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The Atlas of Inequality Aversion: Theory and Empirical Evidence from the Luxembourg Income Study Database

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The atlas of inequality aversion: theory and empirical evidence from the Luxembourg Income Study database

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Abstract

In the distributive analysis, the constant relative inequality aversion utility function is a standard tool for ethical judgements of income distributions. The sole parameter ε of this function expresses a society's aversion to inequality. However, the profession has not committed to the range of ε. This paper aims to estimate the parameter ε of the constant relative inequality aversion utility function using datasets available from the Luxembourg Income Study Database. We utilise the method of estimating ε assuming incomes obey the generalised beta distribution of the second kind. The estimator of ε is derived from the mathematical condition of the existence of the social welfare function. We elaborate an 'atlas' of 388 estimates of ε for 55 countries across time. We also verify two hypotheses: 1) The richer the country, the greater the societal inequality aversion; 2) The greater (lower) the inequality aversion, the lower (greater) income inequality. Our data do not confirm the 1st hypothesis. For verifying the 2nd hypothesis, we use the inequality-development relationship augmented by inequality aversion. The 2nd hypothesis is unfalsified in about 90% of country-year cases.

JEL Classification: *C10; D30; D60; I30, O15*

Keywords: *inequality aversion; Atkinson Index; income distribution; inequality; utility function*

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Introduction

The aim of this paper is twofold. The first aim is to estimate the inequality aversion parameter ε of the *constant relative inequality aversion utility function* (CRIA) (Atkinson, 1970) employing income data for 55 countries from the Luxembourg Income Study (LIS) database. We estimate ε by the mean of Kot's (2020) method after a small complement. The second aim is to verify some prominent hypotheses proposed in the literature concerning relationships between inequality aversion and some economic phenomena. We propose augmenting the standard inequality-development relationship by accounting for inequality aversion.

Knowledge of ε is essential for various reasons. CRIA, with the single parameter ε, is a widely used parametric tool for assessing welfare in the distributive analysis. Schlör et al. (2012, p. 137) argue that *"[ε] reveals both the values of society with respect to distributional justice and the willingness of society to accept transfer costs to achieve distributional justice. […] The epsilon parameter represents a connection between the universal, equal political rights of the citizens and the efficiency criterion of the economy, and it defines fairness from the perspective of society."* As the (minus) elasticity of the marginal utility of income, ε also has a central role in public economics (Young, 1990).

The parameter ε is also a crucial component of the social discount rate that determines the inter-temporal trade-offs acceptable to society (Groom and Maddison, 2019). Thus, the knowledge of ε is essential in evaluating social projects and policies impacting different socioeconomic groups (Evans, 2005, Layard et al. 2008, Aristei and Perugini, 2016).

Frish (1959) emphasised the importance of inequality aversion when calling for a 'worldwide atlas' of inequality aversion. Our paper addresses this demand by providing the estimates of ε for a broad spectrum of countries and years. The elaborated 'atlas' of countries' inequality aversion opens new, exciting avenues in empirical research.

Despite the importance of the parameter in question, "[…] *there is little consensus on the estimation of inequality aversion in the context of income*" (Costa-Font and Cowell, 2019, p.175). As CRIA represents unobservable social preferences over income distributions, the problem is what empirical data the preferences could convincingly reveal.

Various data have been used in the literature for eliciting ε, particularly data coming from the leaky bucket experiments and data from tax schedules (see Section 2 for a review). However, such data are scarce and imperfect (Berg et al., 2018; Clark and D'Ambrosio, 2015). This obstacle limits their usage in worldwide analyses of inequality aversion across countries and over time.

In this paper, we argue that data on disposable incomes are adequate for solving the abovementioned problem. In democratic countries where the majority election rule holds, government choices reveal society's prevailing attitudes (Aristei and Perugini, 2010). Thus a society's unobservable preferences manifest themselves in legislative rules and decisions concerning the redistribution of *market* incomes (wages and capital incomes) by taxes and transfer systems.

Suppose l competitive redistributive policies differing in inequality aversion ε, therefore offering different distributions of *disposable incomes* (incomes after taxes and transfers). However, only one policy 'wins' the competition according to the legally binding social choice rules. Therefore, one may recognise the current distribution of disposable income as the observable manifestation of social preferences. Then one may ask what ε would be if the current distribution of disposable income were 'the winner'?

To answer this question, we approximate the observed discrete distribution of disposable incomes by the generalised beta distribution of the second kind, GB2($x;a,b,p,q$), $x>0$ (MacDonald, 1984). Economists commonly recognise this continuous distribution as the best theoretical approximation to empirical income distributions (Jenkins, 2007). Under GB2, SWF will be the mathematical expectation of the CRIA with respect to this distribution. This expectation exists, i.e. SWF is finite, if and only if ε lies in the interval $(0,ap+1)$ (Kot, 2020). Any redistributive policy using ε outside this interval would promise infinite social welfare. Remarkably, the *Rawlsian leximin*, the limiting case of CRIA when ε approaches infinity (Lambert, 2001, p. 99), promises such unrealistic welfare. We argue in Section 3 that ε obeys the uniform distribution within $(0,ap+1)$ interval. The mean of this distribution can be a plausible theoretical approximation of ε.

The rest of this paper runs as follows. Section 2 provides a concise review of the literature on the methods of estimating ε. Section 3 presents the method of eliciting ε from income data. This section also offers the maximum likelihood estimators of ε. In Section 4, we describe the statistical data. Section 5 presents the results of the empirical analysis of inequality aversion. In Section 6, we test some hypotheses concerning inequality aversion. Section 7 concludes.

Previous literature on estimating inequality aversion

Some preliminaries

In the distributional analysis, CRIA is a preferable parametric utility-of-income function. This function has the following form

$$u(x) = \begin{cases} \frac{x^{1-\varepsilon}}{1-\varepsilon}, for \varepsilon \neq 1 \\ lnx, for \varepsilon = 1 \end{cases}, x>0, \quad (1)$$

where the parameter ε reflects *inequality aversion* (Atkinson, 1970).

CRIA (1) with $\varepsilon<0$ represents an ‘inequality prone ‘society. When $\varepsilon=0$, *u(x)* reflects an 'inequality neutral' society. Such a society prefers one income distribution *F* over another *G* if and only if under *F* the mean income is higher than under *G* (Lambert, 2001, p. 99). When $\varepsilon>0$, the utility function *u(x)* represents an ‘inequality averse’ society. This society supports the Pigou-Dalton Principle of Transfers (Lambert, 2001, p. 46). Young (1990) noted that ε is equal to (minus) the elasticity of the marginal utility of income; high values of ε mean that the marginal utility of income declines as income grows, and therefore an income transfer from the rich to the poor is increasingly desirable.

Let the positive valued random variable *X,* with the distribution function *F(x),* (*X~F(x),* for short), describe income distribution.[3] The utilitarian *social welfare function* (SWF) is the expected value of *u(x),* with respect to *F(x),* namely

$$SWF=E[u(X)]=\int_D u(x)dF(x), \quad (2)$$

where *E* is the expected value operator, and *D* is an admissible integration region. This Lebegue-Stiltjes integral comprises both discrete and continuous types of income distributions.

If income distribution is discrete, with probability mass function $P(X=x_i)=p_i$, $p_i>0$ for all $i=1,2,\ldots$, $\sum_i p_i = 1$, the integral (2) will become the following sum

$$SWF = \sum_i x_i p_i, \; i=1,2,\ldots \quad (3)$$

For $i=1,2,\ldots,n<\infty$, SWF (3) is finite.

When we approximate the discrete income distribution by a continuous one with the density function $f(x)\geq 0$, $x>0$, SWF (2) will become the ‘usual’ Riemann integral, namely

$$SWF = \int_0^\infty u(x)f(x)dx \quad (4)$$

SWF (4) is finite if and only if the following condition holds

$$\int_0^\infty |u(x)|f(x)dx < \infty \quad (5)$$

(Fisz, 1967, p. 64).

[3] We assign capital letters for random variables and lower case letters for the values of random variables.

Some authors assume an arbitrary upper limit z of x to avoid the appearance of convergence problems at the top end. For instance, Lambert (2001, p. 20) describes z as "[any] income level in excess of the highest one actually occurring." Then SWF (4) will have the form

$$SWF = \int_0^z u(x)f(x)dx \tag{6}$$

(Lambert, 2001, p. 21)

Our paper does not follow such a 'top coding' guaranteeing finite SWF. Instead, we can only check whether the integral (4) satisfies the condition (5).

Continuous distributions for always finite sets of *observed* incomes deserve some explanation. Since Vilfredo Pareto (1897), continuous distributions have become a standard mathematical tool for constructing theoretical models of income distributions and applying statistical techniques. Kleiber and Kotz's (2003) monograph presents a broad spectrum of continuous parametric models of income distributions.

Johnson, Kotz, and Balakrishnan (1994, p. 1) noted that the most continuous distributions in model building are *approximations* to discrete distributions. The authors added that such an approximation facilitates mathematical and statistical analysis. The limit theorems justify approximations of discrete income distributions by continuous ones since the *finite* populations of income recipients in countries are usually huge,

Building on the interpretation of ε as inequality aversion, Atkinson (1970) proposed the normative index of inequality $A(\varepsilon,\mu)$

$$A(\varepsilon, \mu) = 1 - \frac{\mu_\varepsilon}{\mu}, \tag{7}$$

where μ is the mean income and μ_ε is *the equally distributed equivalent income* (EDEI) that, if received by all persons, gives the same level of *SWF* (1) as the present distribution (Kolm, 1969; Atkinson, 1970; Sen, 1973). More specifically, for utility function (1) and social welfare function (2), μ_ε is the solution to the equation: $u(\mu_\varepsilon)$=E[$u(X)$], namely

$$\mu_\varepsilon = \begin{cases} (E[X^{1-\varepsilon}])^{1/(1-\varepsilon)}, for\ \varepsilon \neq 1 \\ \exp\{E[\ln X]\}, for\ \varepsilon = 1 \end{cases} \tag{8}$$

For a given income distribution, μ_ε (8) is the SWF, which is determined by ε entirely. If ε=1, μ_ε is the geometric mean, and if ε=2, μ_ε is the harmonic mean. For a given income distribution, μ_ε is a declining function of ε (Lambert, 2001, Chapter 4).

For a *sample* of incomes, $x_1,\ldots,x_n$, Atkinson (1970) proposed the following estimator of EDEI (8):

$$\hat{\mu}_\varepsilon = \begin{cases} \left(\frac{1}{n}\sum_{i=1}^{n} {x_i}^{1-\varepsilon}\right)^{1/(1-\varepsilon)}, for\ \varepsilon \neq 1 \\ exp\left\{\frac{1}{n}\sum_{i=1}^{n} ln\, x_i\right\}, for\ \varepsilon = 1 \end{cases} \tag{9}$$

Using (7). we can express SWF (8) in terms of the mean income and inequality solely

$$\mu_{\varepsilon} = \mu(1 - A(\varepsilon, \mu)) \quad (10)$$

Eq. (9) is known as the Atkinson *abbreviated social welfare function.* A descriptive counterpart of (10) is Sheshinski's (1972) abbreviate social welfare function, popularised by Sen (1973)

$$SAWF = \mu(1 - G), \quad (11)$$

where G is the Gini index of inequality.

Estimation of inequality aversion in experimental economics and beyond

There is a lack of agreement among economists concerning the level of ε (Costa-Font and Cowell, 2019, p.175). In relatively infrequent studies, it is common to assume ε as invariant over time and space. However, little theoretical or empirical ground exists to assume such homogeneity (Aristei and Perugini, 2016).

In one strand of literature, analysts elicit ε from the Leaky Bucket Experiment (LBE) (Okun, 1975). In the LBE, participants assess a tolerable money loss ('leakage'), which inevitably occurs during discrete transfers among society members. The higher leakage a participant of the LBE permits, the greater is his/her aversion to inequality.

Usually, the LBE yields relatively low estimates of ε, notably 0.25 (Amiel et al., 1999) or 0.5. (Pirttilä and Uusitalo, 2010). Clark and D'Ambrosio (2015) note that LBE data have produced quite an extensive range for the estimated level of inequality aversion. The LBE-method is impractical in the retrospective analysis of inequality aversion. Furthermore, conducting worldwide LBEs does not seem feasible. Therefore, the estimates of ε obtained from the LBE are of little use in worldwide analyses of inequality aversion.

In another strand of literature, ε is derived from the relationship between income and happiness (e.g. Layard et al., 2008) or indirect behavioural evidence about consumption patterns (Attanasio & Browning, 1995; Blundell et al., 1994). In yet another approach, ε is estimated as the ratio of the income elasticity of demand to the compensated own-price elasticity (Evans, 2005). Kot (2017) estimates ε using data from the survey in which respondents evaluate income thresholds delimiting the just perceptible changes in the household's welfare.

One can also elicit inequality aversion, ε, from the equal sacrifice model (Richter, 1983; Vitaliano, 1977; Young, 1987). This model assumes that income taxes yield the same loss in individual utility across all income levels.

Algebraically, the principle of equal sacrifice implies that for all income level x and some constant $u_0>0$, the following identity holds:

$$u(x) - u[x - t(x)] = u_0 \tag{12}$$

where x is market income, $u(x)$ is utility and $t(x)$ is the total tax liability according to the income tax schedule (Lambert, 2001, p.175). Let the utility function have the form (1). Differentiating Eq. (12) with respect to x and solving for ε yields

$$\varepsilon = \frac{log(1-mtr)}{log(1-atr)} \tag{13}$$

where $atr=t(x)/x$ is the average tax rate and $mtr = \partial t(x)/\partial x$ is the marginal tax rate (Cowell and Gardiner, 1999; Evans, 2005; Groom and Maddison, 2019).

The estimates of ε based on the equal sacrifice model are much greater than those obtained by the LBE. Evans (2005) estimated ε for 20 OECD countries and found all values in the range 1–2, with the smallest estimate for Ireland (ε =1) and the largest for Austria (ε =1.79). For the UK, Cowell and Gardiner (1999) obtained the estimates of ε as 1.43 and 1.41. Groom and Maddison (2019) got an ε of about 1.5.

However, estimating ε based on the equal sacrifice criterion has some shortfalls. Lambert and Naughton (2009) and Ok (1995) pointed out some theoretical difficulties with the equal sacrifice model. Young (1990) and Mitra and Ok (1996) demonstrated that, in practice, the equal sacrifice criterion might be violated. Groom and Maddison (2019) are more radical on this issue when maintaining that testing the equality of sacrifice assumption is impossible. A practical obstacle in applying the equal sacrifice model for estimating ε is that usable cross-country income data are scarce and imperfect (Berg et al., 2018).

Lambert et al. (2003) estimate countries' inequality aversion by hypothesising the existence of *the natural rate of subjective inequality* (NRSI). The Atkinson index (7) expresses 'subjective inequality' in the authors' terminology, whereas the Gini index expresses 'objective inequality'. The NRSI hypothesis states that countries arrange their affairs to result in the same level φ of 'subjective inequality'. Thus, ε will be the solution to the equation:

$$A(\varepsilon,\mu)= \varphi \tag{14}$$

Lambert et al. (2003) use data on income shares for 96 countries and solve Eq. (14) numerically assuming seven hypothetical values of φ from 0.1 to 0.4, with a step size of 0.05. Thus, the authors obtain seven sets of estimates of ε, which range from 0.194 to 193. We shall test the NRSI hypothesis in Section 6.

Bourguignon and Spadaro (2012) estimated the elasticity of the marginal utility of income nonparametrically. This elasticity is a nonparametric counterpart of the (minus) inequality aversion. The authors inverted the typical logic of deducing the optimal tax-benefit rate schedule from a given social welfare function. Bourguignon and Spadaro (2012) applied their "optimal tax inverse method' to the French redistribution system. The authors ignored non-labour taxable income.

Retrieving the parameter of inequality aversion from a parametric distribution of incomes

This paper estimates the parameter ε of inequality aversion using Kot's (2020) method after introducing a slight complement. The method has the following assumptions:

1. A social decisionmaker's utility-of-income function is CRIA (1).
2. The disposable income distribution is the observable manifestation of a society's attitude towards inequality.
3. The generalised beta of the second kind distribution, GB2(*a,b,p,q*), (MacDonald, 1984), is the theoretical model of the disposable income distribution.

We present the first assumption only for form's sake; CRIA (1) has the single parameter ε that is the object of our interest. CRIA does not pretend to be a universal form of utility-of-income functions.

We discussed the validation of the second assumption in Section 1. In democratic countries, policymakers ought to represent and fulfil societies' expectations and preferences toward various values, particularly income inequality. Policymakers can redistribute income in society through the tax and transfer systems. The *current* distribution of disposable income reflects inequality aversion, i.e. the rate at which a society is willing to trade-off efficiency for equality.

Concerning the third assumption, disposable incomes (per equivalent adult) obey the generalised beta distribution of the second kind, GB2(*a,b,p,q*), with the density function:

$$f(x) = \frac{ax^{ap+1}}{b^{ap}B(p,q)\left[1+\left(\frac{x}{b}\right)^{a}\right]^{p+q}}, x>0, \tag{15}$$

where a, *b, p* and *q* are positive parameters and *B(p,q)* is the Beta function (McDonald, 1984).

The GB2 distribution is now widely acknowledged as providing an excellent theoretical model of income distributions while including many other models as particular or limiting cases (Jenkins, 2007). Bandourian et al. (2003) and Chotikapanich et al. (2018) show that the GB2 distribution is suitable for approximating the actual distribution of income.

Let us consider the l competitive redistributive policies more formally than we discussed in Section 1. Suppose each of the l policies uses the social welfare function (4) based on CRIA (1) but with a different level of inequality aversion ε_i, i=1,…,l. The l social welfare functions induce l optimal tax-benefit rate schedules (Mirreles, 1971, Bourguignon and Spadaro, 2010). Applying these schedules would give l resulting distributions of disposable incomes, say $f(x|\varepsilon_1),\ldots,f(x|\varepsilon_l)$. In other words, every policy promises the social welfare SWF_i, of the following form

$$SWF_i = \begin{cases} \frac{1}{1-\varepsilon_i}\int_0^{\infty} x^{1-\varepsilon_i} f(x|\varepsilon_i)dx, for\ \varepsilon_i \neq 1 \\ \int_0^{\infty} logx f(x|\varepsilon_i)dx, for\ \varepsilon_i = 1 \end{cases}, \quad i=1,\ldots,l, \qquad x>0 \quad (16)$$

As we now use continuous distribution GB2, we have to impose the constraint (5), which guarantees the existence of SWF_i.

According to the legally binding social choice rules, only one policy, say mth, 'wins' the competition in a given year. It means the acknowledgement of ε_m as the socially tolerable level of inequality aversion. Therefore, *the current distribution* of disposable incomes, with the density function $f(x|\varepsilon_m)$, reveals society's preferences toward income inequality.

One may ask what the level of ε_m would be if the current distribution of disposable incomes had the density function $f(x)$ (15)? The following theorem provides a general answer to this question.

Theorem 1 (Kot, 2020). Let $u_\varepsilon(x)$ with $\varepsilon\neq 1$ be given by (1). Let incomes obey the GB2 distribution (15) with a finite mean. Then SWF (16) exists if and only if inequality aversion ε belongs to the interval $(0,ap+1)$.

Theorem 1 states that if the observed GB2(a,b,p,q) distribution of disposable incomes resulted from the social choice based on the CRIA as a criterion, inequality aversion ε must have been in the interval $(0,ap+1)$. The values of ε outside this interval would characterise illusory policies that promised infinite social welfare.

Theorem 1 specifies an interval of inequality aversion ε, but a single value of ε is needed. Kot (2020) proposed the midpoint of the interval $(0,ap+1)$ as the socially tolerable inequality aversion ε, i.e.

$$\varepsilon_{mid} = \frac{1}{2}(ap+1) \qquad (17)$$

Although (17) seems plausible, it needs some justification.

