An empirical analysis about the impact of income components on inequality in European countries

Michele Zenga
Dipartimento di Statistica e Metodi Quantitativi
Università degli Studi di Milano-Bicocca

and

Leo Pasquazzi
Dipartimento di Statistica e Metodi Quantitativi
Università degli Studi di Milano-Bicocca

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Abstract

In this work we use data relating to the year 2012 of the European Union Statistics on Income and Living Conditions (EU-SILC) to analyze and compare the impact from income components, taxes and social contributions on inequality among households in four major euro area countries: France, Germany, Italy and Spain. To this aim we first aggregate, for each household, gross income components into four main components which reflect roughly speaking: (i) employee income, (ii) income from self-employment, (iii) social transfers and (iv) residual income components. Next, we evaluate the contribution from each income component to inequality in the distribution of gross household income as measured by Zenga’s point and synthetic inequality indexes. At this step we apply a very simple decomposition rule which gives rise to readily interpretable results. Finally, to assess the impact from taxes and social contributions, we subtract the latter from gross household income and evaluate the inequality indexes on the distribution of net disposable household income as well.

Keywords: Zenga inequality index, income components, EU-SILC

JEL codes: D30, D31, D33

1 Introduction

In this paper we analyze income data from the cross-sectional component of the EU-SILC relating to the year 2012\(^1\). Our scope is to assess the impact from income components, taxes and social contributions on inequality in the distribution of household income in some European countries. Our results are based on a decomposition rule for Zenga’s (2007) inequality index (see Zenga et al., 2012; and

\(^{1}\)EUSILC UDB 2012 - version 2 of August 2014
Zenga, 2013) whose main idea goes as follows: Let

\[ y_1 \leq y_2 \leq \cdots \leq y_N \]

denote total income \( Y \) of \( N \) households and let

\[ w_1, w_2, \ldots, w_N \]

be positive weights associated to the latter. Given that several households might have the same total income \( Y \), suppose that there are \( r \) different values for \( y_i \) and denote by \( N_1, N_2, \ldots, N_r \) the cumulative frequencies associated to them. To measure inequality in the distribution of total income \( Y \) we shall employ Zenga’s point and synthetic inequality indexes (Zenga, 2007). Their definitions are based on the notions of ”upper” and ”lower” group means, which are given by

\[
\hat{M}_h(Y) := \begin{cases} 
\frac{\sum_{i=N_h+1}^{N} y_i w_i}{\sum_{i=N_h+1}^{N} w_i}, & \text{for } h = 1, 2, \ldots r - 1 \\
y_N & \text{for } h = r
\end{cases}
\]

and

\[
\bar{M}_h(Y) := \frac{\sum_{i=1}^{N_h} y_i w_i}{\sum_{i=1}^{N_h} w_i}, \quad h = 1, 2, \ldots, r,
\]

respectively. Given \( \hat{M}_h(Y) \) and \( \bar{M}_h(Y) \), one can measure inequality between the \( h \)th ”upper” and ”lower” group by

\[
I_h(Y) := \frac{\hat{M}_h(Y) - \bar{M}_h(Y)}{\hat{M}_h(Y)},
\]

and taking the average over these point inequality indexes yields Zenga’s synthetic inequality index

\[
I(Y) := \sum_{h=1}^{r} I_h \times W_h,
\]

where \( W_h := \sum_{i=N_{h-1}+1}^{N_h} w_i / \sum_{i=1}^{N} w_i \) with \( N_0 = 0 \).

Now, assume that

\[
y_i = x_{i,1} + x_{i,2} + \cdots x_{i,c}, \quad i = 1, 2, \ldots, N,
\]
i.e. that total income $Y$ in each household is given by the sum of $c > 1$ income components. The contribution from the $j$th income component $X_j$ to $\tilde{M}_h(Y)$ is then given by

$$\tilde{M}_h(X_j) := \frac{\sum_{i=1}^{N_h} x_{i,j} w_i}{\sum_{i=1}^{N_h} w_i}, \quad h = 1, \ldots, r,$$

and the contribution to $\tilde{M}_h(Y)$ can be defined in similar way. Given that

