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Measuring Income Inequality and Poverty at the Regional Level in OECD Countries

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MEASURING INCOME INEQUALITY AND POVERTY AT THE REGIONAL LEVEL IN OECD COUNTRIES

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MEASURING INCOME INEQUALITY AND POVERTY AT THE REGIONAL LEVEL IN OECD COUNTRIES

ABSTRACT

The extent to which income inequality and poverty vary within countries across different regions is very relevant for policy decisions and monitoring. However, sub-national measures are scarce, given the complexity of producing indicators at the regional level from the available data and the methodological issues related to cross-countries comparability. This paper presents a set of indicators of income inequality and poverty across and within regions for 28 OECD countries. These indicators were produced through a new household-level data collection based on internationally harmonized income definitions undertaken as part of the OECD project on "Measuring regional and local well-being for policymaking". The data were collected at the OECD TL2 territorial level, corresponding to NUTS2 regions in Europe and to large administrative subdivisions (e.g. States in Mexico and Unites States) for non-European countries.

These estimates confirm that there are significant variations in levels of income inequality within countries, and that regional breakdowns are useful for understanding sources and patterns of income disparities and poverty. For most of the countries relying on survey data for measuring income distribution, standard cross-sectional indicators of income inequality and relative poverty at this regional level are estimated with low precision in the smallest regions due to small samples. This has two main implications for data producers and analysts. First, systematic reporting of confidence intervals is needed to make meaningful comparisons of inequality levels across regions and with respect to the national averages. Second, averaged measures for multiple years or small area estimation methods should be considered as means for obtaining more robust measures. The issues related to the estimation of standard errors for three-year averages in rotational panel surveys and to the definition of the computational sampling structure for sub-national estimates are discussed in the paper.

RÉSUMÉ

Il est très utile, pour les décisions des pouvoirs publics et leur suivi, de mesurer les variations entre les régions d'un même pays en termes d'inégalités de revenu et de pauvreté. Or les mesures infranationales dans ce domaine sont rares, compte tenu des difficultés liées à l'élaboration d'indicateurs régionaux à partir des données disponibles et des problèmes méthodologiques inhérents à la comparabilité entre pays. Ce rapport présente une série d'indicateurs régionaux des inégalités de revenu et de la pauvreté couvrant 28 pays de l'OCDE. Ces indicateurs sont issus d'une nouvelle collecte de données réalisée auprès des ménages, fondée sur des définitions du revenu harmonisées à l'échelle internationale dans le cadre du projet de l'OCDE sur la mesure du bien-être au niveau régional et local aux fins de l'élaboration des politiques publiques. Les données ont été recueillies au niveau territorial 2 de l'OCDE, qui correspond aux régions du niveau 2 de la NUTS en Europe et aux grandes subdivisions administratives (comme les États au Mexique ou aux États-Unis) dans les pays non européens.

Ces estimations confirment l'existence de fortes variations du niveau des inégalités de revenu dans les pays, et elles montrent que les ventilations régionales sont utiles pour comprendre les causes et l'évolution des disparités de revenu et de la pauvreté. Pour la plupart des pays qui s'appuient sur des données d'enquêtes pour mesurer la distribution des revenus, les indicateurs transversaux standards des inégalités de revenu et de la pauvreté relative au niveau régional sont peu précis en ce qui concerne les régions les plus petites, en raison de la taille restreinte des échantillons. Ce phénomène a deux implications majeures pour les producteurs de données et les analystes : tout d'abord, une notification systématique des intervalles de confiance est nécessaire pour procéder à des comparaisons utiles des inégalités entre les

régions et par rapport aux moyennes nationales. Ensuite, il convient d'envisager la possibilité d'utiliser des mesures moyennes sur plusieurs années ou des méthodes d'estimation spécifiques aux petits zones afin d'aboutir à des mesures plus précises. Le rapport examine également les problèmes liés à l'estimation des erreurs types pour les moyennes sur trois ans dans les enquêtes par panel avec échantillonnage par rotation, ainsi qu'à la définition de la structure d'échantillonnage pour les estimations infranationales.

Les correspondants nationaux de la Base de données de l'OCDE sur la distribution des revenus et les délégués du Groupe de travail sur les indicateurs territoriaux sont invités à commenter les conclusions de ce rapport et à faire part de leur avis sur la possibilité d'améliorer et de reproduire les statistiques régionales sur le revenu des ménages à l'avenir.

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This paper presents estimates obtained from the network of providers of OECD Income Distribution Database (http://oe.cd/idd), a programme jointly managed by the OECD Directorate for Employment, Labour and Social Affairs and the OECD Statistics Directorate. The regional data, or the information needed to produce regional estimates based on public-use microdata, were kindly provided by: Heather Burgess and David Zago (Australian Bureau of Statistics); Nadja Lamei, Richard Heuberger, Martin Bauer and Thomas Glaser (Statistics Austria); Brian Murphy and Paul Roberts (Statistics Canada); Ana María Peñafiel Castillo (Ministerio de Desarrollo Social of Chile); Jaromír Kalmus and Štěpán Tourek (Czech Statistical Office); Lars Pantmann (Statistics Denmark); Veli-Matti Törmälehto (Statistics Finland); Juliette Ponceau, Fabrice Lenglart and Cédric Houdré (Insee, France); Markus M. Grabka (DIW, Germany); Yafit Alfandari and Liron Sivan-Sherman (Central Bureau of Statistics, Israel); Alessandra Masi, Silvano Vitaletti, Nicoletta Pannuzi and Rosalba Bravi (ISTAT, Italy); Patricia Méndez Carniado (INEGI, Mexico); Wim Bos (Central Bureau of Statistics, Netherlands); Jon Epland (Statistics Norway); Walter Moes and Caroline Brooking (Statistics New Zealand); Yoshihiro Kaneko, Katsuhisa Kojima, Satou Itaru (National Institute of Population and Social Security Research, Japan); Róbert Vlačuha (Statistical Office of the Slovak Republic); Stanka Intihar (Statistical Office of the Republic of Slovenia); Jose María Mendez and Pilar Vega Vicente (INE, Spain); Johanna Åström (SCB, Sweden); Dominique Aubert (BFS, Switzerland); Zühal Daşkiran, Güllü Çalık, and İlkay Kahveci (Turkish Statistical Institute); Haider Alzubaidi (Households Below Average Income, Department for Work and Pensions, United Kingdom); Edward J. Welniak and David S. Johnson (Census Bureau, United States). Errors in the interpretation of the data or in the calculations from micro-data are responsibility of the author.

The full dataset is publicly available at http://stats.oecd.org/Index.aspx?DataSetCode=RWB#

The estimates of income distribution at sub-national level were produced in the context of the OECD project "How's life in your region: Measuring regional and local well-being for policy making" carried out by the OECD Public Governance and Territorial Development under the guidance of the Working Party on Territorial Indicators (WPTI). WPTI Delegates are kindly acknowledged for their comments.

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TABLE OF CONTENTS

Tables

Figures

1. Introduction

1. Substantial research has compared levels of income inequality and poverty across OECD countries (OECD, 2011a). However, national averages may hide significant within-country differences in the distribution of incomes. These spatial differences matter for policy. For example, at given levels of national poverty, a country where poverty is highly concentrated in few depressed areas faces different challenges from a country where poverty is spread equally over space.

2. This paper presents a new collection of comparable data on sub-national differences in income inequality and poverty for OECD countries. The data provide information on mean and median household income levels (including or excluding taxes and public transfers), income distribution (Gini indexes and income quintiles) and relative income poverty (with poverty thresholds set in respect of either the national or regional populations) for one year around 2010 in 28 OECD countries. The data are collected at the OECD TL2 territorial level, corresponding to NUTS2 regions in Europe and to large administrative subdivisions (*e.g.* Mexican States) for non-European countries[1].

3. These new data can contribute to regional analysis in two ways. First, they complement international assessments of differences across regions in living conditions (OECD, 2013), by providing comparable measures of differences in household incomes and poverty levels *between regions*. Second, they can support the analysis of the levels and implications of income inequality in each region, by documenting how household income is distributed *within regions* and how many people are poor relatively to the typical citizen of their region. These data show that OECD countries differ considerably not only in terms of inter-regional disparities in average incomes, but also in terms of spatial concentration of income inequalities.

4. Sub-national data on income and other sources of inequalities are also essential for well-being analysis. Equality of opportunity requires that socio-economic prospects of each individual are not affected by factors beyond their control, such as their place of birth (Roemer, 1997). People-centred policies should thus reflect the interplay of locational and individual level determinants of well-being. Data on income inequality within regions might capture better than national data the effects of perceived distribution inequities on subjective well-being and on human capital investments. Individuals may in fact assign different importance to the income inequalities they experience in their local living context when assessing their own well-being and forming expectations about returns of education and skills. The extension of income data at sub-national level is part of the OECD work on advancing the measurement agenda of well-being to regions and cities (see http://www.oecd.org/regional/how-is-life-in-your-region.htm). Income-based measures of poverty at regional level are a first step towards more encompassing metrics of deprivation that include non-monetary measures.

5. The estimates of regional income distribution presented in this paper allow assessing the relative importance of differences “between” and “within” regions for national inequality. High disparities between regions can undermine national economic growth, leading to inequality of opportunities and creating social tensions that in turn may sustain regional imbalances over time (OECD, 2011b). Convergence and agglomeration processes changing income disparities across regions might also be accompanied by shifts in inequalities within regions, with important implications on social cohesion. Preliminary results presented in this paper, for a set of eight OECD countries, show that inequalities within regions are always more important than differences across regions. These results may depend, however, on the number (too few) and sizes (too large) of regions here considered, as other studies on income inequality seem to suggest (Hoshino, 2012; Milanovic, 2013).

6. The quality of the sub-national income indicators needs to be accurately assessed given their importance for policy monitoring. Regional policy makers often have responsibilities for social policy and

can benefit from accurate information on the shape of income distribution within their jurisdiction. At the national and supra-national level, the goal of pursuing an economic growth that distributes its benefits more equitably across society has become more prominent (EU2020 Strategy; OECD Inclusive Growth Initiative). Achieving inclusive growth objectives requires sharing its benefits across all regions (European Commission, 2011) which, in turn, requires a comprehensive set of indicators at regional level. Focusing on results through the use of comprehensive sets of well-being metrics is one of the innovations in the European Cohesion Policy.

7. The lack of comparative sub-national data on income distribution has typically reflected concerns on data quality, as household surveys are rarely designed to be representative at the regional level. However, the severity of these quality issues has been so far poorly documented. This paper presents confidence intervals for the key indicators derived from surveys, so that the precision of the estimates can be evaluated.

8. The contribution of this paper to producing sub-national estimates of income distribution comparable across countries is threefold.

- First, a set of indicators on income levels and income distribution, along with the confidence intervals, is produced relying on the same methodology for 28 OECD countries. The results from these data confirm the importance of inequalities in the income distribution across and within regions, especially in large countries (Mexico, United States, United Kingdom, Spain and Germany). In regions with high income inequalities, these appear to be mostly driven by disparities in the upper part of the income distribution, with the exception of Italy, Mexico, Norway, Spain, Sweden and United States.

- Second, relative income poverty rates in different regions are presented, comparing results based on different national thresholds; the paper also discusses how to extend poverty measures to take into account differences in living costs among regions.

- Third, the paper discusses possible solutions to reduce the sampling variance of sub-national estimates, focusing on the use of averaged measures for multiple years. We apply a methodology, developed at the University of Siena, for estimating the variance of key indicators based on rotational panels for Spain and Austria. The cumulation of data over three consecutive waves yields a median reduction of variance of around 25% for income distribution and relative poverty indicators. A more systematic application of the variance estimation for three-year averages is however seriously constrained by the lack of detailed information on the surveys' sampling structure.

9. The next section describes the data on income distribution collected by the OECD and their statistical precision. Section 3 provides an overview of the differences in income distribution and relative income poverty between and within regions based on the new data. Section 4 presents the methodology for producing estimates of the variance of three-year averaged indicators. Section 5 concludes discussing the statistical agenda to extend this work.

2. The OECD Income Distribution Database and its extension at the subnational level

10. Since the late 1990s, the OECD has produced indicators on income inequality and poverty based on a set of common definitions, classifications and data treatments. The indicators rely on the most suitable data source available in each country, with the selection of sources generally decided in consultation with national authorities. Data and indicators are collected through a network of national consultants who provide standard tabulations based on comparable definitions and methodological approaches. The data

collection is done via a data questionnaire based on terms of reference available on the OECD Income Distribution website.[2]

11. All the indicators collected by the OECD are based on the concept of "equivalised" household disposable income. In the OECD approach, household income is divided by the square root of household size, under the assumption that household needs increase with household size, but less than proportionally. The definition of household disposable income includes income from wages and salaries, self-employment incomes, realised property incomes, cash transfers from the general government less taxes and social security contributions paid by the households. This income definition excludes the value of social transfers in-kind, imputed rents and imputed income from goods produced for own consumption.

12. This paper presents the extension of this data collection at the sub-national level.[3] Sub-national breakdowns are produced for the indicators listed in Table 1. The main indicators for income inequality are the Gini index and the quintile share ratio (S80/S20, i.e. the ratio between the average income of the top and bottom quintile) of equivalized household disposable income. Relative poverty is measured through headcount ratios (i.e. the share of the population with income below the poverty line) based on different thresholds (e.g. 40, 50 and 60%) of median income of both the national population (national poverty lines) and the regional population (regional poverty lines). All the indicators are also computed for market income, i.e. household income before taxes and public transfers. The comparison of indicators based on market and on disposable income allows a first assessment of the redistributive role of taxes and transfers.

Table 1. Household income indicators collected at regional level

	Indicator
Income Levels	• Mean disposable and market income • Median disposable and market income • Mean disposable income by quintiles
Income Distribution	• Gini index for disposable and market income • Quintile share ratio (S80/S20) for disposable and market income: ratio between average income of the top quintile and average income of the bottom quintile
Relative poverty	• Regional headcount ratios for disposable and market income, with poverty line set at 40, 50 and 60% of the national median income • Regional headcount ratios for disposable and market income, with poverty line set at 40, 50 and 60% of the regional median income

13. The geographic breakdown used in the paper is defined according to the OECD TL2 regional classification, broadly corresponding to the first level of administrative subdivision in each country (NUTS2 regions in Europe, States in the Unites States and Mexico, Provinces and Territories in Canada, etc.). This regional breakdown is meaningful from a policy perspective, as these large regions have considerable responsibilities for policy implementation. The choice is also dictated by practical considerations on data availability: reliable estimates could hardly be produced at a lower level of disaggregation without small-area models, and income survey micro-data do not generally include identifiers for lower geographic levels.

14. Table 2 describes the sources of the data used to compute the indicators listed above, and provides information on the size of the regional samples. For most countries, estimates refer to one single year around 2010; however, estimates for Austria, Spain, United Kingdom and the United States refer to three-year averaged data, to increase the precision of the sub-national estimates. These regional indicators are based on household surveys for most countries, but on administrative sources for Denmark, the

Netherlands, Norway, Sweden, and on a combination of survey and register-based data for Finland and France. The administrative data, which refer to the full population, tend to give higher poverty rates and a more skewed distribution than in the case of survey data, which may result from missing income items in the registers or from differences in the household concepts used in the survey and register data.

Table 2. Data sources used for the sub-national indicators

Country	Data Source and year	Regional level and number of regional units	Households in regional samples (min. - max.)
Australia	2009-10 Survey of Income and Housing (SIH)	TL2, 8 regions	578 -3314
Austria	EU-SILC, 3 year averages for 2008-2009-2010	TL2, 8 regions	207 -1315
Belgium	EU-SILC, 2011 wave (2010 reference income)	TL2, 3 regions	837 -3087
Canada	Survey of Labour and Income Dynamics, 2011 reference	TL2, 10 regions	1766-18050
Chile	CASEN Survey, 2011 reference income	TL2, 15 regions	1588-5779
Czech Republic	EU-SILC, 2011 wave (2010 reference income)	TL2, 8 regions	871 -1441
Denmark	Danish Law Model System 2010	TL2, 5 regions	Register
Finland	EU-SILC, 2012 wave (2011 reference income)	TL2, 4 regions	2298-2755
France	ERFS, 2010 reference income	TL2, 21 regions	304 -8560
Germany	SOEP, 2011 wave (2010 reference income)	TL2, 16 regions	66-1789
Greece	EU-SILC, 2011 wave (2010 reference income)	TL2, 4 regions	706 -2288
Hungary	EU-SILC, 2011 wave (2010 reference income)	NUTS1, 3	2932-5446
Israel	Integrated Income Survey, 2011	TL2, 7 regions	2181-12213
Italy	UDB IT-SILC, 2012 wave (2011 reference income)	TL2, 21 regions	344 -2031
Japan	Comprehensive Survey of Living Conditions, 2009	TL2, 10 regions	729-3378
Mexico	Módulo de Condiciones Socioeconomicas, 2012	TL2, 32 regions	299 -2805
Netherlands	Income Panel Survey, 2010	TL2, 4 regions	9583-44587
New Zealand	Household economic survey, 2011 reference income	TL2, 2 regions	1134-2402
Norway	Income Statistics for Household, 2011 reference income	TL2, 7 regions	Register
Poland	EU-SILC, 2011 wave (2010 reference income)	NUTS1, 6	1294-2651
Slovak Republic	EU-SILC, 2011 wave (2010 reference income)	TL2, 4 regions	611 -2099
Slovenia	EU-SILC, 2011 wave (2010 reference income)	TL2, 2 regions	4380-4859
Spain	EU-SILC, 3 year averages for 2008-2009-2010	TL2, 19 regions	113-1558
Sweden	Income Distribution Survey, 2011 reference income	TL2, 8 regions	630 -3778
Switzerland	EU-SILC, 2011 wave (2010 reference income)	TL2, 7 regions	266-1856
Turkey	Turkish SILC, 2011 reference income	NUTS1, 12	610 -2137
United Kingdom	Households Below Average Income, average for 2010-	TL2, 12 regions	938-3842
United States	Current Population Survey, average for 2010-2012	TL2, 50 regions	2169-20056

15. Even at a relatively low level of territorial disaggregation (OECD TL2), the reliability of estimates can be challenged for several small regions due to the small size of the survey samples. In most cases, the income surveys used for the OECD Income Distribution Database (IDD) are not designed to be representative at the regional level. The problem is particularly evident for city-regions. For example, the Spanish cities of Ceuta and Melilla are represented respectively by 113 and 114 households in the European Union Statistics on Income and Living Conditions (EU-SILC) 2011 sample; similarly, the regions of Bremen and Hamburg in Germany are represented by, respectively, 66 and 166 households in the German Socio-Economic Panel for 2011. These representativeness issues are discussed in detail in section 4 and in the annexes.

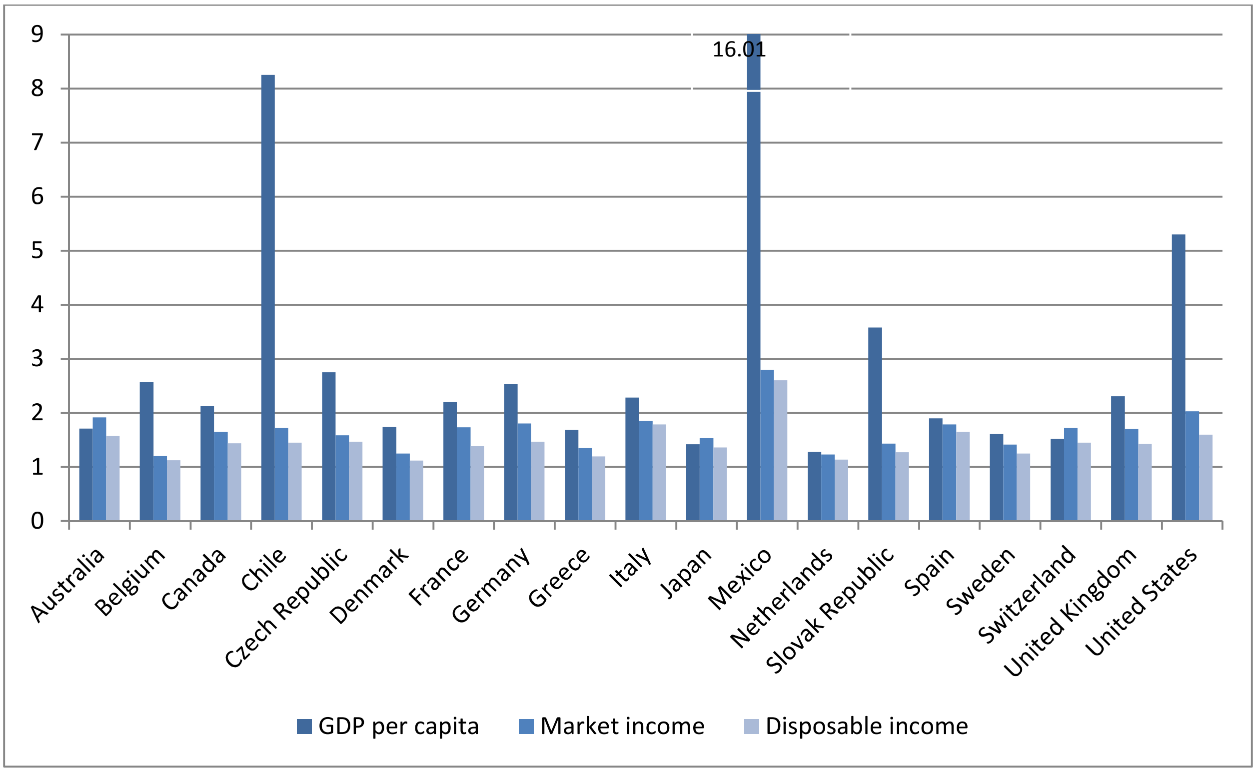
3. An overview of inequalities and poverty differences between and within OECD regions

3.1. Income disparities between regions

16. The most widely used measure of regional disparities in material living standard is the variability in regional GDP (Economist, 2012, OECD 2013). GDP is, however, best understood as a measure of the economic production taking place in each region, rather than of the income enjoyed by the residents of each region, and the differences between production and household income are likely to be especially large when a significant number of residents of one region work in another, or when they transfer a part of their income to family-members living elsewhere. Figure 1 shows, for each country, the ratios between the highest and the lowest value of GDP per capita, household market income and household disposable income data observed across regions. This evidence suggests large cross-country differences in the level of interregional disparities as measured by GDP and household income data.

Figure 1. Regional disparities in GDP per capita, market and disposable household income

Ratio between maximum and minimum regional value, 2010-2011



Note: it should be noted that the GDP measure is calculated in per-capita terms, while the income measures are calculated at the household level with equivalence scales.

Sources: OECD Regional Database and OECD Income Distribution Database at regional level.