We could say more about (17) if we knew the distribution of ε within $(0,ap+1)$ interval. However, if we have no idea about the location of ε, we are in the situation of *total ignorance*, i.e., *in the state of maximum entropy*. Then we can concern, at most, the uniform distribution of ε in this interval because only this distribution exhibits the maximum entropy among all continuous probability distributions with a bounded domain (Cover and Thomas, 1991, p.269). So, we may treat ε as a realisation of the random variable $\mathcal{E}$ that has the uniform distribution in $(0,ap+1)$ interval, [$\mathcal{E} \sim U(0,ap+1)$, for short].

Using known formulae for the uniform distribution, we can get the following descriptive statistics of Ɛ:
The mean:

$$E[\mathcal{E}] = \bar{\varepsilon} = \frac{1}{2}(ap + 1) \quad (18)$$

The median, Me_{ε} is equal to the mean $\bar{\varepsilon}$. A single mode of Ɛ does not exist, or every number in $(0,ap+1)$ interval is the mode.

As Eq. (17) is precisely the same as Eq. (18), we may interpret the midpoint (17) either as the mean (18) or the median of the $U(0,ap+1)$ distribution. Hereafter, we shall use the terms 'the midpoint', the mean' and 'the median' interchangeable.

The kth central moment of Ɛ is

$$E[(\mathcal{E} - \bar{\varepsilon})^k] = \begin{cases} 0, & for\ k\ odd \\ \frac{1}{k-1}\left(\frac{ap+1}{2}\right)^k, & for\ k\ even \end{cases}, \quad k=1,2,\ldots \quad (19)$$

Therefore,the standard deviation of Ɛ is

$$D[\mathcal{E}] = \sigma_{\varepsilon} = \frac{ap+1}{2\sqrt{3}} \quad (20)$$

Other basic descriptive statistics of Ɛ do not depend on a and p; the coefficient of variability $V=\sqrt{3}$, the coefficient of skewness $Sk= 0$, the kurtosis, $Ku=-6/5$.

One can also specify ε_{mid} for the particular cases of the GB2($x;a,b,p,q$) distribution. For the Dagum distribution (Dagum, 1977), i.e. for GB2 with $q=1$, the formula (17) is valid. For the Singh-Maddala distribution (Singh and Maddala, 1976), i.e. for GB2 with $p=1$, and the Fisk distribution (Fisk, 1961), i.e. for GB2 with $p=1$, $q=1$, we get $\varepsilon_{mid} = \frac{1}{2}(a+1)$. When incomes obey the beta distribution of the second kind (MacDonald, 1984), i.e. GB2 with $a=1$, the midpoint estimate of inequality aversion will be $\varepsilon_{mid} = \frac{1}{2}(p+1)$.

Kot (2020) showed that the maximum likelihood (ML) estimator $\hat{\varepsilon}$ of ε_{mid} (17) has the asymptotically normal distribution with the mean of $\hat{\varepsilon}$:

$$E[\hat{\varepsilon}] = \frac{1}{2}[\hat{a}\hat{p} + \widehat{cov}(\hat{a},\hat{p}) + 1] \quad (21)$$

In Eq. 21, the symbols $\hat{a}$ and $\hat{p}$ denote the ML-estimators of a and p, respectively, and $\widehat{cov}(\hat{a},\hat{p})$ is the covariance between $\hat{a}$ and $\hat{p}$. The standard deviation of the estimator $\hat{\varepsilon}$ has the following form

$$D[\hat{\epsilon}] = \frac{1}{2}\begin{Bmatrix} \hat{a}^2\hat{\sigma}_p^2 + \hat{p}^2\hat{\sigma}_a^2 + 2\hat{a}\hat{p}\cdot cov(\hat{a},\hat{p}) \\ +[\widehat{cov}(\hat{a},\hat{p})]^2 \end{Bmatrix}^{1/2}, \quad (22)$$

where $\hat{\sigma}_a^2$ and $\hat{\sigma}_p^2$ are the variances of $\hat{a}$ and $\hat{p}$, respectively (Kot, 2020).[4] The construction of the asymptotic confidence intervals for ε is apparent.

Statistical data

We estimate countries' aversion to inequality based on microdata on disposable household incomes from the Luxembourg Income Study (LIS) Database (2020).[5] We also utilized several datasets from the ERF-LIS Database, namely Egypt (1999, 2004, 2008, 2010, 2012, 2015), Iraq (2007, 2012), Jordan (2002, 2006, 2008, 2010, 2013), Palestine (2010, 2017), and Sudan (2009). These datasets contain the household disposable income comparable across other datasets available at LIS. We use all available LIS data for 55 countries and 1967-2018. Thus we have 388 country-year cases (hereafter called 'cases').[6] Incomes are expressed in International $US PPP adjusted and constant 2011 prices.

Table 1 illustrates the geographical representativeness of the data for the World Bank geographic regions. About 68% of the LIS data comprises the European Region, Central Asia, and North America. 16% of cases include data from the Region of Latin America and the Caribbean. 17% of the cases represent the remaining regions. About 68% of LIS data comprises cases from OECD countries (see Table 1).

We adjust disposable household incomes by the square root equivalence scale (Atkinson et al. 1995). We exclude from our statistical analysis households with zero disposable income. We apply weights equal to household sizes multiplied by survey weights in all calculations. We assume the 0.05 significance level for all statistical tests applied.[7]

It is worth adding that our statistical analyses utilise household disposable income *without* top-coding and bottom-coding. In other words, we neither follow the LIS procedure to top-code incomes at ten times the median nor employ bottom coding at 1% of mean income.[8] Some LIS datasets contain

[4] If a software applied for estimating GB2 does not provide a variance-covariance matrix, $\widehat{cov}(\hat{a},\hat{p})$ might be omitted since the absolute value of this component is usually very small.

[5] Note that the number of LIS datasets increases four times per year as new datasets are added to the Luxembourg Income Study (LIS) Database.

[6] The ERF-LIS Database was provided to LIS by the Economic Research Forum (ERF) and harmonized at LIS with the same standards as the other LIS datasets. For more information, see https://www.lisdatacenter.org/our-data/erf-lis-database

[7] We perform calculations using the software Stata and Statistica (StatSoft) and additional computer programs written by ourselves in Fortran 99.

[8] For LIS practices in respect to the microdata, see Ravallion (2015).

data already top-coded by data providers to guarantee the confidentiality of high-income households/persons. For further details, see Eriksson (2011). Top-codes' assignment diminishes the estimates of inequality measures such as the Gini index (see, among others, Larimore et al., 2008; Feng et al., 2006; Burkhauser et al., 2004; Burkhauser et al., 2007).

We estimate the Gini indices using non-top-coded and top-coded data to assess how top-coding affects economic inequality estimates. The relaxation of top coding has a considerable impact on the measurement of economic inequality. The mean difference accounts for 2.18% of the mean Gini.

Empirical results

Fitting the GB2 distribution

We estimate parameters *a, b, p, q* of the GB2 distribution by the maximum likelihood method using the *gb2lfit* Stata procedure (Jenkins, 2007). The estimates of the parameters are presented in Table A1 in the Appendix. Unfortunately, we cannot test the goodness of fit of the GB2 distribution to countries' income data because the Stata *gb2lfit* procedure does not provide a relevant statistical test.[9]

Classical tests of goodness of fit have usually prescribed the rejection of theoretical distributions. McDonald and Xu (1995) noticed that this result is not uncommon in large sample sizes applications. For instance, Bandourian et al. (2003) fitted the GB2 distribution to grouped LIS data on market household income for 23 countries and 82 country-year cases. The χ^2 test rejected the GB2 distribution in all but five instances, namely Hungary 1991 and Israel 1979, 1986, 1992, and 1997. It is worth adding that the sample sizes of those five cases were small.

McDonald (1984) recommends an indirect approach to checking goodness of fit by comparing estimated population characteristics with independently obtained results. Table 2 illustrates the accuracy of GB2 in predicting the mean incomes (Model 1) and the Gini indices (Model 2).[10]

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[9] The distributional diagnostic plots for each country-year estimation, such as plots of the quantiles of equivalent disposable income against the quantiles of a GB2 distribution as well as the probability plot for disposable equivalent income compared with a GB2 distribution are available upon request. These graphs were generated with commands *qgb2* and *pgb2* using Stata and provided by Nicholas J. Cox.

[10] We have to drop three cases from our sample, notably Israel 1979, and Luxembourg 1991 and 2000, since some parameters of GB2 estimate of the parameter *a* of the fitted GB2 distribution was statistically insignificant. Nevertheless, we present the estimates of parameters of the GB2 distribution for these 3 cases in Table A1.

In Table 2, variables with subscript 'emp' are empirical statistics, whereas variables with subscript 'GB2' are the same statistics predicted by the GB2 distribution. Examining Table 2 shows that the GB2 distribution predicts basic distributional statistics accurately.

The estimates of inequality aversion

We estimate the parameter ε of inequality aversion using the formula (21). The covariance between the estimators of a and p is calculated based on the exact Fisher's information matrix of GB2, developed by Brazauskas (2002). Table A2 in the Appendix contains the estimates of ε, standard errors, 95% confidence intervals, and related normative characteristics.

Fig. 1 shows the estimated density function of the distribution of inequality aversion. We estimate the Gaussian kernel's density function, taking all country-year cases into account. In Fig.1, we observe two peaks, at $\varepsilon=1.62$ and 1.9, and positive skewness of this distribution.

In Fig. 2, we present the world map with the estimated inequality aversions (ε). We take ε for the latest available income year and create the deciles of ε based on 55 countries.[11] Fig. 2 clearly illustrates the diversification of inequality aversion by country and region where most European and Central Asian countries, together with Taiwan, Vietnam, Egypt, and Uruguay, present the highest inequality aversion (8^{th}-10^{th} decile).

Table 3 presents the basic statistics of ε broken down by the World Bank's Geographic Regions. In this table, regions are arranged in descending order of the mean of ε.

Examining Table 3 shows that all estimates of global inequality aversion ε range from 0.97 (Peru, 2004) to 3.8 (Egypt 1999). The differences in inequality aversion between geographic regions are statistically significant.[12] 90% of all estimates of ε are less than 2.5. Thus, we get a range of ε estimates that often do not match the values utilised in empirical research and are calculated based on experiments or surveys. It is worth adding that the mean inequality aversion in the Sub-Saharan Region and the North America Region do not differ statistically (Welch's p=0.954). The latter region comprises two rich countries, notably the USA and Canada.

[11] Most of the country's epsilons are based on the LIS Wave IX (around the year 2013) and X (around the year 2016). Several mapped cases are from previous waves (i.e., Sweden, Romania, France, Island, Ireland, Dominican Republic, Sudan, and India).

[12] We apply Welch's F in ANOVA to test for equality of means because of unequal variance. We get F=40.12963, p=0.00.

The verification of some hypotheses

The estimates of countries' inequality aversion enables the empirical verification of some hypotheses proposed in the literature. In this section, we test the following two hypotheses:

Hypothesis 1: The richer the country, the greater its inequality aversion (Frish, 1959, Atkinson, 1970).

Hypothesis 2: There is a single 'natural rate of subjective inequality' across countries (Lambert et al., 2003)

We can verify hypothesis 1 by estimating the regression functions $\varepsilon=\alpha_0+\alpha_1 Mean_{GB2}+z$, where z is the disturbing term. We obtained the estimate of α_1=0.000001 with the standard error of 0.000003. As $p\text{-}value$=0.614, we cannot reject the null hypothesis H_0: $\alpha_1=0$ against H_1: $\alpha_1 > 0$. Thus, our data do not confirm **Hypothesis 1.** A good illustration of the lack of the relationship between inequality aversion and the level of economic development is the abovementioned comparison of inequality aversion in the North American region and the Sub-Saharan Region.

Hypothesis 2 is the NRSI hypothesis mentioned in Section 2. This hypothesis was put forward by Lambert et al. (2003). We apply the classical *modus tollens* inference rule: $[(NRSI \rightarrow C) \wedge \sim C] \rightarrow \sim NRSI$, which reads: *If NRSI then C, but if not C then not NRSI*, where *C* is an observable consequence of NRSI. Empirical data are decisive whether 'C' or 'not *C*' occurs.

One can deduct two observable consequences of the NRSI. First, C_1*:* the distribution of the Atkinson index among countries is egalitarian, i.e. this index has the one-point distribution at φ, according to Eq. (14). The second consequence, C_2, of the NRSI was suggested by Lambert et al. (2003) as follows: "(…) countries with low (high) tolerance for inequality have low (high) inequality as measured by the Gini coefficient as well." In other words, the greater (lower) societies' inequality aversion, the lower (greater) their income inequality. In general, C_2 reads as: 'the Gini coefficient in income distributions is a declining function of ε.'

The distribution of the Atkinson index, A_ε, presented in Fig. 3, can help assess whether C_1 occurs or not. Examining Fig. 3 shows that A_ε does not have the one-point distribution; two maxima of the density function: φ_1=0.2567 and φ_2=0.4875 are apparent. This observation suggests that there might be two 'natural subjective inequality' rates globally. It is worth noting that Lambert et al. (2003) could not see the second maximum since they assumed the level φ of NRSI did not exceed 0.4.

To check formally whether the *A*-distribution is egalitarian or not, we test the statistical hypothesis H_0: $G_A=0$, against H_1: $G_A>0$, where G_A is the Gini index of the A_ε distribution. As the sample Gini index has the asymptotic normal distribution, the ratio $Z = \hat{G}/D[\hat{G}]$ has the asymptotic standard normal distribution under null, where $\hat{G}$ is the estimator of G and $D[\hat{G}]$ is the standard deviation of $\hat{G}$. We get $\hat{G}$=0.181993, and $D[\hat{G}]$ = 0.006755. As z=26.94 is greater than the critical value z_α=1.64, we reject the NRSI hypothesis since 'not C_1' occurs.

Two circumstances must be accounted for when the second empirical consequence (C_2) of the NRSI hypothesis confronts reality. For presenting the first circumstance let us consider two societies, S_1 and S_2, with income distributions X_i~GB2(x,a_i,b_i,p_i,q_i), and the Lorenz curves $L_i(u)$, $u\epsilon[0,1]$, i=1,2, respectively. G_1 and G_2 denote the Gini indices in distributions X_1 and X_2, respectively. Lorenz dominance, $\geq_L$, is defined as

$$X_1 \geq_L X_2 \leftrightarrow L_1(u) \leq L_2(u),\ \forall\ u\epsilon[0,1], \quad (23)$$

provided the Lorenz curves do not intersect (Kleiber and Kotz, 2003, p.24). Note that inequality in X_1 is not less than inequality in X_2, thus $G_2 \leq G_1$. In the case of GB2, necessary conditions for Lorenz dominance are

$$a_1p_1 \leq a_2p_2 \text{ and } a_1q_1 \leq a_2q_2 \quad (24)$$

(Kleiber and Kotz, 2003, p.192). Recalling (17), we get

$$\varepsilon_1 \leq \varepsilon_2 \text{ and } a_1q_1 \leq a_2q_2 \quad (25)$$

Clearly, the fulfilment of inequality $\varepsilon_1 \leq \varepsilon_2$ *alone* in (23) is not the necessary condition of Lorenz dominance. In other words, greater inequality aversion of S_2 than that of S_1 does not necessarily imply lower income inequality in X_2 than in X_1.

The second circumstance is that C_2 has a competitor in the form of the well-known inequality-development relationship (IDR). Kuznets (1955) originated this relationship in the famous *inverted-U hypothesis*. He showed that during development, inequality first increases and then declines. A large research body has tested Kuznets's hypothesis (see, among others, Tuominen, 2015, for an extensive review) and recently challenged by Piketty (2014).

It is worth noticing that Kuznets and most of his followers have analysed IDR based on inequality in the distribution of *market incomes*, i.e., incomes before tax and social transfers. Thus, they have ruled out all redistributive issues. However, if an analysis of IDR is based on disposable incomes, the effects of redistributive policies should be considered. To do this, we propose augmenting IDR by including social attitudes toward inequality. More specifically, we may treat income inequality, measured by the Gini index, as a function of ε and the mean household disposable income as a development measure.

We shall analyse such an *augmented inequality-development relationship* (AIDR) nonparametrically using graphical visualisations of empirical data.

This approach appears to reveal more features of AIDR than imposed parametric models.

To illustrate this supposition, we present the AIDR for the Latin America and Caribbean Region. Fig. 4a shows the standard IDR in this region.

The parameters of the fitted quadratic polynomial in Fig. 4a are not statistically significant except for the intercept. Thus, one cannot hold that inequality in the Latin America and Caribbean Region traces the classical inverted U-curve.

Fig. 4b shows a parametric AIDR for the region in question, where a quadratic form smoothes the Gini index's surface. AIDR in Fig. 4b shows decreasing inequality when increasing ε, at higher levels of development, *ceteris paribus*. However, inequality seems to follow a U-shaped curve for lower levels of development. Thus the NRSI hypothesis seems to be valid only at high levels of development. The standard IDR appears to be increasing for small ε and decreasing for large ε.

Fig. 4c displays AIDR smoothed by splines; thus, without any parametric form imposed. Examining Fig. 4c shows that the Gini index is a declining function of ε for all development levels, ceteris paribus. This fact corroborates the NRSI hypothesis for the Latin America and Caribbean Region. We also observe that inequality aversion influences the shape of the IDR. For low levels of inequality aversion, the Gini surface exhibits a U-shaped form. However, for high levels of inequality aversion, the shape of the surface becomes the classical Kuznets inverted U-shaped curve. This fact explains the failure in estimating the standard IDR, as in Fig. 4a. The AIDR has an advantage over the standard IDR, which reveals only partial information about the behaviour of inequality in the region in question.

We can draw the same conclusions when examining the contour plot of the AIDR in Fig. 4d. The contour plot in Fig. 4d enables a visual inspection of any single dimension's impact on inequality, *ceteris paribus*. For a given level of development, inequality diminishes with increasing inequality aversion, *ceteris paribus*. This observation corroborates the NRSI hypothesis. For a given level of inequality aversion, we get the standard IDR. The pivotal value of ε of about 1.5 delimits the AIDR shape changes from a U-shaped form to an inverted U-shaped form.

Figures 5a and 5b display the global AIDR for all LIS data cases. Examining Fig. 5b shows some exciting features of AIDR. A broad scatter of empirical points on the plain explains the weakness of Hypothesis 1, which we tested earlier. We also observe that income inequality follows a U-shaped curve as ε increases. Therefore, the NRSI hypothesis is falsified on a global scale. However, the area of increasing inequality aversion is visible for ε above 2.5, which is the last decile of inequality aversion (see Table 3). This observation suggests the falsification of the NRSI hypothesis in about 10% of all cases. It is a matter of an analyst's taste, whether 10% is an acceptable level of significance or not. In Fig. 5b, one can also observe a U-shaped standard IDR, obvious at low inequality aversion levels.

The global AIDR presented in Figures 5a and 5b is the composition of countries' AIDRs. Because of limited space, we shall show only the regional contour maps of the AIDR.

Fig. 6 shows the AIDR for Europe and Central Asia. Fig. 6 shows declining inequality as ε increases at the lowest level (below \$10000) of development, *ceteris paribus*. For higher levels of development and $\varepsilon<2.4$, inequality increases, *ceteris paribus*. As $\varepsilon_{0.90}=2.41$ (see Table 3), about ten per cent of all cases falsifies the NRSI hypothesis in the region in question. For low levels of inequality aversion, namely for $\varepsilon<1.5$, one can observe the declining part of standard IDR. For $\varepsilon>1.5$, IDR traces out an inverted U-shape with a vanishing segment of a decrease.

Fig. 7 displays the AIDR for the North America Region. Fig. 7 shows that inequality is a declining function of ε for all income levels. This observation corroborates the NRSI hypothesis in this region. The standard IDR is an increasing function of development for $\varepsilon<1.7$ and an inverted U-shaped function for greater inequality aversion levels.

Fig. 8 displays the AIDR for the Middle East and North Africa Region. Examining Fig. 8 shows that inequality is a declining function of ε for all development levels. Similarly, the standard IDR is a declining function of development in the region in question.

Fig. 9 shows the AIDR for East Asia and the Pacific Region. Examining Fig. 9 shows that inequality is a declining function of inequality aversion for all development levels. Thus, the NRSI hypothesis is not falsified. The standard IDR displays a U-shaped form, although its increasing segment seems insignificant and consecutively vanishes with increasing ε.

