_{A2C1}	Δb_{A2C2}	Δb_{A2C3}	$\sum_i \Delta b_i$
AT	OECD	-0.0012	0.0001	0.0004	0.0001	0.0018	0.0013	0.0024	0.0012	0.0061
	OECD mod.	-0.0039	0.0002	0.0005	0.0001	-0.0005	0.0013	0.0030	0.0014	0.0021
	SQR	-0.0055	-0.0002	0.0004	0.0001	-0.0014	0.0011	0.0032	0.0015	-0.0007
BE	OECD	-0.0029	0.0001	0.0005	0.0004	-0.0004	0.0007	0.0021	0.0014	0.0019
	OECD mod.	-0.0078	0.0003	0.0007	0.0006	-0.0043	0.0002	0.0017	0.0014	-0.0072
	SQR	-0.0097	-0.0001	0.0006	0.0006	-0.0055	-0.0002	0.0015	0.0013	-0.0114
EE	OECD	-0.0022	0.0003	0.0006	0.0004	-0.0008	0.0008	0.0012	0.0010	0.0012
	OECD mod.	-0.0068	0.0004	0.0009	0.0005	-0.0031	-0.0002	0.0013	0.0010	-0.0059
	SQR	-0.0083	0.0002	0.0007	0.0005	-0.0042	-0.0008	0.0010	0.0010	-0.0099
FI	OECD	-0.0027	0.0002	0.0005	0.0003	-0.0005	0.0006	0.0014	0.0014	0.0012
	OECD mod.	-0.0072	0.0003	0.0007	0.0004	-0.0049	-0.0001	0.0009	0.0013	-0.0086
	SQR	-0.0089	0.0002	0.0007	0.0004	-0.0061	-0.0004	0.0008	0.0013	-0.0120
FR	OECD	-0.0009	0.0000	0.0005	0.0003	0.0014	0.0009	0.0015	0.0015	0.0052
	OECD mod.	-0.0034	0.0001	0.0007	0.0004	-0.0011	0.0007	0.0016	0.0015	0.0006
	SQR	-0.0050	-0.0002	0.0005	0.0003	-0.0021	0.0003	0.0016	0.0015	-0.0031
GE	OECD	-0.0012	0.0003	0.0007	0.0002	0.0016	0.0013	0.0022	0.0015	0.0065
	OECD mod.	-0.0048	0.0005	0.0009	0.0002	-0.0016	0.0010	0.0023	0.0016	0.0001
	SQR	-0.0066	0.0001	0.0008	0.0002	-0.0026	0.0008	0.0024	0.0017	-0.0032
GR	OECD	-0.0012	0.0000	0.0002	0.0001	-0.0003	0.0008	0.0020	0.0015	0.0031
	OECD mod.	-0.0022	0.0000	0.0003	0.0001	0.0015	0.0001	0.0027	0.0020	0.0046
	SQR	-0.0038	0.0000	0.0002	0.0000	0.0009	-0.0002	0.0024	0.0020	0.0016
HU	OECD	-0.0011	0.0001	0.0001	0.0002	0.0006	0.0014	0.0020	0.0015	0.0047
	OECD mod.	-0.0047	0.0002	0.0001	0.0002	-0.0023	0.0011	0.0016	0.0017	-0.0021
	SQR	-0.0065	-0.0001	0.0001	0.0002	-0.0033	0.0006	0.0014	0.0017	-0.0061
IE	OECD	-0.0012	0.0001	0.0009	0.0010	0.0003	0.0014	0.0017	0.0016	0.0057
	OECD mod.	-0.0047	0.0002	0.0013	0.0014	-0.0020	0.0007	0.0017	0.0017	0.0002
	SQR	-0.0067	-0.0008	0.0008	0.0012	-0.0033	0.0000	0.0013	0.0017	-0.0058
IT	OECD	-0.0008	0.0001	0.0001	0.0001	0.0020	0.0015	0.0026	0.0015	0.0072
	OECD mod.	-0.0029	0.0001	0.0001	0.0002	0.0002	0.0017	0.0032	0.0019	0.0044
	SQR	-0.0041	-0.0001	0.0001	0.0002	-0.0005	0.0014	0.0035	0.0019	0.0024
LX	OECD	-0.0017	0.0000	0.0002	0.0001	0.0016	0.0005	0.0016	0.0020	0.0044