17. It is also evident from Figure 1 that the economic indicator used heavily affects the size of inter-regional disparities. Disparities are higher when measured through GDP per capita, partly because of commuters towards urban regions whose production is accounted in the GDP of the destination and whose earnings are included in the income of the origin region. Small countries with low numbers of regions, such as Belgium, the Czech Republic and the Slovak Republic, can have large values of inter-regional disparity in terms of GDP per capita due to the strong concentration of economic activity in the capital

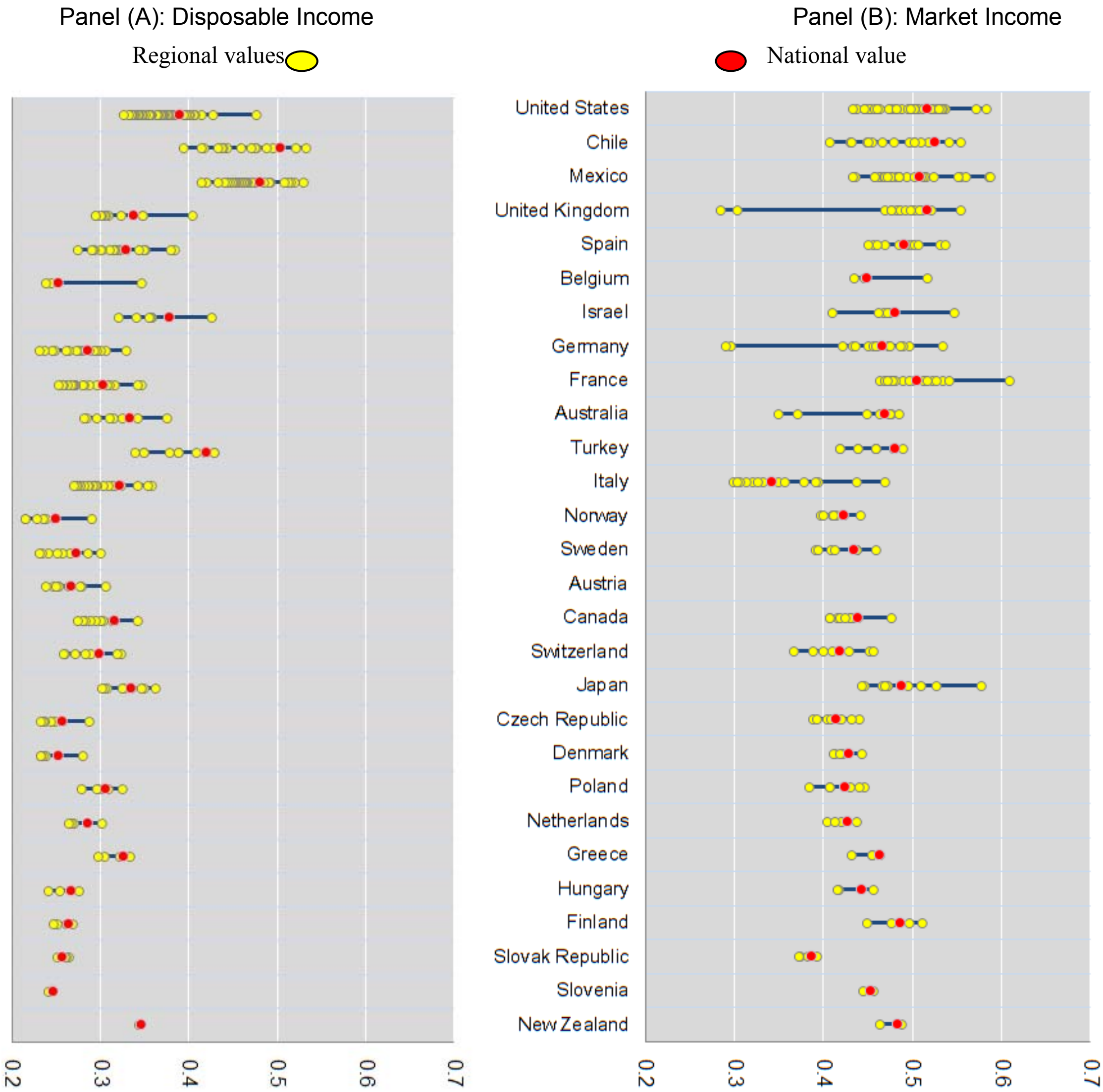
region. For these countries, regional disparities become much lower when calculated on the basis of household income. Different metrics also affect the ranking of countries: for example, Germany has a higher level of interregional disparity than Italy when measured through GDP per capita, while the ranking is reversed using disposable income. Disparities in market income are always larger than disparities in disposable income, which is an indication of the size of redistribution (across regions) achieved. It should be noted that the estimates of average household disposable income presented in this paper can differ from those already published in regional household income accounts (OECD, 2013), reflecting divergences in methodologies and data sources already noted for national estimates (see Fesseau *et al.* 2013).

3.2. Income inequality within regions

18. The data collection allows going beyond comparisons of average material living standards between regions, by looking at how income is distributed within each region. Regional differences in income inequalities are high in all large OECD countries and in some small countries with a dominant urban centre (e.g. Belgium). The regional dispersion in the Gini index of disposable household income is highest in the United States, while the largest levels of the Gini are observed in Mexican and Chilean regions. Conversely, the two regions of New Zealand have an almost identical Gini index,and low differences in the Gini are observed across regions of the Slovak Republic and Finland. In Belgium, Israel, United Kingdom and United States the regions of the capital city have income inequality clearly above the other regions.

19. Gini indexes for market income show a much larger interregional variability than those computed on disposable household income (figure 2, panel B). This confirms that taxes and transfers not only reduce differences in average household income in different regions, but also lower the inequality of household incomes within each region. The effect of taxes and public transfers in reducing regional differences in income inequality is particularly evident in the United Kingdom, Germany, Belgium and Italy. The median reduction in the regional Gini when taking into account taxes and transfers is 30% across the 28 countries, the highest effect being observed for Finnish regions (regional Gini coefficients for disposable income 48% lower in median than regional Gini indexes for market income).

Figure 2. Regional dispersion of Gini indexes



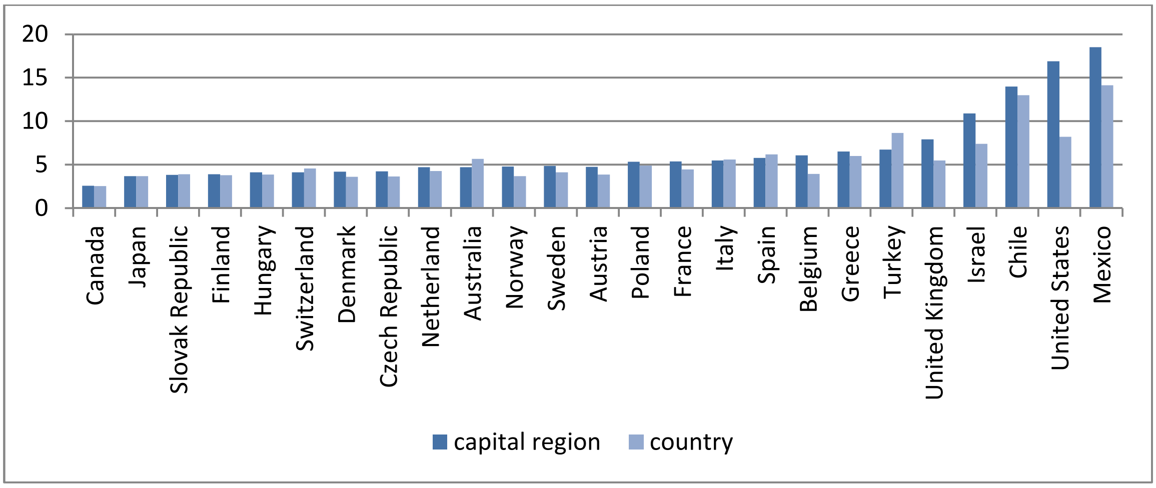
Note: Countries are ordered by the difference between maximum and minimum value of the Gini index for regional disposable income. Each point in the panel represents a region.

Source: Authors' elaborations on OECD Income Distribution Data at regional level.

20. The level of regional disaggregation considered in this paper does not allow a clear identification of rural-urban differences in income inequality levels. Several large TL2 regions cannot be described as either rural or urban, since they host both significant urban centres and low-densely populated rural areas. Existing evidence, mostly on developing countries, points to a positive link between urbanization and inequality (Kanbur and Zhuang, 2013). Figure 3 compares the income quintile share ratio, the ratio of income received by the top quintile of the population to that received by the bottom quintile, for capital regions and national averages. Based on this measure, income differences in capital regions tends to be higher than the national level, suggesting that more urbanized areas have a more skewed income distribution.

Figure 3. Income differences between richest and poorest population quintiles, capital regions and national averages

Quintile share ratios (S80/S20) for disposable income



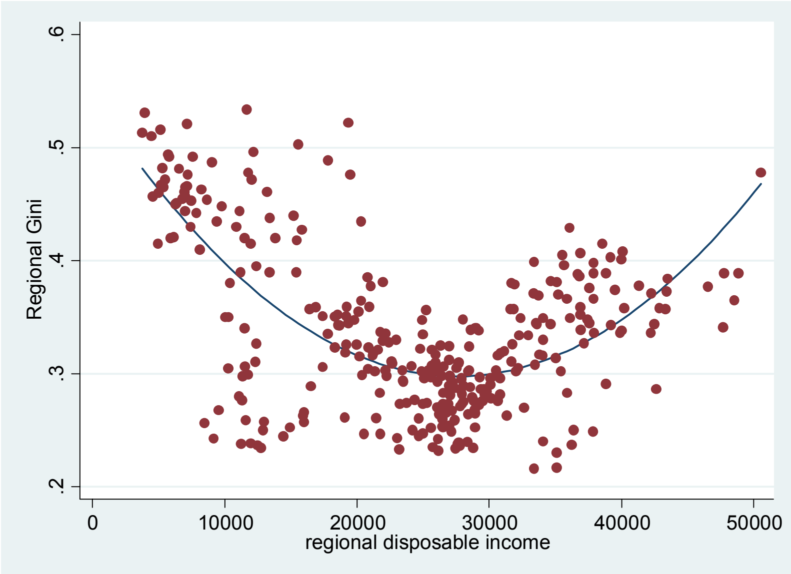
Source: Authors' elaborations on OECD Income Distribution Data at regional level.

21. Considering together all regions in the dataset, the relationship between average levels of household disposable income and inequality appears to be U-shaped: regional Gini indexes first decrease, then increase with regional average income (figure 4). However, average income levels explain less than half of the variance in the regional Gini: there are several regions (such as District of Columbia, London, Western Australia, Alberta) where high average incomes are paired with high income inequality. This suggests that the U-shape pattern is driven by the relatively high level of inequality in the regions of the two countries with the highest and with the lowest average household disposable income (i.e. United States and Mexico).

22. The relationship between income levels and inequality at the regional level is a complex one, deserving further analysis and requiring comparable data for different points in time. There are only few empirical studies on the determinants of inequalities within regions. An early analysis on the United States (Bishop *et al*. 1992) finds that three variables, mean family income, the standard deviation of years of schooling, and per capita educational expenditures, are robust predictor of interstate variations in income inequality. Perugini and Martino (2008) analyse determinants of income inequality in European regions, showing that higher shares of tertiary educated have a positive impact on inequality; in their analysis, regional differences in inequality are also significantly affected by qualitative features of regional labour markets, such as the incidence of part-time employment.

Figure 4. Relationship between average income levels and income inequality levels in OECD regions

Scatterplot of Gini indexes for disposable income and disposable income per capita for regions



Source: Authors' elaborations on OECD Income Distribution Data at regional level.

23. Summary measures like the Gini index do not tell whether income inequality within regions is driven by high-income household stretching the upper tail of the distribution, or by large poverty levels and gaps, affecting the lower tail of the distribution. A simple way to get insights on whether differences are larger in the lower or upper part of the distribution is to compare the income gap between the top earners (the average income of the fifth quintile) and the average earners (third quintile) with the income gap between average earners and low earners (first quintile). Table 3 shows that in the regions with the highest Gini, disparities are generally higher in the upper part of the income distribution than in the lower part; exceptions are Italy, Mexico, Norway Spain, Sweden and the United States where the gaps are higher in the lower tier of the distribution. The picture is less clear when looking at national averages.

Table 3. Inequalities in the upper and lower half of the income distribution

Ratio between average disposable income of the fifth and third quintile compared with ratio between average disposable income of the third and first quintile

	Most unequal region		National values	
	5th/3rd quintile	3rd/1st quintile	5th/3rd quintile	3rd/1st quintile
Australia	2.79	2.48	2.27	2.36
Belgium	3.10	2.56	2.14	2.46
Canada	2.52	2.33	2.25	2.30
Switzerland	2.35	2.21	2.18	2.10
Chile	4.77	3.01	4.62	2.82
Czech Republic	2.20	1.92	2.00	1.82
Germany	2.30	2.10	2.12	2.03
Denmark	2.04	2.04	1.88	1.91
Greece	2.65	2.49	2.64	2.63
Spain	2.32	4.87	2.21	2.82
Finland	2.04	1.92	1.96	1.94
France	2.67	2.03	2.26	1.98
Hungary	2.33	2.10	2.23	2.03
Israel	3.26	3.35	2.48	3.00
Italy	2.05	2.75	2.22	2.54
Japan	2.69	2.46	2.30	2.69
Mexico	3.68	3.91	3.74	3.75
Netherlands	2.22	2.12	2.15	1.99
Norway	2.03	2.35	1.84	2.03
New Zealand	2.22	2.12	2.54	2.14
Poland	2.56	2.29	2.30	2.30
Sweden	2.12	2.28	1.96	2.12
Slovenia	1.81	2.02	1.82	2.02
Slovak Republic	2.09	2.02	2.09	2.03
Turkey	3.47	2.52	3.21	2.70
United Kingdom	3.12	2.52	2.51	2.21
United States	3.45	4.91	2.76	2.96

Note: The most unequal region is defined as the region with the highest Gini indexes of disposable income in the country.

Source: OECD Income Distribution Data at regional level.

24. In all OECD countries, income inequalities within TL2 regions are more pronounced than income disparities between regions. A decomposition of the Theil inequality index allows comparing the within and between-regions contributions to national inequality. Table 4 shows calculations of the Theil index and its between-region component for a selection of European countries, where estimates were possible for five consecutive years (2006 to 2010). In all years, average income disparities between regions explain only a modest fraction of overall inequality, with this contribution ranging from 1% (in Belgium) to 6% (in Hungary) in 2010. However, this low contribution of the between region inequality is a consequence of the use of large regions as geographic units for the analysis here presented. Moreover, cross-country comparisons of the between-region component of the Theil index are highly affected by the number of regions present in each country. It is thus more relevant to look at the evolution over time of the between- and within- components of income inequality for each country. Differences between regions matter more

in 2010 than in 2006 for national inequality in the Czech Republic, in Finland and in Hungary. Conversely, the between-region component has lost strength in the two largest countries, Spain and France, suggesting a convergence in the levels of inequality within the different regions[4].

Table 4. Between-region contribution to overall inequality, 2006-2010

Theil indexes of disposable income at national level and percentage contribution of between-region inequality

	Theil index					Contribution of between-region inequality (in %)				
	2006	2007	2008	2009	2010	2006	2007	2008	2009	2010
Belgium	0.13	0.17	0.14	0.13	0.16	0.89	0.83	0.96	1.05	1.03
Czech Republic	0.13	0.13	0.14	0.13	0.13	3.86	3.93	5.20	5.28	5.70
Spain	0.19	0.19	0.19	0.18	0.18	1.86	2.19	2.23	1.75	1.24
Finland	0.15	0.15	0.15	0.14	0.13	1.82	1.49	1.44	1.52	4.02
France	0.17	0.16	0.16	0.18	0.18	5.85	5.71	4.98	4.41	4.46
Greece	0.21	0.19	0.20	0.19	0.20	4.15	3.77	4.51	4.86	1.97
Hungary	0.13	0.12	0.11	0.10	0.13	4.36	4.96	5.24	5.70	6.20
Poland	0.13	0.18	0.19	0.18	0.20	3.08	3.03	2.77	2.51	3.67

Source: OECD Secretariat estimates based on EU-SILC microdata. The decomposition of the Theil index is calculated using the Stata command ineqdeco, written by Stephen Jenkins (2006).

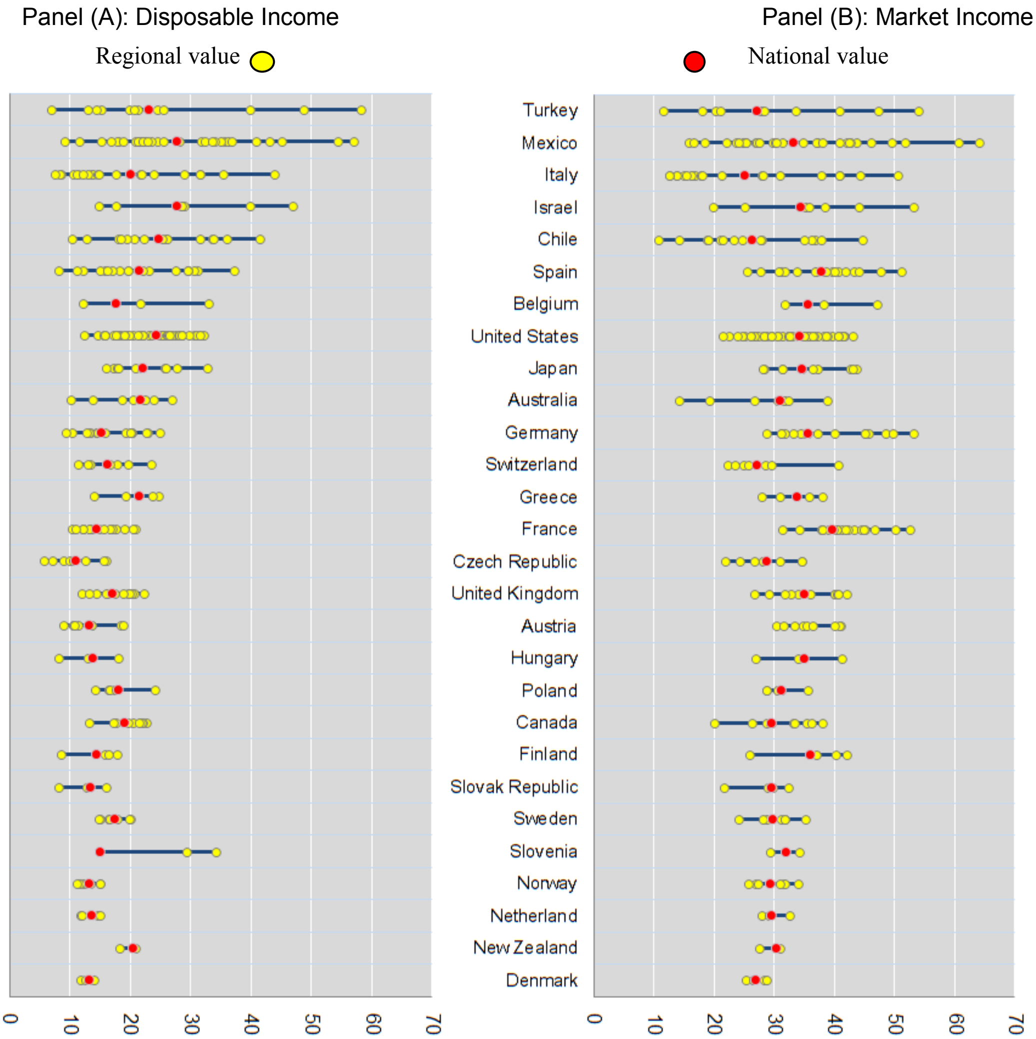
3.2. The bottom-end of the distribution: regional differences in income poverty rates

3.2.1. Disparities in relative poverty between regions

25. One of the most basic decisions for comparing poverty levels, either at the national or regional level, is whether to adopt an absolute or relative approach to measuring poverty. The former entails estimating a "market basket" of goods and determining an absolute poverty line that is the cost of purchasing these goods for households of various sizes (Smeeding *et al.* 2001). The latter bases the poverty line on the distribution of income of a reference population, generally the national population, and fixes a point in this distribution below which individuals are considered to be poor. The main interpretation issue with relative poverty lines is that poverty rates based on them may remain constant or even fall if all households (including the poorest ones) experience a decline in their incomes[5]. Moreover, people identified as poor in one country might not be considered poor in another, given the substantial differences in median incomes across OECD countries.

26. The analysis below relies on relative poverty lines, given the complexity of defining one specific minimum standard of living that can be adopted for all OECD regions and countries at a point in time. Figure 5 shows the interregional dispersion of poverty headcounts with the poverty line defined at 60% of the national median income. We focus on this poverty thresholds as regional estimates tend to be less volatile than with the lower 50% and 40% national thresholds. In the approach used here, income inequality is closely connected to poverty, and the relative poverty measures can be interpreted as a particular measure of inequality at the lower tail of the distribution. However, inter-regional differences in poverty rates do not exactly mirror the differences in inequality shown by the dispersion of Gini coefficients. Regional differences are much more marked in Turkey and Italy, for example, when focusing on the bottom-end of the income distribution. The United States have the second largest inter-regional dispersion of the Gini index, but only the eight largest dispersion of relative poverty rates at regional level.

Figure 5. Regional relative poverty rates



Note: Countries are ordered by the difference between maximum and minimum value of the regional relative poverty headcount at 60% the national median of disposable income. Each point in the panel represents a region.

Source: OECD Income Distribution Data at regional level.

27. The comparison between the right and left panel of Figure 5 also shows that taxes and public transfers reduce both the size and the regional differences in poverty rates in most countries, but the magnitude of the reductions differs across countries. The effect of taxes and transfers in reducing the dispersion of poverty rates based on disposable income, relative to those based on market income, is largest in France, Australia and Germany. Relative poverty rates are lower when measured on disposable income than when measured on market income: considering taxes and transfers in the income measure reduces the regional poverty headcounts of 41% in median across the 28 countries: the highest reductions are observed in France, Czech Republic and Hungary.

28. In general, the poorest regions in each country have poverty rates that can be twice as high the national average (figure 6). In Turkey, for example, the region of South-Eastern Anatolia has a poverty headcount of 58.5% (based on a 60% the national median threshold, with a confidence interval of 56-61), 2.5 times the national one. Regional poverty rates departing significantly from the national ones are also

evident when using lower poverty thresholds in several countries. For example, 38.3 % (with a confidence interval between 33.4-43.2) of the residents of Chiapas in Mexico live with an income below 40% the national median, as compared to 15.7 (with a confidence interval between 15.1 and 16.3) for the average Mexican (Figure 6, Panel C). The difference in poverty levels between poorest and wealthiest regions is partly affected by the definition of disposable income, which does not include imputed rent and social transfers in kind that are generally more relevant in the most deprived regions. For example in Tasmania, an economically disadvantaged area in Australia, the proportion of the population that are 65 years or older with main source of income being a government pension is significantly higher than the national average. This region also receives the highest net government benefits of any state (social assistance benefits in cash and in kind less taxes paid) in Australia. Therefore if poverty rates included imputed rent and STIK, the difference between poverty rates in Tasmania and the national average would be lower than quoted in Figure 6.

Figure 6. Poverty rates with different poverty thresholds

Poverty headcount ratios for the poorest region and for national averages, with poverty lines defined at 60, 50 and 40% the national median disposable income, in percentages.