$$\tilde{M}_h(Y) = \sum_{j=1}^{c} \tilde{M}_h(X_j)$$

and

$$\tilde{M}_h(Y) = \sum_{j=1}^{c} \tilde{M}_h(X_j),$$

it is straightforward to see that

$$I_h(Y) = \sum_{j=1}^{c} \frac{\tilde{M}_h(X_j) - M_h(X_j)}{\tilde{M}_h(Y)}$$

and thus that the contribution from $X_j$ to the point inequality index $I_h(Y)$ is simply given by

$$B_h(X_j) := \frac{\tilde{M}_h(X_j) - M_h(X_j)}{\tilde{M}_h(Y)}.$$

Based on this simple decomposition rule for the point inequality indexes $I_h(Y)$, one can evaluate the contribution from the $j$th income component to the synthetic inequality index $I(Y)$ by

$$B(X_j) := \sum_{h=1}^{r} B_h(X_j) \times W_h.$$

Besides their simplicity, the above decomposition rules for the point and synthetic inequality indexes give rise to readily interpretable results. In fact, the relative contribution

$$\beta_h(X_j) := \frac{B_h(X_j)}{I_h(Y)} = \frac{\tilde{M}_h(X_j) - M_h(X_j)}{\tilde{M}_h(Y) - M_h(Y)}$$

can be viewed as the contribution from income component $X_j$ to the difference between the $h$th “upper” and “lower” groups’ mean income, while

$$\beta(X_j) := \frac{B(X_j)}{I} = \frac{\sum_{h=1}^{r} \beta_h(X_j) \times (I_h(Y) \times W_h)}{\sum_{h=1}^{r} (I_h(Y) \times W_h)}.$$
can be interpreted as a weighted average of the relative contributions $\beta_h(X_j)$.

It has been observed in Zenga (2012), that the relative contributions $\beta_h(X_j)$ and $\beta(X_j)$ should be compared with the shares

$$\gamma(X_j) := \frac{\sum_{i=1}^{N} x_{i,j} \times w_i}{\sum_{i=1}^{N} y_i \times w_i}$$

of the income components on total population income in order to discern whether a given income component $X_j$ has an exacerbating or mitigating impact on inequality in the distribution of total income $Y$. In fact, if

$$x_{i,j} = y_i \times \gamma(X_j), \quad \text{for all } i = 1, 2, \ldots, N,$$

then it is not difficult to see that

$$\gamma(X_j) = \beta_1(X_j) = \beta_2(X_j) = \cdots = \beta_r(X_j) = \beta(X_j),$$

while if

$$x_{i,j} \leq y_i \times \gamma(X_j), \quad \text{for } i \leq i^* < N \quad (1)$$

and

$$x_{i,j} > y_i \times \gamma(X_j), \quad \text{for } i > i^*, \quad (2)$$

then it follows that

$$\gamma(X_j) < \beta_h(X_j) \quad \text{for all } h = 1, 2, \ldots, r \quad (3)$$

and thus

$$\gamma(X_j) < \beta(X_j). \quad (4)$$

These implications suggest that income component $X_j$ exacerbates inequality in the distribution of total income $Y$ if its relative contributions $\beta_h(X_j)$ and $\beta(X_j)$ exceed $\gamma(X_j)$ and that it mitigates inequality otherwise (note that the inequalities involving $\gamma(X_j)$ in (1) to (4) may be reversed).
In the following sections we shall apply the above decomposition rule to cross-sectional EU-SILC data from the year 2012. We first compute the contributions from gross income components to inequality in the distribution of gross household income and then evaluate the impact of taxes and social contributions by comparing inequality in the distribution of gross and net disposable household income.

2 Income data from the EU-SILC dataset

As can be read in the accompanying documentation\textsuperscript{2}, the "EU-SILC is the EU reference source for comparative statistics on income distribution and social exclusion at European level, . . ." and it provides both cross-sectional and longitudinal data. Its reference population includes all private households and their current members residing in the territory of the member state at the time of data collection. For details on the latter aspect of the EU-SILC we refer to the accompanying documentation and to the references therein.