We cannot present the augmented inequality-development relationship for the Sub-Saharan Africa and South Asia regions since the small number of observations makes a visual presentation inconclusive.

Conclusions

This paper offers the atlas of inequality aversion, ε, for 388 LIS datasets using the method proposed by Kot (2020). The method is based solely on disposable income distributions, which embody society's unobservable preferences regarding inequality. Assuming GB2 distribution of disposable income, one can elicit ε from a mathematical condition for the social welfare function's finiteness.

Applying the method in question is easy since only estimates of the parameters of the *GB2* distribution, or its particular cases, are necessary to estimate ε. One can use standard software for this purpose, notably the *gb2fit* Stata module (Jenkins, 2007) or the R codes elaborated by Graf and Nedyalkova (2010).

Our empirical findings reveal several exciting features of countries' inequality aversion. The estimates of ε turn out to be country-specific. Also, the country's ε varies over time. These observations do not necessarily entail changing policymakers' attitudes towards inequality. According to our model of *l competitive policies*, the collective choice selects one policy that is the most adequate to the *current* challenges of an economic situation and social expectations. We hope that understanding the thresholds of a population's tolerance for inequality can help steer economic policy decision making.

The possibility of estimating countries' inequality aversion opens up new exciting perspectives in distributional and welfare analyses. In this paper, we have tested two hypotheses. We found that affluent societies are not necessarily more inequality-averse than poor ones. For ascertaining the NRSI hypothesis, we put forward the augmented inequality-development relationship, which explains income inequality by economic development *and* inequality aversion. Generally, we have confirmed the NRSI hypothesis in about 90% of all cases. Thus, we may say that the existence of one natural rate of inequality seems probable, although the existence of two such natural rates might also be taken into account.

While this paper contributes to the field of welfare economics, we believe that the estimates of inequality aversion for such a large number of countries over time could benefit research in other social science disciplines. We call it the Atlas of Inequality Aversion Parameters, the first such database that allows researchers to obtain the Atkinson index for 55 countries over time. We have not exhausted the research on the estimation of inequality aversion. Further research could utilise more countries employing the Luxembourg Income Study (LIS) Database, which is frequently updated with new country-year data. This database is so far most complete and comparable across time and space.

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Table 1. Geographic distribution of LIS data

Region	*N*	*%*
Latin America & Caribbean	61	15.72
Europe & Central Asia	231	59.54
South Asia	2	0.52
Sub-Saharan Africa	7	1.80
The Middle East & North Africa	25	6.44
East Asia & Pacific	32	8.25
North America	30	7.73

All Regions	388	100.00

Source: Authors' calculation

Table 2. OLS Regression Summary: empirical mean ($Mean_{emp}$) and the Gini index ($Gini_{emp}$) predicted by the GB2 estimates

Regressors	*Model 1* $Mean_{emp}$	*Model 2* $Gini_{emp}$
$Mean_{GB2}$	1.007***	
	(0.00112)	
$Gini_{GB2}$		0.948306***
		(0.004934)
Intercept	-136.784***	0.017976***
	(24.75965)	(0.001707)
N	388	388
adjusted R^2	0.9995	0.9896

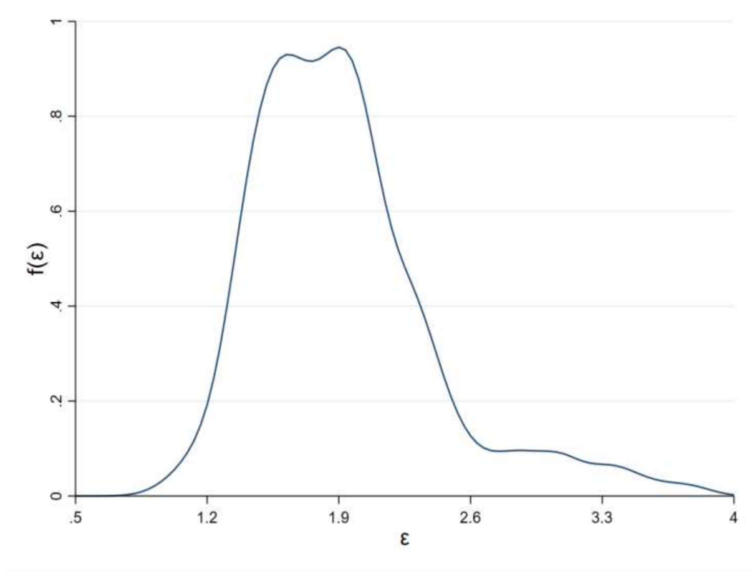
Notes: Subscript 'emp' denotes empirical characteristics (dependent variables)
Subscript 'GB2' denotes GB2 estimates (independent variables)
Standard errors in parentheses; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Source: Authors' calculations using data from Table A2 in Appendix

Table 3. Descriptive statistics of inequality aversion in geographic regions

Geographic Region	*Mean*	*Median*	*Min.*	*Max.*	*Std. Dev.*	*Skew-ness*
Latin America & Caribbean	2.38408	2.04238	1.41161	3.80051	0.78528	0.552
Europe & Central Asia	2.00117	1.74186	1.42036	3.45236	0.57064	1.287
South Asia	1.99491	1.96880	1.30795	3.32174	0.36181	0.795
Sub-Saharan Africa	1.65410	1.53103	0.96919	3.62513	0.51061	2.294
The Middle East & North Africa	1.54855	1.30975	1.16449	2.76475	0.55993	2.212
East Asia & Pacific	1.53567	1.53605	1.32629	1.87235	0.14630	0.657
North America	1.49620	1.49620	1.48208	1.51031	0.01996	
All Regions	1.92079	1.85271	0.96919	3.80051	0.48253	1.259

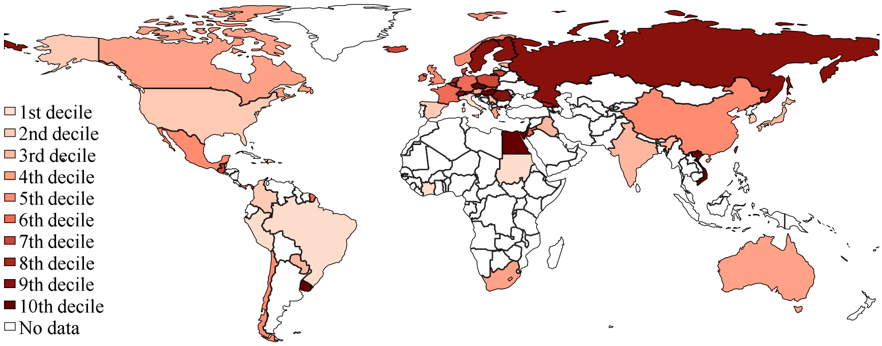
Source: Author's calculations

Figure 1. The density function of inequality aversion
Note: Gaussian kernel, all country-year cases



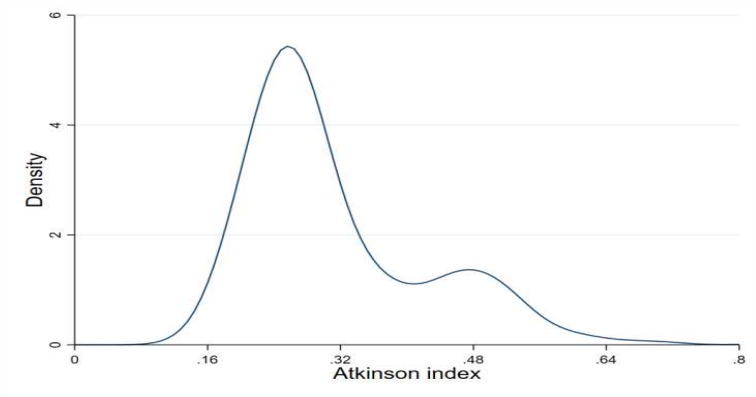
Source: Authors' elaboration

Figure 2. The map of inequality aversion
Note: Deciles, all country cases, the latest available year



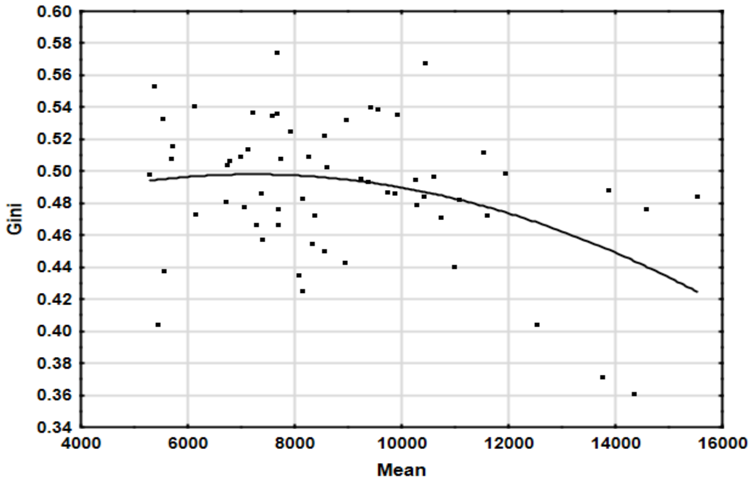
Source: Authors' elaboration

Figure 3. The density function of the Atkinson index
Note: Gaussian kernel, all country-year cases



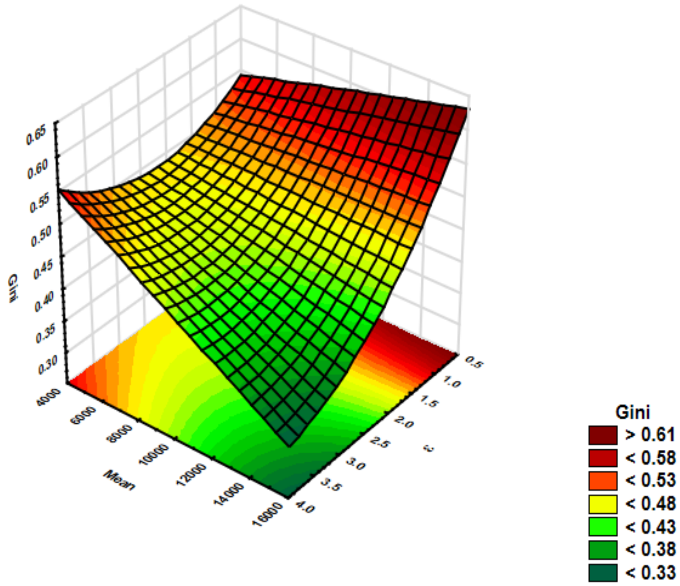
Source: Authors' elaboration

Figure 4a. The standard IDR for the Latin America and Caribbean regions.
Note: a quadratic polynomial fitted



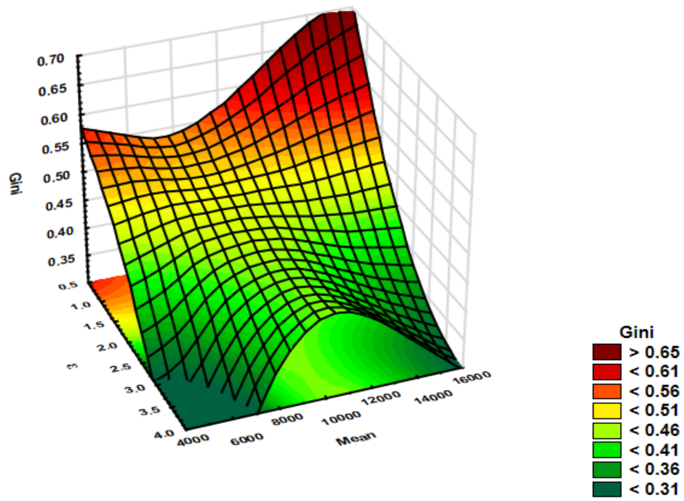
Source: Authors' elaboration

Figure 4b. The AIDR for the Latin America and Caribbean region.
Note: Gini surface smoothed by the quadratic form



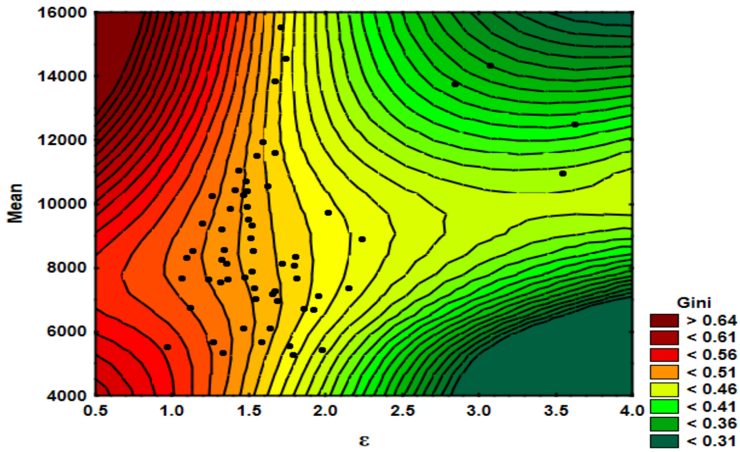
Source: Authors' elaboration

Figure 4c. The AIDR for the Latin America and Caribbean Region.
Note: Gini surface smoothed by splines.



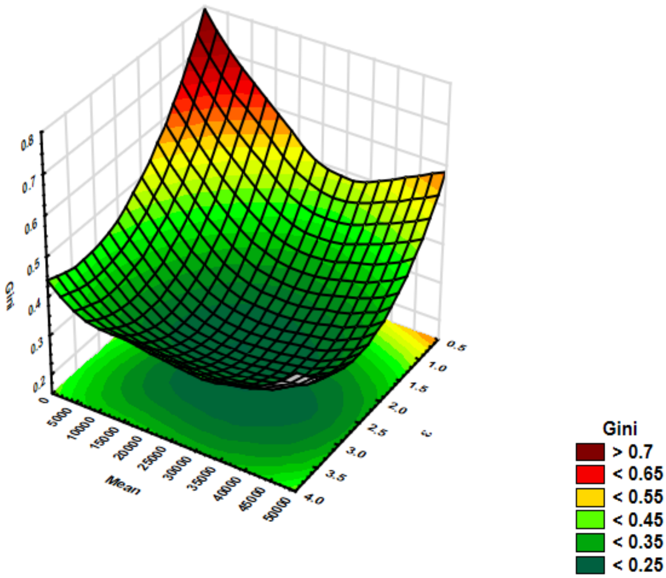
Source: Authors' elaboration

Figure 4d. The contours of the AIDR for Latin America and the Caribbean region.
Note: Gini surface smoothed by splines.



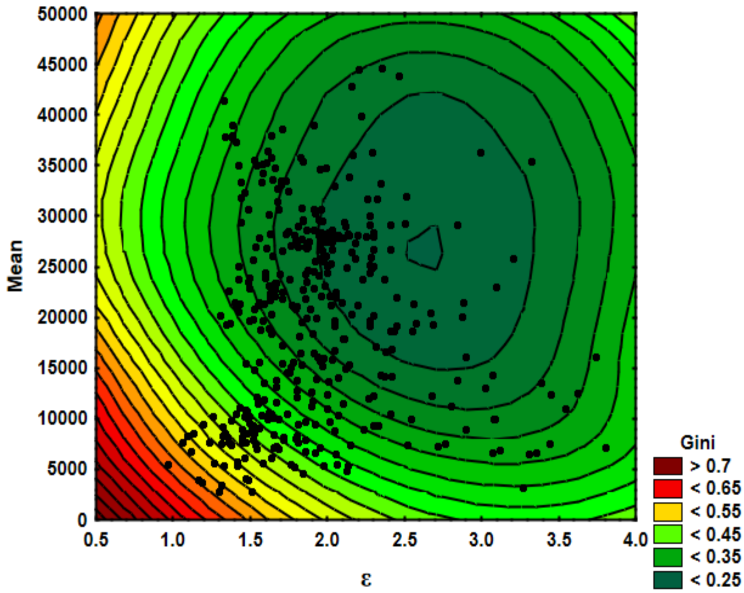
Source: Authors' elaboration

Figure 5a. The Global AIDR.
Note: Gini Surface Smoothed by Splines.



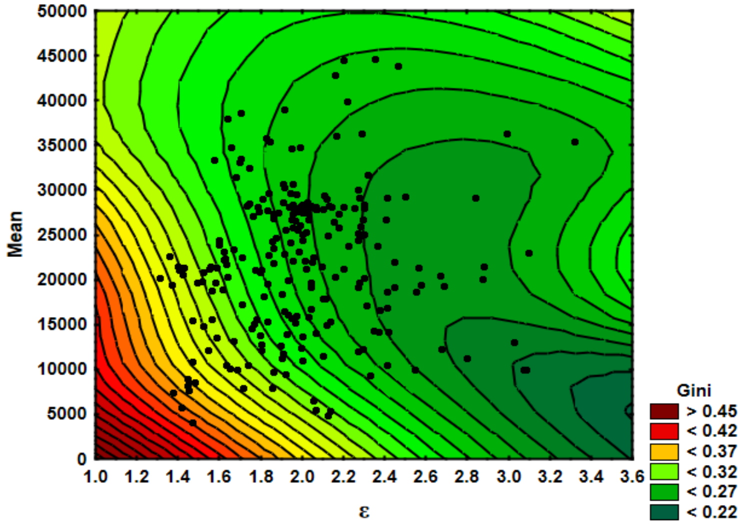
Source: Authors' elaboration

Figure 5b. The Contours of the Global AIDR.
Note: Gini Surface Smoothed by Splines.

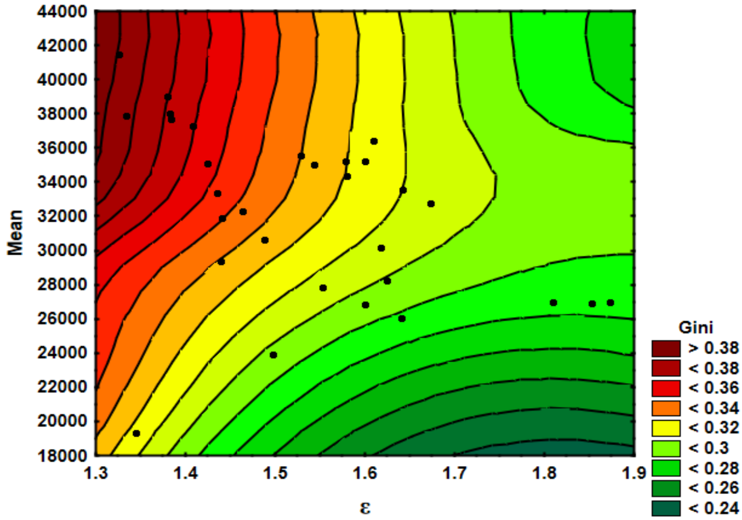


Source: Authors' elaboration

Figure 6. The Contours of the AIDR for Europe and Central Asia.
Note: Gini Surface Smoothed by Splines.

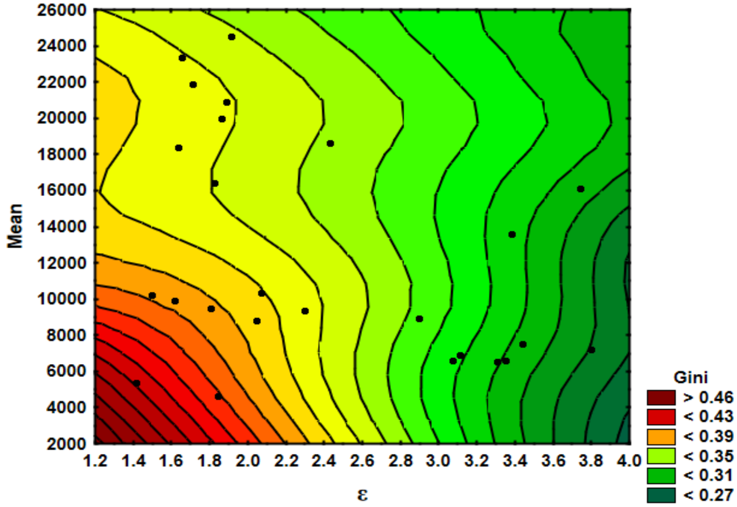


Source: Authors' elaboration
Figure 7. The Contours of the AIDR for North America.
Note: Gini Surface Smoothed by Splines.