Panel A: poverty line at 60% the national median disposable

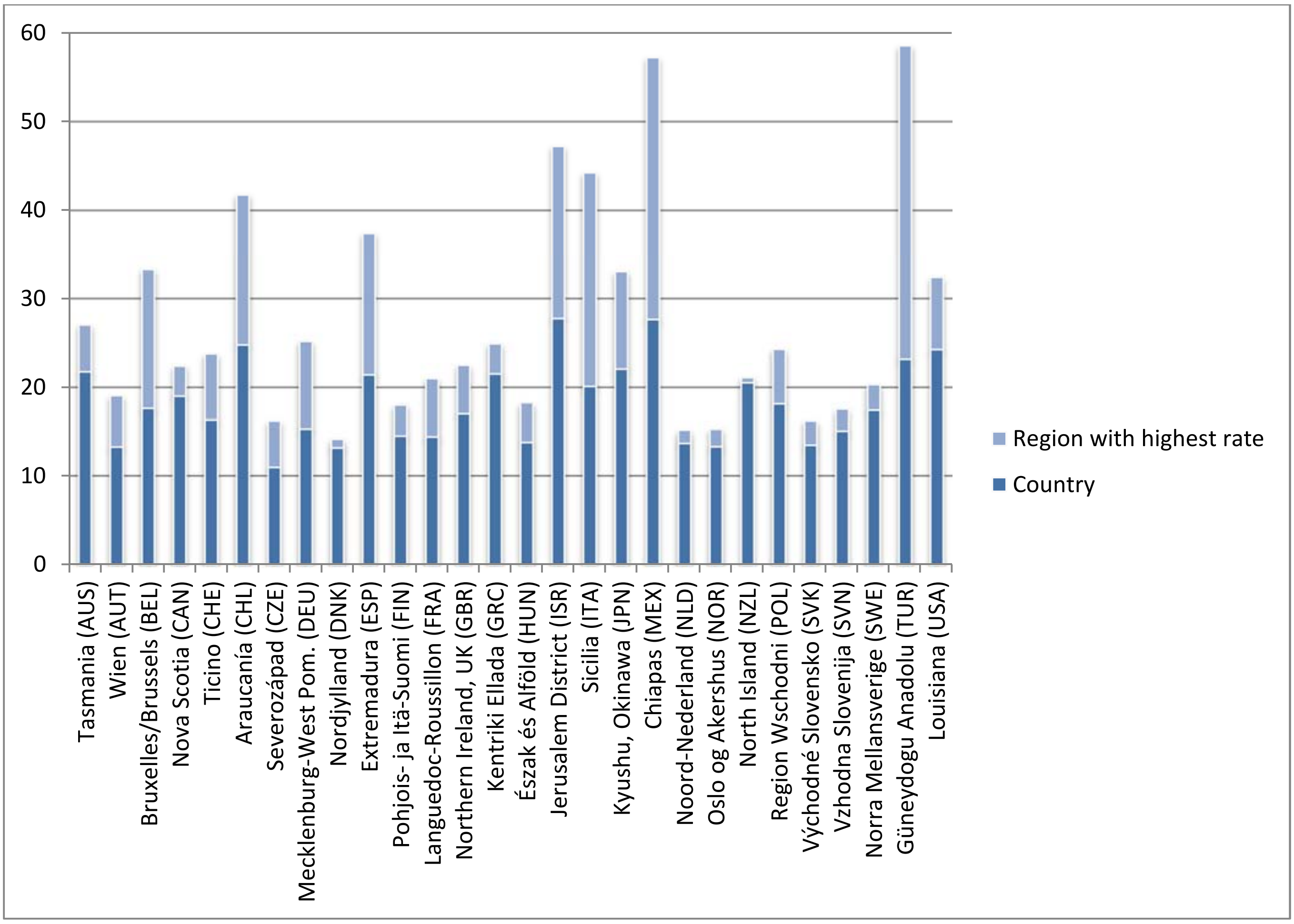
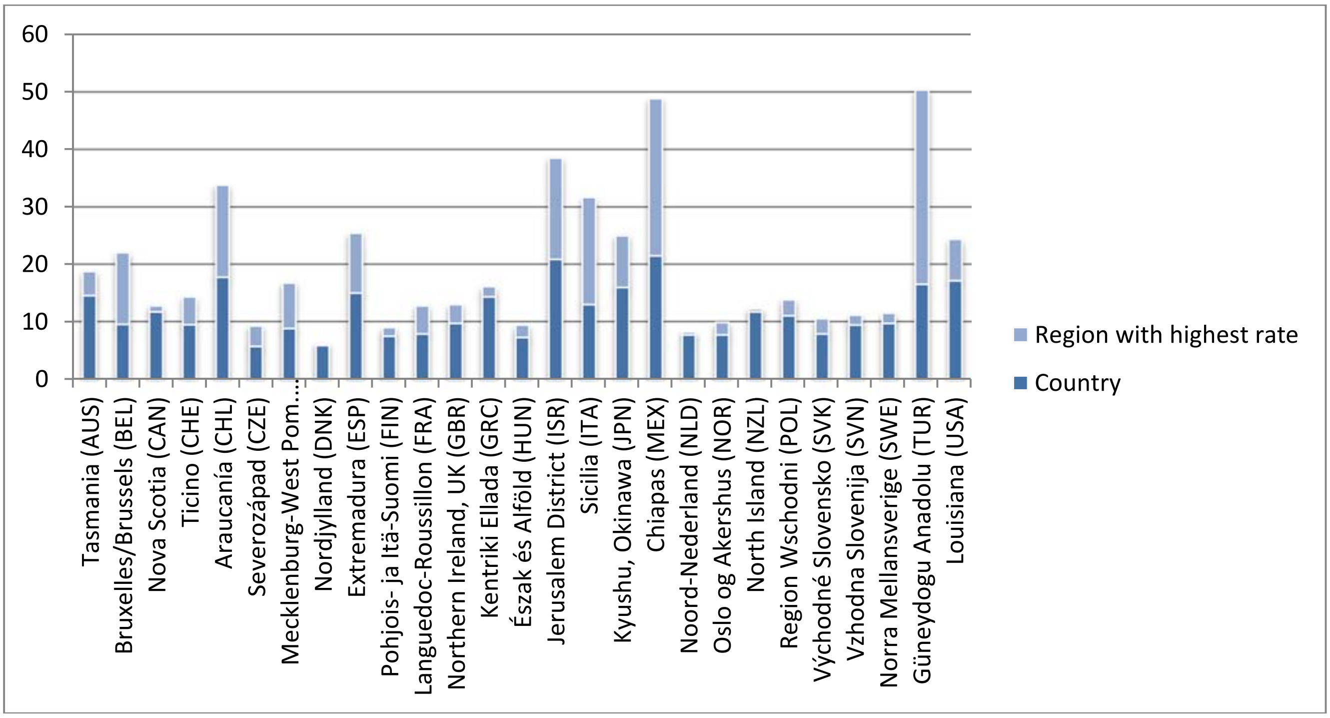
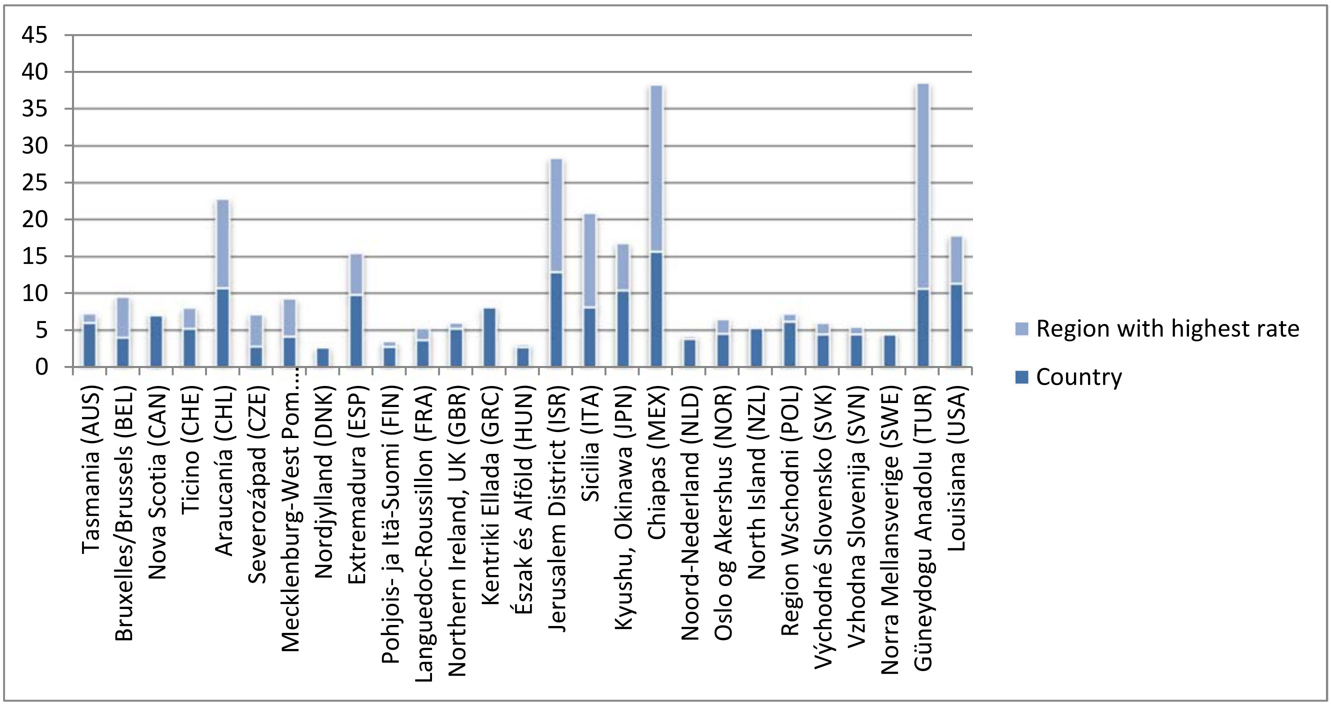


Figure 6. Poverty rates with different poverty thresholds (cont.)

Panel B: poverty line at 50% the national median disposable income



Panel C: poverty line at 40% the national median disposable income



Source: OECD Income Distribution Data at regional level. The poorest region is defined as the region with the highest poverty headcount at 60% of the national median disposable income.

3.2.2. Incidence of poverty within regions

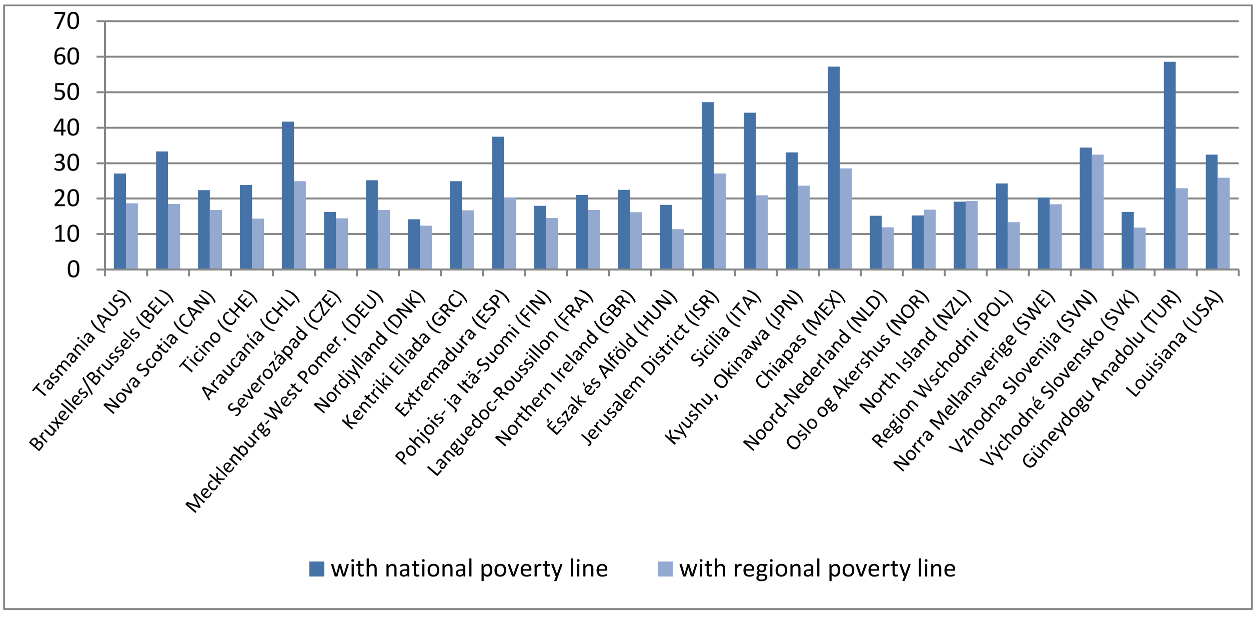
29. The choice of the reference population for setting relative poverty threshold is crucial from a well-being perspective. When an individual evaluates his or her living conditions, does he compare himself to the average person in his country, to those with similar skills or occupation in supranational entities (*e.g.* the EU) or to those living in his neighbourhoods? It is conceivable, for example that people living in the capital city will compare themselves with others living in the same or other large cities, rather than with those living in remote rural areas (Kangas and Ritakallio, 2007). Rainwater, Smeeding, and Coder (1999) argue that the regional level "approximates much better, although not perfectly, the community standards for social activities and participation that define persons as of 'average' social standing or 'below average' or 'poor'". At the same time, many social policies (e.g. health, education, retirement) aim to provide level of provisions that are uniform across the country, implying that poverty threshold set with respect to a national reference are more appropriate.

30. The use of different reference populations in defining relative poverty measures can be useful for policy. In particular, localised poverty lines provide regional policy makers with information on how many people can be considered poor taking as a reference the median earner of the region. With a regional or localized poverty line, the identification of the income poor population takes into account that the median income differ across regions, and that these differences will partly reflect differences in costs of living: a person considered as income poor with respect to a national thresholds might not be classified as poor with a regional poverty line, if he lives in a relatively low-income region. Regional poverty lines thus introduce a within-region perspective to the measurement of poverty, which may usefully complements the poverty measures based on national or supra-national poverty lines.

31. Figure 7 shows that using regional poverty lines reduces the headcount rates for the poorest region in most countries. Poverty rates are halved in Sicily, South-Eastern Anatolia and Chiapas. While the overall regional dispersion decreases, the poverty ranking across different regions is in general not much affected.

Figure 7. Differences in poverty rates using national and regional poverty lines

Headcount rates for regions with highest level of poverty in each country, poverty lines defined at 60% of the median.



Source: OECD Income Distribution Data at regional level.

32. Regional poverty lines have the obvious advantage of portraying a spatial distribution of poverty that is less sensitive to geographic variations in living costs. However, given that a different reference population is used for each region, the comparison of poverty rates across regions is less straightforward. A more direct way to correct for spatial differences in costs of living would be using regional price indexes. While the practical importance of within-country variations in prices is well acknowledged, regional price indexes or PPPs are not available at the international level[6]. Using Canadian data, Zhang et al. (2010) show that local poverty lines have effects on interregional poverty differences that are similar to those obtained through local price indexes.

33. Research on specific countries confirms the relevance of price differences for the measurement of interregional disparities in living conditions[7]. For example, Massari et al. (2011) show that the poor households living in Southern Italy significantly improve their relative condition after controlling for regional differences in purchasing power, but only when housing price variations are included in the PPP index. Similarly, Joliffe (2006) adjusts the poverty rates in metropolitan and non-metropolitan areas of the United States using a spatial price index based on the Fair Market Rent (FMR) data: based on his estimates, the poverty rankings between metropolitan and non-metropolitan areas get reversed when using the spatial index, with approximately 20 percent lower poverty headcounts in non-metro areas. Finally, Kosfeld and Eckey (2008) estimated a consumer price index (CPI) and a housing rent index (HRI) for German NUTS regions, finding that disparities of regional per capita GDP adjusted for PPP reduced but did not eliminate the real income gap between eastern and western länders.

3.2.3. Regional differences in material deprivation

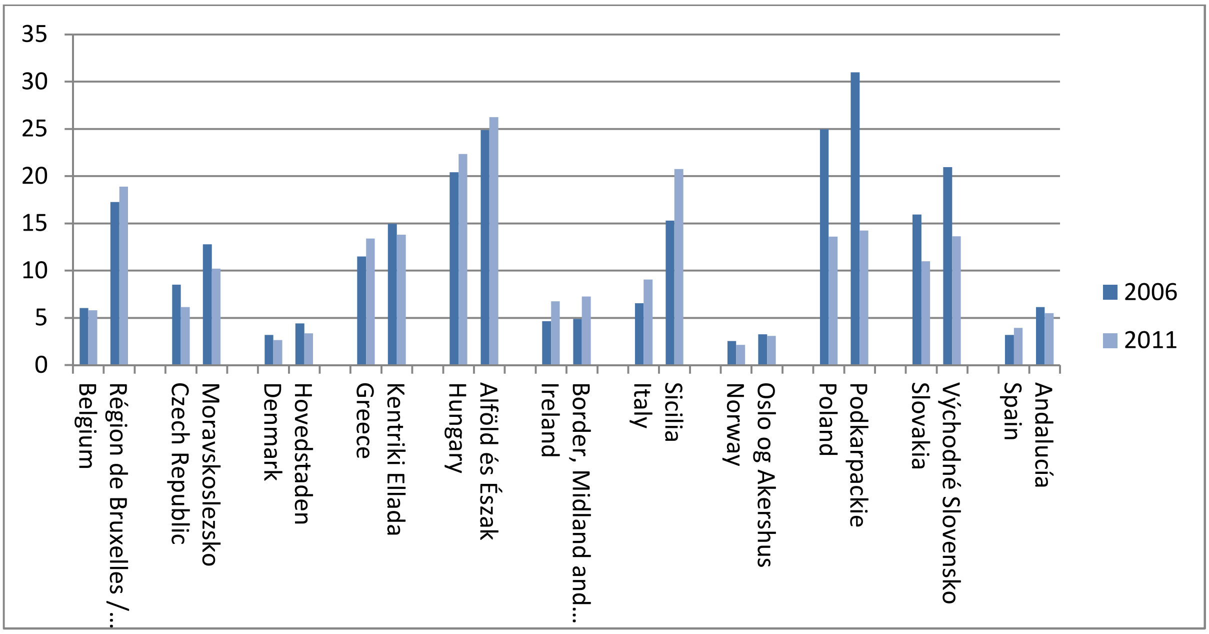
34. Beyond the setting of poverty lines, the second basic decision for comparing poverty across groups or regions is that of the choice of the 'evaluative space', i.e. the metric of interest. In theory, poverty should be understood as a 'well-being' failure, implying that it should be measured through multiple indicators (one for each of the dimensions that are regarded as constituents of people's well-being), no matter the level of geographic aggregation considered. This implies that income-based measures need to be complemented by non-monetary measures to present a solid empirical picture of spatial differences in poverty and deprivation.[8] Non-monetary measures are based on either the respondent's self-assessment of their own material conditions or on measures of ownership of consumer goods and living standards (Boarini and Mira d'Ercole, 2006) but could also extend to measures of other types of achievements, such as their health, skills and political voice.

35. The severe material deprivation rate is a measure that is regularly used to monitor material distress in Europe, through the EU-SILC Survey. Individuals are defined as severely materially deprived if they face an enforced inability to pay for at least four of the following items: *i)* to pay their rent, mortgage or utility bills; *ii)* to keep their home adequately warm; iii) to face unexpected expenses; *iv)* to eat meat or proteins regularly; *v)* to afford a short period of holidays away from home; *vi)* to own a television set; *vii)* to own a washing machine; viii) to own a car; and *ix)* to own a telephone. This indicator is closer to an absolute measure of poverty as it is based on a set of commodities, each with the same weight, that are equal across all countries.[9] This indicator is also based on counting the same number of deprivations in all EU countries, implying that it is based on a common EU-wide norm (as compared to the country specific thresholds used when measuring the income-poverty headcount). As the list of deprivation items is generally country-specific (and influenced by cultural factors), no measure of 'material deprivation' is regularly compiled for OECD countries.

36. To illustrate the potential impact of using a different well-being metric (and area-wide threshold), Figure 8 shows the gap between the European regions with the highest rate of material deprivation and the national average, as well as their evolution over the period 2006-2011. An interesting case is Poland, where the region with the highest rate of material deprivation in 2006 managed to halve this rate by 2011,

converging towards the national average. Conversely, in Italy and Ireland, severe material deprivation increased at the same rate for the most deprived regions (Sicily in Italy; Midland and Western region in Ireland) and for the country as a whole.[10] These severe material deprivation rates calculated at regional level are highly correlated with the relative income poverty headcounts in some countries (in Italy, in particular), while the correlation is not statistically significant in others (*e.g.* Spain).

Figure 8. Changes of severe material deprivation rates in the most deprived European regions



Source: Eurostat

37. More subjective measures of deprivation, such as the self-reported inability to make ends meet, would be also relevant for the monitoring of regional difference in material distress. Statistics to monitor multiple dimensions of material deprivation have been developed through a harmonized survey for Europe, but comparable data are rarely available for non-European OECD countries. A policy-relevant ranking of regional material deprivation can also be obtained through composite indicators. Annoni and Weziak-Bialowolska (2012) integrate different indicators of poverty in a composite measure at the regional level.

4. Statistical precision of regional income and poverty estimates

4.1. Computation of confidence intervals for yearly regional data

38. The regional indicators presented above should be used with caution given sampling error issues. These issues are much more severe for some countries and for those regions with smallest sample within these countries. The regular publication of confidence intervals alongside point estimates can help users evaluate whether differences across regions and with respect to national averages are statistically robust or possibly driven by sampling error. For example, 4 out of the 21 Italian regions have poverty headcounts overlapping the national value, so that the statistical difference of the estimates for these regions and the national values cannot be confirmed at a 5% confidence level. Data providers can also usefully 'flag' estimates with high sampling error, using simple criteria such as the number of sampled household in the respective cell or defining reliability thresholds based on the coefficient of variation.

39. Standard errors or other quality assessments are however not routinely published for regional data. Such information cannot be easily produced by researchers from micro-data files as the computation of sampling error need to take into account variations in the sampling design. Unfortunately, detailed information on the sampling structure is rarely available in the public-use files of household surveys such as the EU-SILC. For this paper, an effort has been made to get access to the variables describing the sampling structure that are essential for sampling error computation, namely the identifiers for strata and primary sampling units (PSUs).[11] To that end, the original strata and PSU variables have been redefined in order to make variance estimation for regional indicators possible, efficient and stable, following methods developed at the University of Siena and explained in detail in the annexes.

40. For the 'typical' household surveys based on reasonably large samples but complex design, two broad approaches are generally applied for variance estimation. These are the approach based on: *i)* Taylor linearization; and *ii)* resampling such as the Bootstrap, Balanced repeated replication (BRR) and Jackknife repeated replication (JRR). Linearization has the clear advantage of requiring much less computational time. The JRR procedure, by comparison, is more attractive because the same variance estimation formula can be applied to different types of statistics. Both linearized and resampling methodologies can be extended to longitudinal samples and to measures developed over multiple cross-sections. For those countries where regional indicators have been produced directly by the OECD Secretariat from public use microdata (Austria, Belgium, Czech Republic, Greece, Hungary, Poland, Slovak Republic, Switzerland), resampling methods have been used for computing sampling errors of all the indicators[12].

41. Table 5 provides a summary of the precision of the estimates, for those regions for which it was possible to produce estimates of the variance. The table shows the median size of the 95% confidence intervals, both weighted by the size of the point estimate (for the relative measures shown in columns 1.1, 2.1…) and not weighted (for the absolute measures shown in columns 1.2, 2.2…). For example, column 1.2 shows that for the indicator 'relative poverty with poverty line defined at 40% the national median' the difference between the upper and the lower bound of the confidence interval of the Australian estimates is 2.4 percentage points (as a median value across the 8 regions). Given that the absolute value of the size of the confidence interval is affected by the absolute value of the indicator (countries with higher poverty rates have, ceteris paribus, larger confidence interval for the poverty rate estimate), column 1.1 (2.1, 3.1…) weighs the confidence interval size by the value of the indicator as a way to improve the comparability of this summary measure across countries. Even for these relative summary measures, the cross-country comparability is possibly hampered by the fact that countries use different methodologies for calculating the confidence intervals.

42. As expected, the confidence intervals tend to be larger in countries where regional samples are smaller, such as Germany where in median the upper and lower confidence interval of the relative poverty rate at 60% the national median income are separated by 8.4 percentage points. For a similar sample size, the confidence intervals are smaller in Spain, where three-year averaged data were used, than in Italy, where the indicators refer to a single year. The confidence intervals weighted by the point estimates are also larger for the poverty indicators based on the 40% poverty line than for indicators based on the 60% poverty line, given that the size of the relevant survey cell diminishes with lower poverty thresholds. For the Gini index of disposable income, in around 7% of the regions the absolute size of the confidence interval (i.e. the difference between the upper and lower bound of the estimate) is higher than 10 percentage point; while for the poverty headcount based on the 60% the national median, the confidence interval is larger than 10 percentage points in around 10% of the regions.

Table 5. Median size of confidence intervals for poverty and income distribution indicators

Median relative precision (size of the confidence interval/point estimate) and median size of confidence interval

Indicator	Relative Poverty defined at 40% national median income		Relative poverty defined at 60% national median income		Gini disposable income		S80/S20 (quintile share ratio) disposable income	
Country	Relative median confidence interval (1.1)	Absolute median confidence interval (1.2)	Relative median confidence interval (2.1)	Absolute median confidence interval (2.2)	Relative median confidence interval (3.1)	Absolute median confidence interval (3.2)	Relative median confidence interval (4.1)	Absolute median confidence interval (4.2)
Australia	0.41	2.39	0.18	4.41	0.11	0.03	0.34	1.80
Austria			0.42	5.17	0.16	0.04	0.23	0.86
Belgium	0.50	2.72	0.22	4.41	0.14	0.05	0.17	0.61
Chile	0.30	3.40	0.24	6.00	0.06	0.02	0.87	10.30
Czech Republic	0.53	1.16	0.31	3.51	0.33	0.08	0.15	0.52
Germany	0.88	4.05	0.42	8.45	0.17	0.04	0.22	0.88
Spain	0.32	3.20	0.23	4.30	0.09	0.03	0.23	1.40
Finland	0.50	1.45	0.21	3.39	0.08	0.02	0.11	0.40
Greece	0.46	3.50	0.27	6.00	0.11	0.04	0.25	1.56
Hungary	0.50	1.41	0.22	2.77	0.06	0.02	0.09	0.32
Israel	0.14	1.60	0.08	2.20	0.00	0.00		
Italy	0.55	3.40	0.33	5.60	0.15	0.04	0.25	1.10
Mexico	0.37	5.15	0.24	6.35				
Poland	0.39	2.44	0.23	4.43	0.09	0.03	0.15	0.73
Slovak Republic	0.62	3.02	0.31	4.60	0.14	0.04	0.19	0.72
Slovenia	0.30	1.31	0.17	2.57	0.11	0.03	0.09	0.31
Switzerland	0.50	2.05	0.28	4.81	0.33	0.10	0.16	0.65
Turkey	0.29	2.61	0.20	5.02	0.42	0.17	0.17	1.19
United States	0.27	2.60	0.19	4.10	0.08	0.03	0.17	1.20

Note: the relative median confidence interval (1.1) is calculated as the median of the difference between the upper and lower bound of the 95% confidence interval of the indicator in each region, divided by the point estimate of the indicator. The absolute median confidence interval (2.1) is the median absolute value of the difference between the upper and lower bound in each region.