In the present work we shall be merely interested in the income variables included in the "EUSILC UDB 2012 - version of 2 of August 2014", which have been collected at either personal or household level. The numbers of interviewed persons (only persons aged 16 and over are eligible sample members) and households for each country included in our analysis are reported in Table 1.

At the outset we shall consider total household gross income (variable HY010), henceforth indicated by $Y_{\text{gross}}$. Based on the data included in the EU-SILC we know for each household how $Y_{\text{gross}}$ is composed in terms of

$X_1$ employee income: which is defined as the sum over all household members

of gross employee cash or near cash income (variable PY010G) and company

\textsuperscript{2}EU-SILC 065 (operation 2012)
Table 1: Sample sizes by country

<table>
<thead>
<tr>
<th>Country</th>
<th># personal interviews</th>
<th># household interviews</th>
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<tr>
<td>Italy</td>
<td>40,287</td>
<td>19,579</td>
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<td>Germany</td>
<td>23,587</td>
<td>13,145</td>
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<tr>
<td>France</td>
<td>22,742</td>
<td>11,999</td>
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<tr>
<td>Spain</td>
<td>28,210</td>
<td>12,714</td>
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$X_2$ **self-employment income**: which is defined as the sum over all household members of *gross cash benefits or losses from self employment including royalties* (variable PY021G)

$X_3$ **social benefits**: which includes the sum over all household members of *unemployment benefits* (variable PY090G), *old-age benefits* (variable PY100G), *survivors’ benefits* (variable PY110G), *sickness benefits* (variable PY120G), *disability benefits* (variable PY130G) and *education-related allowances* (variable PY140G). Moreover this income component includes the sum of the following gross components collected at household level: *family/children related allowances* (variable HY050G), *social exclusion not elsewhere classified* (variable HY060G) and *housing allowances* (variable HY070G)

$X_4$ **residual income components**: which includes the sum over all household members of *pensions received from individual private plans other than those covered under ESSPROS* (variable PY080G) and the sum of the following gross components collected at household level: *income from rental of a property or land* (variable HY040G), *regular inter-household cash transfers received* (variable HY080G), *interests, dividends, profit from capital investments in un-
incorporated business (variable HY090G) and income received by people aged under 16 (variable HY110G)

Knowing that

\[ Y_{\text{gross}} = X_1 + X_2 + X_3 + X_4, \]

we shall evaluate, by means of the decomposition rule outlined in Section 1, the contributions to inequality in the distribution of \( Y_{\text{gross}} \) from the gross income components \( X_1, X_2, X_3 \) and \( X_4 \).

Next, given that most researchers are actually interested in total disposable household income (variable HY020), henceforth \( Y_{\text{net}} \), we shall also include the following typically negative income components in our analysis: regular taxes on wealth (variable HY120G), tax on income and social contributions (variable HY140G) and regular inter-household cash transfers paid (variable HY130). Subtracting the latter income components from \( Y_{\text{gross}} \) yields, according to the definition given in the EU-SILC, total disposable household income \( Y_{\text{net}} \) (variable HY020) and comparing Zenga’s inequality indexes on \( Y_{\text{gross}} \) and \( Y_{\text{net}} \) provides useful insight into how taxes and social contributions affect inequality (in the analyzed datasets the share of regular inter-household cash transfers paid is negligible).

It is worth noting that, as an alternative approach, the typically negative income components could well be aggregated into an additional fifth income component \( X_5 \). Adding \( X_5 \) to the first four gross components yields \( Y_{\text{net}} \) and the decomposition rule outlined in Section 1 could well be applied directly to \( Y_{\text{net}} \). Even though this alternative approach does account for the joint distribution of \( Y_{\text{gross}} \) and \( Y_{\text{net}} \), while the approach of this paper does not, we think that the alternative approach would give rise to results whose interpretation is less immediate because it is unusual to view taxes and social contributions as a (negative) component of net disposable income. To further support the choice made in this paper we observe that the fact
that $Y_{\text{gross}}$ and $Y_{\text{net}}$ are usually almost perfectly cograduated determines a quite narrow range for the possible joint distributions.