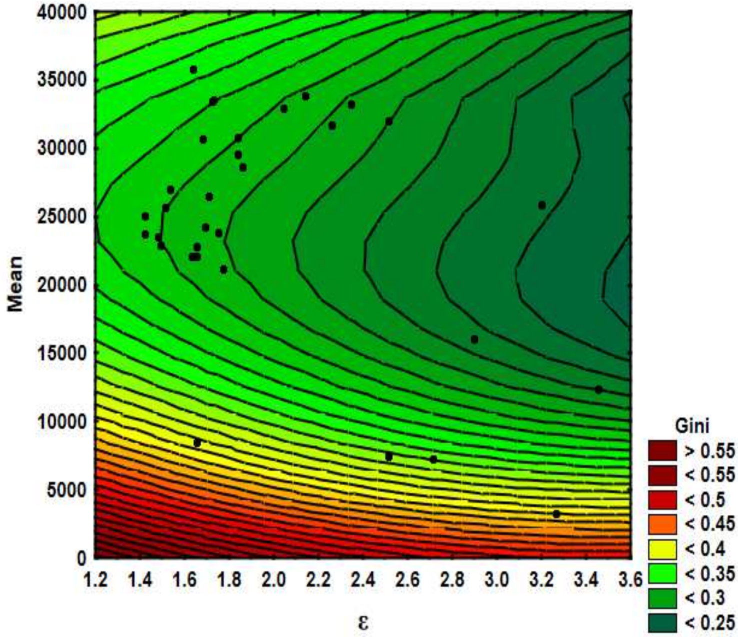
Source: Authors' elaboration

Figure 8. The Contours of ADAIR for the Middle East and North Africa. Note: Gini surface smoothed by splines.



Source: Authors' elaboration

Figure 9. The Contours of the ADAIR for East Asia and the Pacific. Note: Gini Surface Smoothed By Splines.



Source: Authors' elaboration

Appendix

Table A1. Estimates of the GB2(a,b,p,q) distribution parameters
Notes: symbol D[] denotes the standard errors of estimates; N-the number of households
Source: Author's calculations using data on household disposable incomes from the LIS database, adjusted by the equivalence scale in the form of the square-root of the household size.

Country	*Year*	*a*	*D[a]*	*b*	*D[b]*	*p*	*D[p]*	*q*	*D[q]*	*N*
Australia	1981	2.73453	0.12516	35232.02	1492.08	0.84540	0.05064	2.74908	0.30293	42211
Australia	1985	3.00767	0.18091	29914.79	1132.70	0.75179	0.05950	1.83266	0.21619	20408
Australia	1989	2.83104	0.12513	29252.31	777.35	0.81629	0.04846	1.75688	0.14598	39022
Australia	1995	2.48179	0.15120	26513.81	1138.95	1.02422	0.08736	2.01520	0.24085	17915
Australia	2001	2.51393	0.15813	28084.61	1084.39	0.99704	0.08832	1.78305	0.20587	16820
Australia	2003	2.60437	0.12872	30478.10	991.13	0.91512	0.06254	1.84740	0.17343	24560
Australia	2004	3.04685	0.14752	28705.48	624.07	0.79419	0.05226	1.27101	0.10122	28492
Australia	2008	3.09511	0.18086	32475.17	680.82	0.79251	0.06395	1.06499	0.09338	22874
Australia	2010	2.74966	0.10870	34606.17	638.94	0.89515	0.04929	1.31753	0.08549	42164
Australia	2014	3.82382	0.17522	35227.20	508.26	0.59427	0.03521	0.83488	0.05501	33786
Austria	1987	3.68339	0.24403	28350.48	583.46	0.97230	0.09031	1.65429	0.18595	24799
Austria	1994	5.12467	0.55384	28395.76	718.13	0.50150	0.06654	0.70782	0.10728	7978
Austria	1995	3.66196	0.15982	32537.52	725.46	0.59854	0.03251	1.59302	0.13228	47753
Austria	1997	4.45533	0.49881	28369.26	879.44	0.61133	0.08699	0.93804	0.15923	7285
Austria	2000	4.71063	0.59485	28634.00	836.65	0.63199	0.10292	0.87474	0.16070	6175
Austria	2004	5.51891	0.49090	28851.55	480.66	0.52819	0.05801	0.62374	0.07449	13039
Austria	2007	4.84126	0.38032	33046.02	673.19	0.48657	0.04632	0.76279	0.08668	13618
Austria	2010	5.29707	0.40683	34288.59	602.83	0.45266	0.04177	0.68515	0.07339	13928
Austria	2013	5.42436	0.42463	33018.41	562.03	0.45816	0.04339	0.66149	0.07104	12979
Austria	2016	6.70906	0.58185	35325.09	561.88	0.31984	0.03136	0.52474	0.05968	12827
Belgium	1985	3.64808	0.24768	20340.88	487.02	1.06815	0.10326	1.51927	0.17710	18293
Belgium	1988	4.34554	0.36626	20579.28	497.32	0.82819	0.09618	1.11028	0.14626	11096
Belgium	1992	3.07468	0.31040	24465.30	1108.16	1.34125	0.19774	2.20647	0.42249	10703
Belgium	1995	4.66632	0.52218	25930.47	692.34	0.58831	0.08674	0.88581	0.13937	6637
Belgium	1997	3.53914	0.29152	29433.02	1097.35	0.81547	0.08937	1.64332	0.24884	12243
Belgium	2000	4.63761	0.57754	25515.38	735.75	0.62648	0.10577	0.77052	0.12796	5083
Belgium	2004	2.95317	0.23497	25396.51	741.60	1.29198	0.16351	1.48846	0.18369	12112
Belgium	2007	3.59311	0.24761	29368.74	632.52	0.84790	0.08461	1.23557	0.12740	15104
Belgium	2010	3.16145	0.24022	34666.61	1146.62	0.92040	0.09887	1.81353	0.24128	14289
Belgium	2013	2.80256	0.21053	35654.36	1383.67	1.09014	0.11907	2.15653	0.29850	14340
Belgium	2016	2.93838	0.21991	33321.82	1050.68	1.10277	0.12230	1.85558	0.23789	14019
Brazil	2006	1.80161	0.03927	4926.41	46.92	1.14097	0.03623	1.06822	0.03455	397969
Brazil	2009	1.96455	0.04127	6047.66	52.74	1.03789	0.03095	1.04163	0.03254	386715
Brazil	2011	2.51937	0.05481	7106.34	53.80	0.69468	0.01969	0.79661	0.02433	338597
Brazil	2013	2.33054	0.05310	7592.10	57.61	0.83882	0.02625	0.90073	0.02903	342720
Brazil	2016	3.17920	0.06135	7747.90	44.63	0.47547	0.01104	0.60402	0.01547	437103
Canada	1971	4.67766	0.20343	24829.62	333.18	0.36088	0.01822	0.89637	0.05919	77744
Canada	1975	4.41606	0.18718	30592.29	425.02	0.45152	0.02303	1.09116	0.07395	78795
Canada	1981	3.29300	0.16850	34925.35	931.50	0.69243	0.04557	1.70300	0.16350	41845
Canada	1987	2.91645	0.18830	33700.16	1106.19	0.89770	0.07797	1.83003	0.21887	30722
Canada	1991	2.99834	0.13151	32341.44	653.43	0.90245	0.05434	1.70683	0.13280	53222
Canada	1994	2.68708	0.09008	33922.90	619.70	1.02146	0.04785	2.05048	0.12863	97858
Canada	1997	3.52385	0.11045	33702.54	475.72	0.62435	0.02488	1.36862	0.07480	86600
Canada	1998	3.91895	0.12781	31602.55	339.70	0.53728	0.02214	0.98373	0.04849	79432
Canada	2000	3.79521	0.12533	29827.19	317.98	0.59240	0.02521	0.93991	0.04610	72850
Canada	2004	3.53568	0.12594	32314.75	383.15	0.63192	0.02931	1.02481	0.05512	68541
Canada	2007	3.55839	0.12334	33917.80	393.53	0.65944	0.03001	0.99665	0.05204	64783
Canada	2010	3.58606	0.13063	35400.29	422.06	0.63708	0.03045	0.99916	0.05433	60362
Canada	2012	3.48763	0.13309	38507.39	523.71	0.61940	0.03059	1.09394	0.06464	57539
Canada	2013	3.06507	0.11629	42277.20	777.88	0.68095	0.03341	1.35293	0.08808	54483
Canada	2014	3.77479	0.14531	38942.11	499.13	0.57155	0.02791	0.99123	0.05804	55551
Canada	2015	3.78380	0.14855	39485.55	496.22	0.54368	0.02670	0.95894	0.05662	59727
Canada	2016	3.72657	0.13435	39142.70	483.50	0.59053	0.02706	1.02625	0.05717	62148
Canada	2017	3.54774	0.10132	39975.23	414.59	0.62551	0.02302	1.05909	0.04713	91884
Chile	1990	2.63741	0.10336	3236.21	46.67	0.73039	0.03770	0.63620	0.03357	103840
Chile	1992	2.37515	0.07540	3396.30	46.72	0.97195	0.04421	0.70947	0.03072	141853
Chile	1994	1.88154	0.05745	4479.87	65.99	1.08215	0.04729	1.00024	0.04549	175871
Chile	1996	2.16883	0.07353	4841.72	71.97	0.92791	0.04371	0.81805	0.03948	133376
Chile	1998	2.18759	0.06217	5062.10	62.51	0.91030	0.03579	0.79733	0.03207	186878
Chile	2000	2.87496	0.07527	5199.50	44.48	0.63175	0.02122	0.54893	0.01857	250869
Chile	2003	2.51611	0.06135	5286.30	48.47	0.78546	0.02566	0.67895	0.02255	255114
Chile	2006	2.28633	0.05442	6004.75	57.24	0.97777	0.03292	0.82493	0.02774	267421
Chile	2009	3.17419	0.07550	6313.39	46.82	0.65909	0.02021	0.54072	0.01671	245032
Chile	2011	3.01946	0.07901	6681.56	56.26	0.72071	0.02495	0.58731	0.02019	199413
Chile	2013	2.97390	0.07415	7661.27	61.83	0.78608	0.02660	0.60641	0.01987	217666
Chile	2015	2.74948	0.06000	8100.11	62.56	0.90036	0.02758	0.68004	0.01998	266057

Country	*Year*	*a*	*D[a]*	*b*	*D[b]*	*p*	*D[p]*	*q*	*D[q]*	*N*
Chile	2017	2.88903	0.06819	8546.37	68.76	0.83262	0.02707	0.63105	0.01977	215517
China	2002	0.65767	0.09517	2294.18	285.27	8.41365	2.27458	8.15257	2.29266	61692
China	2013	1.36063	0.08064	12146.45	790.31	1.69430	0.15196	3.43492	0.42003	61138
Colombia	2004	2.26789	0.18865	3140.82	87.67	0.73055	0.08090	0.76066	0.08607	34559
Colombia	2007	2.00723	0.02851	4757.00	32.51	0.72872	0.01352	0.86306	0.01782	825029
Colombia	2010	1.97062	0.02814	4815.01	31.39	0.87256	0.01694	0.94622	0.01992	817501
Colombia	2013	2.06305	0.02875	6117.58	40.07	0.79266	0.01475	0.98499	0.02052	792514
Colombia	2016	2.38391	0.03213	6178.48	34.19	0.71695	0.01273	0.87393	0.01702	773923
Czech Rep.	1992	5.82284	0.27354	8877.31	73.48	0.88490	0.06021	0.76209	0.04814	43234
Czech Rep.	1996	3.77619	0.13344	10339.49	96.83	1.15338	0.06074	1.00225	0.05210	71821
Czech Rep.	2002	3.58074	0.26835	10246.59	210.03	1.41141	0.16845	1.02730	0.11077	18962
Czech Rep.	2004	3.99155	0.38119	12325.92	274.84	0.96038	0.12967	0.90570	0.12477	10333
Czech Rep.	2007	4.48653	0.24592	15007.78	188.63	0.83545	0.06263	0.85180	0.06729	26931
Czech Rep.	2010	4.30860	0.28871	15644.65	230.29	0.84270	0.07729	0.88242	0.08518	20627
Czech Rep.	2013	4.63687	0.35519	14639.88	208.26	0.82552	0.08746	0.76938	0.08033	18210
Czech Rep.	2016	4.00647	0.26215	17123.16	272.39	0.95322	0.08806	1.00211	0.09726	19205
Denmark	1987	11.47900	1.27210	26958.57	209.15	0.19133	0.02287	0.35257	0.04478	25536
Denmark	1992	8.81499	0.59738	27262.78	223.93	0.26508	0.02053	0.56126	0.04735	25694
Denmark	1995	4.50457	0.09112	27951.35	146.46	0.78719	0.02223	1.31094	0.04128	173097
Denmark	2000	4.21645	0.08661	29271.56	155.66	0.85179	0.02504	1.34812	0.04255	175368
Denmark	2004	4.33780	0.08468	31129.47	162.90	0.78295	0.02144	1.28874	0.03874	176996
Denmark	2007	5.85983	0.12203	31813.40	121.64	0.50155	0.01343	0.81044	0.02281	179423
Denmark	2010	5.50176	0.10214	32372.70	132.19	0.51478	0.01230	0.81343	0.02095	180266
Denmark	2013	5.33582	0.09338	30978.69	130.04	0.54072	0.01214	0.80579	0.02004	183962
Denmark	2016	5.32903	0.09269	31836.09	133.55	0.52931	0.01172	0.78003	0.01922	187596
Dominican Rep.	2007	2.37612	0.18722	4807.99	136.29	0.68673	0.07039	0.75563	0.08232	30817
Egypt	1999	4.11048	0.17190	4088.63	74.14	1.60592	0.12562	0.60360	0.03156	113139
Egypt	2004	3.55288	0.10760	3928.64	51.68	1.60530	0.08803	0.73451	0.02885	207316
Egypt	2008	3.71767	0.16005	4134.61	68.13	1.50977	0.11373	0.74388	0.04185	109685
Egypt	2010	4.00680	0.30443	4429.02	105.93	1.28334	0.16015	0.69956	0.06901	34051
Egypt	2012	4.13311	0.30798	4702.99	100.11	1.26486	0.14940	0.69802	0.06900	32717
Egypt	2015	3.52370	0.20989	4537.43	120.47	1.66897	0.18270	0.76360	0.05931	52203
Estonia	2000	2.63983	0.20400	6450.19	190.11	1.02566	0.11164	1.06055	0.12565	17143
Estonia	2004	2.75728	0.25352	9899.33	402.29	0.83575	0.10170	1.16637	0.17486	11843
Estonia	2007	2.43072	0.20614	17840.63	986.12	1.03094	0.12027	1.94462	0.31669	13026
Estonia	2010	2.53989	0.21533	16067.26	852.98	0.92041	0.10419	1.76377	0.28308	13417
Estonia	2013	2.18761	0.16511	19414.51	1148.47	0.96910	0.09789	1.89082	0.28116	14741
Finland	1987	5.05288	0.29254	21599.30	290.87	0.70119	0.05402	1.23810	0.11285	34093
Finland	1991	5.56935	0.32280	23519.78	288.01	0.61003	0.04540	1.04062	0.09190	32380
Finland	1995	4.97031	0.30468	18847.82	235.24	0.83493	0.07173	0.96503	0.08550	25228
Finland	2000	4.00453	0.21429	20294.92	294.85	0.97121	0.07756	1.02286	0.07858	27839
Finland	2004	3.88587	0.20298	23702.19	341.96	0.92582	0.07031	1.05919	0.08121	29109
Finland	2007	3.76876	0.22292	26801.30	412.03	0.89093	0.07641	1.11140	0.09549	26480
Finland	2010	3.48365	0.20331	27658.95	495.15	1.00674	0.08711	1.26300	0.11218	23015
Finland	2013	3.56115	0.19248	27037.39	434.40	1.01142	0.08029	1.20200	0.09884	27136
Finland	2016	4.36584	0.24415	25945.77	349.39	0.82548	0.06517	0.87512	0.06884	24818
France	1978	5.09484	0.28937	21338.87	301.53	0.42672	0.02880	0.62300	0.04854	31724
France	1984	8.13299	0.56904	20010.28	197.27	0.25158	0.01958	0.34904	0.02861	31603
France	1989	4.93600	0.31580	20914.82	310.53	0.52731	0.04197	0.71769	0.06403	23294
France	1994	3.53792	0.20003	20540.64	321.79	0.97496	0.07868	0.96251	0.07961	29204
France	2000	3.18537	0.19099	20893.35	387.82	1.17250	0.10247	1.17992	0.11030	25743
France	2005	4.15730	0.26049	23095.08	339.81	0.72171	0.06012	0.86650	0.07771	25364
France	2010	5.18408	0.27192	26306.97	262.90	0.51437	0.03373	0.63952	0.04429	40915
Georgia	2010	1.61854	0.13111	4005.08	263.90	1.19769	0.13724	1.77366	0.26156	18988
Georgia	2013	1.42426	0.19872	4316.89	390.43	2.19834	0.50324	2.30740	0.56647	9601
Georgia	2016	1.33718	0.20885	5938.62	678.91	2.32841	0.58216	2.81526	0.82522	9179
Germany	1973	5.47042	0.14955	24126.66	138.94	0.51938	0.01731	0.62345	0.02336	135016
Germany	1978	4.56324	0.12147	25970.59	159.53	0.77834	0.02808	0.78516	0.02946	128803
Germany	1981	4.11408	0.42689	24069.44	714.75	0.86257	0.12277	1.07273	0.17310	7356
Germany	1983	2.93178	0.09615	24590.08	249.44	1.59638	0.08427	1.41701	0.07207	118366
Germany	1984	5.61109	0.45466	24544.97	418.19	0.48572	0.04855	0.73219	0.08273	14654
Germany	1987	4.67533	0.38671	26064.67	547.81	0.64955	0.06918	0.91521	0.11350	13067
Germany	1989	5.07375	0.41019	26328.50	492.98	0.60324	0.06277	0.77711	0.08920	12486
Germany	1991	2.71105	0.21334	27242.00	917.88	1.31539	0.15142	1.83468	0.25603	17918
Germany	1994	4.41778	0.32764	25898.77	493.34	0.66942	0.06354	0.91550	0.10224	17804
Germany	1995	5.05981	0.37624	25973.26	440.85	0.57437	0.05293	0.78049	0.08428	17418
Germany	1998	4.32191	0.30992	25698.72	468.78	0.76528	0.07138	0.94066	0.10292	18097
Germany	2000	4.90915	0.28383	26884.03	330.51	0.62199	0.04583	0.78833	0.06488	28887
Germany	2001	6.04235	0.39711	25029.73	242.88	0.49632	0.04013	0.54362	0.04549	30256
Germany	2002	5.09817	0.31485	26645.65	304.75	0.57634	0.04528	0.70657	0.05906	28930
Germany	2003	6.02091	0.38634	26602.28	274.78	0.45944	0.03595	0.58355	0.04844	28057
Germany	2004	4.68994	0.29863	26157.61	325.41	0.64397	0.05338	0.76665	0.06720	26819
Germany	2005	4.41286	0.25698	25169.02	310.88	0.67219	0.05194	0.75269	0.05965	28785
Germany	2006	3.96023	0.24526	25401.41	355.16	0.79428	0.06733	0.87893	0.07688	26735