	OECD mod.	-0.0014	0.0000	0.0003	0.0001	0.0016	0.0008	0.0018	0.0022	0.0054
	SQR	-0.0024	-0.0002	0.0002	0.0001	0.0009	0.0008	0.0020	0.0022	0.0036
NL	OECD	-0.0013	0.0000	0.0005	0.0002	0.0024	0.0010	0.0024	0.0017	0.0068
	OECD mod.	-0.0037	0.0000	0.0007	0.0003	0.0002	0.0012	0.0032	0.0019	0.0037
	SQR	-0.0051	-0.0002	0.0004	0.0003	-0.0006	0.0010	0.0035	0.0019	0.0011
NW	OECD	-0.0028	0.0002	0.0006	0.0003	-0.0009	0.0006	0.0014	0.0013	0.0006
	OECD mod.	-0.0075	0.0004	0.0010	0.0004	-0.0050	-0.0002	0.0009	0.0012	-0.0090
	SQR	-0.0090	0.0003	0.0009	0.0004	-0.0062	-0.0006	0.0008	0.0012	-0.0120
PL	OECD	-0.0010	0.0001	0.0002	0.0003	0.0004	0.0014	0.0016	0.0021	0.0049
	OECD mod.	-0.0031	0.0000	0.0002	0.0003	-0.0011	0.0011	0.0020	0.0027	0.0022
	SQR	-0.0049	-0.0002	0.0002	0.0004	-0.0020	0.0004	0.0018	0.0039	-0.0004
RL	OECD	-0.0027	0.0000	0.0004	0.0001	-0.0012	0.0003	0.0015	0.0003	-0.0012
	OECD mod.	-0.0075	-0.0003	0.0006	0.0002	-0.0032	-0.0009	0.0011	0.0008	-0.0091
	SQR	-0.0090	-0.0004	0.0005	0.0002	-0.0038	-0.0013	0.0011	0.0011	-0.0117
SI	OECD	-0.0014	0.0000	0.0002	---	-0.0006	0.0005	0.0012	0.0010	0.0009
	OECD mod.	-0.0054	0.0000	0.0002	---	-0.0027	-0.0006	0.0003	0.0012	-0.0070
	SQR	-0.0070	-0.0001	0.0002	---	-0.0036	-0.0011	-0.0002	0.0011	-0.0107
ES	OECD	-0.0006	0.0000	0.0001	0.0000	0.0004	0.0007	0.0011	0.0005	0.0024
	OECD mod.	-0.0033	0.0000	0.0002	0.0000	-0.0021	-0.0001	0.0003	0.0002	-0.0046
	SQR	-0.0048	-0.0001	0.0001	0.0001	-0.0030	-0.0005	0.0001	0.0001	-0.0080
SW	OECD	-0.0028	0.0002	0.0007	0.0005	-0.0005	0.0006	0.0017	0.0014	0.0019
	OECD mod.	-0.0071	0.0005	0.0011	0.0006	-0.0047	0.0000	0.0016	0.0017	-0.0063
	SQR	-0.0085	0.0004	0.0011	0.0007	-0.0056	-0.0001	0.0017	0.0018	-0.0084
CH	OECD	-0.0005	0.0000	0.0002	0.0002	0.0042	0.0009	0.0029	0.0022	0.0101
	OECD mod.	-0.0025	0.0000	0.0003	0.0002	0.0029	0.0013	0.0035	0.0026	0.0082
	SQR	-0.0039	-0.0001	0.0002	0.0002	0.0023	0.0014	0.0038	0.0027	0.0066
UK	OECD	-0.0014	0.0002	0.0012	0.0011	0.0015	0.0010	0.0022	0.0019	0.0078
	OECD mod.	-0.0048	0.0003	0.0016	0.0015	-0.0013	0.0008	0.0024	0.0028	0.0033
	SQR	-0.0067	-0.0003	0.0012	0.0013	-0.0029	0.0005	0.0022	0.0025	-0.0021

Note. Definition: $\Delta b_i = \frac{1}{2}\left[\sum_{j=1}^{n}\left|\frac{\mu_j - \mu_i}{\mu_i}\right|\pi_i^h p_j^h - \sum_{j=1}^{n}\left|\frac{\mu_j - \mu_i}{\mu_i}\right|\pi_i^{ES} p_j^{ES}\right]$