Source: Authors' elaborations on OECD Income Distribution Data at regional level.

4.2. Three year-averaged indicators for reducing volatility of the estimates

43. The large sampling variance of direct estimates for regions with small samples can be addressed in different ways. Averaging the results over multiple years is an intuitive method for increasing the robustness of regional estimates[13]. While the cost of this approach is a loss of timeliness, as year-to-year changes cannot be assessed, its advantage is that it provides more stable estimates, which can be useful for evaluating the effects of funding and policy programmes, generally implemented with a four or five year programming periods.

44. Three-year averages may be produced either: i) by combining estimates from the different waves; or ii) by pooling data at the micro level. The two approaches tend to give numerically similar results, but the averaging of estimates from different waves is more feasible to implement with complex survey designs. The quantification of efficiency gains from averaging across multiple years is not straightforward in surveys, such as EU-SILC, that are based on rotational panel. In these cases, a new sample of households and individuals is introduced each year to replace a fraction of the existing sample. In these cases, cross-sectional samples are not independent, resulting in correlation between estimates from

different waves. Apart from correlations at the individual level, additional correlation arises because of the common structure (stratification and clustering) of the waves of a panel (Verma and Betti 2011).

45. The approach used in this paper was to test two different methods to produce variance estimates for three-year averaged indicators in EU-SILC, building on previous work at the University of Siena (Verma *et.al* 2010). A first, direct approach defines a common structure of strata and PSUs for the three waves of the sample, and applies standard JRR replications to the union of the three cross-sectional samples. The definition of a common sample structure requires consistent coding of the sampling variable over the three waves, so that common sampling units can be identified. This condition is not respected in the public-use files of EU-SILC. An alternative (indirect) method has thus been developed to approximate the correlation across the cross-sectional waves using information from the longitudinal data of EU-SILC, which enables linking individuals and households across years. The two methods are described in more detail in Annex 3.

46. The direct and indirect methods were applied to EU-SILC data for Austria and Spain, and both perform well at national and regional level. The results are shown in Table 6. In the case of Spain, the 'median' reduction of the standard errors when using the average of estimates for three years ranges between 16% for the Gini coefficient to 38% for the quintile share ratio (S80/S20). The 'mean' reduction in standard errors is smaller because it is highly affected from few outliers, especially for the poverty headcount ratios (HCR). Differences in the mean reduction across the different indicators could also be partly due to the fact that the JRR methodology performs well for Gini but can produce instable results for measures based on quantiles. In the case of Austria, mean and median reductions are almost identical, showing a reduction of about 25-30%.

Table 6. Median and mean reduction of regional standard errors using averages for three-years, Spain and Austria

	Spain		Austria	
	Median	Mean	Median	Mean
Poverty headcount ratio at 60% national poverty line	20%	1%	30%	29%
S80/S20	38%	23%	25%	24%
Gini	16%	10%	26%	23%

Note: For the methodology used to calculate the reduction in standard errors from averaging over three waves, see Annex 3 and Verma *et al*. (2010).

5. Conclusions and statistical agenda

47. Moving beyond country averages towards regional estimates of income inequality and poverty is an important step forward in identifying mechanisms leading to deprivation and then formulating effective anti-poverty policies. Data constraints loom large in studies of income inequality, poverty and social exclusion at the sub-national level. Despite these limits, there is much that can be said about spatial differences in living conditions based on the data that are already available in most OECD countries. This paper contributes to the policy discussion on spatial inequalities, presenting a unique set of income distribution data at regional level for a large number of OECD countries at a point in time.

48. A focus on the bottom-end of the income distribution is particularly relevant to evaluate the rationale for spatially-targeted redistribution and social policies. It is well established that the endowments of the area explain a substantial proportion of the poverty of people living in it, controlling for individual and household characteristics, such as age, household composition or ethno-linguistic group (Jalan and Ravallion, 1997)[14]. The quality of infrastructure, the distance to largest agglomerations, and the ability of

local government to finance public investments and stimulate private sector development can influence the scope of opportunities available to skilled individuals and the rate of return to these skills, leading to spatial concentration of human capital and income. Regional imbalances in poverty rates are often persistent, as internal migration processes tend to be selective with poorest people facing higher migration costs.

49. The regional income distribution and poverty indicators discussed in this paper send the clear message that national averages mask important intra-country variance in poverty and inequality. The regional data presented in this paper are highly comparable and sourced from either household surveys or administrative data, according to internationally agreed definitions. The production of these data at regular intervals would make possible to identify those regions that experience significant changes in income inequality and poverty, and to draw for the design of regional policy. However, for those countries whose estimates are drawn from nationally-representative surveys, the main limitation of the direct estimates obtained from these surveys is that confidence intervals can be large for small regions, making it difficult to conclude whether differences across similar regions or changes from one year to the next are 'real' or the artefact of sampling errors.

50. Publishing subnational estimates with confidence intervals is important for their correct interpretation and use. Despite the development of software routines for the computation of standard errors, users of household survey data with complex design can often only approximate the variance of their regional estimates. This is due to limited information on the survey's sampling structure in the microdata available to researchers. As discussed in detail in Annex 2, the provision of 'computational strata and PSUs' variables in the public-use files would improve the capacity of users to correctly estimate the sampling variance, with limited confidentiality issues.

51. The statistical precision of the regional estimates of income inequality and poverty can be improved in a variety of ways. The allocation of resources for social cohesion programs should take into account regional differences in poverty and material deprivation rates. However, poverty estimates that are too volatile over time can hardly be used for taking decisions on the allocation of regional funds. This paper has shown that the stability of these estimates increases by averaging data over consecutive waves, even if the gains in statistical precision are limited (around 25% for three-year averages) when surveys are based on with rotational panels.

52. Other options to improve the quality of subnational estimates require more investments in methodological work and possible changes in data production. Modifying the sample design to achieve representativeness at regional level is the most straightforward solution. However, this solution is often costly as it might require increases in the overall sample size. Improved use of administrative data has the potential of delivering highly reliable poverty and income distribution statistics at any geographical disaggregation, with the limitation that only income-based measures of material deprivation can be produced. The Inclusion of income and poverty modules in surveys with larger samples, such as Labour Force Surveys (LFS), is another option whose costs should be evaluated.

53. Beyond these options, there has been much progress in recent years in the application of small-area models for "borrowing strength" in the case of small samples. At Eurostat, relevant work has tested for 10 countries the possibility of matching EU-SILC data with LFS data, exploiting common variables in the two surveys[15]. International projects, such as "Sample" and the "ESS-Net on Small Area Estimation" have consolidated methodologies in this area, produced flexible software routines and facilitated dialogue among statistical offices[16]. Two caveats, however, apply. First, there is no model that is good in general: each application of small area estimation must be adapted to its expected use and users. Second, these models are best implemented at the national level. Model-based estimates require extensive trial-and-errors

processes, and the modelling should be adapted to the specificities of each country (number of regions, sample sizes, auxiliary data from administrative sources).

54. The value of model-based approaches increases when moving to finer levels of spatial disaggregation. Detailed poverty maps are powerful tools for targeting social funds and for the design of safety nets. A poverty mapping project managed by the World Bank is currently producing poverty estimates for small administrative units (LAU2) of some EU Member States, with first estimates showing promising results.[17]

55. In the future, a statistical agenda to increase the availability and quality of regional data on income distribution and living standards more generally should consider the following elements:

- Increase the availability of direct survey estimates at the TL2 regional level to other OECD countries and years. Work in this field should include supporting informed use of these estimates, by publishing quality assessments (*e.g.* standard errors, relative sampling errors) and providing guidance to data users.

- Define precision thresholds for the regional survey estimates, providing instructions on whether the estimates are of 'sufficient quality' to be included in OECD databases.

- Support further analysis of regional differences in income inequality and poverty levels, by making available regional identifiers and complete information on the sampling design in public-use survey micro-data, so as to allow better estimates of standard errors.

- If indicators cannot be produced on an annual basis, consider producing a selection of indicators at regular intervals (e.g. every three or five years). This should include evaluating whether three-year averages are significantly more reliable than yearly estimates, given the survey data available, and whether administrative sources could be used for the regional income indicators.

- Support international efforts to develop and test model-based methodologies that can strengthen the precision of the TL2 level estimates or allow the production of indicators at lower levels of regional breakdowns (TL3 regions, municipalities, functional regions).

- Continue research on regional PPPs and differences in price levels between regions.

- Consider developing non-income based measures of deprivation at the regional level.

56. The high policy demand for subnational income distribution estimates requires a coordinated response from the statistical community. Further analysis of the data presented in this paper and coordinated testing of the development options described above could hopefully lead to the regular production of high-quality regional income statistics. A wide range of policies, at multiple levels of implementation (supra-national, national, regional, local), can benefit from the integration of these data in their benchmarking and evaluation frameworks.

NOTES

1 Data have been produced at a larger level of territorial disaggregation for Poland (NUTS1), Hungary (NUTS1), Turkey (NUTS1) after consultations with statistical offices in these countries.

2 Estimates were provided by either the OECD national correspondents listed in the acknowledgements or directly produced by the OECD Secretariat based on public-use files. See the terms of references at www.oecd.org/els/soc/IDD-ToR.pdf. Further information on the OECD IDD and related analyses is available at www.oecd.org/social/inequality-and-poverty.htm

3 The selection of the indicators and the choice of sub-national level of analysis were informed by a technical meeting that gathered selected experts from statistical institute and academia, hosted by the OECD in November 2012. A questionnaire on data availability was circulated to statistical offices at the beginning of the project to identify the most suitable national data source.

4 Giammatteo (2007) shows the results of a similar decomposition of the Theil inequality index in Italy over the 90s. Italian inequality resulted to be increased of 28.8% between 1989 and 2000. This overall trend was the result of a moderate increase in between-region inequality (5% over the decade) and a stronger impact of the within component (+33%).

5 This concern is addressed, in the OECD Income Distribution Database, through the use of relative poverty lines 'anchored in time', whose movements reflect changes in the income of poor households relative to a threshold referring to a reference year in the past.

6 The derivation of regional PPPs has been discussed in several instances at the Eurostat-OECD PPP Programme. Despite the high level of interest, there have been so far few results at the European level, given the complexities of building a regionally representative price database. United Kingdom, Italy and Turkey have led the most ambitious measurement projects, testing and establishing regional price indexes. Similar measurement efforts have been carried out in other OECD countries, such as Canada, Chile, Colombia, Mexico and the United States among others.

7 Annoni and Weziak-Bialowolska (2012) is one of the few studies showing comparative evidence on the effects of price differentials. They include housing costs in the computation of individual incomes and poverty lines for European regions, finding considerable changes in regional differences in relative poverty rates.

8 Another limit of the measures of income-poverty presented in this paper, is that the income concept used excludes a range of imputed income items (such as income from own consumption of goods, the service in kind provided by governments to households, the imputed rents from home-ownership) that contribute to households' economic well-being.

9 Non-monetary measures of material deprivation are not exempt from problems. They may fail to distinguish between poor outcomes that result from financial constraints and those due to personal choices and lifestyles; even when survey questions do distinguish between these two conditions, data on material deprivation may be affected by habits, past-dependent preferences and low aspirations (Boarini and Mira d'Ercole, 2006).

10 The EU-SILC regionalized data used in figure 8 have been averaged over two years as they suffer from the volatility issues discussed above.

11 It was possible to obtain detailed information on the sampling design from the statistical offices of Austria, Switzerland, Spain and Slovenia. The Turkish Statistical Office implemented directly the definition of the computation sampling structure, following the advices on the definition of the computational sampling

structure and the SAS programs developed for this paper. For other EU-SILC countries (Belgium, Greece, Slovak Republic, Poland), the confidence intervals shown in the annex of the paper are to be considered provisional, as they assume simple random sampling. This assumption is likely to underestimate the real size of the confidence intervals (Goedeme, 2012). They will be updated once it becomes possible to define (computational) strata and primary sampling units for each country.

12 SAS and STATA programs to reproduce the results are available upon requests. SAS routines for linearised estimation of indicators of poverty and social exclusion have been developed in the context of the Net-SILC2 project and are documented in Osier *et al.* (2013).

13 Other methods of data consolidation have been explored to reduce the sensitivity of regional estimates to irregularities of small sample data. Verma *et al*. (2010) discuss how the robustness of relative poverty rates can be increased by computing these rates using several poverty lines, and taking an appropriate average of those rates.

14 Kristensen (1997) refers to 'excluded spaces' as a relevant dimension of social exclusion, interacting and intensifying the effects of individual social exclusion and contributing to a 'spiral of decline'.

15 The methodology 'multiply impute' the income variable from SILC in the larger LFS sample, exploiting common variables in the two surveys. Model-based estimates of at-risk-of-poverty rates at NUTS2 level from the imputed data show significantly lower standard errors than the direct estimates from SILC. However, the unit-level models are found to artificially reduce differences between regions. More work is planned to test alternative small-area methodologies that can better account for regional heterogeneity and to improve estimation of mean squared errors (MSE).

16 Sample (Small Area Methods for Poverty and Living Condition Estimates) is a EU-funded research project completed in 2011. The project has developed and implemented small area estimation models of poverty and deprivation at NUTS3 and NUTS4 level, using EU-SILC and local administrative data. One of the relevant features of the project is the active participation of local stakeholders and policymakers in the identification and testing of the indicators and data dissemination tools. ESS-Net on Small Area Estimation (SAE) is a collaborative platform whose objective is to increase knowledge sharing of SAE methods across statistical institutes.

17 A comparison of these model estimates with register data for Denmark and Slovenia shows that model-based estimates identified correctly between 85 and 90% of the poorest 50 municipalities in Slovenia, while for Denmark results were less accurate.

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ANNEX 1. STATISTICAL TABLES

Table A1.1. Disposable and market income in USD PPP, 2010 (thousands)

	Mean Disposable household income			Mean household income before taxes and transfers			Median Disposable household income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Australia	33.0	32.3	33.7	35.0	34.1	36.0	27.9	27.6	28.3
Australian Capital Territory	42.6	40.4	44.8	49.9	46.8	53.0	39.5	36.6	42.5
New South Wales	33.6	32.5	34.8	36.1	34.5	37.7	28.8	27.9	29.7
Northern Territory	35.9	33.8	38.0	39.8	36.5	43.1	33.8	31.3	36.2
Queensland	31.7	30.7	32.6	33.0	31.6	34.4	27.6	27.0	28.2
South Australia	30.7	29.4	31.9	31.6	29.7	33.5	26.4	25.4	27.4
Tasmania	27.1	26.2	27.9	26.0	24.7	27.4	23.2	22.1	24.3
Victoria	31.8	30.8	32.7	33.3	31.9	34.7	26.7	25.9	27.5
Western Australia	37.6	33.9	41.3	41.6	36.9	46.3	29.7	28.6	30.9
Belgium	26.5	26.0	26.9	27.2	26.5	28.0	24.7	24.3	25.1
Bruxelles/Brussels	24.9	23.4	26.5	25.2	22.7	27.7	19.3	17.4	21.1
Région wallonne	24.7	24.0	25.4	24.3	23.2	25.4	23.3	22.4	24.2
Vlaams Gewest	27.7	27.1	28.4	29.3	28.1	30.4	26.1	25.5	26.7
Canada	34.1			30.5			29.6		
Alberta	42.5			40.7			35.0		
British Columbia	33.8			29.3			29.8		
Manitoba	30.8			28.1			27.3		
New Brunswick	29.7			24.6			26.2		
Newfoundland and Labrador	32.2			27.1			28.0		
Nova Scotia	29.8			25.7			26.9		
Ontario	35.0			31.4			30.7		
Prince Edward Island	29.5			24.6			26.6		
Quebec	30.1			26.4			26.8		
Saskatchewan	35.4			32.5			31.5		
Chile	15.6	14.9	16.3	16.4	15.7	17.2	9.5		
Antofagasta	20.3	18.2	22.4	21.6	19.4	23.9	14.0		
Araucanía	11.7	9.2	14.2	11.7	9.0	14.3	6.6		
Arica Y Parinacota	13.4	12.1	14.8	13.9	12.5	15.3	9.4		
Atacama	15.2	14.0	16.5	15.9	14.6	17.3	10.8		
Aysén	17.8	16.0	19.7	18.6	16.5	20.8	11.0		
Bío-Bío	12.2	10.4	14.0	12.6	10.6	14.5	7.5		
Coquimbo	12.0	11.1	12.9	12.4	11.3	13.4	8.8		
Los Lagos	12.1	11.2	12.9	12.4	11.4	13.3	7.9		
Los Rios	11.8	10.0	13.6	12.1	10.1	14.0	7.5		
Magallanes y Antártica	19.5	16.8	22.2	21.1	17.9	24.2	12.7		
Maule	11.1	10.1	12.2	11.3	10.1	12.4	7.6		
Metropolitana de Santiago	19.4	17.7	21.0	20.8	18.9	22.7	11.0		
O'Higgins	12.4	11.6	13.2	12.9	12.0	13.8	9.8		
Tarapacá	15.5	14.3	16.7	16.2	14.8	17.6	11.5		
Valparaíso	13.2	12.4	14.1	13.8	12.9	14.8	8.8		
Czech Republic	13.0	12.8	13.2	7.7	7.5	7.8	11.6	11.4	11.8
Jihovýchod	12.9	12.6	13.3	7.6	7.3	7.9	11.5	11.4	11.7
Jihozápad	12.7	12.4	13.0	7.5	7.2	7.8	11.4	11.0	11.7
Moravskoslezsko	11.2	11.0	11.5	6.4	6.1	6.6	10.3	10.0	10.6

	Mean Disposable household income			Mean household income before taxes and transfers			Median Disposable household income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Praha	16.5	16.0	17.0	10.1	9.7	10.5	14.3	13.7	14.9
Severovýchod	12.5	12.2	12.8	7.4	7.1	7.6	11.2	11.0	11.4
Severozápad	11.6	11.4	11.9	6.6	6.3	6.9	10.8	10.5	11.0
Stredni Cechy	14.5	14.1	14.9	8.8	8.5	9.2	13.1	12.6	13.6
Strední Morava	12.0	11.6	12.3	6.9	6.6	7.2	10.8	10.6	10.9
Denmark	29.0			35.5			26.7		
Hovedstaden	30.8			40.0			27.8		
Midtjylland	28.4			34.3			26.6		
Nordjylland	27.5			32.0			25.9		
Sjælland	28.8			34.8			27.1		
Syddanmark	27.8			32.8			26.0		
Finland	28.4	28.3	28.6	28.3	28.1	28.6	25.8	25.5	26.0
Etelä-Suomi	26.5	25.9	27.1	25.1	24.2	26.1	24.4	23.8	25.1
Helsinki-Uusimaa & Ahvenmaa	32.7	32.1	33.4	35.7	34.8	36.9	29.6	29.0	30.2
Länsi-Suomi	27.2	26.6	27.7	26.4	25.5	27.3	25.3	24.8	26.0
Pohjois- ja Itä-Suomi	26.4	25.7	27.2	24.2	23.2	25.3	24.0	23.2	24.8
France	28.5			24.2			24.2		
Alsace	30.9			28.7			26.0		
Aquitaine	28.0			23.1			24.5		
Auvergne	27.7			22.8			23.2		
Basse-Normandie	26.2			20.6			23.3		
Bourgogne	27.0			21.9			22.8		
Bretagne	27.8			22.7			24.3		
Centre (FR)	27.4			22.3			24.8		
Champagne-Ardenne	26.6			21.8			22.5		
Corse	28.0			21.3			22.6		
Franche-Comté	26.5			21.4			23.7		
Haute-Normandie	27.0			21.6			24.1		
Languedoc-Roussillon	25.4			19.5			22.0		
Limousin	25.0			18.8			21.6		
Lorraine	26.7			22.1			23.8		
Midi-Pyrénées	26.9			22.7			24.2		
Nord-Pas-De-Calais	25.6			21.1			21.8		
Pays de la Loire	26.5			21.7			23.3		
Picardie	26.1			21.4			23.1		
Poitou-Charentes	26.2			20.4			23.2		
Provence-Alpes-Côte d'Azur	27.5			22.5			23.2		
Rhône-Alpes	28.1			23.8			24.0		
Île de France	34.6			32.7			28.2		
Germany	29.4	29.1	29.8	32.1	31.6	32.6	25.9	25.6	26.2
Baden-Wuerttemberg	31.3	30.4	32.1	35.9	34.4	37.3	28.7	27.7	29.4
Bavaria	30.7	29.7	31.5	34.7	33.0	36.3	28.2	26.9	28.5
Berlin	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Brandeburg	25.0	24.1	26.1	24.3	21.9	26.4	23.5	22.2	24.6
Bremen	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Hamburg	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Hesse	33.5	31.1	34.9	39.7	37.0	42.4	28.1	27.0	30.5
Lower Saxony	28.9	27.8	30.1	30.1	28.5	32.3	27.1	26.3	28.2
Mecklenburg-West Pomerania	23.7	21.8	25.1	22.0	19.6	25.2	21.5	19.5	23.0

	Mean Disposable household income			Mean household income before taxes and transfers			Median Disposable household income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Northrine-Westphalia	30.6	29.9	32.0	33.9	32.0	35.6	26.1	25.2	26.9
Rhineland-Palatinate	28.4	26.5	31.3	31.7	28.9	36.3	24.9	23.6	26.7
Saarland	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Saxony	24.2	23.1	25.0	24.2	22.5	25.6	22.4	21.3	23.9
Saxony-Anhalt	24.4	23.0	25.9	23.5	20.7	26.3	21.3	20.4	23.2
Schleswig-Holstein	28.6	26.8	31.0	29.4	25.2	33.5	24.9	22.7	25.9
Thuringa	23.2	22.4	24.4	22.4	20.9	24.5	21.2	20.0	21.9
Greece	19.2	18.6	19.8	19.0	18.1	19.8	16.6	16.1	17.1
Attiki	20.9	19.9	21.9	21.7	20.1	23.3	18.3	17.3	19.3
Kentriki Ellada	17.4	16.6	18.3	16.1	14.8	17.4	14.9	13.8	16.0
Nisia Aigaiou - Kriti	20.4	18.9	21.9	20.7	18.2	23.3	18.4	16.8	19.9
Voreia Ellada	17.8	16.9	18.7	16.8	15.7	17.9	15.0	14.3	15.7
Hungary	9.5	5.7	5.8	8.2	4.8	5.1	8.5	5.1	5.2
Dunántúl	9.2	5.4	5.7	7.6	4.4	4.8	8.5	5.0	5.2
Közép-Magyarország	11.3	6.7	7.0	10.7	6.2	6.8	10.1	5.9	6.3
Észak és Alföld	8.5	5.0	5.2	6.8	4.0	4.2	7.6	4.5	4.6
Israel	21.1	20.9	21.2	22.3	22.1	22.5	17.9	17.7	18.0
Central District	25.7	25.4	26.0	28.7	28.2	29.1	23.1	22.8	23.4
Haifa District	21.0	20.6	21.3	22.0	21.5	22.5	17.9	17.6	18.4
Jerusalem District	15.9	15.5	16.2	16.0	15.4	16.5	11.5	11.1	12.0
Judea & Samaria Area	19.2	18.7	19.8	20.0	19.2	20.8	16.1	15.5	16.9
Northern District	16.4	16.2	16.7	16.2	15.9	16.6	13.5	13.0	13.8
Southern District	18.7	18.4	19.0	18.5	18.1	19.0	16.3	16.0	16.6
Tel Aviv District	25.2	24.8	25.7	27.7	27.1	28.4	21.4	20.9	21.8
Italy	24.8	24.6	25.1	23.4	23.2	23.7	21.9	21.7	22.1
Abruzzo	21.8	21.0	22.5	20.3	19.6	21.1	20.5	18.4	22.5
Basilicata	20.1	18.4	21.8	18.3	16.7	20.0	17.1	15.3	19.0
Calabria	19.1	18.0	20.3	17.4	16.2	18.6	16.6	15.6	17.6
Campania	18.6	17.9	19.4	17.2	16.5	18.0	16.2	15.4	17.1
Emilia-Romagna	30.1	28.8	31.5	28.6	27.3	30.0	26.3	25.3	27.3
Friuli-Venezia Giulia	27.1	25.2	29.0	25.7	23.8	27.6	23.9	22.9	24.9
Lazio	26.3	25.6	27.1	25.1	24.3	25.8	22.5	21.9	23.1
Liguria	27.0	25.2	28.8	26.0	24.2	27.9	23.8	23.0	24.6
Lombardia	29.3	28.6	30.1	28.1	27.3	28.8	25.9	25.2	26.6
Marche	26.1	24.7	27.5	24.6	23.2	26.0	23.5	22.3	24.7
Molise	20.8	19.3	22.4	19.4	17.9	20.9	18.1	16.9	19.3
Piemonte	27.7	26.7	28.8	26.3	25.2	27.3	24.9	24.2	25.6
Provincia Autonoma di Bolzano/Bozen	30.1	28.2	32.0	28.5	26.4	30.5	27.7	25.0	30.3
Provincia Autonoma di Trento	28.1	26.6	29.6	26.5	25.1	28.0	25.8	24.3	27.2
Puglia	20.2	19.5	20.9	18.5	17.7	19.3	17.3	16.3	18.3
Sardegna	22.3	21.2	23.3	20.7	19.7	21.7	20.5	19.4	21.7
Sicilia	16.9	16.0	17.8	15.4	14.5	16.4	14.6	13.5	15.7
Toscana	27.0	26.0	28.0	25.8	24.8	26.9	23.9	23.2	24.7
Umbria	25.3	24.5	26.2	24.1	23.3	25.0	23.5	22.9	24.0
Valle d'Aosta/Vallée d'Aoste	28.7	27.3	30.1	27.1	25.8	28.4	25.8	24.3	27.3
Veneto	26.3	25.7	27.0	25.1	24.4	25.7	23.6	22.9	24.3