Country	*Year*	*a*	*D[a]*	*b*	*D[b]*	*p*	*D[p]*	*q*	*D[q]*	*N*
Germany	2007	4.10118	0.24331	25398.31	352.61	0.76373	0.06235	0.83366	0.06855	24997
Germany	2008	4.13499	0.25490	25847.39	372.25	0.72906	0.06062	0.83509	0.07212	23332
Germany	2009	3.57883	0.18899	26997.40	388.66	0.85690	0.06337	1.06130	0.08289	37575
Germany	2010	3.40928	0.15610	27410.47	384.73	0.90366	0.05824	1.13062	0.07890	44131
Germany	2011	3.44916	0.16436	26139.55	356.43	0.94602	0.06380	1.07161	0.07673	42526
Germany	2012	3.38716	0.15736	26408.19	353.02	0.92312	0.06061	1.10529	0.07723	47805
Germany	2013	3.19310	0.15325	26095.22	387.18	1.02744	0.07192	1.17676	0.08563	41650
Germany	2014	3.41749	0.16480	28291.64	438.03	0.84219	0.05517	1.14494	0.08647	41236
Germany	2015	3.69300	0.18587	28063.93	391.53	0.76326	0.05255	0.99827	0.07350	36940
Germany	2016	3.95268	0.19469	29070.71	384.55	0.66261	0.04261	0.91421	0.06583	39742
Greece	1995	3.13152	0.28184	17213.07	630.20	0.61869	0.07076	1.09574	0.15604	14054
Greece	2000	2.20719	0.23313	21003.32	1383.29	1.09501	0.16358	2.02611	0.39565	11140
Greece	2004	2.85358	0.22466	20946.72	668.46	0.89429	0.09669	1.23455	0.15636	14861
Greece	2007	2.95208	0.20974	21363.96	575.91	0.92083	0.09206	1.21870	0.13605	16819
Greece	2010	3.49829	0.26300	21449.42	562.22	0.61748	0.06025	1.03605	0.11839	14989
Greece	2013	3.06655	0.19541	14894.95	381.15	0.70759	0.05982	1.19608	0.12079	20973
Guatemala	2006	0.98836	0.07450	3909.35	260.59	3.33617	0.46154	2.79204	0.35907	68552
Guatemala	2011	2.05640	0.10526	4416.46	122.58	0.74125	0.05030	0.98956	0.07664	65561
Guatemala	2014	2.44164	0.13427	3558.24	85.94	1.20588	0.10416	0.96666	0.07496	54699
Hungary	1991	4.68425	0.62044	11921.68	375.34	0.55716	0.09323	0.74243	0.13720	5803
Hungary	1994	4.63168	0.72068	8948.14	297.40	0.53480	0.10047	0.58278	0.12190	5283
Hungary	1999	3.73200	0.46689	7580.43	270.71	0.98045	0.17486	0.84417	0.15175	5428
Hungary	2005	4.37296	0.59146	9991.92	306.70	0.82217	0.15378	0.70385	0.12893	5161
Hungary	2007	4.43085	0.58060	10665.33	325.48	0.79993	0.14710	0.79939	0.14376	4854
Hungary	2009	4.39432	0.75910	10607.87	336.47	0.73062	0.16444	0.80884	0.19745	4699
Hungary	2012	3.30494	0.45917	11919.35	541.98	0.84732	0.16270	1.26280	0.27571	4727
Hungary	2015	3.28638	0.36705	13240.82	460.10	1.12324	0.18558	1.23733	0.21401	6236
Iceland	2004	7.13800	0.85599	27077.49	473.77	0.45108	0.06566	0.48900	0.07361	8832
Iceland	2007	5.94870	0.67668	30758.70	618.86	0.56084	0.08165	0.52211	0.07514	8643
Iceland	2010	6.44378	0.66095	28396.44	538.12	0.46652	0.05928	0.62205	0.08467	8851
India	2004	1.83435	0.05566	1744.18	29.38	1.10158	0.04624	1.10499	0.05330	214663
India	2011	1.95569	0.06291	2384.27	35.72	1.00438	0.04469	0.97514	0.04716	203967
Iraq	2007	3.89519	0.17872	7908.00	95.95	0.57267	0.03355	0.60680	0.03657	127052
Iraq	2012	2.97439	0.11566	10015.55	138.44	0.67067	0.03458	0.97799	0.05567	175930
Ireland	1987	2.55779	0.23189	13226.20	604.91	1.11526	0.14458	1.39970	0.21533	13166
Ireland	1994	1.96065	0.18314	13622.76	805.22	2.09506	0.32820	1.72995	0.27453	10978
Ireland	1995	1.81094	0.20974	13457.29	970.61	2.41449	0.49589	1.89903	0.36193	9512
Ireland	1996	1.53218	0.21096	15277.89	1442.74	3.09886	0.78521	2.73718	0.64845	8746
Ireland	2000	2.14851	0.29815	28281.41	1871.30	1.39769	0.30605	2.21297	0.51723	7515
Ireland	2004	1.77045	0.14533	25248.99	1266.55	2.26115	0.33821	2.34798	0.31182	15520
Ireland	2007	2.37510	0.18411	29288.26	1066.40	1.53089	0.19236	1.72824	0.21877	12519
Ireland	2010	3.19767	0.25566	30242.37	1150.83	0.78817	0.08256	1.32609	0.18539	10944
Israel	1979	0.63131	0.37397	9609.62	5438.30	18.13812	22.06294	16.17351	17.99277	8436
Israel	1986	1.04165	0.18740	14990.90	2398.45	5.53665	1.75209	7.08574	2.61501	18610
Israel	1992	1.00666	0.21238	15806.51	2280.92	6.44188	2.49933	7.31827	3.01044	19132
Israel	1997	2.03333	0.15975	18620.68	1028.32	1.30203	0.14975	2.10848	0.31235	17972
Israel	2001	1.31171	0.14142	18738.19	1518.20	2.94151	0.54747	3.72588	0.75312	19502
Israel	2005	1.70612	0.12585	24100.19	1602.22	1.32790	0.14626	2.58990	0.37298	20985
Israel	2007	1.24160	0.12770	33920.70	5263.39	2.19170	0.34395	4.95484	1.19331	20273
Israel	2010	1.26830	0.11436	28546.49	2878.61	2.18739	0.31951	3.99582	0.73436	20137
Israel	2012	1.44130	0.11571	34397.59	3240.92	1.67825	0.20335	3.78986	0.65552	28751
Israel	2014	1.45433	0.12999	45493.47	6069.81	1.59029	0.20768	4.65025	1.00666	27831
Israel	2016	1.06029	0.14160	105314.83	50345.82	2.66204	0.52450	13.33613	6.41845	29739
Italy	1986	2.34604	0.15949	17922.77	572.20	1.36286	0.14075	1.78488	0.20696	25064
Italy	1987	3.44244	0.20220	21174.62	571.55	0.57593	0.04101	0.96858	0.09378	25027
Italy	1989	1.62100	0.15240	18849.22	921.40	2.93706	0.48333	3.03538	0.50679	25145
Italy	1991	2.35806	0.15607	23845.41	849.94	1.35306	0.13451	2.09595	0.25126	24886
Italy	1993	3.38210	0.20713	23888.30	630.85	0.54546	0.04173	1.05502	0.10320	23926
Italy	1995	3.34031	0.20717	21898.67	515.48	0.60806	0.04908	1.05131	0.09949	23867
Italy	1998	4.48801	0.32200	22764.71	446.84	0.40256	0.03472	0.70531	0.06948	20699
Italy	2000	3.64663	0.22941	22592.30	482.01	0.58056	0.04684	0.92771	0.08660	22051
Italy	2004	3.60320	0.21362	21574.15	437.05	0.62790	0.04883	0.89838	0.07804	20556
Italy	2008	3.71054	0.21669	22786.08	461.69	0.60574	0.04590	0.90705	0.07862	19802
Italy	2010	4.89196	0.32298	24246.21	447.00	0.36758	0.02846	0.69787	0.06479	19685
Italy	2014	4.55463	0.28570	23449.66	468.65	0.38189	0.02855	0.82581	0.07601	19056
Italy	2016	4.98742	0.36386	24189.77	487.42	0.32402	0.02727	0.70174	0.07174	16182
Ivory Coast	2002	2.26013	0.14347	2365.32	67.17	0.60568	0.04871	0.75097	0.06685	55628
Ivory Coast	2008	1.94579	0.10493	2428.09	68.94	0.83243	0.06196	1.00253	0.08008	57740
Ivory Coast	2015	2.26016	0.13256	2540.97	68.65	0.58811	0.04322	0.74103	0.06122	43817
Japan	2008	3.51228	0.37842	28736.62	1051.34	0.57783	0.07952	1.03137	0.16814	11776
Japan	2010	3.30057	0.36943	27866.28	1028.33	0.82580	0.12731	1.08066	0.18372	8403
Japan	2013	5.61541	0.85827	27319.28	785.79	0.36841	0.06647	0.55718	0.10887	6136
Jordan	2002	2.16779	0.26437	6179.06	350.69	1.42365	0.27835	1.23027	0.22460	16171
Jordan	2006	1.66926	0.23122	4711.21	464.34	2.87180	0.74674	1.69106	0.36621	16840

Country	*Year*	*a*	*D[a]*	*b*	*D[b]*	*p*	*D[p]*	*q*	*D[q]*	*N*
Jordan	2008	2.56334	0.27901	5872.32	290.78	1.40435	0.24784	0.96293	0.14964	15351
Jordan	2010	2.79358	0.28768	7009.47	294.91	1.12573	0.17868	0.87782	0.12651	15362
Jordan	2013	2.79808	0.25775	7640.70	232.20	0.93463	0.12051	0.96765	0.13089	25771
Lithuania	2010	2.56218	0.20137	12698.96	650.58	0.88634	0.09203	1.69492	0.25400	12211
Lithuania	2013	2.19584	0.18926	11548.81	494.83	1.27156	0.15877	1.53179	0.22465	11816
Luxembourg	1985	2.42502	0.40427	22624.74	1563.82	2.14073	0.56202	2.47142	0.76277	6042
Luxembourg	1991	1.57401	0.42159	23172.45	4290.64	6.14204	3.45759	4.21817	1.90246	5498
Luxembourg	1994	2.53906	0.42669	31552.05	1929.75	2.22408	0.60998	2.11720	0.62075	4981
Luxembourg	1997	2.40507	0.34538	31527.05	1682.14	2.07074	0.49751	1.95753	0.46654	6630
Luxembourg	2000	1.42983	0.37878	25649.25	4721.14	6.26083	3.39968	4.17341	1.89362	6189
Luxembourg	2004	3.66456	0.40723	41668.45	1157.75	0.92869	0.14315	1.06006	0.17765	9661
Luxembourg	2007	3.50452	0.35533	38709.48	1060.40	1.05846	0.15875	1.03206	0.15226	10083
Luxembourg	2010	2.61632	0.20886	42343.18	1437.55	1.50287	0.18523	1.77852	0.24330	14853
Luxembourg	2013	2.86217	0.27104	43460.67	1637.68	1.15891	0.16025	1.54243	0.24476	9965
Mexico	1984	1.55736	0.16232	4245.65	256.97	1.61854	0.25892	1.75516	0.30988	23866
Mexico	1989	1.96487	0.12343	3920.38	109.33	1.15329	0.10820	1.08544	0.10033	56916
Mexico	1992	1.80728	0.12682	3725.57	124.08	1.30599	0.14187	1.07409	0.10935	50646
Mexico	1994	1.40037	0.09132	3186.55	148.56	2.07263	0.23547	1.45795	0.14485	60045
Mexico	1996	1.66073	0.09555	2792.64	89.10	1.54475	0.14215	1.23022	0.10668	64606
Mexico	1998	1.37471	0.09805	3753.72	160.82	1.56894	0.17559	1.66031	0.19182	47806
Mexico	2000	1.16731	0.10103	3723.01	213.32	2.32659	0.34541	2.05008	0.29074	42341
Mexico	2002	1.29094	0.08966	3810.44	153.35	2.19534	0.26105	1.88199	0.20881	72389
Mexico	2004	1.95919	0.09160	4812.39	97.04	1.06022	0.07079	1.09937	0.07753	91344
Mexico	2008	1.34307	0.06318	5470.41	150.17	1.93532	0.15149	1.88450	0.14337	118721
Mexico	2010	1.94930	0.08440	5623.15	105.51	1.05791	0.06563	1.20373	0.07990	107537
Mexico	2012	1.57438	0.13412	4732.54	197.52	1.66705	0.23030	1.48631	0.19524	33683
Mexico	2014	2.30935	0.11417	4490.97	83.05	1.01208	0.07293	0.88331	0.06101	73494
Mexico	2016	1.98951	0.05379	5410.69	61.35	1.30182	0.05436	1.18719	0.04757	257600
Mexico	2018	2.29847	0.05849	5785.06	53.84	1.05727	0.03949	1.02063	0.03750	268992
Netherlands	1983	5.91026	0.48038	20513.43	384.34	0.45127	0.04337	0.68463	0.08012	13154
Netherlands	1987	3.88007	0.31308	19182.96	493.25	1.11832	0.12685	1.18859	0.15786	10711
Netherlands	1990	5.48483	0.42546	24813.80	486.33	0.49338	0.04689	0.70569	0.07846	10807
Netherlands	1993	4.92769	0.35637	27957.85	735.81	0.45735	0.03956	1.06989	0.13145	12954
Netherlands	1999	4.52217	0.36979	27528.47	652.00	0.74137	0.08001	1.11168	0.14562	10408
Netherlands	2004	5.95643	0.35063	25586.55	300.36	0.49175	0.03549	0.60412	0.04787	23756
Netherlands	2007	5.23969	0.29099	25562.07	296.83	0.67603	0.04984	0.61598	0.04534	25448
Netherlands	2010	4.05325	0.22331	26379.49	380.23	0.94297	0.07303	0.96479	0.07915	25461
Netherlands	2013	4.99337	0.27814	26154.71	326.85	0.64061	0.04628	0.73540	0.05733	24494
Norway	1979	6.05211	0.36891	18099.73	212.23	0.51053	0.03860	0.82558	0.07236	25751
Norway	1986	5.00060	0.45754	24230.38	487.01	0.62206	0.07329	0.98215	0.13401	14265
Norway	1991	6.89578	0.46790	24276.12	272.63	0.43080	0.03563	0.65083	0.05886	24437
Norway	1995	8.00540	0.56123	24482.77	227.40	0.33455	0.02744	0.54973	0.04868	26290
Norway	2000	10.30141	0.72901	27317.54	188.98	0.26446	0.02120	0.36146	0.02943	34835
Norway	2004	11.12714	0.84864	29310.41	196.89	0.24048	0.02040	0.31966	0.02762	33977
Norway	2007	10.75592	0.19717	35830.54	66.16	0.22349	0.00446	0.37353	0.00815	467193
Norway	2010	11.33424	0.20597	37801.04	68.41	0.20417	0.00400	0.35741	0.00770	488558
Norway	2013	10.18085	0.17142	41316.45	78.88	0.22373	0.00409	0.39158	0.00798	506423
Palestine	2010	1.13979	0.17107	5496.50	787.72	2.35556	0.57298	3.71809	1.08728	22588
Palestine	2017	1.41459	0.17147	8496.11	1183.48	1.28895	0.22799	3.04782	0.75433	20175
Panama	2007	0.58856	0.10743	21075.46	8824.21	5.13823	1.56754	9.98204	4.14801	48838
Panama	2010	1.28576	0.09811	10427.24	582.03	1.49066	0.17358	2.29475	0.30796	48584
Panama	2013	1.05589	0.10235	11688.91	948.82	2.20321	0.34340	3.16811	0.57181	43812
Paraguay	2000	1.83479	0.14126	7636.58	320.29	0.75338	0.07728	1.10346	0.12953	36944
Paraguay	2004	2.04190	0.14465	4859.80	159.09	0.94987	0.09515	0.95565	0.09877	34297
Paraguay	2007	2.17519	0.21564	6296.92	254.43	0.76733	0.10316	0.93056	0.13203	20845
Paraguay	2010	1.88166	0.18258	7592.89	358.32	0.87279	0.11901	1.18496	0.17279	20277
Paraguay	2013	1.79540	0.16170	8645.95	416.80	1.03789	0.13317	1.27793	0.18137	20904
Paraguay	2016	1.59411	0.11006	8064.99	305.22	1.23575	0.12967	1.49490	0.16185	37713
Peru	2004	2.24658	0.13770	6993.85	236.36	0.41770	0.03077	1.04644	0.09685	82366
Peru	2007	1.47326	0.07560	10177.65	563.33	0.83035	0.05723	2.09678	0.20387	91510
Peru	2010	2.58396	0.12753	9458.40	236.30	0.43409	0.02582	1.00430	0.07547	86281
Peru	2013	2.51027	0.10970	10910.01	260.59	0.47318	0.02516	1.15497	0.08058	115719
Peru	2016	2.44324	0.09780	10747.93	227.08	0.51755	0.02568	1.17584	0.07454	128939
Poland	1986	2.08757	0.17061	12446.45	519.88	1.82940	0.23651	2.97445	0.45198	34198
Poland	1992	3.40018	0.24943	8688.15	186.27	1.20307	0.13164	1.15221	0.12919	18806
Poland	1995	5.22450	0.18861	7503.08	53.98	0.46417	0.02057	0.59146	0.02778	103466
Poland	1999	4.65156	0.16342	8946.59	68.59	0.61101	0.02765	0.73732	0.03570	99734
Poland	2004	3.94017	0.13584	8640.58	74.73	0.69033	0.03154	0.77881	0.03731	98925
Poland	2007	4.42796	0.13545	10146.44	74.12	0.63505	0.02506	0.66931	0.02791	111896
Poland	2010	3.63287	0.11168	11878.34	101.41	0.82799	0.03491	0.86595	0.03825	107880
Poland	2013	4.22705	0.13266	12495.69	96.86	0.61428	0.02484	0.72184	0.03119	102569
Poland	2016	4.98815	0.16272	14776.52	99.10	0.57410	0.02362	0.65625	0.02896	99016
Romania	1995	3.65540	0.12360	5032.21	45.98	0.89453	0.04318	1.03616	0.05113	93190
Romania	1997	4.08579	0.14095	4507.59	36.40	0.79613	0.03824	0.87622	0.04225	92334