3 Results

Table 2 is a summary of the main results of our computations. All results we are going to comment below have been obtained by substituting the household cross-sectional weight (variable DB090) in place of $w_i$ in the formulae of Section 1. For ease of comparison among countries, in $\beta_h(\cdot)$ and $I_h(\cdot)$ we substituted the subscript $h$, which depends on the number of different values observed for the income variables $Y_{\text{gross}}$ and $Y_{\text{net}}$, by values $p$ ranging from 0 to 1. The value of $h$ corresponding to the indicated value of the subscript $p$ is given by

$$h = \max \left\{ h' : \sum_{h''=1}^{h'} W_{h''} \leq p \right\}.$$

According to the results reported in Table 2 and their elaborations in Table 3, the country with largest mean income $M(\cdot)$ (gross and net disposable) is France, where $M(Y_{\text{gross}}) = 46,798$ Euro and $M(Y_{\text{net}}) = 37,859$ Euro. It follow Germany with $M(Y_{\text{gross}}) = 43,066$ Euro and $M(Y_{\text{net}}) = 31,644$ Euro, Italy with $M(Y_{\text{gross}}) = 39,902$ Euro and $M(Y_{\text{net}}) = 29,956$ Euro and finally Spain with $M(Y_{\text{gross}}) = 27,827$ Euro and $M(Y_{\text{net}}) = 23,972$ Euro. In percentage terms, the largest gap between gross and net disposable household income is observed in Germany, where $(M(Y_{\text{gross}}) - M(Y_{\text{net}}))/M(Y_{\text{gross}}) = 26.5\%$, then in Italy (24.9%), France (19.1%) and finally in Spain (13.9%).

As for inequality, according to Zenga’s synthetic inequality index $I(\cdot)$ it is smallest in France for both gross and net disposable household income. In fact, $I(Y_{\text{gross}}) = 0.723$ for France, which means that the lower mean $\tilde{M}_h(Y_{\text{gross}})$ is on average 72.3% smaller than the corresponding upper mean $\tilde{M}_h(Y_{\text{gross}})$. Going over to
net disposable household income, Zenga’s synthetic index reduces to \( I(Y_{\text{net}}) = 0.699 \), which amounts to a decrease of \( I(Y_{\text{gross}}) - I(Y_{\text{net}}) = 0.024 \). In Germany, the country with second largest inequality following France, we observe the largest reduction in inequality in passing from \( Y_{\text{gross}} \) to \( Y_{\text{net}} \): \( I(Y_{\text{gross}}) = 0.744 \) and \( I(Y_{\text{net}}) = 0.708 \) so that \( I(Y_{\text{gross}}) - I(Y_{\text{net}}) = 0.036 \). Also Italy, the third country following France in terms of inequality, exhibits clearly a larger reduction of the synthetic Zenga index than France: \( I(Y_{\text{gross}}) = 0.755 \) and \( I(Y_{\text{net}}) = 0.721 \) so that \( I(Y_{\text{gross}}) - I(Y_{\text{net}}) = 0.034 \). In Spain, the country where income is most unequally distributed among the considered ones, \( I(Y_{\text{gross}}) = 0.756 \), \( I(Y_{\text{net}}) = 0.745 \) and the reduction in inequality in going from \( Y_{\text{gross}} \) to \( Y_{\text{net}} \) is smallest: \( I(Y_{\text{gross}}) - I(Y_{\text{net}}) = 0.011 \).

To provide a better insight into the distribution of \( Y_{\text{gross}} \) and \( Y_{\text{net}} \), we divided the household sample from each country into 20 classes according to \( Y_{\text{gross}} \) in such a way that the sum of the weights \( w_i \) in each class is approximately equal to 5\% of their sum over the whole sample. Then we computed the class means for \( Y_{\text{gross}} \) and \( Y_{\text{net}} \) and plotted them against each other. Figures 1 to 4 show the outcome along with the inequality curves \( I_p(Y_{\text{gross}}) \) and \( I_p(Y_{\text{net}}) \) as functions of \( p \in (0,1) \) (note that the scales on the ordinate axes are different; the lower panels show the inequality curves on a larger scale for \( p \in (0,0.1) \) and \( p \in (0.9,1) \), respectively). As expected, the class means for \( Y_{\text{net}} \) tend to be concave functions of the corresponding class means for \( Y_{\text{gross}} \) and, accordingly, \( I_p(Y_{\text{net}}) \) is usually smaller than \( I_p(Y_{\text{gross}}) \), but in France, Germany and Italy \( I_p(Y_{\text{net}}) \) exceeds \( I_p(Y_{\text{gross}}) \) for very small values of \( p \). Exact values of \( I_p(Y_{\text{gross}}) \) and \( I_p(Y_{\text{net}}) \) for some selected values of \( p \in (0,1) \) are reported in Table 2 for each country.