	Mean Disposable household income			Mean household income before taxes and transfers			Median Disposable household income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Japan	22.2			21.9			19.2		
Chugoku	22.2			20.4			19.8		
Hokkaido	20.3			18.8			16.5		
Hokuriku	22.7			21.4			20.2		
Kinki	21.8			21.5			18.7		
Kyushu, Okinawa	18.4			17.2			15.5		
Northern-Kanto, Koshin	22.5			22.4			19.8		
Shikoku	19.8			18.3			16.7		
Southern-Kanto	25.0			26.4			21.8		
Tohoku	20.0			18.6			17.6		
Toukai	24.2			24.2			22.1		
Mexico	6.6	6.7	6.4	5.9	6.1	5.8	4.5	4.4	4.5
Aguacalientes	7.2	7.8	6.6	6.5	7.1	5.9	4.8	4.5	5.2
Baja California Norte	8.7	9.2	8.1	8.1	8.6	7.5	6.1	5.7	6.4
Baja California Sur	9.0	9.7	8.3	8.1	8.8	7.5	6.1	5.6	6.7
Campeche	7.2	8.0	6.3	6.4	7.3	5.6	4.4	4.1	4.7
Chiapas	3.8	4.1	3.5	3.2	3.5	2.9	2.3	2.1	2.5
Chihuahua	7.2	7.8	6.7	6.3	6.8	5.8	4.9	4.6	5.2
Coahuila	7.5	8.2	6.8	6.8	7.5	6.1	5.3	4.9	5.7
Colima	7.9	8.4	7.4	7.0	7.4	6.5	5.7	5.4	6.0
Distrito Federal (MX)	9.4	9.9	8.9	8.3	8.7	7.8	6.5	6.1	6.9
Durango	5.2	5.5	4.9	4.5	4.8	4.2	3.6	3.4	3.8
Guanajuato	6.3	6.7	5.9	5.8	6.2	5.4	4.5	4.2	4.8
Guerrero	4.0	4.4	3.5	3.5	3.9	3.0	2.3	2.0	2.6
Hidalgo	5.0	5.5	4.6	4.4	4.7	4.1	3.6	3.3	3.9
Jalisco	7.0	7.5	6.6	6.5	6.9	6.0	5.0	4.7	5.3
Mexico	7.0	7.9	6.1	6.5	7.4	5.7	4.8	4.5	5.1
Michoacan	5.4	5.9	5.0	5.0	5.4	4.6	3.8	3.4	4.1
Morelos	6.2	6.5	5.8	5.5	5.8	5.2	4.6	4.3	4.9
Nayarit	5.8	6.2	5.4	5.1	5.5	4.7	4.1	3.8	4.4
Nuevo Leon	9.8	10.7	8.9	9.0	9.9	8.1	7.1	6.6	7.6
Oaxaca	4.5	4.9	4.1	3.8	4.2	3.5	3.0	2.6	3.3
Puebla	4.6	4.9	4.3	4.2	4.5	3.9	3.3	3.0	3.5
Queretaro	7.6	8.3	6.9	6.9	7.6	6.3	5.0	4.7	5.4
Quintana Roo	7.0	7.5	6.5	6.6	7.1	6.1	5.0	4.8	5.3
San Luis Potosi	5.5	5.9	5.1	4.9	5.3	4.5	3.8	3.5	4.0
Sinaloa	6.8	7.3	6.4	6.1	6.4	5.7	4.9	4.6	5.2
Sonora	8.3	8.8	7.8	7.4	7.9	7.0	5.7	5.4	6.1
Tabasco	5.7	6.1	5.3	5.2	5.5	4.8	3.7	3.4	4.0
Tamaulipas	7.0	7.4	6.6	6.2	6.5	5.8	5.0	4.7	5.2
Tlaxcala	5.0	5.3	4.7	4.5	4.9	4.2	3.8	3.6	4.0
Veracruz	5.3	5.8	4.8	4.6	5.2	4.1	3.6	3.4	3.8
Yucatan	6.4	6.8	6.0	5.6	6.0	5.3	4.5	4.2	4.8
Zacatecas	5.2	5.7	4.6	4.5	4.9	4.0	3.2	2.9	3.5
Netherlands	29.6			37.6			25.9		
Noord-Nederland	26.8			32.3			23.8		
Oost-Nederland	28.9			36.2			25.6		
West-Nederland	30.5			39.8			26.4		
Zuid-Nederland	29.3			36.6			26.0		

	Mean Disposable household income			Mean household income before taxes and transfers			Median Disposable household income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
New Zealand	28.6	27.2	30.0	31.5	29.7	33.3	23.3	22.9	23.7
North Island (NZ)	28.7	27.0	30.4	31.8	29.5	34.1	23.3	22.8	23.9
South Island (NZ)	28.4	26.0	30.7	30.7	28.0	33.4	23.2	22.6	23.5
Norway	36.4			39.4			33.9		
Agder og Rogaland	37.9			42.3			34.8		
Hedmark og Oppland	33.4			32.8			32.0		
Nord-Norge	35.1			35.1			33.7		
Oslo og Akershus	38.8			45.3			35.4		
Sør-Østlandet	35.1			36.0			33.0		
Trøndelag	34.1			35.7			32.8		
Vestlandet	36.2			39.5			34.3		
Poland	11.5	6.6	6.8	11.5	6.5	6.8	10.1	5.8	6.0
Region Centralny	12.4	7.0	7.4	12.8	7.1	7.8	10.3	5.8	6.2
Region Poludniowo-[illegible]	12.4	6.8	7.6	12.3	6.6	7.7	10.7	6.0	6.5
Region Poludniowy	11.8	6.6	7.1	11.5	6.4	7.0	10.7	6.0	6.4
Region Pólnocno-[illegible]	11.1	6.3	6.7	11.0	6.1	6.7	10.3	5.7	6.2
Region Pólnocny	11.4	6.3	6.9	11.5	6.2	7.1	10.0	5.5	6.1
Region Wschodni	10.3	5.8	6.2	10.0	5.5	6.1	8.9	4.9	5.4
Slovak Republic	16.0	15.7	16.3	14.0	13.6	14.3	14.5	14.2	14.8
Bratislavský kraj	19.1	18.2	20.0	18.1	16.8	19.5	17.4	16.4	18.4
Stredné Slovensko	16.0	15.4	16.6	14.2	13.4	14.9	14.6	14.0	15.2
Východné Slovensko	15.0	14.5	15.4	12.6	12.1	13.2	14.0	13.6	14.3
Západné Slovensko	15.9	15.4	16.5	13.6	13.0	14.2	14.3	13.9	14.6
Slovenia	21.8	21.5	22.0	22.1	21.8	22.5	20.3	19.9	20.7
Vzhodna Slovenija	20.6	20.3	20.8	20.4	20.0	20.9	19.3	19.0	19.7
Zahodna Slovenija	23.1	22.7	23.4	23.9	23.4	24.5	21.5	21.2	21.8
Spain	22.0	21.8	22.2	19.9	19.6	20.1	19.5	19.2	19.7
Andalucía	18.5	18.1	19.0	15.9	15.3	16.5	15.9	15.4	16.3
Aragón	23.5	22.8	24.2	21.4	20.4	22.4	22.1	21.3	22.9
Asturias	23.5	22.8	24.3	19.1	18.1	20.0	21.1	20.3	22.0
Baleares	23.0	22.1	23.9	21.7	20.6	22.9	21.3	20.0	22.5
Canarias (ES)	19.2	18.3	20.1	17.4	16.3	18.5	16.3	15.5	17.1
Cantabria	22.6	21.6	23.7	18.5	17.3	19.7	20.6	19.5	21.6
Castilla y León	21.6	21.0	22.3	18.9	18.0	19.8	19.3	18.3	20.3
Castilla-La Mancha	19.3	18.5	20.2	17.8	16.7	19.0	16.7	15.8	17.6
Cataluña	23.5	23.0	24.0	21.7	20.9	22.4	21.5	20.8	22.1
Ciudad Autónoma de Ceuta (ES)	22.0	20.0	24.0	20.2	17.9	22.4	17.4	15.5	19.2
Ciudad Autónoma de Melilla (ES)	20.8	18.5	23.1	19.6	16.8	22.4	18.6	17.0	20.2
Comunidad Valenciana	21.2	20.7	21.8	18.9	18.2	19.7	18.8	18.1	19.5
Comunidad de Madrid	26.0	25.3	26.6	25.5	24.6	26.3	23.2	22.5	23.9
Extremadura	17.4	16.7	18.2	15.2	14.1	16.2	14.7	14.2	15.2
Galicia	21.4	20.8	21.9	17.8	17.1	18.6	19.3	18.6	19.9
La Rioja (ES)	21.2	20.4	22.1	19.2	18.1	20.3	19.9	18.9	20.8
Navarra	28.8	27.5	30.1	27.1	25.6	28.7	26.9	25.6	28.2
País Vasco	27.3	26.5	28.0	24.6	23.5	25.7	25.3	24.3	26.4
Región de Murcia	18.3	17.6	19.1	16.4	15.3	17.4	16.6	15.9	17.4
Sweden	28.0			29.9			25.6		
Mellersta Norrland	25.8			26.7			24.4		
Norra Mellansverige	25.6			26.0			24.4		

	Mean Disposable household income			Mean household income before taxes and transfers			Median Disposable household income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Småland med öarna	26.1			26.7			24.8		
Stockholm	32.0			36.8			28.8		
Sydsverige	27.4			28.9			24.8		
Västsverige	27.4			28.9			25.8		
Östra Mellansverige	27.2			28.5			24.7		
Övre Norrland	26.2			27.0			24.7		
Switzerland	26.4	26.0	26.9	31.1	30.4	31.8	23.1	22.6	23.6
Espace Mittelland	23.2	22.7	23.8	27.3	26.5	28.1	20.9	20.3	21.6
Nordwestschweiz	27.2	26.3	28.0	32.1	30.6	33.5	23.3	21.6	25.0
Ostschweiz	24.7	24.1	25.3	29.0	28.0	30.1	22.6	21.7	23.5
Région lémanique	27.0	25.7	28.3	32.4	30.6	34.2	23.0	22.7	23.3
Ticino	21.5	21.1	21.9	21.5	20.3	22.7	19.4	18.5	20.3
Zentralschweiz	27.9	26.9	28.9	32.6	31.1	34.1	24.4	23.6	25.1
Zürich	31.2	30.5	31.8	37.1	36.0	38.1	26.2	25.7	26.8
Turkey	11.5	11.2	11.8	9.5	9.3	9.8	8.6	8.4	8.7
Akdeniz	10.9	10.3	11.4	9.1	8.7	9.6	7.7	7.5	7.8
Bati Anadolu	13.4	12.8	14.0	11.1	10.6	11.5	10.2	9.8	10.6
Bati Karadeniz	10.3	10.0	10.6	7.6	7.4	7.9	8.5	8.2	8.8
Bati Marmara	11.2	10.7	11.7	8.9	8.5	9.4	8.6	8.4	8.7
Dogu Karadeniz	10.1	9.6	10.5	7.9	7.6	8.3	8.1	7.7	8.5
Dogu Marmara	11.5	11.2	11.9	9.2	8.9	9.5	9.3	9.0	9.6
Ege	13.8	13.2	14.5	11.3	10.7	11.8	10.0	9.4	10.6
Güneydogu Anadolu	5.9	5.7	6.2	5.2	4.9	5.4	4.2	3.9	4.6
Istanbul	15.4	14.7	16.2	13.3	12.6	14.0	11.4	11.1	11.7
Kuzeydogu Anadolu	8.1	7.8	8.5	7.0	6.6	7.3	6.1	5.8	6.4
Orta Anadolu	10.4	10.0	10.8	8.7	8.3	9.1	8.1	7.8	8.4
Ortadogu Anadolu	7.4	6.9	8.0	6.3	5.8	6.7	5.2	4.5	5.9
United Kingdom	29.2			31.0			24.0		
East Midlands (UK)	26.6			27.3			23.0		
East of England	32.4			36.1			26.0		
London	35.6			40.9			26.5		
North East (UK)	25.1			24.2			21.8		
North West (UK)	26.2			25.7			22.5		
Northern Ireland (UK)	24.9			24.0			21.5		
Scotland	28.5			30.1			24.1		
South East (UK)	34.1			38.9			28.1		
South West (UK)	27.9			28.9			24.3		
Wales	25.9			25.2			22.4		
West Midlands (UK)	25.7			25.3			22.1		
Yorkshire and The	26.0			26.0			21.8		
United States	38.8	38.6	39.1	41.9	41.6	42.3	31.1	30.9	31.3
Alabama	35.1	32.9	37.4	35.5	32.4	38.6	28.3	25.4	31.2
Alaska	42.9	40.9	44.9	45.7	42.9	48.6	37.0	34.9	39.1
Arizona	36.9	34.7	39.0	38.4	35.5	41.4	29.2	27.7	30.6
Arkansas	31.7	29.9	33.5	31.1	28.5	33.7	26.7	24.8	28.6
California	40.1	39.3	40.9	45.0	43.7	46.2	30.7	30.1	31.4
Colorado	42.3	40.7	43.8	46.9	44.8	49.1	35.8	34.2	37.4
Connecticut	48.8	47.0	50.7	57.4	54.4	60.3	39.0	37.8	40.1
Delaware	37.6	36.4	38.8	39.8	38.0	41.6	32.6	31.4	33.8
District of Columbia	50.5	48.0	53.0	63.2	59.1	67.2	36.8	33.7	39.9
Florida	37.9	36.9	38.9	38.1	36.7	39.6	29.5	28.7	30.4

	Mean Disposable household income			Mean household income before taxes and transfers			Median Disposable household income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Georgia	35.7	34.3	37.0	39.0	37.0	41.0	28.3	27.0	29.5
Hawaii	40.2	38.8	41.6	43.2	41.1	45.3	33.8	32.3	35.3
Idaho	33.6	32.2	34.9	34.3	32.4	36.1	27.8	25.8	29.8
Illinois	40.0	38.6	41.4	45.3	43.2	47.5	31.4	30.1	32.6
Indiana	35.2	33.6	36.8	37.6	35.4	39.9	29.2	27.5	30.9
Iowa	37.2	36.3	38.1	40.3	39.1	41.6	32.0	31.1	32.8
Kansas	36.9	35.5	38.3	39.2	37.2	41.2	30.5	29.3	31.8
Kentucky	31.8	30.5	33.2	32.7	30.7	34.8	26.8	25.4	28.2
Louisiana	33.4	31.4	35.4	34.4	31.7	37.2	26.9	24.9	28.8
Maine	37.5	36.1	38.8	39.6	37.6	41.6	31.9	30.7	33.2
Maryland	48.6	46.8	50.3	53.4	50.8	55.9	41.0	39.4	42.5
Massachusetts	46.5	44.5	48.6	53.3	50.1	56.6	39.1	37.5	40.7
Michigan	37.9	36.7	39.2	39.4	37.5	41.4	31.8	30.7	32.9
Minnesota	42.2	40.9	43.6	46.9	44.9	48.9	37.0	35.7	38.2
Mississippi	31.9	29.1	34.8	32.2	28.1	36.4	27.0	25.1	28.8
Missouri	37.9	35.9	39.9	41.1	37.9	44.2	30.2	28.4	31.9
Montana (US)	32.3	30.8	33.8	31.9	30.0	33.8	28.2	26.8	29.6
Nebraska	39.2	38.1	40.3	43.5	41.9	45.1	34.2	32.7	35.6
Nevada	36.8	35.1	38.6	37.4	34.9	39.8	29.3	27.9	30.6
New Hampshire	47.7	45.9	49.4	51.5	49.0	54.0	41.7	40.2	43.1
New Jersey	47.7	45.9	49.6	54.5	51.4	57.5	39.0	37.4	40.5
New Mexico	36.1	33.4	38.8	37.5	33.4	41.6	27.0	25.1	29.0
New York	39.2	38.1	40.3	44.1	42.4	45.9	30.9	30.1	31.7
North Carolina	33.8	32.4	35.1	36.5	34.3	38.6	27.7	26.7	28.7
North Dakota	43.3	41.0	45.6	48.1	44.9	51.3	37.0	35.1	38.9
Ohio	35.9	34.7	37.1	37.6	35.8	39.5	29.8	28.5	31.1
Oklahoma	36.7	34.8	38.6	38.9	36.0	41.7	29.4	27.8	31.0
Oregon	36.1	34.5	37.8	38.1	35.8	40.5	30.5	28.6	32.4
Pennsylvania	39.5	38.3	40.7	42.2	40.5	44.0	32.5	31.5	33.5
Rhode Island	41.3	39.8	42.9	44.1	41.9	46.3	34.9	33.2	36.5
South Carolina	31.6	30.5	32.7	31.5	29.9	33.2	27.2	26.0	28.3
South Dakota	36.9	35.2	38.6	37.9	35.6	40.2	31.6	30.2	33.0
Tennessee	34.7	32.9	36.5	34.4	32.0	36.8	28.2	26.4	30.0
Texas	38.6	37.5	39.6	40.9	39.5	42.3	29.3	28.4	30.1
Utah	36.9	35.4	38.5	40.5	38.0	42.9	30.3	28.8	31.8
Vermont	39.9	38.5	41.2	42.8	40.8	44.8	34.4	33.1	35.7
Virginia	43.4	41.9	45.0	49.0	46.7	51.3	35.8	34.2	37.4
Washington	43.5	41.6	45.4	45.4	42.8	48.0	35.1	33.9	36.4
West Virginia	33.4	31.3	35.4	33.7	30.8	36.6	28.3	26.9	29.6
Wisconsin	37.9	36.6	39.3	40.9	38.9	42.9	32.5	30.7	34.4
Wyoming	40.0	38.6	41.4	41.8	39.9	43.6	34.6	33.1	36.2

Note: Data for Canada, Denmark, Germany, Israel, Italy, New Zealand, Norway and Sweden refer to household income measured in 2011. For all the other countries the household income is measured in 2010. Spain and United Kingdom provided estimates for three-year averages (2008-2010 income figures for Spain, 2010-2012 income figures for United Kingdom). "N.P." means "not-publishable", *i.e.* precision or sample size is rated as too low according to national criteria.

Table A1.2. Selected income distribution indicators

	Gini disposable income			Gini Market Income			S80/S20 disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Australia	0.33	0.32	0.34	0.47	0.46	0.48	5.7	5.2	6.2
Australian Capital Territory	0.29	0.27	0.3	0.35	0.33	0.37	4.7	3.3	6.1
New South Wales	0.34	0.33	0.36	0.48	0.46	0.49	6.0	5.1	6.9
Northern Territory	0.28	0.25	0.31	0.37	0.33	0.41	4.6	2.9	6.3
Queensland	0.31	0.3	0.33	0.45	0.43	0.47	5.0	4.3	5.8
South Australia	0.32	0.3	0.34	0.47	0.45	0.5	5.1	4.1	6.0
Tasmania	0.30	0.28	0.31	0.48	0.46	0.5	4.5	3.8	5.2
Victoria	0.33	0.31	0.34	0.46	0.45	0.48	5.4	4.7	6.1
Western Australia	0.38	0.33	0.42	0.49	0.45	0.53	6.9	4.6	9.2
Austria	0.27	3.75	4.02				3.9	0.3	0.3
Burgenland (AT)	0.25	3.02	4.28				3.7	0.2	0.3
Kärnten	0.25	3.23	4.17				3.7	0.2	0.3
Niederösterreich	0.25	3.33	3.88				3.6	0.2	0.3
Oberösterreich	0.24	3.07	3.62				3.4	0.2	0.3
Salzburg	0.28	3.48	4.5				4.0	0.3	0.3
Steiermark	0.25	3.28	3.91				3.6	0.2	0.3
Tirol	0.26	3.32	4.19				3.8	0.2	0.3
Vorarlberg	0.28	3.12	4.69				3.9	0.2	0.3
Wien	0.31	4.44	5.1				4.8	0.3	0.3
Belgium	0.25	0.23	0.27	0.45	0.43	0.47	3.9	3.8	4.1
Bruxelles/Brussels	0.35	0.32	0.37	0.52	0.49	0.54	6.1	5.5	6.7
Région wallonne	0.25	0.23	0.26	0.45	0.43	0.46	3.9	3.6	4.2
Vlaams Gewest	0.24	0.21	0.27	0.44	0.4	0.47	3.5	3.2	3.8
Canada	0.32			0.44			2.5		
Alberta	0.34			0.43			2.6		
British Columbia	0.32			0.43			2.6		
Manitoba	0.30			0.41			2.4		
New Brunswick	0.28			0.43			2.3		
Newfoundland and Labrador	0.31			0.48			2.6		
Nova Scotia	0.28			0.42			2.4		
Ontario	0.31			0.44			2.6		
Prince Edward Island	0.28			0.42			2.4		
Quebec	0.29			0.44			2.3		
Saskatchewan	0.3			0.41			2.6		
Chile	0.5	0.5	0.51	0.52	0.52	0.53	13.0	12.5	13.5
Antofagasta	0.44	0.43	0.44	0.45	0.44	0.46	9.7	4.5	17.4
Araucanía	0.53	0.5	0.57	0.56	0.53	0.59	15.2	5.6	31.7
Arica Y Parinacota	0.44	0.42	0.46	0.45	0.43	0.47	9.3	5.1	18.7
Atacama	0.44	0.43	0.45	0.46	0.44	0.47	10.3	6.9	15.8
Aysén	0.49	0.48	0.5	0.51	0.5	0.52	12.6	8.1	18.8
Bío-Bío	0.5	0.47	0.52	0.52	0.54	0.5	11.9	7.2	17.7
Coquimbo	0.41	0.4	0.43	0.43	0.42	0.45	8.6	5.5	13.0
Los Lagos	0.47	0.46	0.49	0.5	0.49	0.52	10.6	7.6	14.5
Los Rios	0.48	0.46	0.49	0.5	0.49	0.52	10.9	6.0	17.3
Magallanes y Antártica	0.48	0.45	0.5	0.5	0.48	0.52	11.3	6.0	19.2
Maule	0.44	0.43	0.45	0.47	0.48	0.46	9.1	6.0	12.9
Metropolitana de Santiago	0.52	0.51	0.53	0.54	0.54	0.55	14.0	9.8	20.1
O'Higgins	0.4	0.38	0.41	0.41	0.4	0.42	8.0	4.8	12.2
Tarapacá	0.42	0.41	0.43	0.43	0.42	0.44	9.9	6.5	14.7
Valparaíso	0.46	0.45	0.47	0.48	0.47	0.49	10.7	7.8	14.5
Czech Republic	0.26	0.25	0.26	0.41	0.4	0.42	3.6	3.5	3.8
Jihovýchod	0.25	0.21	0.29	0.41	0.35	0.47	3.5	3.3	3.7
Jihozápad	0.23	0.2	0.27	0.39	0.32	0.45	3.2	3.0	3.4
Moravskoslezsko	0.24	0.19	0.29	0.43	0.34	0.52	3.5	3.2	3.8
Praha	0.29	0.27	0.31	0.4	0.37	0.43	4.2	3.9	4.5
Severovýchod	0.24	0.2	0.28	0.4	0.34	0.46	3.2	3.0	3.5