Country	*Year*	*a*	*D[a]*	*b*	*D[b]*	*p*	*D[p]*	*q*	*D[q]*	*N*
Russia	2000	2.73292	0.28769	5074.11	225.66	0.67172	0.09133	0.90756	0.14291	8461
Russia	2004	2.37049	0.25286	9587.27	606.16	0.79675	0.11049	1.31356	0.24193	7954
Russia	2007	2.00965	0.23030	18615.65	2125.95	1.03888	0.16134	2.66086	0.66713	8566
Russia	2010	3.70597	0.29645	15110.13	418.54	0.55213	0.05381	0.84167	0.10187	14994
Russia	2011	1.79394	0.12137	18385.02	787.73	1.59445	0.15813	1.96125	0.24382	24900
Russia	2013	2.22842	0.07042	20335.77	270.34	1.27016	0.05968	1.47539	0.07555	105592
Russia	2014	2.01226	0.06886	20855.87	341.34	1.50410	0.07748	1.85500	0.10983	105084
Russia	2015	1.71173	0.05632	21180.18	425.97	1.93734	0.09883	2.63812	0.16291	138387
Russia	2016	1.70436	0.03415	18781.00	203.22	2.08205	0.06687	2.52488	0.09136	367080
Serbia	2006	3.26842	0.29531	9574.76	402.47	0.53500	0.06021	1.23676	0.18617	14360
Serbia	2010	3.54432	0.32445	10127.59	386.13	0.53422	0.06047	1.16474	0.17527	13510
Serbia	2013	4.02104	0.36690	8469.05	231.10	0.47224	0.05342	0.85156	0.11116	12980
Serbia	2016	3.54290	0.27250	10393.06	305.30	0.55196	0.05363	1.15021	0.14039	17774
Slovakia	1992	5.73382	0.26885	9403.46	76.59	0.90122	0.06085	0.90645	0.05985	47712
Slovakia	1996	8.10960	0.43236	10799.83	89.93	0.29257	0.01743	0.50196	0.03480	48740
Slovakia	2004	4.47090	0.39326	10904.00	212.74	0.67162	0.07845	0.88491	0.11043	15418
Slovakia	2007	4.29028	0.33192	14740.57	319.34	0.73067	0.07489	1.07543	0.12945	16541
Slovakia	2010	4.79849	0.38206	16408.72	353.63	0.55560	0.05478	0.87860	0.10584	15329
Slovakia	2013	5.57756	0.45278	15743.32	283.36	0.45378	0.04408	0.68887	0.07866	15704
Slovenia	1997	5.18852	0.69691	17370.96	484.00	0.59119	0.10138	0.98746	0.19681	8639
Slovenia	1999	5.83498	0.67304	17260.18	343.25	0.50486	0.07237	0.82449	0.13339	12658
Slovenia	2004	4.46645	0.46489	19624.34	563.18	0.72126	0.09739	1.17962	0.19874	11302
Slovenia	2007	4.37878	0.46614	22441.24	697.19	0.70463	0.09855	1.34066	0.23484	11094
Slovenia	2010	5.92617	0.58669	24408.93	580.99	0.38328	0.04458	0.84197	0.12430	11514
Slovenia	2012	3.76413	0.36908	24157.65	844.82	0.68922	0.08837	1.27874	0.20643	10805
Slovenia	2015	3.06228	0.33725	25035.49	1103.70	0.99198	0.15444	1.79950	0.34403	11228
South Africa	2010	0.51238	0.09100	774.52	388.38	8.84050	3.57553	4.41856	1.30698	29206
South Africa	2012	1.14513	0.09881	2786.01	170.83	1.83954	0.25233	1.38119	0.18801	32972
South Africa	2015	0.84379	0.07284	4361.50	366.51	2.53305	0.35237	2.36437	0.36772	37805
South Korea	2006	3.69173	0.19753	29553.06	650.01	0.53736	0.03550	1.27168	0.11492	44842
South Korea	2008	3.50678	0.19612	30181.56	750.49	0.56060	0.03874	1.29603	0.12468	38842
South Korea	2010	4.25735	0.25126	30387.61	650.80	0.43238	0.03006	1.03969	0.09974	37787
South Korea	2012	4.32915	0.25401	32310.46	664.29	0.42563	0.02963	1.04948	0.09891	36005
Spain	1980	2.76175	0.11504	13230.23	222.26	0.94163	0.05412	1.37004	0.09382	88413
Spain	1985	3.04564	0.36203	10987.68	383.80	0.98435	0.16562	1.08303	0.19332	11582
Spain	1990	2.82647	0.11526	15974.00	272.70	1.02461	0.05849	1.41772	0.09704	72018
Spain	1995	2.87496	0.21755	19246.23	655.45	0.73868	0.07241	1.12320	0.13812	18318
Spain	2000	2.61001	0.21182	23472.59	919.17	0.92712	0.10460	1.39550	0.18901	13650
Spain	2004	2.95650	0.14682	26946.05	736.61	0.70964	0.04580	1.52674	0.13694	37032
Spain	2007	2.97218	0.15445	29250.18	827.63	0.75394	0.05101	1.59602	0.15232	35903
Spain	2010	2.87757	0.15365	29832.95	1057.47	0.64420	0.04291	1.65626	0.17256	34587
Spain	2013	2.79952	0.15508	28043.81	931.18	0.66079	0.04647	1.51864	0.15381	31542
Spain	2016	3.55400	0.17711	28711.08	614.69	0.48205	0.02944	1.10615	0.08924	34830
Sudan	2009	1.96829	0.14874	1934.52	68.36	0.80776	0.08272	0.96711	0.10719	48618
Sweden	1967	12.16343	1.69953	12499.43	164.46	0.15916	0.02332	0.32804	0.05391	14282
Sweden	1975	4.98968	0.28857	19107.12	362.03	0.58755	0.04316	1.45102	0.14741	29268
Sweden	1981	5.68059	0.32664	18505.64	317.83	0.57683	0.04103	1.28501	0.13046	24495
Sweden	1987	7.15285	0.46055	19413.36	239.62	0.39497	0.03021	0.86389	0.08235	21588
Sweden	1992	7.50536	0.44406	21801.94	215.34	0.35462	0.02422	0.64308	0.05224	28194
Sweden	1995	14.59206	1.13364	19272.65	115.94	0.18008	0.01467	0.28977	0.02619	34204
Sweden	2000	6.20043	0.32779	22099.25	201.77	0.47000	0.03035	0.63002	0.04443	33139
Sweden	2005	5.15993	0.23422	25680.59	250.88	0.63086	0.03757	0.88110	0.05743	36918
Switzerland	1982	8.15922	0.70193	29733.86	343.72	0.32966	0.03277	0.32482	0.03231	16107
Switzerland	1992	6.36056	0.52513	32408.65	468.20	0.41740	0.04032	0.47221	0.04988	16745
Switzerland	2000	4.50386	0.41615	32587.27	761.90	0.66171	0.07938	0.77795	0.10275	9220
Switzerland	2002	3.04452	0.27694	35226.46	1195.16	1.17684	0.15891	1.42032	0.21044	9292
Switzerland	2004	4.26885	0.42225	35893.31	1024.23	0.68043	0.08723	0.98548	0.15007	7993
Switzerland	2007	5.31973	0.42361	36041.82	561.51	0.45251	0.04363	0.56658	0.05865	16397
Switzerland	2010	4.09262	0.27152	36655.94	632.64	0.69053	0.06165	0.83510	0.07777	17602
Switzerland	2013	3.59905	0.26360	33744.31	674.66	0.95590	0.10229	0.91375	0.09414	15651
Taiwan	1981	2.42673	0.14830	9025.50	226.96	2.43332	0.26335	1.66975	0.16102	73306
Taiwan	1986	3.21490	0.15640	12421.39	187.75	1.48992	0.11409	1.10816	0.08083	74441
Taiwan	1991	2.21839	0.13545	20381.10	490.50	2.43686	0.25707	1.98549	0.19973	68439
Taiwan	1995	4.74303	0.22838	31093.34	418.58	0.49745	0.02843	0.72380	0.05128	57664
Taiwan	1997	2.43725	0.14828	28149.54	611.96	1.65086	0.15787	1.68238	0.16833	52491
Taiwan	2000	2.68042	0.15839	29817.25	579.73	1.37651	0.12287	1.46498	0.13926	49793
Taiwan	2005	2.78796	0.16017	30249.66	568.58	1.17556	0.09810	1.28202	0.11630	46386
Taiwan	2007	2.26342	0.15004	29151.02	723.98	1.55357	0.15661	1.76465	0.19730	46230
Taiwan	2010	2.80527	0.15255	29643.99	606.48	0.95551	0.07173	1.31861	0.11637	47900
Taiwan	2013	3.43909	0.18662	29583.72	458.63	0.77709	0.05553	0.99773	0.08197	50518
Taiwan	2016	2.88552	0.14698	30817.49	531.96	1.07033	0.07723	1.27249	0.10341	50569
United Kingdom	1969	2.84566	0.20222	9370.22	241.17	1.61705	0.18270	1.41243	0.16028	24748
United Kingdom	1974	2.86485	0.21798	13981.62	369.40	1.30597	0.15356	1.59896	0.19535	18973
United Kingdom	1979	2.59624	0.18550	18119.23	760.66	1.24790	0.12904	2.28606	0.31717	18313

Country	*Year*	*a*	*D[a]*	*b*	*D[b]*	*p*	*D[p]*	*q*	*D[q]*	*N*
United Kingdom	1986	3.12211	0.18068	17201.86	505.10	0.81807	0.06271	1.33220	0.13605	18320
United Kingdom	1991	2.05189	0.13188	19560.53	824.22	1.36532	0.13274	2.00049	0.23293	17089
United Kingdom	1994	2.55848	0.07648	16105.25	239.69	1.20616	0.05310	1.20642	0.05851	62804
United Kingdom	1995	2.90267	0.17260	19234.57	560.04	0.76902	0.06117	1.14311	0.11097	16580
United Kingdom	1999	2.17537	0.07271	18690.54	342.61	1.42475	0.07333	1.52617	0.08526	58994
United Kingdom	2004	2.89028	0.09102	20673.55	256.39	1.03215	0.04726	0.98122	0.04611	64329
United Kingdom	2007	3.37749	0.11096	25502.05	301.74	0.72963	0.03197	0.87710	0.04262	56880
United Kingdom	2010	4.00229	0.13620	23324.96	232.83	0.64520	0.02816	0.68588	0.03270	57840
United Kingdom	2013	3.37636	0.12340	22457.49	286.45	0.86334	0.04298	0.85085	0.04608	46109
United Kingdom	2016	3.89483	0.14609	24974.43	294.58	0.64018	0.03106	0.72814	0.03872	44068
United States	1974	4.11041	0.25748	36242.22	758.09	0.45682	0.03453	1.00953	0.09828	34165
United States	1979	3.47931	0.08479	39551.76	421.10	0.56788	0.01740	1.32337	0.05466	181202
United States	1986	2.57690	0.06882	45496.38	787.37	0.73005	0.02570	1.87131	0.09351	155100
United States	1991	2.57319	0.06738	42545.58	643.27	0.74924	0.02609	1.67807	0.07806	155538
United States	1994	2.97712	0.07152	36983.97	372.40	0.62781	0.01978	1.10958	0.04100	148897
United States	1997	3.31410	0.08534	37386.98	346.50	0.55787	0.01850	0.94043	0.03531	130799
United States	2000	3.73680	0.08072	39437.91	260.09	0.48585	0.01321	0.81689	0.02455	217017
United States	2004	3.80178	0.08197	41967.90	293.80	0.43850	0.01161	0.81020	0.02464	209265
United States	2007	3.29356	0.07137	42037.62	329.17	0.53430	0.01472	0.92669	0.02927	204929
United States	2010	2.91624	0.06061	43533.95	425.83	0.60614	0.01618	1.15298	0.03836	203351
United States	2013	2.99133	0.07484	40812.23	442.27	0.59039	0.01887	1.01357	0.03900	138397
United States	2016	3.55655	0.08323	43004.71	347.10	0.46466	0.01318	0.78195	0.02629	184462
Uruguay	2004	1.60071	0.07715	4650.56	148.31	2.16238	0.17856	1.48098	0.11262	55508
Uruguay	2007	1.38380	0.05336	3406.72	171.14	4.40148	0.37616	1.68550	0.09838	137859
Uruguay	2010	1.37599	0.05543	4575.93	223.34	4.54242	0.40006	1.95142	0.12154	126943
Uruguay	2013	1.32818	0.05847	8493.66	246.82	3.52435	0.28732	2.66195	0.19791	123867
Uruguay	2016	1.31815	0.06323	8585.43	286.64	3.89410	0.35658	2.79207	0.22401	115806
Vietnam	2011	1.64155	0.13979	4553.39	248.56	2.69665	0.43345	1.94447	0.25633	36640
Vietnam	2013	1.51761	0.14797	5921.40	283.09	2.65654	0.46124	2.57427	0.41699	36057

Table A2. Estimates of inequality aversion ε and related characteristics
Notes:
LB, LU- lower and upper boundaries of 95% confidence interval of $\hat{\varepsilon}$
Atk- the Atkinson index $A(\varepsilon,\mu)$, where μ is the mean of GB2 estimates
$D[\hat{\varepsilon}]$ - the standard deviation of the estimator $\hat{\varepsilon}$, Eq. (19)
EDEI - the equally distributed equivalent income
Source: Authors' calculations using data from Table A1

Country	*Year*	*Normative characteristics*						*Empirical estimates*		*GB2 estimates*	
		$\hat{\varepsilon}$	$D[\hat{\varepsilon}]$	LB	UB	Atk	EDEI	Mean	Gini	Mean	Gini
Australia	1981	1.6559	0.0148	1.6270	1.6848	0.2413	16750	22114	0.2807	22077	0.2832
Australia	1985	1.6305	0.0206	1.5902	1.6708	0.2492	16575	22138	0.2915	22078	0.2937
Australia	1989	1.6554	0.0159	1.6244	1.6865	0.2625	16805	22839	0.3025	22787	0.3037
Australia	1995	1.7708	0.0278	1.7163	1.8254	0.2751	15349	20983	0.3152	21174	0.3057
Australia	2001	1.7531	0.0282	1.6978	1.8084	0.2842	17066	23726	0.3203	23842	0.3150
Australia	2003	1.6916	0.0210	1.6505	1.7327	0.2744	17607	24206	0.3148	24266	0.3107
Australia	2004	1.7098	0.0201	1.6705	1.7491	0.2766	19206	26545	0.3157	26548	0.3150
Australia	2008	1.7262	0.0236	1.6800	1.7724	0.2965	23556	33534	0.3351	33486	0.3324
Australia	2010	1.7306	0.0174	1.6965	1.7648	0.2977	23566	33557	0.3336	33553	0.3304
Australia	2014	1.6361	0.0163	1.6041	1.6680	0.2813	25712	36016	0.3311	35773	0.3276
Austria	1987	2.2905	0.0324	2.2270	2.3541	0.2017	19925	24967	0.2273	24960	0.2269
Austria	1994	1.7843	0.0377	1.7104	1.8581	0.2344	21566	28192	0.2805	28169	0.2805
Austria	1995	1.5959	0.0119	1.5727	1.6191	0.2288	18410	23889	0.2766	23870	0.2784
Austria	1997	1.8612	0.0429	1.7772	1.9453	0.2259	20755	26830	0.2660	26810	0.2675
Austria	2000	1.9875	0.0524	1.8848	2.0901	0.2196	21978	28115	0.2576	28163	0.2577
Austria	2004	1.9566	0.0349	1.8881	2.0251	0.2322	23566	30649	0.2691	30693	0.2727
Austria	2007	1.6776	0.0247	1.6292	1.7259	0.2403	23876	31510	0.2842	31429	0.2899
Austria	2010	1.6986	0.0243	1.6510	1.7462	0.2355	25348	33216	0.2793	33158	0.2853
Austria	2013	1.7423	0.0263	1.6908	1.7938	0.2337	24936	32731	0.2804	32540	0.2820
Austria	2016	1.5727	0.0204	1.5327	1.6128	0.2335	25584	33617	0.2834	33375	0.2899
Belgium	1985	2.4480	0.0467	2.3565	2.5395	0.2085	15224	19219	0.2282	19234	0.2276
Belgium	1988	2.2988	0.0526	2.1957	2.4018	0.2051	16022	20226	0.2321	20156	0.2326
Belgium	1992	2.5616	0.0672	2.4298	2.6933	0.2118	16863	21400	0.2225	21393	0.2231
Belgium	1995	1.8719	0.0442	1.7854	1.9585	0.2231	19213	24849	0.2663	24729	0.2651
Belgium	1997	1.9429	0.0355	1.8733	2.0124	0.2163	18951	24198	0.2502	24182	0.2517
Belgium	2000	1.9509	0.0570	1.8391	2.0626	0.2395	20293	28222	0.3159	26684	0.2774
Belgium	2004	2.4071	0.0612	2.2872	2.5270	0.2590	19792	27370	0.2852	26708	0.2663
Belgium	2007	2.0230	0.0358	1.9529	2.0931	0.2359	21394	28226	0.2780	27997	0.2667
Belgium	2010	1.9548	0.0338	1.8885	2.0210	0.2289	21881	28486	0.2648	28376	0.2607
Belgium	2013	2.0274	0.0372	1.9545	2.1003	0.2378	21793	28607	0.2642	28592	0.2630
Belgium	2016	2.1200	0.0411	2.0394	2.2005	0.2384	22145	29061	0.2671	29077	0.2606
Brazil	2006	1.5278	0.0064	1.5153	1.5403	0.5178	4126	8220	0.5022	8556	0.5224
Brazil	2009	1.5195	0.0060	1.5077	1.5313	0.4795	4869	9090	0.4783	9354	0.4936
Brazil	2011	1.3751	0.0047	1.3658	1.3843	0.4464	5464	9570	0.4694	9870	0.4863
Brazil	2013	1.4774	0.0056	1.4665	1.4884	0.4422	5984	10512	0.4601	10729	0.4711
Brazil	2016	1.2558	0.0031	1.2497	1.2619	0.4381	5766	9839	0.4721	10262	0.4947
Canada	1971	1.3440	0.0069	1.3306	1.3575	0.2545	14402	19301	0.3172	19320	0.3184
Canada	1975	1.4970	0.0084	1.4805	1.5134	0.2334	18357	23900	0.2901	23946	0.2895
Canada	1981	1.6401	0.0143	1.6121	1.6680	0.2382	19862	26041	0.2848	26073	0.2842
Canada	1987	1.8090	0.0212	1.7675	1.8505	0.2477	20281	26918	0.2836	26959	0.2828
Canada	1991	1.8529	0.0167	1.8202	1.8856	0.2465	20299	26932	0.2818	26940	0.2801
Canada	1994	1.8724	0.0128	1.8473	1.8974	0.2537	20127	26951	0.2849	26967	0.2832
Canada	1997	1.6001	0.0093	1.5819	1.6182	0.2445	20280	26869	0.2926	26843	0.2932
Canada	1998	1.5528	0.0092	1.5348	1.5708	0.2581	20681	27907	0.3152	27875	0.3103
Canada	2000	1.6241	0.0108	1.6030	1.6452	0.2666	20689	28280	0.3189	28209	0.3144
Canada	2004	1.6171	0.0111	1.5953	1.6389	0.2717	21955	30194	0.3204	30144	0.3184
Canada	2007	1.6732	0.0123	1.6491	1.6973	0.2718	23846	32919	0.3183	32745	0.3156
Canada	2010	1.6423	0.0122	1.6184	1.6661	0.2707	24490	33678	0.3181	33581	0.3164
Canada	2012	1.5801	0.0113	1.5579	1.6023	0.2685	25113	34351	0.3174	34331	0.3172
Canada	2013	1.5436	0.0113	1.5214	1.5657	0.2750	25398	35038	0.3215	35032	0.3232
Canada	2014	1.5787	0.0113	1.5565	1.6009	0.2633	25942	35266	0.3127	35215	0.3135
Canada	2015	1.5286	0.0102	1.5086	1.5486	0.2694	25992	35573	0.3198	35574	0.3220
Canada	2016	1.6003	0.0110	1.5788	1.6218	0.2610	26057	35237	0.3087	35258	0.3099
Canada	2017	1.6096	0.0093	1.5914	1.6277	0.2673	26684	36440	0.3133	36415	0.3147
Chile	1990	1.4631	0.0108	1.4419	1.4843	0.5168	2951	5666	0.5032	6107	0.5412
Chile	1992	1.6542	0.0125	1.6298	1.6786	0.5340	3356	6765	0.5055	7202	0.5367
Chile	1994	1.5180	0.0097	1.4991	1.5369	0.5180	3809	7667	0.5096	7903	0.5254
Chile	1996	1.5062	0.0106	1.4854	1.5270	0.5184	4309	8435	0.5023	8948	0.5324
Chile	1998	1.4956	0.0088	1.4784	1.5129	0.5246	4536	9000	0.5097	9540	0.5391
Chile	2000	1.4081	0.0062	1.3959	1.4203	0.5394	4810	9511	0.5237	10443	0.5681
Chile	2003	1.4881	0.0071	1.4742	1.5020	0.5143	4816	9302	0.5029	9915	0.5354
Chile	2006	1.6177	0.0084	1.6013	1.6341	0.4868	5432	10143	0.4737	10584	0.4970
Chile	2009	1.5460	0.0072	1.5319	1.5601	0.4856	5930	10760	0.4742	11529	0.5118
Chile	2011	1.5880	0.0085	1.5714	1.6047	0.4758	6258	11234	0.4649	11938	0.4987