Consider next the four gross income components and their impact on inequality in the distribution of \( Y_{\text{gross}} \). Going through the shares \( \gamma(\cdot) \), it is immediately apparent that employee income \( X_1 \) accounts for most of population income in all countries.
In fact, it accounts for $\gamma(X_1) = 47.5\%$ of population income in Italy, the country where $\gamma(X_1)$ is smallest, and for $\gamma(X_1) = 64.5\%$ of population income in Germany, where $\gamma(X_1)$ is largest. The relative contributions $\beta_p(X_1)$ do clearly exceed $\gamma(X_1)$ over most of the range of $p$ and they exhibit an inverse U-shaped trend as functions of $p \in (0, 1)$. In Germany $\beta_{0.50}(X_1) = 90.5\%$ at its maximum value, which means that employee income $X_1$ accounts for $90.5\%$ of the difference between $\bar{M}_{0.5}(Y_{\text{gross}})$ and $\bar{M}_{0.5}(Y_{\text{gross}})$ (also here we used $p$ in place of $h$ in the subscripts of the "upper" and "lower" group means). Given that also $\beta(X_1)$ is clearly larger than $\gamma(X_1)$ in the four considered countries, we conclude that employee income $X_1$ has an exacerbating impact on inequality.

The second largest income component in terms of its share on population income is given by the social benefits $X_3$ component. The share of this income component ranges from $\gamma(X_3) = 25.5\%$ in Germany to $\gamma(X_3) = 29.0\%$ in Italy. However, as opposed to what is observed for gross employee income $X_1$, the relative contributions $\beta_p(X_3)$ are smaller than $\gamma(X_3)$ and their trend as functions of $p \in (0, 1)$ is decreasing. Accordingly, also $\beta(X_3)$ is clearly smaller than $\gamma(X_3)$, confirming the inequality offsetting impact of social benefits $X_3$.

As for the third largest income component in terms of $\gamma(\cdot)$, it is given by self-employment income $X_2$ in all countries except for France, where the share of the residual income components $X_4$ is nearly twice as large. The share of self-employment income $X_2$ ranges from $\gamma(X_2) = 5.5\%$ in Germany to $\gamma(X_2) = 18.8\%$ in Italy and in all considered countries self-employment income $X_2$ exhibits a clear inequality fostering effect, since $\beta_p(X_2)$ does widely exceed $\gamma(X_2)$ over the whole range of $p$.

The residual income components $X_4$ in aggregated form account for less than 5\% of population income in all considered countries but France, where $\gamma(X_4) = 12\%$. 

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The relative contribution \( \beta_p(X_4) \) is, except for Germany, larger than \( \gamma(X_4) \) over most of the range of \( p \), but just in France the difference is quite marked. This fact leads to conclude that the residual income components \( X_4 \) do have a positive impact on inequality in France, while in the remaining three countries the impact on inequality from \( X_4 \) is about neutral.