	Gini disposable income			Gini Market Income			S80/S20 disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Severozápad	0.26	0.21	0.3	0.44	0.35	0.52	3.9	3.5	4.2
Stredni Cechy	0.24	0.21	0.27	0.38	0.34	0.43	3.4	3.2	3.7
Strední Morava	0.24	0.19	0.29	0.41	0.33	0.5	3.3	3.1	3.6
Denmark	0.25			0.43			3.6		
Hovedstaden	0.28			0.44			4.2		
Midtjylland	0.24			0.41			3.4		
Nordjylland	0.23			0.42			3.3		
Sjælland	0.23			0.41			3.3		
Syddanmark	0.24			0.42			3.3		
Finland	0.26	0.26	0.27	0.49	0.48	0.49	3.8	3.7	3.9
Etelä-Suomi	0.25	0.24	0.26	0.5	0.48	0.51	3.6	3.4	3.8
Helsinki-Uusimaa & Ahvenmaa	0.27	0.26	0.28	0.45	0.43	0.47	3.9	3.7	4.1
Länsi-Suomi	0.25	0.24	0.26	0.48	0.46	0.49	3.6	3.4	3.7
Pohjois- ja Itä-Suomi	0.26	0.25	0.28	0.51	0.49	0.53	3.7	3.5	4.0
France	0.30			0.5			4.5		
Alsace	0.32			0.51			4.3		
Aquitaine	0.28			0.50			4.2		
Auvergne	0.31			0.53			4.0		
Basse-Normandie	0.27			0.50			3.9		
Bourgogne	0.31			0.54			3.9		
Bretagne	0.27			0.48			3.8		
Centre (FR)	0.26			0.47			3.9		
Champagne-Ardenne	0.28			0.49			4.2		
Corse	0.35			0.61			4.8		
Franche-Comté	0.26			0.48			3.9		
Haute-Normandie	0.25			0.47			4.0		
Languedoc-Roussillon	0.3			0.54			4.5		
Limousin	0.27			0.51			4.0		
Lorraine	0.27			0.48			4.1		
Midi-Pyrénées	0.27			0.47			4.3		
Nord-Pas-De-Calais	0.30			0.52			4.2		
Pays de la Loire	0.27			0.48			3.8		
Picardie	0.27			0.48			4.1		
Poitou-Charentes	0.26			0.48			4.0		
Provence-Alpes-Côte d'Azur	0.31			0.52			4.7		
Rhône-Alpes	0.29			0.47			4.4		
Île de France	0.34			0.50			5.4		
Germany	0.29	0.28	0.3	0.47	0.46	0.47	4.3	4.2	4.5
Baden-	0.26	0.25	0.27	0.43	0.42	0.45	3.8	3.6	4.1
Bavaria	0.28	0.26	0.29	0.44	0.42	0.45	4.2	3.8	4.5
Berlin	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Brandeburg	0.25	0.23	0.26	0.49	0.45	0.52	3.6	3.3	4.3
Bremen	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Hamburg	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Hesse	0.31	0.29	0.33	0.46	0.43	0.49	4.6	4.2	5.1
Lower Saxony	0.26	0.25	0.29	0.45	0.42	0.47	4.0	3.7	4.5
Mecklenburg-West Pomerania	0.27	0.25	0.3	0.49	0.44	0.53	3.6	2.6	4.0
Northrine-Westphalia	0.3	0.28	0.31	0.46	0.44	0.47	4.5	4.2	4.9
Rhineland-Palatinate	0.3	0.27	0.36	0.48	0.44	0.52	4.5	3.7	5.5
Saarland	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Saxony	0.25	0.24	0.28	0.49	0.47	0.52	3.4	3.1	3.8
Saxony-Anhalt	0.28	0.26	0.3	0.51	0.48	0.54	4.2	3.9	4.6
Schleswig-Holstein	0.29	0.26	0.31	0.47	0.43	0.51	4.3	3.8	5.2
Thuringa	0.23	0.22	0.25	0.47	0.44	0.5	3.3	3.1	3.5

	Gini disposable income			Gini Market Income			S80/S20 disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Greece	0.33	0.32	0.33	0.46	0.45	0.48	6.0	5.6	6.4
Attiki	0.32	0.31	0.34	0.46	0.44	0.49	6.5	5.7	7.3
Kentriki Ellada	0.31	0.29	0.32	0.46	0.43	0.48	5.0	4.6	5.5
Nisia Aigaiou - Kriti	0.3	0.28	0.32	0.43	0.4	0.47	5.1	4.1	6.2
Voreia Ellada	0.34	0.32	0.35	0.46	0.43	0.48	6.0	5.2	6.7
Hungary	0.27	0.26	0.27	0.44	0.44	0.45	3.9	3.8	4.0
Dunántúl	0.24	0.23	0.25	0.42	0.4	0.43	3.5	3.3	3.7
Közép-Magyarország	0.28	0.27	0.29	0.42	0.4	0.43	4.1	3.9	4.3
Észak és Alföld	0.26	0.25	0.26	0.46	0.45	0.47	3.6	3.5	3.7
Israel	0.38	0.38	0.38	0.48	0.48	0.48	7.4		
Central District	0.32	0.32	0.32	0.41	0.41	0.41	5.8		
Haifa District	0.36	0.36	0.36	0.47	0.47	0.47	6.7		
Jerusalem District	0.43	0.43	0.43	0.55	0.55	0.55	10.9		
Judea & Samaria Area	0.36	0.36	0.36	0.47	0.47	0.47	7.1		
Northern District	0.36	0.36	0.36	0.47	0.47	0.47	6.4		
Southern District	0.34	0.34	0.34	0.48	0.48	0.48	6.4		
Tel Aviv District	0.36	0.36	0.36	0.46	0.46	0.46	6.8		
Italy	0.32	0.32	0.33	0.34	0.34	0.35	5.6	5.5	5.8
Abruzzo	0.28	0.25	0.32	0.31	0.27	0.34	4.7	3.7	5.7
Basilicata	0.35	0.31	0.4	0.40	0.35	0.44	7.3	4.8	9.7
Calabria	0.32	0.29	0.34	0.36	0.33	0.38	5.6	4.7	6.4
Campania	0.34	0.33	0.36	0.38	0.36	0.40	6.9	6.1	7.8
Emilia-Romagna	0.3	0.27	0.32	0.31	0.28	0.33	4.4	3.9	4.9
Friuli-Venezia Giulia	0.29	0.24	0.33	0.30	0.26	0.35	4.1	3.4	4.8
Lazio	0.32	0.31	0.34	0.34	0.33	0.35	5.5	5.1	5.9
Liguria	0.30	0.25	0.34	0.31	0.27	0.36	4.8	3.8	5.8
Lombardia	0.30	0.28	0.31	0.31	0.29	0.32	4.7	4.3	5.1
Marche	0.29	0.27	0.32	0.32	0.29	0.34	4.7	4.1	5.3
Molise	0.30	0.28	0.33	0.33	0.30	0.37	4.9	4.0	5.7
Piemonte	0.31	0.29	0.33	0.32	0.30	0.34	5.2	4.6	5.7
Provincia Autonoma di Bolzano/Bozen	0.28	0.25	0.31	0.30	0.27	0.33	4.1	3.7	4.5
Provincia Autonoma di Trento	0.28	0.25	0.3	0.29	0.26	0.32	4.2	3.7	4.8
Puglia	0.31	0.30	0.34	0.35	0.33	0.37	5.3	4.8	5.9
Sardegna	0.30	0.28	0.32	0.33	0.30	0.35	5.2	4.5	5.8
Sicilia	0.36	0.34	0.38	0.39	0.37	0.41	7.9	6.2	9.6
Toscana	0.29	0.28	0.3	0.31	0.29	0.32	4.5	4.2	4.9
Umbria	0.27	0.26	0.29	0.29	0.27	0.30	4.3	3.9	4.7
Valle d'Aosta/Vallée d'Aoste	0.28	0.26	0.3	0.30	0.28	0.32	4.1	3.6	4.7
Veneto	0.27	0.26	0.28	0.29	0.27	0.30	40.0	3.8	4.3
Japan	0.34	0.33	0.34	0.49	0.48	0.49	3.7		
Chugoku	0.3	0.3	0.31	0.47	0.46	0.48	3.4		
Hokkaido	0.36	0.34	0.39	0.58	0.55	0.60	3.2		
Hokuriku	0.31	0.3	0.32	0.45	0.44	0.46	3.3		
Kinki	0.34	0.33	0.35	0.50	0.48	0.51	3.7		
Kyushu, Okinawa	0.35	0.34	0.36	0.51	0.50	0.52	3.8		
Northern-Kanto, Koshin	0.33	0.32	0.34	0.47	0.46	0.48	3.7		
Shikoku	0.35	0.34	0.36	0.53	0.51	0.54	3.7		
Southern-Kanto	0.33	0.32	0.35	0.47	0.46	0.48	3.6		
Tohoku	0.33	0.32	0.33	0.47	0.46	0.48	3.6		
Toukai	0.31	0.30	0.31	0.44	0.43	0.46	3.3		
Mexico	0.48			0.51			14.1		
Aguacalientes	0.47			0.49			22.8		
Baja California Norte	0.45			0.47			55.2		
Baja California Sur	0.49			0.51			46.7		
Campeche	0.52			0.55			17.2		
Chiapas	0.51			0.59			2.5		
Chihuahua	0.48			0.51			21.7		
Coahuila	0.45			0.47			27.6		
Colima	0.44			0.46			37.0		

	Gini disposable income			Gini Market Income			S80/S20 disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Distrito Federal (MX)	0.44			0.47			101.3		
Durango	0.47			0.5			7.5		
Guanajuato	0.45			0.47			14.2		
Guerrero	0.53			0.59			2.8		
Hidalgo	0.46			0.48			5.9		
Jalisco	0.46			0.47			22.1		
Mexico	0.46			0.48			18.5		
Michoacan	0.47			0.49			7.6		
Morelos	0.42			0.43			15.0		
Nayarit	0.49			0.51			10.7		
Nuevo Leon	0.45			0.47			67.5		
Oaxaca	0.51			0.56			4.6		
Puebla	0.46			0.5			4.2		
Queretaro	0.49			0.51			24.3		
Quintana Roo	0.47			0.48			20.8		
San Luis Potosi	0.47			0.51			8.2		
Sinaloa	0.46			0.48			18.1		
Sonora	0.46			0.49			39.1		
Tabasco	0.49			0.52			8.4		
Tamaulipas	0.44			0.46			19.9		
Tlaxcala	0.41			0.44			5.9		
Veracruz	0.48			0.52			6.8		
Yucatan	0.45			0.48			13.9		
Zacatecas	0.52			0.56			6.7		
Netherlands	0.29			0.43			4.3		
Noord-Nederland	0.27			0.42			3.9		
Oost-Nederland	0.27			0.41			3.9		
West-Nederland	0.30			0.44			4.7		
Zuid-Nederland	0.27			0.41			4.0		
New Zealand	0.35	0.34	0.36	0.48	0.47	0.49	5.7		
North Island (NZ)	0.35	0.34	0.36	0.49	0.48	0.5	5.8		
South Island (NZ)	0.34	0.32	0.37	0.47	0.45	0.48	5.6		
Norway	0.25			0.42			3.7		
Agder og Rogaland	0.25			0.41			3.6		
Hedmark og Oppland	0.22			0.42			3.1		
Nord-Norge	0.22			0.40			3.1		
Oslo og Akershus	0.29			0.44			4.8		
Sør-Østlandet	0.23			0.42			3.3		
Trøndelag	0.24			0.41			3.7		
Vestlandet	0.24			0.4			3.5		
Poland	0.31	0.3	0.31	0.42	0.42	0.43	4.9	4.7	5.1
Region Centralny	0.33	0.31	0.34	0.45	0.43	0.46	5.3	5.0	5.7
Region Poludniowo-Zachodni	0.31	0.28	0.34	0.43	0.4	0.46	4.9	4.3	5.5
Region Poludniowy	0.30	0.29	0.31	0.41	0.39	0.42	5.0	4.6	5.3
Region Pólnocno-Zachodni	0.28	0.27	0.29	0.39	0.37	0.4	4.4	4.0	4.7
Region Pólnocny	0.30	0.28	0.32	0.41	0.39	0.43	4.5	4.0	5.0
Region Wschodni	0.30	0.29	0.32	0.44	0.43	0.46	4.7	4.4	5.1
Slovak Republic	0.26	0.24	0.27	0.39	0.38	0.4	3.9	3.7	4.1
Bratislavský kraj	0.26	0.24	0.28	0.38	0.34	0.41	3.8	3.4	4.3
Stredné Slovensko	0.27	0.25	0.28	0.39	0.37	0.42	3.9	3.5	4.3
Východné Slovensko	0.25	0.24	0.26	0.37	0.35	0.39	3.8	3.5	4.1
Západné Slovensko	0.26	0.23	0.30	0.38	0.36	0.40	3.8	3.5	4.2
Slovenia	0.25	0.24	0.25	0.45	0.45	0.46	3.7	3.6	3.8
Vzhodna Slovenija	0.25	0.23	0.26	0.46	0.42	0.49	3.7	3.5	3.8
Zahodna Slovenija	0.24	0.23	0.25	0.45	0.42	0.47	3.6	3.4	3.8
Spain	0.33	0.33	0.33	0.49	0.49	0.49	6.2	6.1	6.4
Andalucía	0.35	0.34	0.36	0.53	0.52	0.54	7.6	6.9	8.3
Aragón	0.29	0.28	0.31	0.46	0.44	0.47	5.4	4.8	6.0
Asturias	0.29	0.28	0.31	0.5	0.48	0.52	4.8	4.3	5.3
Baleares	0.33	0.31	0.35	0.45	0.43	0.47	6.9	5.8	8.0
Canarias (ES)	0.35	0.33	0.37	0.5	0.48	0.52	7.1	6.3	7.9

	Gini disposable income			Gini Market Income			S80/S20 disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Cantabria	0.31	0.29	0.33	0.47	0.45	0.49	5.8	5.0	6.5
Castilla y León	0.32	0.31	0.33	0.5	0.49	0.52	6.1	5.5	6.6
Castilla-La Mancha	0.34	0.33	0.36	0.51	0.49	0.53	7.0	6.2	7.8
Cataluña	0.30	0.29	0.31	0.46	0.45	0.47	5.3	5.0	5.6
Ciudad Autónoma de Ceuta (ES)	0.38	0.35	0.41	0.48	0.44	0.52	10.4	6.6	14.2
Ciudad Autónoma de Melilla (ES)	0.38	0.35	0.42	0.5	0.46	0.54	12.6	8.9	16.2
Comunidad Valenciana	0.32	0.31	0.33	0.49	0.47	0.5	5.6	5.2	6.0
Comunidad de Madrid	0.32	0.31	0.32	0.44	0.43	0.45	5.8	5.4	6.2
Extremadura	0.35	0.34	0.37	0.54	0.52	0.56	6.8	5.9	7.8
Galicia	0.3	0.29	0.31	0.49	0.48	0.51	5.2	4.8	5.7
La Rioja (ES)	0.32	0.3	0.33	0.48	0.46	0.5	6.4	5.5	7.4
Navarra	0.28	0.26	0.29	0.42	0.4	0.44	4.6	4.0	5.2
País Vasco	0.29	0.28	0.3	0.46	0.44	0.47	5.1	4.7	5.5
Región de Murcia	0.32	0.31	0.34	0.47	0.45	0.49	6.9	6.0	7.7
Sweden	0.27			0.44			4.1		
Mellersta Norrland	0.23			0.39			3.5		
Norra Mellansverige	0.25			0.44			3.7		
Småland med öarna	0.24			0.41			3.5		
Stockholm	0.30			0.44			4.9		
Sydsverige	0.29			0.46			4.4		
Västsverige	0.26			0.41			3.9		
Östra Mellansverige	0.27			0.44			4.0		
Övre Norrland	0.23			0.40			3.4		
Switzerland	0.30	0.29	0.31	0.42	0.41	0.43	4.6	4.4	4.8
Espace Mittelland	0.27	0.22	0.32	0.4	0.33	0.47	4.1	4.0	4.3
Nordwestschweiz	0.29	0.24	0.34	0.41	0.34	0.48	4.4	4.0	4.7
Ostschweiz	0.26	0.21	0.31	0.37	0.29	0.44	3.8	3.5	4.2
Région lémanique	0.32	0.27	0.38	0.45	0.39	0.52	5.2	4.8	5.6
Ticino	0.26	0.21	0.31	0.46	0.30	0.62	3.8	3.5	4.2
Zentralschweiz	0.28	0.24	0.33	0.39	0.32	0.46	4.3	3.9	4.6
Zürich	0.32	0.29	0.35	0.43	0.39	0.47	5.1	4.9	5.2
Turkey	0.42	0.41	0.43	0.48	0.47	0.49	8.7	8.3	9.0
Akdeniz	0.43	0.34	0.52	0.49	0.40	0.58	8.2	7.3	9.2
Bati Anadolu	0.39	0.34	0.44	0.44	0.38	0.50	7.3	6.7	7.8
Bati Karadeniz	0.35	0.27	0.43	0.46	0.35	0.57	6.0	5.5	6.6
Bati Marmara	0.39	0.31	0.47	0.48	0.38	0.58	7.5	6.8	8.2
Dogu Karadeniz	0.35	0.24	0.46	0.42	0.29	0.55	5.7	5.1	6.4
Dogu Marmara	0.34	0.28	0.4	0.42	0.34	0.50	5.4	5.1	5.8
Ege	0.42	0.37	0.47	0.48	0.42	0.54	8.0	7.4	8.6
Güneydogu Anadolu	0.42	0.23	0.61	0.46	0.27	0.65	8.6	7.9	9.4
Istanbul	0.39	0.35	0.43	0.44	0.40	0.48	6.7	6.2	7.3
Kuzeydogu Anadolu	0.41	0.27	0.55	0.46	0.32	0.60	8.2	7.6	8.8
Orta Anadolu	0.38	0.29	0.47	0.46	0.36	0.56	7.0	6.5	7.6
Ortadogu Anadolu	0.43	0.24	0.62	0.48	0.28	0.68	9.0	7.7	10.4
United Kingdom	0.34			0.52			5.5		
East Midlands (UK)	0.31			0.49			4.9		
East of England	0.35			0.50			5.7		
London	0.41			0.56			7.9		
North East (UK)	0.30			0.52			4.5		
North West (UK)	0.30			0.52			4.7		
Northern Ireland (UK)	0.30			0.51			4.7		
Scotland	0.32			0.50			5.2		
South East (UK)	0.35			0.48			5.9		
South West (UK)	0.30			0.47			4.6		
Wales	0.30			0.51			4.6		
West Midlands (UK)	0.31			0.51			4.8		
Yorkshire and The Humber	0.31			0.51			4.8		
United States	0.39	0.39	0.39	0.52	0.51	0.52	8.2	8.1	8.3
Alabama	0.38	0.36	0.40	0.53	0.50	0.55	7.9	7.1	8.8

	Gini disposable income			Gini Market Income			S80/S20 disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Alaska	0.36	0.34	0.38	0.45	0.43	0.47	7.2	6.6	7.8
Arizona	0.41	0.38	0.43	0.52	0.5	0.55	9.5	8.2	10.9
Arkansas	0.38	0.36	0.40	0.54	0.51	0.57	8.6	7.3	9.9
California	0.41	0.40	0.42	0.53	0.52	0.54	9.0	8.7	9.4
Colorado	0.37	0.36	0.38	0.48	0.46	0.49	7.6	7.1	8.2
Connecticut	0.39	0.37	0.41	0.51	0.49	0.52	7.9	7.2	8.5
Delaware	0.34	0.33	0.36	0.48	0.46	0.49	6.5	6.1	7.0
District of Columbia	0.48	0.46	0.50	0.58	0.56	0.61	16.9	14.9	18.9
Florida	0.40	0.39	0.41	0.54	0.52	0.55	8.5	8.0	8.9
Georgia	0.40	0.38	0.41	0.52	0.50	0.54	8.8	8.1	9.5
Hawaii	0.36	0.34	0.37	0.48	0.46	0.50	6.7	6.1	7.3
Idaho	0.34	0.32	0.37	0.49	0.45	0.52	6.0	5.4	6.6
Illinois	0.40	0.39	0.41	0.52	0.51	0.54	8.3	7.7	8.9
Indiana	0.37	0.35	0.39	0.51	0.48	0.53	7.3	6.7	8.0
Iowa	0.33	0.32	0.34	0.45	0.44	0.46	5.6	5.3	5.9
Kansas	0.36	0.34	0.38	0.48	0.47	0.50	6.9	6.2	7.6
Kentucky	0.36	0.34	0.37	0.50	0.48	0.52	6.8	6.2	7.4
Louisiana	0.40	0.38	0.42	0.52	0.49	0.55	9.2	8.1	10.3
Maine	0.35	0.33	0.36	0.50	0.48	0.52	6.4	5.9	6.9
Maryland	0.37	0.35	0.38	0.46	0.44	0.48	7.3	6.7	7.8
Massachusetts	0.38	0.36	0.39	0.50	0.48	0.52	7.8	7.2	8.5
Michigan	0.37	0.35	0.38	0.50	0.49	0.52	7.3	6.8	7.8
Minnesota	0.34	0.32	0.35	0.45	0.43	0.47	6.2	5.7	6.7
Mississippi	0.38	0.35	0.40	0.53	0.51	0.56	8.1	7.2	8.9
Missouri	0.39	0.37	0.41	0.53	0.51	0.55	8.0	7.2	8.9
Montana (US)	0.33	0.32	0.35	0.47	0.46	0.49	6.1	5.6	6.6
Nebraska	0.34	0.33	0.36	0.45	0.44	0.47	6.4	5.9	6.9
Nevada	0.39	0.37	0.40	0.50	0.48	0.52	8.0	7.3	8.7
New Hampshire	0.34	0.33	0.35	0.44	0.42	0.45	6.3	5.8	6.7
New Jersey	0.39	0.37	0.41	0.51	0.49	0.53	8.4	7.7	9.0
New Mexico	0.43	0.40	0.46	0.57	0.54	0.61	10.7	9.2	12.2
New York	0.40	0.39	0.41	0.53	0.52	0.55	9.0	8.5	9.6
North Carolina	0.37	0.35	0.39	0.52	0.50	0.55	7.0	6.3	7.8
North Dakota	0.36	0.34	0.37	0.45	0.44	0.47	6.9	6.3	7.5
Ohio	0.37	0.35	0.38	0.50	0.49	0.52	7.2	6.7	7.8
Oklahoma	0.39	0.37	0.41	0.52	0.49	0.55	7.8	7.0	8.6
Oregon	0.35	0.34	0.36	0.50	0.48	0.51	6.3	5.9	6.8
Pennsylvania	0.37	0.36	0.38	0.50	0.49	0.51	7.6	7.1	8.1
Rhode Island	0.38	0.36	0.39	0.51	0.49	0.54	7.9	7.3	8.6
South Carolina	0.36	0.34	0.37	0.51	0.50	0.53	7.3	6.6	7.9
South Dakota	0.35	0.33	0.38	0.46	0.44	0.49	6.7	5.7	7.7
Tennessee	0.38	0.36	0.40	0.51	0.49	0.54	7.9	7.1	8.8
Texas	0.41	0.41	0.43	0.52	0.51	0.54	9.1	8.6	9.7
Utah	0.34	0.32	0.36	0.45	0.43	0.47	5.7	5.1	6.2
Vermont	0.34	0.32	0.35	0.46	0.44	0.48	5.9	5.5	6.3
Virginia	0.37	0.36	0.39	0.48	0.47	0.50	7.8	7.1	8.4
Washington	0.38	0.37	0.40	0.50	0.48	0.52	7.6	7.0	8.3
West Virginia	0.37	0.35	0.40	0.53	0.50	0.56	7.6	6.5	8.7
Wisconsin	0.34	0.32	0.35	0.46	0.44	0.48	6.1	5.6	6.5
Wyoming	0.34	0.32	0.35	0.43	0.41	0.45	6.2	5.7	6.8

Note: Data for Denmark, Germany, Italy, New Zealand, Norway and Sweden refer to household income measured in 2011. For all the other countries the household income is measured in 2010. Spain and United Kingdom provided estimates for three-year averages (2008-2010 income figures for Spain, 2010-2012 income figures for United Kingdom). “N.P.” means “not-publishable”, i.e. precision or sample size is rated as too low according to national criteria.