Country	*Year*	*Normative characteristics*						*Empirical estimates*		*GB2 estimates*	
		$\hat{\varepsilon}$	$D[\hat{\varepsilon}]$	LB	UB	Atk	EDEI	Mean	Gini	Mean	Gini
Chile	2013	1.6688	0.0090	1.6512	1.6864	0.4713	7329	13161	0.4591	13863	0.4883
Chile	2015	1.7377	0.0089	1.7202	1.7553	0.4667	7768	13956	0.4523	14568	0.4767
Chile	2017	1.7027	0.0093	1.6844	1.7210	0.4707	8220	14849	0.4590	15530	0.4843
China	2002	3.2666	0.0942	3.0821	3.4512	0.6291	1208	3249	0.4155	3256	0.4157
China	2013	1.6526	0.0171	1.6192	1.6861	0.3940	5125	8438	0.4007	8458	0.3950
Colombia	2004	1.3282	0.0154	1.2980	1.3583	0.5214	2568	5042	0.5245	5366	0.5537
Colombia	2007	1.2314	0.0027	1.2262	1.2365	0.5373	3543	7278	0.5624	7658	0.5746
Colombia	2010	1.3597	0.0033	1.3532	1.3663	0.5105	3745	7293	0.5252	7651	0.5366
Colombia	2013	1.3176	0.0030	1.3118	1.3235	0.4724	4356	8039	0.4966	8256	0.5092
Colombia	2016	1.3546	0.0031	1.3486	1.3606	0.4419	4542	7988	0.4740	8138	0.4828
Czech Rep.	1992	3.0759	0.0428	2.9920	3.1598	0.1875	8090	9998	0.2060	9957	0.2022
Czech Rep.	1996	2.6775	0.0301	2.6185	2.7365	0.2500	9176	12251	0.2565	12235	0.2559
Czech Rep.	2002	3.0264	0.0744	2.8806	3.1723	0.2654	9598	13064	0.2555	13067	0.2558
Czech Rep.	2004	2.4155	0.0637	2.2906	2.5403	0.2494	10682	14257	0.2666	14232	0.2657
Czech Rep.	2007	2.3736	0.0363	2.3024	2.4449	0.2293	12782	16604	0.2517	16584	0.2522
Czech Rep.	2010	2.3148	0.0398	2.2369	2.3927	0.2340	13159	17165	0.2563	17179	0.2575
Czech Rep.	2013	2.4131	0.0454	2.3241	2.5021	0.2367	12859	16861	0.2587	16845	0.2580
Czech Rep.	2016	2.4089	0.0443	2.3221	2.4957	0.2336	14313	18722	0.2538	18675	0.2524
Denmark	1987	1.5981	0.0134	1.5718	1.6244	0.2006	19520	24342	0.2579	24418	0.2563
Denmark	1992	1.6683	0.0144	1.6401	1.6965	0.1863	19065	23554	0.2423	23430	0.2383
Denmark	1995	2.2730	0.0114	2.2507	2.2952	0.1858	20489	25273	0.2238	25166	0.2163
Denmark	2000	2.2957	0.0118	2.2726	2.3189	0.1939	21575	26806	0.2275	26763	0.2220
Denmark	2004	2.1981	0.0107	2.1771	2.2192	0.1943	22667	28164	0.2323	28134	0.2258
Denmark	2007	1.9695	0.0083	1.9533	1.9856	0.1916	23839	29624	0.2458	29490	0.2338
Denmark	2010	1.9161	0.0080	1.9004	1.9318	0.2024	24149	30437	0.2620	30279	0.2454
Denmark	2013	1.9426	0.0083	1.9264	1.9588	0.2074	23480	29814	0.2539	29625	0.2491
Denmark	2016	1.9103	0.0080	1.8947	1.9260	0.2120	24153	30881	0.2609	30649	0.2546
Dominican Rep.	2007	1.3156	0.0153	1.2856	1.3456	0.4973	3803	7221	0.5123	7566	0.5352
Egypt	1999	3.8005	0.0602	3.6826	3.9185	0.3602	4613	7285	0.3218	7211	0.3143
Egypt	2004	3.3517	0.0353	3.2825	3.4209	0.3536	4264	6629	0.3189	6596	0.3153
Egypt	2008	3.3064	0.0463	3.2156	3.3971	0.3294	4378	6584	0.3055	6528	0.2993
Egypt	2010	3.0708	0.0685	2.9365	3.2051	0.3111	4560	6627	0.2956	6619	0.2947
Egypt	2012	3.1137	0.0702	2.9760	3.2513	0.3006	4816	6876	0.2844	6886	0.2859
Egypt	2015	3.4404	0.0733	3.2967	3.5840	0.3478	4913	7772	0.3293	7533	0.3076
Estonia	2000	1.8533	0.0363	1.7822	1.9244	0.3480	5189	7846	0.3683	7958	0.3653
Estonia	2004	1.6518	0.0321	1.5889	1.7148	0.3166	6899	10025	0.3490	10095	0.3522
Estonia	2007	1.7528	0.0328	1.6884	1.8172	0.2837	10453	14603	0.3124	14594	0.3138
Estonia	2010	1.6687	0.0289	1.6120	1.7254	0.2852	9419	13168	0.3191	13178	0.3212
Estonia	2013	1.5599	0.0250	1.5109	1.6089	0.3191	10626	15546	0.3536	15606	0.3548
Finland	1987	2.2714	0.0262	2.2201	2.3227	0.1733	15856	19202	0.2070	19180	0.2061
Finland	1991	2.1986	0.0248	2.1501	2.2471	0.1733	17569	21254	0.2095	21253	0.2091
Finland	1995	2.5744	0.0414	2.4933	2.6555	0.1919	15661	19436	0.2173	19379	0.2151
Finland	2000	2.4442	0.0395	2.3668	2.5215	0.2309	16961	22268	0.2558	22054	0.2490
Finland	2004	2.2984	0.0341	2.2316	2.3653	0.2338	19166	25370	0.2659	25012	0.2558
Finland	2007	2.1785	0.0319	2.1159	2.2412	0.2355	20899	27536	0.2666	27337	0.2612
Finland	2010	2.2532	0.0368	2.1811	2.3254	0.2379	21338	28180	0.2634	28000	0.2587
Finland	2013	2.3006	0.0354	2.2311	2.3700	0.2385	21353	28179	0.2609	28040	0.2579
Finland	2016	2.3014	0.0361	2.2308	2.3721	0.2321	21755	28427	0.2584	28330	0.2566
France	1978	1.5869	0.0156	1.5563	1.6175	0.2616	15756	21517	0.3186	21339	0.3152
France	1984	1.5229	0.0132	1.4970	1.5488	0.2618	15372	20959	0.3479	20825	0.3213
France	1989	1.8011	0.0227	1.7567	1.8456	0.2397	16039	20926	0.2901	21097	0.2844
France	1994	2.2243	0.0346	2.1565	2.2921	0.2724	17334	23833	0.2899	23823	0.2898
France	2000	2.3670	0.0416	2.2855	2.4485	0.2703	17333	23673	0.2788	23752	0.2793
France	2005	1.9998	0.0277	1.9456	2.0540	0.2474	18358	24400	0.2807	24392	0.2807
France	2010	1.8330	0.0178	1.7981	1.8679	0.2450	20921	27734	0.2918	27711	0.2887
Georgia	2010	1.4691	0.0247	1.4208	1.5175	0.4297	2342	4083	0.4446	4107	0.4485
Georgia	2013	2.0650	0.0759	1.9163	2.2136	0.4416	3054	5460	0.4003	5470	0.4014
Georgia	2016	2.0563	0.0756	1.9082	2.2044	0.4323	3702	6499	0.3898	6521	0.3916
Germany	1973	1.9205	0.0108	1.8994	1.9417	0.2350	19561	25553	0.2711	25571	0.2765
Germany	1978	2.2757	0.0161	2.2443	2.3072	0.2376	22191	29171	0.2638	29109	0.2632
Germany	1981	2.2731	0.0645	2.1466	2.3996	0.2197	19046	24416	0.2439	24408	0.2455
Germany	1983	2.8400	0.0284	2.7844	2.8957	0.2716	21212	29127	0.2607	29122	0.2602
Germany	1984	1.8624	0.0288	1.8060	1.9187	0.2114	18522	23426	0.2613	23488	0.2563
Germany	1987	2.0179	0.0370	1.9455	2.0904	0.2156	19907	25355	0.2529	25377	0.2527
Germany	1989	2.0296	0.0383	1.9546	2.1046	0.2183	20860	26739	0.2575	26686	0.2560
Germany	1991	2.2828	0.0458	2.1929	2.3726	0.2568	19277	25888	0.2696	25938	0.2672
Germany	1994	1.9783	0.0311	1.9174	2.0392	0.2273	19801	25614	0.2629	25626	0.2642
Germany	1995	1.9527	0.0296	1.8947	2.0107	0.2200	20155	25758	0.2615	25841	0.2603
Germany	1998	2.1532	0.0365	2.0818	2.2247	0.2259	20446	26287	0.2571	26412	0.2561
Germany	2000	2.0264	0.0248	1.9778	2.0750	0.2232	21341	27441	0.2603	27473	0.2602
Germany	2001	1.9989	0.0236	1.9527	2.0452	0.2332	21070	27407	0.2756	27477	0.2731
Germany	2002	1.9688	0.0236	1.9226	2.0150	0.2310	21392	27796	0.2719	27817	0.2700
Germany	2003	1.8828	0.0210	1.8416	1.9240	0.2257	21285	27525	0.2757	27488	0.2701

Country	Year	Normative characteristics						Empirical estimates		GB2 estimates	
		$\hat{\varepsilon}$	$D[\hat{\varepsilon}]$	LB	UB	Atk	EDEI	Mean	Gini	Mean	Gini
Germany	2004	2.0097	0.0260	1.9588	2.0607	0.2370	21091	27761	0.2761	27642	0.2729
Germany	2005	1.9827	0.0253	1.9331	2.0324	0.2546	20605	27782	0.2937	27644	0.2890
Germany	2006	2.0724	0.0292	2.0151	2.1296	0.2566	20728	27946	0.2885	27882	0.2850
Germany	2007	2.0656	0.0298	2.0072	2.1240	0.2560	20891	28211	0.2917	28078	0.2855
Germany	2008	2.0069	0.0288	1.9504	2.0634	0.2541	20886	28119	0.2893	28002	0.2864
Germany	2009	2.0331	0.0247	1.9848	2.0815	0.2549	20880	28063	0.2861	28022	0.2831
Germany	2010	2.0403	0.0230	1.9951	2.0854	0.2583	20985	28250	0.2891	28293	0.2847
Germany	2011	2.1313	0.0258	2.0806	2.1819	0.2624	20863	28288	0.2892	28283	0.2845
Germany	2012	2.0632	0.0229	2.0182	2.1082	0.2629	20558	27877	0.2926	27892	0.2876
Germany	2013	2.1402	0.0269	2.0875	2.1928	0.2694	20542	28196	0.2941	28116	0.2883
Germany	2014	1.9389	0.0212	1.8974	1.9805	0.2572	20909	28118	0.2940	28151	0.2884
Germany	2015	1.9092	0.0215	1.8671	1.9513	0.2571	21260	28748	0.2986	28618	0.2913
Germany	2016	1.8094	0.0181	1.7739	1.8450	0.2551	21672	29116	0.3003	29095	0.2953
Greece	1995	1.4686	0.0217	1.4261	1.5110	0.2983	10848	15393	0.3504	15459	0.3501
Greece	2000	1.7083	0.0354	1.6389	1.7776	0.3050	11986	17217	0.3335	17245	0.3325
Greece	2004	1.7756	0.0320	1.7130	1.8383	0.2959	14830	20953	0.3283	21061	0.3271
Greece	2007	1.8588	0.0324	1.7954	1.9223	0.2873	15549	21620	0.3280	21817	0.3157
Greece	2010	1.5799	0.0228	1.5353	1.6245	0.2743	14296	19663	0.3246	19699	0.3227
Greece	2013	1.5848	0.0199	1.5459	1.6238	0.2867	9652	13569	0.3345	13531	0.3316
Guatemala	2006	2.1486	0.0407	2.0688	2.2284	0.5853	3056	7380	0.4914	7370	0.4867
Guatemala	2011	1.2621	0.0101	1.2423	1.2819	0.4733	2999	5841	0.5271	5694	0.5159
Guatemala	2014	1.9720	0.0281	1.9169	2.0271	0.4064	3228	5545	0.4159	5438	0.4044
Hungary	1991	1.8037	0.0473	1.7110	1.8964	0.2459	9168	12178	0.2883	12158	0.2896
Hungary	1994	1.7358	0.0490	1.6397	1.8319	0.2934	7390	10359	0.3260	10459	0.3366
Hungary	1999	2.3273	0.0893	2.1523	2.5022	0.2809	6757	9365	0.2902	9397	0.2942
Hungary	2005	2.2951	0.0841	2.1302	2.4600	0.2685	8999	12301	0.2877	12302	0.2886
Hungary	2007	2.2692	0.0814	2.1096	2.4288	0.2419	9126	12096	0.2701	12037	0.2667
Hungary	2009	2.1027	0.0701	1.9653	2.2401	0.2429	8743	11508	0.2706	11548	0.2737
Hungary	2012	1.8993	0.0582	1.7853	2.0133	0.2538	8436	11337	0.2884	11306	0.2866
Hungary	2015	2.3442	0.0785	2.1904	2.4980	0.2546	10651	14301	0.2682	14289	0.2681
Iceland	2004	2.1073	0.0485	2.0122	2.2024	0.2124	23124	29600	0.2574	29358	0.2518
Iceland	2007	2.1656	0.0555	2.0568	2.2745	0.2421	27300	36276	0.2798	36019	0.2753
Iceland	2010	2.0021	0.0423	1.9192	2.0849	0.2019	22659	28612	0.2453	28390	0.2439
India	2004	1.5103	0.0091	1.4924	1.5282	0.4952	1394	2655	0.4930	2763	0.5053
India	2011	1.4821	0.0088	1.4648	1.4993	0.5051	1974	3803	0.5064	3988	0.5192
Iraq	2007	1.6152	0.0117	1.5922	1.6381	0.3435	6531	10108	0.3952	9948	0.3858
Iraq	2012	1.4974	0.0084	1.4810	1.5138	0.3283	6877	10463	0.3882	10238	0.3749
Ireland	1987	1.9257	0.0461	1.8353	2.0162	0.3078	9628	13766	0.3345	13908	0.3258
Ireland	1994	2.5531	0.0974	2.3622	2.7441	0.3748	11689	18799	0.3387	18695	0.3358
Ireland	1995	2.6855	0.1183	2.4536	2.9174	0.3931	11716	19471	0.3446	19302	0.3393
Ireland	1996	2.8733	0.1423	2.5945	3.1521	0.4008	12059	20339	0.3340	20126	0.3275
Ireland	2000	2.0010	0.0614	1.8806	2.1214	0.2989	17564	25090	0.3141	25052	0.3089
Ireland	2004	2.5013	0.0717	2.3608	2.6417	0.3593	18758	29705	0.3308	29277	0.3220
Ireland	2007	2.3175	0.0608	2.1984	2.4366	0.3013	22166	31962	0.3024	31724	0.2977
Ireland	2010	1.7599	0.0335	1.6943	1.8255	0.2593	20083	27124	0.2946	27112	0.2976
Israel	1986	3.3834	0.1415	3.1061	3.6608	0.4343	7693	13612	0.3098	13600	0.3087
Israel	1992	3.7422	0.1719	3.4053	4.0791	0.4530	8805	16109	0.3055	16097	0.3048
Israel	1997	1.8235	0.0349	1.7551	1.8920	0.3215	11157	16479	0.3371	16445	0.3366
Israel	2001	2.4290	0.0694	2.2931	2.5649	0.4049	11085	18634	0.3524	18628	0.3460
Israel	2005	1.6327	0.0266	1.5805	1.6849	0.3530	11906	18484	0.3775	18403	0.3711
Israel	2007	1.8605	0.0379	1.7862	1.9348	0.3855	12274	19927	0.3693	19973	0.3676
Israel	2010	1.8870	0.0402	1.8083	1.9657	0.4007	12511	21053	0.3843	20877	0.3780
Israel	2012	1.7094	0.0256	1.6592	1.7596	0.3643	13920	21845	0.3731	21897	0.3685
Israel	2014	1.6564	0.0235	1.6103	1.7024	0.3460	15296	23211	0.3671	23389	0.3583
Israel	2016	1.9113	0.0321	1.8484	1.9741	0.3679	15490	24437	0.3476	24508	0.3452
Italy	1986	2.0984	0.0370	2.0259	2.1710	0.2994	12578	18029	0.3093	17951	0.3066
Italy	1987	1.4912	0.0167	1.4585	1.5240	0.2911	13937	19650	0.3327	19660	0.3434
Italy	1989	2.8803	0.0768	2.7298	3.0308	0.3616	13677	21439	0.3044	21425	0.3021
Italy	1991	2.0952	0.0353	2.0260	2.1643	0.2791	15451	21474	0.2910	21433	0.2903
Italy	1993	1.4223	0.0151	1.3928	1.4519	0.2884	14615	20586	0.3406	20538	0.3448
Italy	1995	1.5155	0.0174	1.4813	1.5496	0.2860	14198	19899	0.3397	19886	0.3367
Italy	1998	1.4033	0.0151	1.3737	1.4328	0.2818	15142	21199	0.3438	21082	0.3429
Italy	2000	1.5584	0.0187	1.5217	1.5951	0.2802	15442	21519	0.3292	21453	0.3301
Italy	2004	1.6310	0.0214	1.5892	1.6729	0.2850	15503	21870	0.3345	21681	0.3303
Italy	2008	1.6236	0.0210	1.5825	1.6648	0.2766	16125	22417	0.3219	22290	0.3234
Italy	2010	1.3990	0.0144	1.3709	1.4272	0.2666	15787	21642	0.3199	21525	0.3287
Italy	2014	1.3696	0.0137	1.3427	1.3966	0.2632	14324	19611	0.3205	19440	0.3261
Italy	2016	1.3080	0.0132	1.2820	1.3339	0.2716	14744	20451	0.3265	20242	0.3384
Ivory Coast	2002	1.1843	0.0099	1.1650	1.2037	0.5301	1741	3529	0.5541	3705	0.5767
Ivory Coast	2008	1.3098	0.0122	1.2858	1.3337	0.4958	1754	3593	0.5434	3479	0.5287
Ivory Coast	2015	1.1645	0.0097	1.1455	1.1835	0.5366	1854	3799	0.5607	4001	0.5846
Japan	2008	1.5146	0.0254	1.4648	1.5643	0.2772	18551	25679	0.3282	25665	0.3292
Japan	2010	1.8620	0.0466	1.7707	1.9533	0.2747	20747	28696	0.3084	28606	0.3070