**Literature review**

Since it was first proposed in Zenga (2007), several research papers have been published about Zenga’s point and synthetic inequality indexes \( I_p(\cdot) \) and \( I(\cdot) \). First applications to income data can be found in Zenga (2007b), Zenga (2008) and Greselin et al. (2013), while Polisicchio (2008), Polisicchio and Porro (2008), Porro (2008) and Porro (2011) analyze properties of the curve defined by the point inequality indexes \( I_p(\cdot) \) as function of \( p \in (0,1) \) and its relation with the Lorenz (1905) curve. Inferential problems related to the synthetic \( I(\cdot) \) index have been analyzed by Greselin and Pasquazzi (2009), Greselin et al. (2010), Langel and Tillé (2012), Antal et al. (2011) and Greselin et al. (2014) and, as for decomposition rules, Radaelli (2008a) proposes a subgroups decomposition for the point and synthetic inequality indexes that has been applied to real income data in Radaelli (2007), Radaelli (2008b) and Greselin et al. (2009). A comparison of the properties of the latter with a subgroups decomposition rule for Gini’s index can be found in Radaelli (2010). The income components decomposition rule we have applied in the present work has been originally proposed in Zenga et al. (2012) and has been extended to the Gini (1914) and Bonferroni (1930) indexes in Zenga (2013).
References


Table 2: Contributions to inequality from income components

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<td>M(·)</td>
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<td>I₀₀.₀₅(·)</td>
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<td>I₀₀.₁₀(·)</td>
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<tr>
<td>Yᵍ gross</td>
<td>46,798</td>
<td>0.819</td>
<td>0.780</td>
<td>0.720</td>
<td>0.679</td>
<td>0.681</td>
<td>0.734</td>
<td>0.782</td>
<td>0.723</td>
<td>43,066</td>
<td>0.857</td>
<td>0.828</td>
<td>0.769</td>
<td>0.709</td>
</tr>
<tr>
<td>Yʰ net</td>
<td>37,859</td>
<td>0.806</td>
<td>0.759</td>
<td>0.700</td>
<td>0.659</td>
<td>0.648</td>
<td>0.665</td>
<td>0.681</td>
<td>0.699</td>
<td>31,644</td>
<td>0.847</td>
<td>0.798</td>
<td>0.729</td>
<td>0.666</td>
</tr>
</tbody>
</table>
### Italy

<table>
<thead>
<tr>
<th></th>
<th>(\gamma(\cdot))</th>
<th>(\beta_{0.05}(\cdot))</th>
<th>(\beta_{0.10}(\cdot))</th>
<th>(\beta_{0.25}(\cdot))</th>
<th>(\beta_{0.50}(\cdot))</th>
<th>(\beta_{0.75}(\cdot))</th>
<th>(\beta_{0.90}(\cdot))</th>
<th>(\beta_{0.95}(\cdot))</th>
<th>(\beta(\cdot))</th>
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</thead>
<tbody>
<tr>
<td>(X_1)</td>
<td>0.475</td>
<td>0.504</td>
<td>0.531</td>
<td>0.580</td>
<td>0.590</td>
<td>0.528</td>
<td>0.442</td>
<td>0.377</td>
<td>0.531</td>
</tr>
<tr>
<td>(X_2)</td>
<td>0.188</td>
<td>0.197</td>
<td>0.209</td>
<td>0.228</td>
<td>0.257</td>
<td>0.309</td>
<td>0.370</td>
<td>0.427</td>
<td>0.275</td>
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<tr>
<td>(X_3)</td>
<td>0.290</td>
<td>0.256</td>
<td>0.212</td>
<td>0.142</td>
<td>0.099</td>
<td>0.112</td>
<td>0.115</td>
<td>0.136</td>
<td></td>
</tr>
<tr>
<td>(X_4)</td>
<td>0.047</td>
<td>0.043</td>
<td>0.047</td>
<td>0.050</td>
<td>0.055</td>
<td>0.063</td>
<td>0.077</td>
<td>0.081</td>
<td>0.058</td>
</tr>
</tbody>
</table>

\[M(\cdot)\] \(I_{0.05}(\cdot)\) \(I_{0.10}(\cdot)\) \(I_{0.25}(\cdot)\) \(I_{0.50}(\cdot)\) \(I_{0.75}(\cdot)\) \(I_{0.90}(\cdot)\) \(I_{0.95}(\cdot)\) \(I(\cdot)\)