Table A1.3. Selected relative poverty indicators, percentages

	Headcount 60% national poverty line for disposable income			Headcount 60% national poverty line for market income			Headcount 40% national poverty line for disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Australia	21.7	21.0	22.5	31.0	30.3	31.8	6.0	5.5	6.5
Australian Capital Territory	10.4	7.8	13.0	14.4	11.6	17.2	2.9	1.6	4.2
New South Wales	22.4	20.8	24.1	32.0	30.1	33.9	6.5	5.5	7.4
Northern Territory	13.9	9.3	18.6	19.4	12.8	26.0	6.3	2.1	10.4
Queensland	20.6	19.1	22.2	30.8	28.8	32.8	5.1	4.1	6.1
South Australia	24.1	22.0	26.1	32.5	30.2	34.8	4.8	3.7	5.9
Tasmania	27.1	24.6	29.6	39.0	36.6	41.4	7.3	6.1	8.5
Victoria	22.7	20.9	24.5	31.9	29.9	33.9	6.4	5.3	7.6
Western Australia	18.9	16.6	21.3	27.0	24.5	29.5	6.1	4.8	7.4
Austria	13.3	12.5	14.1						
Burgenland (AT)	13.8	9.0	18.6						
Kärnten	18.7	14.3	23.0						
Niederösterreich	10.8	9.2	12.3						
Oberösterreich	9.2	7.8	10.6						
Salzburg	11.7	9.1	14.2						
Steiermark	13.8	11.6	15.9						
Tirol	10.9	8.6	13.1						
Vorarlberg	11.1	7.9	14.2						
Wien	19.1	16.4	21.7						
Belgium	17.6	16.5	18.8	35.6	34.0	37.2	4.1	3.5	4.7
Bruxelles/Brussels	33.3	29.3	37.3	47.3	43.1	51.6	9.5	7.1	12.0
Région wallonne	21.9	19.7	24.1	38.4	35.8	41.0	5.4	4.1	6.8
Vlaams Gewest	12.4	11.0	13.8	32.0	30.0	34.0	2.4	1.8	3.0
Canada	19.0			29.6			7.0		
Alberta	13.5			20.3			4.7		
British Columbia	19.9			29.7			9.2		
Manitoba	21.7			29.5			8.0		
New Brunswick	21.9			36.4			6.3		
Newfoundland and Labrador	20.7			38.2			6.2		
Nova Scotia	22.4			33.4			7.1		
Ontario	17.8			28.9			7.1		
Prince Edward Island	22.9			35.6			4.9		
Quebec	22.1			33.7			6.8		
Saskatchewan	17.5			26.5			5.4		
Chile	24.8	23.8	25.9	26.3	25.3	27.3	10.7	10.1	11.2
Antofagasta	10.5	8.4	12.7	10.9	8.6	13.2	4.1	3.0	5.2
Araucanía	41.7	38.4	45.1	45.0	41.2	48.8	22.8	20.3	25.4
Arica Y Parinacota	25.5	20.8	30.1	25.0	20.6	29.3	9.4	7.2	11.5
Atacama	20.8	17.8	23.8	21.2	18.2	24.2	9.6	7.9	11.2
Aysén	19.6	17.3	22.0	21.8	19.3	24.3	8.2	6.5	9.9
Bío-Bío	34.1	29.8	38.3	36.4	31.9	40.9	15.9	13.8	18.0
Coquimbo	26.2	23.1	29.3	28.1	24.8	31.3	11.4	9.3	13.5
Los Lagos	31.7	28.6	34.9	35.3	31.9	38.7	13.9	12.3	15.5
Los Rios	36.3	32.7	39.8	38.1	34.4	41.8	15.5	13.4	17.6
Magallanes y Antártica	13.1	10.9	15.4	14.4	12.1	16.8	5.6	4.1	7.2
Maule	33.9	31.7	36.2	37.1	34.5	39.6	13.2	11.9	14.4
Metropolitana de Santiago	18.7	16.5	21.0	19.3	17.4	21.3	7.2	6.4	8.0
O'Higgins	22.5	19.1	25.9	23.5	20.0	26.9	9.0	7.8	10.2
Tarapacá	18.2	15.8	20.5	19.0	16.5	21.5	7.9	5.7	10.1

	Headcount 60% national poverty line for disposable income			Headcount 60% national poverty line for disposable income			Headcount 40% national poverty line for disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Valparaíso	26.4	23.9	28.8	27.9	25.3	30.4	11.8	10.1	13.6
Czech Republic	11.0	10.0	11.9	28.8	27.9	29.7	2.9	2.4	3.3
Jihovýchod	10.7	9.4	12.1	28.5	26.3	30.6	2.2	1.7	2.8
Jihozápad	9.3	7.8	10.8	27.0	24.9	29.1	1.2	0.8	1.5
Moravskoslezsko	15.9	13.9	17.9	34.9	32.2	37.5	5.0	3.7	6.3
Praha	6.0	4.6	7.4	22.1	18.9	25.4	1.8	1.2	2.4
Severovýchod	10.2	8.7	11.6	28.4	25.5	31.3	2.0	1.5	2.5
Severozápad	16.3	13.9	18.6	34.8	31.7	38.0	7.1	5.5	8.8
Stredni Cechy	7.3	5.1	9.5	24.4	22.3	26.6	1.4	0.9	1.8
Strední Morava	12.9	10.0	15.8	31.2	29.0	33.3	2.8	2.1	3.6
Denmark	13.2			27.0			2.7		
Hovedstaden	13.5			25.5			3.5		
Midtjylland	12.9			26.7			2.7		
Nordjylland	14.2			29.0			2.6		
Sjælland	12.1			26.7			1.9		
Syddanmark	13.3			28.7			2.4		
Finland	14.5	13.8	15.3	36.0	35.0	36.9	2.8	2.5	3.2
Etelä-Suomi	16.7	14.8	18.5	40.4	38.0	42.8	3.4	2.5	4.3
Helsinki-Uusimaa & Ahvenmaa	8.7	7.5	10.0	26.1	24.2	28.0	1.8	1.2	2.4
Länsi-Suomi	16.0	14.4	17.6	37.3	35.2	39.5	2.8	2.1	3.4
Pohjois- ja Itä-Suomi	18.0	16.2	19.8	42.4	40.1	44.7	3.6	2.8	4.4
France	14.4			39.6			3.7		
Alsace	12.4			34.5			3.1		
Aquitaine	13.4			40.0			3.2		
Auvergne	15.0			42.0			2.7		
Basse-Normandie	14.4			43.5			3.0		
Bourgogne	16.8			45.4			4.7		
Bretagne	11.1			38.3			2.8		
Centre (FR)	10.6			39.3			2.4		
Champagne-Ardenne	14.5			41.5			3.7		
Corse	20.7			52.9			4.9		
Franche-Comté	14.0			40.7			3.5		
Haute-Normandie	12.4			39.4			2.6		
Languedoc-Roussillon	21.0			50.3			5.3		
Limousin	17.8			47.0			3.6		
Lorraine	14.5			39.7			4.1		
Midi-Pyrénées	14.4			38.0			4.4		
Nord-Pas-De-Calais	19.3			45.2			4.8		
Pays de la Loire	13.6			40.6			3.7		
Picardie	15.9			40.6			3.3		
Poitou-Charentes	14.2			42.6			2.6		
Provence-Alpes-Côte d'Azur	17.2			44.7			4.4		
Rhône-Alpes	13.7			38.3			3.6		
Île de France	12.4			31.5			3.5		
Germany	15.3	14.5	15.9	35.6	34.9	36.4	4.2	3.8	4.8
Baden-Wuerttemberg	9.5	8.3	11.5	31.4	29.1	34.4	1.9	1.1	3.2
Bavaria	13.6	11.8	15.9	31.3	29.0	33.7	5.1	3.6	6.8
Berlin	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Brandeburg	20.2	16.7	25.1	45.3	41.3	52.3	5.7	4.1	8.1
Bremen	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.

	Headcount 60% national poverty line for disposable income			Headcount 60% national poverty line for market income			Headcount 40% national poverty line for disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Hamburg	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Hesse	10.6	7.7	12.9	29.0	25.5	32.9	2.6	1.2	3.9
Lower Saxony	14.7	12.0	17.2	34.7	30.3	37.5	4.4	3.1	6.3
Mecklenburg-West	25.2	20.3	33.0	50.0	43.7	56.8	9.3	6.2	13.1
Northrine-Westphalia	14.8	13.1	16.4	33.4	31.4	35.8	3.4	2.7	4.2
Rhineland-Palatinate	20.4	17.1	25.1	35.5	31.9	40.2	3.5	1.6	5.3
Saarland	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.	N.P.
Saxony	19.5	16.8	22.7	45.4	41.3	48.6	5.8	3.6	7.8
Saxony-Anhalt	23.2	19.0	29.0	48.8	44.3	54.9	9.8	6.3	13.7
Schleswig-Holstein	16.1	12.4	21.7	37.4	32.9	43.0	5.8	2.7	10.0
Thuringa	23.0	19.0	27.5	40.2	36.2	44.8	6.5	4.4	9.2
Greece	21.5	20.0	23.0	33.8	32.2	35.3	8.1	7.1	9.1
Attiki	19.6	16.8	22.3	31.2	28.1	34.3	7.7	6.0	9.3
Kentriki Ellada	25.0	21.7	28.2	38.2	34.8	41.7	6.9	5.2	8.6
Nisia Aigaiou - Kriti	14.2	10.8	17.7	28.2	23.9	32.4	5.6	3.2	8.0
Voreia Ellada	24.0	21.5	26.5	36.0	33.2	38.7	10.1	8.3	11.9
Hungary	13.8	12.9	14.7	35.0	33.9	36.2	2.8	2.4	3.1
Dunántúl	13.2	11.8	14.7	34.3	32.3	36.3	2.9	2.2	3.6
Közép-Magyarország	8.4	7.0	9.8	27.1	25.2	29.0	2.1	1.4	2.8
Észak és Alföld	18.3	16.9	19.6	41.5	39.8	43.2	3.2	2.7	3.7
Israel	27.8	27.4	28.2	34.4	34.0	34.8	12.9	12.6	13.2
Central District	15.1	14.5	15.7	20.1	19.4	20.8	5.7	5.3	6.1
Haifa District	28.5	27.3	29.7	35.4	34.2	36.6	10.1	9.3	10.9
Jerusalem District	47.2	45.8	48.6	53.5	52.1	54.9	28.4	27.1	29.7
Judea & Samaria Area	28.8	26.9	30.7	36.0	33.9	38.1	15.7	14.1	17.3
Northern District	40.0	38.9	41.1	44.4	43.3	45.5	18.5	17.7	19.3
Southern District	29.1	28.0	30.2	38.6	37.4	39.8	13.4	12.6	14.2
Tel Aviv District	17.9	17.1	18.7	25.3	24.4	26.2	7.2	6.6	7.8
Italy	20.1	19.4	20.7	25.1	24.5	25.7	8.1	7.6	8.5
Abruzzo	22.2	17.3	27.1	28.4	23.4	33.5	8.1	4.6	11.6
Basilicata	31.7	24.6	38.9	41.1	33.1	49.2	15.3	10.2	20.3
Calabria	31.8	27.3	36.2	41.1	36.1	46.0	13.0	10.1	15.8
Campania	35.7	32.6	38.9	44.6	41.3	47.8	17.4	14.6	20.1
Emilia-Romagna	8.6	7.0	10.2	12.9	11.3	14.5	2.5	1.8	3.2
Friuli-Venezia Giulia	10.7	8.8	12.6	15.2	12.9	17.5	1.9	1.2	2.6
Lazio	17.9	15.7	20.1	21.4	19.3	23.5	6.1	5.1	7.1
Liguria	13.8	10.7	16.9	16.9	13.8	19.9	4.7	2.8	6.6
Lombardia	11.3	9.5	13.2	14.1	12.4	15.8	3.8	2.7	4.8
Marche	15.0	14.4	15.6	18.2	15.9	20.5	6.2	4.9	7.5
Molise	24.2	18.4	30.1	31.2	26.0	36.5	10.9	6.8	15.0
Piemonte	14.1	11.9	16.3	17.1	14.9	19.3	5.3	4.2	6.5
Provincia Autonoma di Bolzano/Bozen	7.7	5.2	10.2	12.8	8.1	17.5	3.2	1.5	4.9
Provincia Autonoma di Trento	12.5	8.5	16.6	15.6	11.3	19.9	2.3	1.2	3.5
Puglia	29.2	26.4	32.0	38.1	37.5	38.8	11.7	9.7	13.7
Sardegna	21.9	18.9	25.0	28.1	24.3	31.8	10.2	7.8	12.5
Sicilia	44.2	40.6	47.8	50.8	47.1	54.4	20.9	18.1	23.6
Toscana	13.3	11.5	15.0	16.4	14.4	18.3	5.0	4.0	6.0
Umbria	14.9	12.1	17.8	18.1	14.6	21.5	4.8	3.7	5.8

	Headcount 60% national poverty line for disposable income			Headcount 60% national poverty line for market income			Headcount 40% national poverty line for disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Valle d'Aosta/Vallée d'Aoste	8.7	5.9	11.5	14.0	11.0	17.0	3.4	1.3	5.5
Veneto	11.7	9.8	13.6	16.7	14.6	18.8	3.2	2.1	4.3
Japan	22.1			34.6			10.4		
Chugoku	18.3			34.9			8.6		
Hokkaido	25.9			44.0			12.3		
Hokuriku	18.1			31.6			7.4		
Kinki	22.1			36.7			11.1		
Kyushu, Okinawa	33.0			43.4			16.9		
Northern-Kanto, Koshin	21.1			31.7			10.0		
Shikoku	28.1			43.0			13.6		
Southern-Kanto	17.5			28.6			7.3		
Tohoku	26.2			37.5			13.1		
Toukai	16.3			28.3			7.2		
Mexico	27.7	26.9	28.4	33.3	32.5	34.1	15.7	15.1	16.3
Aguacalientes	21.7	19.2	24.1	27.2	24.4	30.0	11.8	10.2	13.4
Baja California Norte	15.4	13.4	17.5	18.7	16.6	20.9	7.6	6.2	9.0
Baja California Sur	18.3	15.1	21.6	23.9	20.3	27.4	10.4	8.0	12.9
Campeche	28.3	25.4	31.2	35.0	31.9	38.1	16.0	13.3	18.7
Chiapas	57.2	53.2	61.2	64.3	60.6	67.9	38.3	33.4	43.2
Chihuahua	22.8	19.5	26.0	30.4	26.8	34.0	11.3	9.0	13.7
Coahuila	19.0	16.4	21.6	24.4	21.5	27.3	9.0	7.3	10.7
Colima	17.1	14.7	19.5	22.4	20.0	24.9	9.0	7.3	10.7
Distrito Federal (MX)	9.3	7.6	11.1	16.8	14.8	18.9	3.2	2.3	4.2
Durango	35.3	32.5	38.1	42.9	40.0	45.8	17.7	14.8	20.6
Guanajuato	25.8	23.0	28.5	30.0	27.1	32.9	13.2	10.9	15.5
Guerrero	54.7	50.6	58.8	60.8	57.0	64.5	40.2	35.9	44.4
Hidalgo	35.9	32.2	39.6	42.3	38.2	46.3	20.5	17.5	23.6
Jalisco	21.5	18.6	24.5	25.6	22.5	28.7	12.7	10.5	15.0
Mexico	21.1	18.2	23.9	25.2	22.3	28.1	9.3	7.5	11.2
Michoacan	33.8	29.8	37.9	38.2	34.0	42.4	18.3	15.0	21.6
Morelos	23.2	20.3	26.0	27.7	24.7	30.8	9.9	7.6	12.2
Nayarit	32.6	29.0	36.2	37.3	33.8	40.8	21.5	17.1	25.8
Nuevo Leon	11.8	9.8	13.7	16.0	13.6	18.3	6.1	4.8	7.3
Oaxaca	45.4	40.3	50.5	52.0	47.1	56.9	33.2	28.3	38.0
Puebla	41.0	37.1	44.8	46.3	42.5	50.1	23.9	20.8	27.1
Queretaro	22.3	18.9	25.6	27.3	24.0	30.7	11.9	9.2	14.6
Quintana Roo	22.2	19.1	25.3	25.6	22.8	28.5	13.9	10.8	17.0
San Luis Potosi	34.2	30.2	38.3	41.1	37.2	45.1	20.1	16.2	24.0
Sinaloa	23.8	20.5	27.2	30.5	26.8	34.2	12.3	10.1	14.6
Sonora	18.1	15.4	20.8	25.2	22.1	28.2	9.9	8.0	11.9
Tabasco	37.0	32.7	41.2	42.7	38.8	46.6	21.6	17.7	25.6
Tamaulipas	21.6	18.6	24.6	27.5	24.1	30.8	10.7	8.8	12.6
Tlaxcala	31.9	29.3	34.5	37.5	34.7	40.4	16.3	14.3	18.4
Veracruz	36.4	32.3	40.4	43.9	39.7	48.2	21.2	18.0	24.4
Yucatan	24.8	21.3	28.3	31.6	28.0	35.2	12.6	9.9	15.3
Zacatecas	43.4	39.7	47.1	49.7	45.9	53.5	26.6	23.5	29.7
Netherlands	13.7			29.5			3.9		
Noord-Nederland	15.2			32.9			4.3		
Oost-Nederland	12.1			28.1			3.4		
West-Nederland	14.8			29.4			4.3		
Zuid-Nederland	12.2			29.5			3.4		

	Headcount 60% national poverty line for disposable income			Headcount 60% national poverty line for market income			Headcount 40% national poverty line for disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
New Zealand	20.5			30.4			5.3		
North Island (NZ)	21.1			31.2			5.4		
South Island (NZ)	18.4			27.7			4.9		
Norway	13.3			29.3			4.6		
Agder og Rogaland	11.3			25.9			3.5		
Hedmark og Oppland	13.7			34.2			3.6		
Nord-Norge	11.9			31.2			3.5		
Oslo og Akershus	15.3			27.5			6.5		
Sør-Østlandet	13.0			32.0			3.4		
Trøndelag	15.3			31.8			6.7		
Vestlandet	12.4			27.2			4.5		
Poland	18.1	17.3	18.9	31.2	30.2	32.3	6.2	5.7	6.7
Region Centralny	16.8	15.2	18.4	30.8	28.6	32.9	5.9	4.8	6.9
Region Poludniowo-Zachodni	14.5	12.2	16.8	30.8	27.5	34.2	5.4	3.8	6.9
Region Poludniowy	16.6	14.9	18.4	31.4	29.2	33.5	6.8	5.6	8.1
Region Pólnocno-Zachodni	17.6	15.4	19.8	29.0	26.4	31.5	5.9	4.5	7.4
Region Pólnocny	17.8	15.6	20.0	29.0	26.3	31.6	5.1	4.1	6.2
Region Wschodni	24.3	22.0	26.6	35.9	33.2	38.5	7.2	6.0	8.4
Slovak Republic	13.5	12.3	14.6	29.6	28.2	31.0	4.5	3.8	5.3
Bratislavský kraj	8.3	5.5	11.0	22.0	18.0	25.9	2.6	1.0	4.1
Stredné Slovensko	13.3	11.1	15.5	29.1	26.4	31.8	4.6	3.1	6.1
Východné Slovensko	16.2	13.8	18.6	32.6	29.7	35.4	6.0	4.4	7.6
Západné Slovensko	12.9	11.0	14.8	30.0	27.6	32.3	3.8	2.7	5.0
Slovenia	15.1	14.2	16.0	32.0	30.9	33.2	4.5	4.0	5.0
Vzhodna Slovenija	17.6	16.1	19.1	34.4	32.5	36.3	5.4	4.7	6.2
Zahodna Slovenija	12.5	11.4	13.5	29.6	28.2	30.9	3.6	3.0	4.1
Spain	21.4	20.8	21.9	37.9	37.4	38.4	9.8	9.4	10.1
Andalucía	30.7	29.2	32.3	48.0	46.4	49.6	15.3	14.1	16.5
Aragón	16.4	14.4	18.5	34.1	31.6	36.5	7.0	5.7	8.3
Asturias	12.4	10.2	14.5	38.2	35.3	41.0	5.9	4.5	7.3
Baleares	19.8	17.0	22.6	31.4	28.5	34.4	11.2	9.1	13.3
Canarias (ES)	29.8	27.1	32.4	44.4	41.4	47.4	14.2	12.1	16.3
Cantabria	17.2	14.7	19.8	37.0	33.9	40.1	8.5	6.6	10.4
Castilla y León	22.4	20.4	24.4	40.3	38.0	42.6	9.0	7.7	10.4
Castilla-La Mancha	29.7	27.2	32.2	42.2	39.6	44.7	13.7	11.7	15.6
Cataluña	16.1	14.8	17.4	32.1	30.5	33.7	6.9	5.9	7.9
Ciudad Autónoma de Ceuta (ES)	29.7	21.4	38.1	38.9	30.6	47.2	17.6	11.5	23.6
Ciudad Autónoma de Melilla (ES)	31.3	25.6	37.1	40.9	34.8	47.0	20.0	14.9	25.1
Comunidad Valenciana	19.8	18.0	21.6	38.3	36.4	40.2	8.1	6.9	9.3
Comunidad de Madrid	15.3	14.0	16.6	27.9	26.2	29.5	6.5	5.5	7.5
Extremadura	37.4	34.2	40.6	51.4	48.3	54.5	15.5	13.1	17.9
Galicia	18.5	16.7	20.2	39.9	37.7	42.1	7.6	6.4	8.7
La Rioja (ES)	23.4	20.7	26.0	37.3	34.4	40.2	10.0	8.4	11.6
Navarra	8.4	6.6	10.2	25.7	22.9	28.4	4.8	3.2	6.4
País Vasco	11.4	9.6	13.2	30.9	28.8	33.0	5.1	4.0	6.2
Región de Murcia	27.7	24.5	30.8	43.6	40.1	47.0	14.0	11.5	16.5

	Headcount 60% national poverty line for disposable income			Headcount 60% national poverty line for market income			Headcount 40% national poverty line for disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Sweden	17.4			29.7			4.5		
Mellersta Norrland	16.7			28.9			4.6		
Norra Mellansverige	20.3			35.4			4.4		
Småland med öarna	18.1			31.9			3.4		
Stockholm	15.0			24.4			4.5		
Sydsverige	20.1			32.0			5.2		
Västsverige	16.9			28.3			4.7		
Östra Mellansverige	17.9			31.9			4.1		
Övre Norrland	15.2			31.4			4.3		
Switzerland	16.3	15.2	17.4	27.1	26.0	28.2	5.2	4.7	5.7
Espace Mittelland	19.9	17.6	22.3	29.8	27.6	31.9	7.2	6.1	8.3
Nordwestschweiz	13.6	10.8	16.4	25.1	21.9	28.3	4.4	3.2	5.6
Ostschweiz	16.8	14.1	19.4	26.0	23.4	28.5	4.1	3.0	5.1
Région lémanique	18.0	15.6	20.4	28.7	26.9	30.6	6.0	5.3	6.8
Ticino	23.8	21.0	26.6	40.9	32.7	49.2	8.0	5.8	10.3
Zentralschweiz	13.2	11.4	15.1	23.7	19.5	27.9	3.5	2.5	4.5
Zürich	11.5	9.7	13.3	22.6	21.4	23.7	3.5	2.9	4.1
Turkey	23.2	22.3	24.1	27.1	26.3	27.9	10.6	10.1	11.2
Akdeniz	25.8	23.3	28.4	28.2	26.5	29.9	9.5	8.3	10.7
Bati Anadolu	14.7	12.5	16.9	18.3	17.0	19.6	5.2	3.8	6.6
Bati Karadeniz	20.2	11.6	28.7	33.8	31.8	35.8	7.5	6.4	8.5
Bati Marmara	20.8	19.0	22.7	28.6	25.3	32.0	9.7	8.5	10.9
Dogu Karadeniz	21.4	14.0	28.8	28.2	26.0	30.4	6.3	4.0	8.6
Dogu Marmara	13.3	10.0	16.6	21.2	18.0	24.5	3.3	2.7	3.9
Ege	15.5	13.9	17.1	20.5	18.3	22.7	4.5	3.8	5.2
Güneydogu Anadolu	58.5	56.1	61.0	54.1	51.4	56.9	38.5	36.3	40.8
Istanbul	7.1	6.1	8.2	11.8	10.6	12.9	2.1	1.7	2.5
Kuzeydogu Anadolu	40.0	37.1	42.9	41.1	37.9	44.3	22.3	20.1	24.4
Orta Anadolu	24.6	22.6	26.7	27.8	26.0	29.6	9.5	8.1	11.0
Ortadogu Anadolu	48.9	44.1	53.7	47.5	45.1	50.0	26.5	23.9	29.0
United Kingdom	17.0			35.1			5.2		
East Midlands (UK)	17.7			36.2			6.2		
East of England	13.4			29.4			4.2		
London	16.3			31.9			6.3		
North East (UK)	20.1			42.3			5.0		
North West (UK)	19.0			40.7			5.1		
Northern Ireland (UK)	22.5			40.8			6.0		
Scotland	16.7			34.3			5.3		
South East (UK)	12.3			26.9			4.4		
South West (UK)	14.6			33.0			4.7		
Wales	19.8			40.2			5.0		
West Midlands (UK)	20.8			40.7			5.9		
Yorkshire and The Humber	20.5			40.3			5.4		
United States	24.3	24.1	24.6	34.3	34.0	34.6	11.3	11.1	11.5
Alabama	27.7	24.5	30.8	40.5	37.0	44.1	13.3	11.5	15.1
Alaska	17.8	15.6	20.0	27.4	24.3	30.5	8.2	6.9	9.5
Arizona	28.7	25.6	31.9	37.8	35.1	40.4	13.9	11.8	16.0
Arkansas	31.8	27.8	35.8	44.9	40.6	49.2	17.0	14.5	19.6
California	25.5	24.6	26.4	34.5	33.5	35.5	12.0	11.4	12.7
Colorado	20.7	18.9	22.6	29.0	26.9	31.1	9.5	8.1	10.8
Connecticut	16.0	14.4	17.5	25.4	23.7	27.2	6.7	5.7	7.7