\(Y_{\text{gross}}\) 39,902 0.905 0.851 0.770 0.710 0.696 0.729 0.766 0.755

\(Y_{\text{net}}\) 29,956 0.895 0.819 0.725 0.665 0.661 0.724 0.807 0.721

### Spain

<table>
<thead>
<tr>
<th></th>
<th>(\gamma(\cdot))</th>
<th>(\beta_{0.05}(\cdot))</th>
<th>(\beta_{0.10}(\cdot))</th>
<th>(\beta_{0.25}(\cdot))</th>
<th>(\beta_{0.50}(\cdot))</th>
<th>(\beta_{0.75}(\cdot))</th>
<th>(\beta_{0.90}(\cdot))</th>
<th>(\beta_{0.95}(\cdot))</th>
<th>(\beta(\cdot))</th>
</tr>
</thead>
<tbody>
<tr>
<td>(X_1)</td>
<td>0.618</td>
<td>0.615</td>
<td>0.675</td>
<td>0.774</td>
<td>0.800</td>
<td>0.796</td>
<td>0.707</td>
<td>0.601</td>
<td>0.743</td>
</tr>
<tr>
<td>(X_2)</td>
<td>0.082</td>
<td>0.112</td>
<td>0.112</td>
<td>0.106</td>
<td>0.112</td>
<td>0.146</td>
<td>0.218</td>
<td>0.320</td>
<td>0.142</td>
</tr>
<tr>
<td>(X_3)</td>
<td>0.272</td>
<td>0.251</td>
<td>0.188</td>
<td>0.092</td>
<td>0.056</td>
<td>0.021</td>
<td>0.027</td>
<td>0.023</td>
<td>0.081</td>
</tr>
<tr>
<td>(X_4)</td>
<td>0.028</td>
<td>0.022</td>
<td>0.025</td>
<td>0.027</td>
<td>0.032</td>
<td>0.037</td>
<td>0.048</td>
<td>0.057</td>
<td>0.034</td>
</tr>
</tbody>
</table>

\[M(\cdot)\] \(I_{0.05}(\cdot)\) \(I_{0.10}(\cdot)\) \(I_{0.25}(\cdot)\) \(I_{0.50}(\cdot)\) \(I_{0.75}(\cdot)\) \(I_{0.90}(\cdot)\) \(I_{0.95}(\cdot)\) \(I(\cdot)\)

\(Y_{\text{gross}}\) 27,827 0.962 0.876 0.776 0.708 0.686 0.708 0.733 0.756

\(Y_{\text{net}}\) 23,972 1.004 0.908 0.773 0.693 0.667 0.694 0.722 0.745

\(X_1\) employee income, \(X_2\) self-employment income, \(X_3\) social transfers, \(X_4\) residual income components, \(Y_{\text{gross}}\) total household gross income, \(Y_{\text{net}}\) total disposable household income, \(M(\cdot)\) mean of variable between parenthesis (expressed in Euro)
Table 3: Comparisons between the distributions of $Y_{\text{gross}}$ and $Y_{\text{net}}$

<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>Germany</th>
<th>Italy</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>$M(Y_{\text{gross}})$</td>
<td>46,798</td>
<td>43,066</td>
<td>39,902</td>
<td>27,827</td>
</tr>
<tr>
<td>$M(Y_{\text{net}})$</td>
<td>37,859</td>
<td>31,644</td>
<td>29,956</td>
<td>23,972</td>
</tr>
<tr>
<td>$\frac{M(Y_{\text{gross}}) - M(Y_{\text{net}})}{M(Y_{\text{gross}})}$</td>
<td>0.191</td>
<td>0.265</td>
<td>0.249</td>
<td>0.139</td>
</tr>
<tr>
<td>$I(Y_{\text{gross}})$</td>
<td>0.723</td>
<td>0.744</td>
<td>0.755</td>
<td>0.756</td>
</tr>
<tr>
<td>$I(Y_{\text{net}})$</td>
<td>0.699</td>
<td>0.708</td>
<td>0.721</td>
<td>0.745</td>
</tr>
<tr>
<td>$I(Y_{\text{gross}}) - I(Y_{\text{net}})$</td>
<td>0.024</td>
<td>0.036</td>
<td>0.034</td>
<td>0.011</td>
</tr>
</tbody>
</table>
Figure 1: Zenga’s inequality curves for France
Figure 2: Zenga’s inequality curves for Germany
Figure 3: Zenga’s inequality curves for Italy
Figure 4: Zenga’s inequality curves for Spain