	Headcount 60% national poverty line for disposable income			Headcount 60% national poverty line for market income			Headcount 40% national poverty line for disposable income		
	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound	Point estimate	Lower bound	Upper bound
Delaware	21.9	19.8	24.0	32.6	30.4	34.8	9.4	8.1	10.7
District of Columbia	27.2	25.0	29.5	34.2	31.8	36.6	17.3	15.6	19.0
Florida	25.5	24.2	26.7	38.4	37.0	39.7	12.0	11.2	12.8
Georgia	28.8	26.9	30.7	36.9	34.8	38.9	13.8	12.4	15.2
Hawaii	19.7	17.5	21.9	29.8	27.5	32.2	8.1	6.7	9.5
Idaho	25.4	21.5	29.2	37.5	33.3	41.6	8.9	7.4	10.3
Illinois	23.6	22.2	25.0	31.6	29.9	33.3	10.3	9.4	11.2
Indiana	25.8	23.7	27.8	35.8	33.4	38.2	12.4	10.9	13.8
Iowa	18.4	16.8	20.0	28.4	26.6	30.3	7.2	6.2	8.1
Kansas	22.4	20.6	24.1	32.7	30.6	34.9	10.8	9.2	12.3
Kentucky	30.7	27.8	33.7	41.9	38.5	45.3	13.2	11.3	15.1
Louisiana	32.4	29.3	35.5	41.7	37.9	45.4	17.9	15.1	20.7
Maine	20.1	18.1	22.0	33.3	31.0	35.6	9.5	8.2	10.7
Maryland	14.8	13.6	16.1	22.7	21.2	24.2	6.7	5.9	7.6
Massachusetts	18.5	16.6	20.3	27.4	25.1	29.7	8.4	7.3	9.5
Michigan	23.4	21.6	25.1	35.4	33.3	37.5	10.8	9.7	11.9
Minnesota	15.9	14.0	17.8	25.0	23.0	27.0	7.4	6.4	8.4
Mississippi	31.2	27.4	34.9	41.5	36.8	46.3	15.8	13.8	17.8
Missouri	24.8	22.2	27.4	35.5	32.1	38.9	11.9	10.0	13.8
Montana (US)	25.6	23.0	28.1	39.8	36.9	42.8	11.1	9.2	13.0
Nebraska	18.4	17.0	19.8	26.6	24.5	28.6	8.2	7.0	9.4
Nevada	26.3	24.2	28.4	36.1	33.5	38.8	12.0	10.5	13.4
New Hampshire	12.6	11.3	14.0	21.8	20.0	23.5	5.9	5.0	6.9
New Jersey	17.6	16.0	19.1	26.8	25.0	28.6	8.0	7.1	8.9
New Mexico	31.8	28.8	34.8	43.4	40.2	46.7	16.9	14.8	19.0
New York	26.4	25.0	27.7	35.1	33.7	36.5	12.2	11.3	13.0
North Carolina	28.4	25.9	30.9	39.0	36.6	41.3	11.6	9.8	13.5
North Dakota	16.0	13.4	18.6	24.1	21.5	26.6	7.6	6.1	9.1
Ohio	24.7	22.8	26.7	36.1	34.1	38.2	11.8	10.6	12.9
Oklahoma	26.5	23.8	29.2	36.8	33.6	39.9	11.3	9.8	12.7
Oregon	23.9	21.4	26.3	36.6	34.1	39.1	9.1	7.9	10.3
Pennsylvania	22.4	20.9	23.9	32.9	31.4	34.5	10.4	9.4	11.3
Rhode Island	22.4	20.4	24.4	34.7	32.3	37.0	11.2	9.8	12.5
South Carolina	29.9	27.9	32.0	41.6	39.5	43.7	14.8	13.4	16.3
South Dakota	21.5	18.5	24.6	30.7	27.7	33.8	10.1	7.8	12.5
Tennessee	28.4	25.0	31.8	38.8	35.3	42.4	13.5	10.9	16.1
Texas	26.8	25.4	28.2	35.2	33.7	36.7	12.4	11.4	13.4
Utah	18.1	15.8	20.5	27.6	24.6	30.6	7.3	6.1	8.5
Vermont	17.5	15.6	19.5	28.5	25.6	31.5	7.0	5.7	8.3
Virginia	18.1	16.6	19.5	26.9	25.3	28.5	9.5	8.4	10.6
Washington	19.2	17.7	20.8	30.7	29.1	32.4	8.1	7.0	9.1
West Virginia	28.7	24.6	32.7	40.9	37.5	44.2	14.5	11.5	17.4
Wisconsin	19.3	16.8	21.8	29.8	27.3	32.3	7.8	6.6	9.0
Wyoming	17.8	15.6	20.0	26.3	23.5	29.1	7.4	6.1	8.7

Note: Data for Denmark, Germany, Italy, New Zealand, Norway and Sweden refer to household income measured in 2011. For all the other countries the household income is measured in 2010. Spain and United Kingdom provided estimates for three-year averages (2008-2010 income figures for Spain, 2010-2012 income figures for United Kingdom). "N.P." means "not-publishable", i.e. precision or sample size is rated as too low according to national criteria.

ANNEX 2. SPECIFICATION OF SAMPLE STRUCTURE VARIABLES FOR COMPUTATION OF SAMPLING ERRORS

57. Regionally disaggregated statistics from social surveys should be published with confidence intervals, to enable statistically sound comparisons of the point estimates. Researchers working on micro-data from sample-based surveys should also take into account variations in the sampling design. The issue is that the original sampling design variables are often anonymised in the social survey micro-data files, and supporting documentation is not detailed enough for the purposes of variance estimation. This annex provides some advice for improving the quality of information on sampling design. The technical recommendations are tailored to EU-SILC, the single most important data source for comparative analysis of income and social conditions in European countries. However, the methodology and suggestions are applicable also to household surveys in non-European countries. These advises are based on results from several years of research at the University of Siena.

58. For the types of sample designs involved in EU-SILC, and in the practical procedures for variance estimation, the necessary information about the sample structure can be provided in the form of two variables defined for each unit: the 'computational' stratum and 'computational' primary sampling unit (PSU) to which the unit belongs. In general, the new variables 'computational' stratum and 'computational' PSU are related (and sometimes identical) to the stratum and PSU variables available in the EU-SILC user database available to researchers (SILC-UDB). However, very often the UDB variables require some redefinition before they can be used for the purpose of variance estimation. The definition of computational strata and PSUs can be a technically complex task requiring sampling expertise, as well as knowledge of details concerning the sample design, selection and implementation – details which are country- and possibly even wave-specific. The creation of the two variables defined above is therefore best done at the country level, with the help of national sampling and survey experts.

59. In order to correctly define the computational strata and PSUs, information concerning the following three aspects should be available:

1. Codes of the sample structure in the micro-data files.

2. Detailed description of the sample design, for instance identifying features such as the presence of self-representing units, systematic selection etc.

3. Information connecting the sample structure codes in the micro-data with descriptions of the particular sample design features, so as to be able to identify the design features applicable to particular units.

60. For EU-SILC, this information is not readily available at the central level for all countries. Practical variance estimation methods need to make some basic assumptions about the sample design. First, the sample selection is independent between strata. Second, two or more primary selections are drawn from each stratum randomly, independently and with replacement. Third, the number of primary selections is large enough for valid use of the in the variance estimation equations.

61. Though the basic assumptions regarding the structure of the sample for application of the method are met reasonably well in many EU-SILC surveys, often these assumptions are not met exactly. In many practical situations some aspects of sample structure need to be redefined to make variance computation possible, efficient and stable. The following adjustments might be required:

4. It may be necessary to regroup ('collapse') strata so as to ensure that each stratum has at least two sample PSU's – the minimum number required for the computation of variance.

5. Units which are included into the sample automatically ('self-representing units') are in fact strata rather than PSU's, and computational PSU's have to be defined at a lower stage within each such unit.

6. In samples selected systematically, the implied implicit stratification is often used to define explicit strata, from each of which an independent sample is supposed to have been selected. Such strata have to be formed by pairing or otherwise grouping of PSU's in the order of their selection from the systematic list, ensuring that each resulting computational stratum has at least two primary selections.

7. Sometimes non-response can result in the disappearance from the sample of whole PSU's. This can disturb the structure of the sample, such as leaving fewer than two PSU's in some strata. Variance computation requires some redefinition of the computational units to meet the basic requirement of having at least 2 PSU's per stratum.

62. The above-mentioned problem arises more frequently and seriously when computing sampling errors for subclasses (subpopulations), especially for regions and other geographic subdivisions. The risk can be reduced by aggregating PSU's and strata to create fewer, larger computational units. Such considerations apply equally irrespective of the particular technique adopted for variance computation - whether the Jackknife repeated replication (JRR) or Linearization, for example.

63. When the JRR procedure is used for variance estimation, the number of replications is equal or at least similar to the number of PSU's in the sample. In a large sample where elements (households, persons) have been selected directly, the number of replications which can be formed will be of the order of the sample size, normally running into thousands. Computational issues might require forming much fewer computational units, such as creating 'pseudo-cluster' from random groupings of sample elements, and then random pairing of these 'clusters' to construct computational strata.

64. There are restrictions on the detail with which information identifying individual sampling units, PSU's, strata etc. can be included in the public-release micro data. Grouping of units and strata can help in preserving confidential nature of the data. Reducing the detail included in this manner would *make* unnecessary the suppression of information on sample structure as has been done in the microdata disseminated by Eurostat.

65. The important practical question is: how many random groups (computational PSUs) should be created? It is known from theory that such random grouping does not affect the expected value of the variance of the sample. However, it does affect the stability (variance) of the variance estimates. As the number of random groups is reduced, the variance estimates tend to become less stable – we can get different results from repletion of the same procedure, and hence also as the number of random groups is increased or decreased in the neighbourhood. With a larger number of random groups, the computations tend to become stable and not depend on the exact number of random groups chosen.

66. From numerical experience with EU-SILC and similar applications, 200 random groups are a safe choice in all cases, and even 100 in almost all cases. It is desirable to keep this number small for computational efficiency and to do some numerical testing of the stability of the results with different numbers of groups.

67. Normally, variance estimation for subpopulations does not require new procedures. The only complication is that in computations involving subclasses – especially small and not well-distributed

subclasses – it can happen that some PSUs and strata contain no elements of interest. This can make the results unstable and biased. The risk can be reduced by aggregating PSUs and strata to create fewer, large units for the purpose of computation.

68. If the existing sample is an *unstratified* sample of elements, there is no need to create separate computational strata: all the computational PSUs defined by random grouping can constitute a single computational stratum. If, however, the existing sample is a *stratified* sample of elements, normally the existing stratification can be retained unchanged to constitute the required computational strata, but ensuring that at least *two* random groups are created within each stratum. Larger strata can have more than two random groups each. One scheme can be to assign to each stratum a (rounded) number of random groups proportional to its (weighted) sample size – with the total number of random groups taken as 100-200 – and then adjust this number it to ensure that it is not less than 2 for any stratum.

69. If the existing strata are too small and numerous, merging of strata (on the basis of similarity of stratum characteristics) can also be considered as described earlier.

70. The above principles also apply to samples (or particular domains of the sample) which, while being multi-stage, involve numerous small PSUs. As noted, grouping of small PSUs within and across strata, and grouping of strata to form fewer and larger computational units is generally desirable to improve stability of the results. Our general recommendation is to begin, as the basis, by defining 100-200 computational PSUs of approximately equal size, and then adjusting and fine-tuning the scheme in accordance with details of the actual design. The final choice is always a matter of statistical judgement and numerical experimentation.

ANNEX 3. METHODOLOGY FOR VARIANCE ESTIMATION OF MULTI-YEAR AVERAGED ESTIMATES

71. This annex explains statistical methods for variance estimation of sub-national estimates based on the cumulation of data over rounds of regularly repeated national surveys. This issue has been discussed in Verma *et al.* (2013) and the proposed solutions are based on research at the University of Siena for the Sample (Small Area Methods for Poverty and Living condition Estimates) project and this OECD project.

Pooling of data versus pooling of estimates

72. Estimates from samples from the same population are most efficiently pooled with weights in proportion to their variances (meaning, with similar designs, in direct proportion to their sample sizes). Alternatively, the samples may be pooled at the micro level, with unit weights inversely proportion to their probabilities of appearing in any of the samples. This latter procedure may be more efficient (*e.g.*, O'Muircheataigh and Pedlow, 2002), but may be impossible to apply as it requires information, for every unit in the pooled sample, on its probability of selection into each of the samples irrespective of whether or not the unit appears in the particular sample (Wells, 1998). Another serious difficulty in pooling samples is that, in the presence of complex sampling designs, the structure of the resulting pooled sample can become too complex or even unknown to permit proper variance estimation. In any case, different waves of a survey like EU-SILC do not correspond to exactly the same population. The problem is akin to that of combining samples selected from multiple frames, for which it has been noted that micro level pooling is generally not the most efficient method (Lohr and Rao, 1996). For the above reasons, pooling of wave-specific estimates rather than of micro data sets is generally the appropriate approach to aggregation over time from surveys such as EU-SILC.

Direct methodology based on common sampling structure across waves

73. Consider, for example, the computation of poverty rates using data from three consecutive waves of a survey. For each wave, a person's poverty status (poor or non-poor) is determined based on the income distribution of that wave separately, and the proportion poor at each wave is computed. These proportions are then averaged over a number of consecutive waves. The issue is to quantify the gain in sampling precision from such pooling, given that data from different waves of a rotational panel are highly correlated.

74. For this purpose, the JRR variance estimation methodology used for the cross-sectional estimates can be easily extended on the following lines. The total sample of interest is formed by the union of all the cross-sectional samples being compared or aggregated. Using as basis the common structure of this total sample, a set of JRR replications is defined. Each replication is formed such that when a unit is to be excluded in its construction, it is excluded simultaneously from every wave where the unit appears. For each replication, the required measure is constructed for each of the cross-sectional samples involved, and these measures are used to obtain the required averaged measure for the replication, from which variance is then estimated in the usual way.

75. We first construct a common structure of strata and PSUs from the union of the three datasets and assign to this common structure new weights equal to the average of the weights of the three years:

$$w_t^{(Common)} = (w_t)^{Average} = (w_1 + w_2 + w_3) / 3$$

76. For each year (t) and for each replication (k), we can estimate $y_k^{(t)}$ where *t=1,2,3* and from this, the required statistic $y_k^{Average} = \sum_t a_t y_k^{(t)}$; that in our case is just $y_k^{Average} = (y_k^1 + y_k^2 + y_k^3)/3$.

77. The variance estimate of this measure $V = \sum_t a_t V^{(t)}$ can be easily estimated applying the usual JRR for variance estimation as if the statistic would be a common cross sectional measure.

Indirect methodology based on the longitudinal sample

78. The direct methodology explained above requires consistent coding of the sample structure across the survey waves. As already mentioned, lack of information on the sample structure in survey data files is a long-standing and persistent problem in survey work. Indeed, the major problem in computing sampling errors for EU-SILC is the lack of sufficient information for this purpose in the micro-data available to researchers. Verma *et al.* (2010) have developed approximate procedures in order to overcome these limitations partially. The method exploits the fact that households and individuals can be linked across waves in the longitudinal dataset of EU-SILC. The longitudinal data thus make possible to estimate the correlation between the waves. So, as example, if we want to produce the estimates for the average of three years, we use the longitudinal dataset for three years to impute a measure of the correlation between the three cross-sectional data sets. With this measure we can easily calculate the variance of a measure averaged over three years at national level. For details on the procedure see Verma *et al.* (2010).

79. To get the same estimate at regional level, we follow a simplified methodology. The idea (Verma *et al.* 2010) is to use the variance of the measure averaged over three years at national level and make the assumption that the coefficients of variation of the measure at national and regional level are the same. Then, we decompose the design effect in all its components: effect of the weights, effect of clustering of persons within households, effect of clustering of persons and households within dwellings, effect of correlation in non-independent samples. Some of these components are the same at national and regional level, other can be easily calculated at regional level. With these quantities and the above assumption, we get the required measures of the variance averaged over three years at regional level.

Detailed results for Spain and Austria

80. At national level (Table A3.1) the results show a sensible reduction of the standard error (s.e.) using the three years average, that is, for each index, very similar in both countries.

Table A3.1. National estimates for one year and average over three years, Spain and Austria

	(a) est 2011	(b) s.e. 2011	(c) s.e. 3 years average	(d) 1-(c)/(b)
AUSTRIA				
Poverty headcount ratio (HCR) 60% national p.l.	*13.8*	0.61	0.43	30%
S80/S20	*4.0*	0.08	0.07	21%
Gini	*26.9*	0.38	0.31	18%
SPAIN				
HCR 60% national p.l.	*22.0*	0.48	0.31	35%
S80/S20	*6.5*	0.15	0.11	28%
Gini	*33.8*	0.30	0.24	20%

Table A3.2. Median and mean reduction of the s.e. using 3 years average compare with 1 year estimate

	median	mean
HCR 60% national poverty line	20%	1%
S80/S20	38%	23%
Gini	16%	10%

81. As shown in Table A3.2, we have a median reduction of the standard errors using average of 3 years that goes from 16% for Gini to 38% for S80/S20. The mean reduction is smaller because it is very affected from few outliers, especially in the Poverty Headcount Ratio (HCR, Table A3.3(A)), where the standard error for one year is too small. This could be due to three reasons: (i) the JRR methodology, that performs well for Gini and can produce instable results for measures based on quantiles; (ii) to instability of regional estimates for one year; (iii) to the results of the two other years considered (2009 and 2010).

82. At the regional level, the comparison of standard errors between one-year and three-year estimates is more complex, given the instability of the one-year estimates with small samples. This problem is particularly evident for countries with a small number of PSUs, such as Austria. Table A3 shows results for Spanish and Austrian TL2 regions. The JRR procedure for the one-year estimates for Austria has been adapted to increase the stability of results in case of small number of PSUs. We have followed the same idea used to get the regional estimates averaged over three years.

Table A3.3. Spain regional estimates for one year and average over three years

(A): Spain

	HCR 60%, national poverty line				S80/S20				Gini			
	(a) est 2011	(b) s.e. 2011	(c) s.e. 3 years average	(d) (c)/(b)	(a) est 2011	(b) s.e. 2011	(c) s.e. 3 years average	(d) (c)/(b)	(a) est 2011	(b) s.e. 2011	(c) s.e. 3 years average	(d) (c)/(b)
ES11	*18.4*	1.17	0.83	0.71	*5.6*	0.36	0.18	0.50	*31.2*	2.49	2.14	0.86
ES12	*10.3*	1.04	0.71	0.68	*4.7*	0.42	0.22	0.52	*29.7*	2.09	2.40	1.15
ES13	*19.9*	0.95	2.08	2.20	*6.1*	0.29	0.22	0.78	*32.8*	3.45	2.69	0.78
ES21	*11.0*	0.84	0.47	0.57	*5.1*	0.28	0.17	0.59	*30.1*	1.30	1.15	0.89
ES22	*9.5*	0.83	0.60	0.72	*4.8*	0.48	0.19	0.40	*28.7*	1.93	1.43	0.74
ES23	*25.0*	1.50	0.98	0.65	*7.6*	0.54	0.28	0.51	*34.5*	3.30	2.59	0.79
ES24	*17.9*	1.52	2.72	1.79	*6.2*	0.36	0.25	0.69	*31.1*	2.70	2.09	0.77
ES30	*16.4*	1.91	0.93	0.49	*6.0*	0.25	0.21	0.83	*32.4*	1.81	1.49	0.82
ES41	*23.0*	1.39	1.33	0.96	*6.3*	1.64	0.60	0.36	*33.2*	3.30	2.76	0.84
ES42	*31.8*	1.74	1.18	0.68	*7.4*	0.97	0.47	0.48	*36.3*	4.72	4.09	0.87
ES43	*35.2*	2.05	2.33	1.14	*7.3*	0.59	0.36	0.62	*36.0*	5.01	5.31	1.06
ES51	*17.1*	1.03	0.55	0.53	*5.4*	0.29	0.17	0.58	*30.8*	2.02	1.57	0.78
ES52	*20.1*	1.01	1.04	1.03	*5.4*	0.41	0.27	0.66	*31.2*	2.77	2.45	0.88
ES53	*18.6*	1.13	1.84	1.64	*6.7*	0.48	0.43	0.90	*32.6*	2.75	2.20	0.80
ES61	*32.0*	1.17	0.94	0.80	*8.6*	0.52	0.31	0.61	*36.9*	3.76	3.15	0.84
ES62	*24.7*	1.56	1.31	0.84	*5.4*	0.35	0.38	1.08	*30.2*	4.29	3.93	0.91
ES63	*23.5*	1.34	2.46	1.84	*5.3*	0.39	0.85	2.16	*35.5*	2.93	4.96	1.69
ES64	*31.8*	2.15	1.51	0.70	*10.3*	0.93	0.64	0.68	*39.1*	3.93	2.85	0.73
ES70	*32.0*	1.19	1.07	0.90	*7.6*	0.52	0.84	1.61	*37.9*	4.28	3.50	0.82
Mean				***0.99***				***0.77***				***0.90***
Median				***0.80***				***0.62***				***0.84***

(B): Austria

	HCR 60%, national poverty line				S80/S20				Gini			
		(b) s.e. 2011	(c) s.e. 3 years average	(d) (c)/(b)	est 2011	(b) s.e. 2011	(c) s.e. 3 years average	(d) (c)/(b)	(a) est 2011	(b) s.e. 2011	(c) s.e. 3 years average	(d) (c)/(b)
AT11	14.78	3.72	2.44	0.66	3.97	0.48	0.32	0.68	26.5	2.10	1.48	0.70
AT12	10.74	1.07	0.78	0.74	3.56	0.18	0.14	0.78	24.89	0.90	0.70	0.78
AT13	19.67	1.86	1.35	0.73	5.00	0.23	0.17	0.75	31.58	0.95	0.73	0.77
AT21	20.1	3.35	2.24	0.67	3.71	0.31	0.24	0.75	25.7	1.49	1.11	0.74
AT22	11.87	1.30	1.10	0.85	3.67	0.22	0.16	0.75	25.54	1.04	0.77	0.74
AT31	10.52	1.12	0.72	0.64	3.33	0.18	0.14	0.77	23.13	0.93	0.74	0.80
AT32	12.13	1.88	1.32	0.70	4.31	0.36	0.26	0.71	29.93	1.82	1.31	0.72
AT33	13.72	1.91	1.15	0.60	4.16	0.30	0.22	0.71	28.56	1.50	1.10	0.73
AT34	10.24	1.99	1.59	0.80	3.20	0.43	0.40	0.95	23.93	1.99	1.79	0.90
Mean				***0.71***				***0.76***				***0.77***
Median				***0.70***				***0.75***				***0.74***