Country	*Year*	*Normative characteristics*						*Empirical estimates*		*GB2 estimates*	
		$\hat{\varepsilon}$	$D[\hat{\varepsilon}]$	LB	UB	Atk	EDEI	Mean	Gini	Mean	Gini
Japan	2013	1.5338	0.0324	1.4703	1.5972	0.2607	19975	27126	0.3164	27018	0.3176
Jordan	2002	2.0424	0.0605	1.9238	2.1610	0.3956	5317	8871	0.3909	8797	0.3859
Jordan	2006	2.8964	0.1291	2.6433	3.1495	0.4658	4783	9062	0.3870	8953	0.3797
Jordan	2008	2.2993	0.0737	2.1550	2.4437	0.3936	5676	9533	0.3874	9360	0.3764
Jordan	2010	2.0717	0.0574	1.9592	2.1842	0.3761	6458	10569	0.3905	10351	0.3779
Jordan	2013	1.8071	0.0325	1.7435	1.8707	0.3468	6188	9427	0.3650	9473	0.3689
Lithuania	2010	1.6353	0.0282	1.5800	1.6907	0.2883	7453	10471	0.3232	10471	0.3262
Lithuania	2013	1.8956	0.0437	1.8100	1.9813	0.3427	8328	12612	0.3481	12671	0.3521
Luxembourg	1985	3.0944	0.1473	2.8057	3.3831	0.2589	17077	23028	0.2357	23042	0.2363
Luxembourg	1994	3.3217	0.1840	2.9611	3.6824	0.2661	26008	35406	0.2354	35438	0.2362
Luxembourg	1997	2.9889	0.1362	2.7220	3.2557	0.2883	25878	36365	0.2610	36362	0.2610
Luxembourg	2004	2.2006	0.0565	2.0899	2.3113	0.2480	33441	44430	0.2701	44471	0.2707
Luxembourg	2007	2.3535	0.0657	2.2247	2.4823	0.2640	32806	44532	0.2776	44573	0.2772
Luxembourg	2010	2.4655	0.0609	2.3462	2.5849	0.2701	31981	43793	0.2723	43812	0.2694
Luxembourg	2013	2.1579	0.0550	2.0501	2.2657	0.2627	31631	42590	0.2874	42901	0.2790
Mexico	1984	1.7601	0.0378	1.6860	1.8341	0.4515	3047	5507	0.4328	5556	0.4380
Mexico	1989	1.6329	0.0203	1.5930	1.6728	0.4681	3259	6159	0.4762	6126	0.4735
Mexico	1992	1.6800	0.0240	1.6330	1.7270	0.5189	3357	6857	0.5005	6976	0.5093
Mexico	1994	1.9511	0.0330	1.8865	2.0157	0.5684	3075	7003	0.5052	7125	0.5138
Mexico	1996	1.7826	0.0244	1.7349	1.8303	0.5214	2527	5213	0.4913	5280	0.4980
Mexico	1998	1.5783	0.0219	1.5353	1.6213	0.5218	2716	5645	0.5047	5680	0.5078
Mexico	2000	1.8578	0.0350	1.7891	1.9265	0.5613	2955	6673	0.4992	6736	0.5039
Mexico	2002	1.9170	0.0276	1.8628	1.9711	0.5329	3127	6613	0.4749	6694	0.4813
Mexico	2004	1.5385	0.0133	1.5124	1.5646	0.4636	3779	6957	0.4710	7044	0.4780
Mexico	2008	1.7996	0.0181	1.7642	1.8350	0.5071	4119	8397	0.4752	8356	0.4727
Mexico	2010	1.5310	0.0117	1.5080	1.5540	0.4395	4144	7328	0.4528	7393	0.4578
Mexico	2012	1.8121	0.0327	1.7480	1.8762	0.4908	3912	7622	0.4624	7683	0.4667
Mexico	2014	1.6685	0.0169	1.6354	1.7016	0.4562	3957	7226	0.4628	7277	0.4667
Mexico	2016	1.7950	0.0106	1.7741	1.8158	0.4385	4534	8475	0.4622	8074	0.4354
Mexico	2018	1.7150	0.0090	1.6974	1.7326	0.4130	4780	8182	0.4285	8143	0.4257
Netherlands	1983	1.8332	0.0291	1.7762	1.8902	0.2110	15486	19643	0.2522	19628	0.2573
Netherlands	1987	2.6685	0.0733	2.5248	2.8121	0.2197	15982	20255	0.2362	20482	0.2317
Netherlands	1990	1.8525	0.0330	1.7880	1.9171	0.2198	18972	24316	0.2720	24315	0.2645
Netherlands	1993	1.6268	0.0225	1.5827	1.6708	0.2108	17700	22211	0.2733	22429	0.2623
Netherlands	1999	2.1758	0.0453	2.0870	2.2646	0.1997	20715	25909	0.2310	25884	0.2322
Netherlands	2004	1.9641	0.0252	1.9147	2.0135	0.2209	20753	26572	0.2736	26637	0.2626
Netherlands	2007	2.2704	0.0345	2.2028	2.3381	0.2437	22732	30091	0.2792	30057	0.2712
Netherlands	2010	2.4106	0.0396	2.3329	2.4882	0.2360	22272	28941	0.2630	29151	0.2547
Netherlands	2013	2.0989	0.0293	2.0416	2.1562	0.2277	21508	27760	0.2672	27851	0.2621
Norway	1979	2.0447	0.0239	1.9979	2.0916	0.1832	13684	16712	0.2300	16754	0.2237
Norway	1986	2.0550	0.0353	1.9859	2.1241	0.1966	18067	22489	0.2341	22486	0.2343
Norway	1991	1.9851	0.0241	1.9379	2.0324	0.1874	18804	23265	0.2315	23141	0.2306
Norway	1995	1.8390	0.0189	1.8020	1.8760	0.1886	18510	23054	0.2423	22813	0.2365
Norway	2000	1.8619	0.0169	1.8289	1.8950	0.1971	21936	27939	0.2612	27320	0.2458
Norway	2004	1.8377	0.0165	1.8054	1.8700	0.2020	23713	31043	0.2833	29714	0.2517
Norway	2007	1.7019	0.0036	1.6949	1.7090	0.1957	26935	33835	0.2458	33487	0.2484
Norway	2010	1.6571	0.0033	1.6505	1.6636	0.1966	27970	35360	0.2513	34814	0.2506
Norway	2013	1.6389	0.0033	1.6325	1.6453	0.2017	30358	38469	0.2519	38030	0.2563
Palestine	2010	1.8423	0.0450	1.7541	1.9305	0.4510	2552	4666	0.4176	4647	0.4156
Palestine	2017	1.4116	0.0234	1.3657	1.4575	0.4001	3237	5413	0.4263	5396	0.4245
Panama	2007	2.0121	0.0409	1.9318	2.0923	0.6120	3777	9749	0.4868	9735	0.4869
Panama	2010	1.4583	0.0165	1.4259	1.4907	0.4762	5384	10293	0.4799	10277	0.4793
Panama	2013	1.6631	0.0249	1.6144	1.7118	0.5068	5721	11583	0.4717	11599	0.4728
Paraguay	2000	1.1911	0.0118	1.1680	1.2141	0.4956	4749	9388	0.5390	9415	0.5404
Paraguay	2004	1.4695	0.0203	1.4298	1.5093	0.4887	3947	7698	0.5062	7719	0.5078
Paraguay	2007	1.3342	0.0198	1.2954	1.3731	0.4651	4593	8810	0.5156	8586	0.5027
Paraguay	2010	1.3210	0.0195	1.2827	1.3592	0.4602	4977	9461	0.5087	9220	0.4954
Paraguay	2013	1.4315	0.0234	1.3857	1.4773	0.4603	5977	10981	0.4776	11075	0.4824
Paraguay	2016	1.4848	0.0193	1.4471	1.5226	0.4747	5473	10500	0.4885	10419	0.4844
Peru	2004	0.9692	0.0041	0.9611	0.9773	0.4515	3031	5467	0.5420	5527	0.5328
Peru	2007	1.1117	0.0060	1.0999	1.1234	0.4526	3703	6746	0.5133	6764	0.5067
Peru	2010	1.0608	0.0049	1.0513	1.0703	0.4005	4612	7592	0.4879	7693	0.4768
Peru	2013	1.0939	0.0044	1.0853	1.1026	0.3813	5148	8217	0.4621	8320	0.4549
Peru	2016	1.1322	0.0045	1.1234	1.1411	0.3806	5299	8486	0.4579	8555	0.4500
Poland	1986	2.4094	0.0402	2.3306	2.4882	0.2768	7620	10546	0.2708	10537	0.2702
Poland	1992	2.5447	0.0563	2.4344	2.6550	0.2566	7394	9945	0.2621	9946	0.2630
Poland	1995	1.7124	0.0103	1.6922	1.7327	0.2594	5883	7745	0.3439	7943	0.3075
Poland	1999	1.9210	0.0134	1.8947	1.9472	0.2461	7153	9444	0.2979	9488	0.2846
Poland	2004	1.8599	0.0135	1.8335	1.8863	0.2804	6968	9585	0.3283	9682	0.3157
Poland	2007	1.9059	0.0130	1.8803	1.9314	0.2757	8480	11630	0.3203	11708	0.3114
Poland	2010	2.0039	0.0151	1.9742	2.0336	0.2833	9816	13588	0.3187	13695	0.3097
Poland	2013	1.7982	0.0118	1.7751	1.8213	0.2757	9964	13605	0.3313	13758	0.3158
Poland	2016	1.9317	0.0130	1.9062	1.9572	0.2478	12103	15834	0.2990	16091	0.2868

Country	Year	Normative characteristics						Empirical estimates		GB2 estimates	
		$\hat{\varepsilon}$	$D[\hat{\varepsilon}]$	LB	UB	Atk	EDEI	Mean	Gini	Mean	Gini
Romania	1995	2.1348	0.0177	2.1002	2.1695	0.2522	4010	5429	0.2856	5363	0.2769
Romania	1997	2.1263	0.0172	2.0925	2.1600	0.2488	3699	4960	0.2816	4925	0.2766
Russia	2000	1.4174	0.0284	1.3616	1.4731	0.3741	3570	5705	0.4213	5703	0.4205
Russia	2004	1.4441	0.0298	1.3857	1.5024	0.3488	5864	8936	0.3872	9005	0.3923
Russia	2007	1.5438	0.0317	1.4817	1.6058	0.3093	8413	12175	0.3445	12179	0.3452
Russia	2010	1.5229	0.0218	1.4802	1.5656	0.2922	10529	14887	0.3391	14876	0.3438
Russia	2011	1.9300	0.0338	1.8638	1.9962	0.3739	12479	19835	0.3642	19931	0.3678
Russia	2013	1.9152	0.0151	1.8856	1.9447	0.3443	14997	22811	0.3506	22871	0.3526
Russia	2014	2.0133	0.0168	1.9804	2.0462	0.3425	14549	22075	0.3396	22129	0.3414
Russia	2015	2.1581	0.0170	2.1247	2.1914	0.3490	13281	20376	0.3309	20401	0.3316
Russia	2016	2.2743	0.0118	2.2511	2.2974	0.3582	12623	19659	0.3315	19667	0.3318
Serbia	2006	1.3742	0.0182	1.3385	1.4099	0.2824	5335	7316	0.3550	7435	0.3414
Serbia	2010	1.4466	0.0202	1.4071	1.4862	0.2671	5974	8075	0.3330	8150	0.3233
Serbia	2013	1.4493	0.0207	1.4088	1.4898	0.2762	5523	7528	0.3582	7630	0.3337
Serbia	2016	1.4777	0.0182	1.4420	1.5134	0.2661	6274	8459	0.3314	8549	0.3206
Slovakia	1992	3.0833	0.0409	3.0032	3.1634	0.1710	8253	9980	0.1894	9956	0.1876
Slovakia	1996	1.6863	0.0123	1.6621	1.7104	0.2033	7937	10028	0.2498	9962	0.2560
Slovakia	2004	2.0009	0.0355	1.9314	2.0704	0.2285	8461	10973	0.2710	10966	0.2646
Slovakia	2007	2.0671	0.0357	1.9971	2.1370	0.2141	11014	14028	0.2480	14015	0.2483
Slovakia	2010	1.8327	0.0286	1.7767	1.8888	0.2203	11971	15432	0.2643	15353	0.2642
Slovakia	2013	1.7652	0.0256	1.7150	1.8154	0.2228	11753	15175	0.2690	15121	0.2707
Slovenia	1997	2.0332	0.0451	1.9448	2.1217	0.1911	12787	15805	0.2293	15808	0.2302
Slovenia	1999	1.9726	0.0344	1.9051	2.0400	0.1907	12895	15933	0.2320	15933	0.2327
Slovenia	2004	2.1104	0.0429	2.0264	2.1944	0.1982	14310	17853	0.2311	17847	0.2326
Slovenia	2007	2.0425	0.0398	1.9644	2.1205	0.1938	15516	19251	0.2301	19246	0.2303
Slovenia	2010	1.6356	0.0242	1.5881	1.6830	0.2034	16192	20387	0.2523	20327	0.2557
Slovenia	2012	1.7969	0.0338	1.7307	1.8631	0.2294	16030	20844	0.2711	20803	0.2710
Slovenia	2015	2.0186	0.0435	1.9334	2.1038	0.2341	16242	21221	0.2628	21206	0.2620
South Africa	2010	2.7648	0.1493	2.4722	3.0573	0.8582	1066	7968	0.6612	7521	0.6418
South Africa	2012	1.5531	0.0297	1.4949	1.6113	0.6982	2735	7956	0.6073	9063	0.6565
South Africa	2015	1.5686	0.0296	1.5106	1.6266	0.6907	3214	9823	0.6037	10391	0.6260
South Korea	2006	1.4919	0.0113	1.4697	1.5141	0.2494	17177	22786	0.3065	22886	0.3040
South Korea	2008	1.4829	0.0122	1.4590	1.5068	0.2571	17456	23361	0.3146	23498	0.3114
South Korea	2010	1.4204	0.0108	1.3991	1.4416	0.2487	17852	23664	0.3100	23762	0.3082
South Korea	2012	1.4213	0.0110	1.3998	1.4428	0.2455	18880	24930	0.3069	25023	0.3050
Spain	1980	1.8002	0.0145	1.7719	1.8286	0.2900	9092	12831	0.3203	12806	0.3197
Spain	1985	1.9981	0.0505	1.8992	2.0970	0.2962	8730	12383	0.3149	12404	0.3169
Spain	1990	1.9479	0.0182	1.9123	1.9836	0.2776	11340	15730	0.3018	15698	0.3015
Spain	1995	1.5617	0.0229	1.5168	1.6065	0.3129	12912	18616	0.3559	18792	0.3557
Spain	2000	1.7096	0.0317	1.6474	1.7718	0.3045	15621	22454	0.3367	22459	0.3364
Spain	2004	1.5490	0.0144	1.5208	1.5772	0.2708	15494	21288	0.3162	21249	0.3183
Spain	2007	1.6204	0.0158	1.5895	1.6512	0.2623	17108	23031	0.3108	23192	0.3064
Spain	2010	1.4268	0.0122	1.4029	1.4508	0.2775	15432	21130	0.3368	21359	0.3314
Spain	2013	1.4249	0.0131	1.3993	1.4505	0.2902	15129	21209	0.3446	21314	0.3432
Spain	2016	1.3566	0.0106	1.3359	1.3773	0.2790	16314	22623	0.3396	22626	0.3401
Sudan	2009	1.2948	0.0137	1.2680	1.3216	0.5027	1409	2829	0.5357	2834	0.5367
Sweden	1967	1.4679	0.0162	1.4361	1.4997	0.2121	8591	11011	0.2605	10904	0.2721
Sweden	1975	1.9658	0.0210	1.9247	2.0069	0.1759	12500	15165	0.2164	15169	0.2164
Sweden	1981	2.1383	0.0253	2.0888	2.1878	0.1614	12926	15388	0.2003	15413	0.1987
Sweden	1987	1.9125	0.0208	1.8717	1.9533	0.1668	13710	16444	0.2168	16455	0.2110
Sweden	1992	1.8307	0.0174	1.7967	1.8647	0.1840	15998	19574	0.2330	19605	0.2314
Sweden	1995	1.8138	0.0142	1.7860	1.8417	0.1787	14965	18316	0.2237	18222	0.2283
Sweden	2000	1.9569	0.0200	1.9178	1.9960	0.2083	17512	22258	0.2581	22119	0.2511
Sweden	2005	2.1274	0.0224	2.0835	2.1714	0.1997	19989	25086	0.2392	24976	0.2355
Switzerland	1982	1.8429	0.0273	1.7895	1.8964	0.2641	26063	35849	0.3257	35416	0.3104
Switzerland	1992	1.8265	0.0273	1.7730	1.8800	0.2494	26914	34866	0.3288	35856	0.2953
Switzerland	2000	1.9890	0.0450	1.9007	2.0772	0.2443	26282	34989	0.2858	34780	0.2798
Switzerland	2002	2.2906	0.0631	2.1671	2.4142	0.2566	27040	36298	0.2748	36373	0.2699
Switzerland	2004	1.9517	0.0443	1.8649	2.0385	0.2264	26776	34398	0.2704	34610	0.2639
Switzerland	2007	1.7031	0.0240	1.6560	1.7502	0.2627	28460	38615	0.3185	38602	0.3113
Switzerland	2010	1.9126	0.0304	1.8530	1.9721	0.2579	28936	39211	0.2990	38989	0.2937
Switzerland	2013	2.2194	0.0459	2.1294	2.3094	0.2765	28868	39978	0.2962	39898	0.2939
Taiwan	1981	3.4524	0.0649	3.3251	3.5797	0.3188	8451	12386	0.2672	12407	0.2685
Taiwan	1986	2.8948	0.0422	2.8121	2.9775	0.2843	11512	16083	0.2707	16085	0.2714
Taiwan	1991	3.2028	0.0567	3.0917	3.3139	0.3173	17651	25883	0.2725	25853	0.2716
Taiwan	1995	1.6796	0.0138	1.6525	1.7067	0.2511	23011	30727	0.2916	30727	0.3000
Taiwan	1997	2.5116	0.0387	2.4357	2.5875	0.2992	22431	31981	0.2874	32009	0.2882
Taiwan	2000	2.3446	0.0335	2.2791	2.4102	0.2884	23650	33202	0.2892	33233	0.2900
Taiwan	2005	2.1385	0.0286	2.0824	2.1946	0.2956	23861	33824	0.3054	33874	0.3068
Taiwan	2007	2.2580	0.0332	2.1931	2.3230	0.3131	21791	31667	0.3070	31722	0.3083
Taiwan	2010	1.8401	0.0199	1.8011	1.8792	0.2904	20967	29498	0.3170	29547	0.3181
Taiwan	2013	1.8361	0.0185	1.7998	1.8724	0.2763	22304	30723	0.3082	30817	0.3105
Taiwan	2016	2.0441	0.0238	1.9974	2.0908	0.2863	23510	32883	0.3035	32943	0.3046

Country	Year	*Normative characteristics*						*Empirical estimates*		*GB2 estimates*	
		$\hat{\varepsilon}$	$D[\hat{\varepsilon}]$	LB	UB	Atk	EDEI	Mean	Gini	Mean	Gini
United Kingdom	1969	2.8003	0.0661	2.6708	2.9298	0.2807	8112	11291	0.2682	11278	0.2678
United Kingdom	1974	2.3703	0.0490	2.2742	2.4664	0.2581	10575	14288	0.2684	14254	0.2662
United Kingdom	1979	2.1198	0.0382	2.0450	2.1946	0.2479	11217	14884	0.2674	14913	0.2658
United Kingdom	1986	1.7769	0.0266	1.7247	1.8291	0.2636	11533	15454	0.3085	15662	0.3002
United Kingdom	1991	1.9005	0.0360	1.8300	1.9711	0.3250	12452	18491	0.3409	18447	0.3348
United Kingdom	1994	2.0428	0.0220	1.9998	2.0859	0.3342	13079	19599	0.3467	19645	0.3413
United Kingdom	1995	1.6159	0.0243	1.5683	1.6635	0.3059	13108	18803	0.3482	18886	0.3461
United Kingdom	1999	2.0496	0.0235	2.0035	2.0956	0.3482	14312	21871	0.3597	21956	0.3467
United Kingdom	2004	1.9915	0.0202	1.9520	2.0310	0.3331	17434	26198	0.3564	26142	0.3472
United Kingdom	2007	1.7320	0.0149	1.7029	1.7612	0.3047	19669	28250	0.3443	28289	0.3413
United Kingdom	2010	1.7909	0.0156	1.7604	1.8215	0.3020	19270	27484	0.3388	27605	0.3389
United Kingdom	2013	1.9573	0.0218	1.9145	2.0000	0.3098	18897	27249	0.3352	27378	0.3333
United Kingdom	2016	1.7465	0.0168	1.7135	1.7794	0.2982	20011	28359	0.3498	28514	0.3374
United States	1974	1.4388	0.0122	1.4150	1.4627	0.2550	21890	29202	0.3178	29382	0.3134
United States	1979	1.4879	0.0057	1.4768	1.4991	0.2565	22779	30607	0.3110	30636	0.3104
United States	1986	1.4406	0.0061	1.4287	1.4526	0.2884	22698	31846	0.3412	31897	0.3390
United States	1991	1.4640	0.0064	1.4514	1.4765	0.2964	22734	32292	0.3461	32312	0.3449
United States	1994	1.4345	0.0063	1.4222	1.4469	0.3110	22999	33707	0.3705	33378	0.3633
United States	1997	1.4244	0.0065	1.4117	1.4371	0.3084	24250	35582	0.3726	35064	0.3634
United States	2000	1.4078	0.0049	1.3982	1.4173	0.3013	26059	37933	0.3701	37293	0.3594
United States	2004	1.3335	0.0044	1.3250	1.3421	0.3040	26390	38418	0.3736	37916	0.3670
United States	2007	1.3799	0.0049	1.3702	1.3895	0.3150	26742	39166	0.3827	39040	0.3725
United States	2010	1.3838	0.0050	1.3740	1.3937	0.3141	25846	37785	0.3696	37679	0.3694
United States	2013	1.3830	0.0062	1.3710	1.3951	0.3261	25633	38094	0.3793	38037	0.3811
United States	2016	1.3263	0.0047	1.3171	1.3355	0.3268	27923	41434	0.3827	41478	0.3885
Uruguay	2004	2.2306	0.0376	2.1569	2.3042	0.4995	4466	8793	0.4343	8923	0.4429
Uruguay	2007	3.5454	0.0669	3.4143	3.6764	0.5975	4418	10786	0.4304	10976	0.4404
Uruguay	2010	3.6251	0.0691	3.4898	3.7605	0.5590	5518	12426	0.4002	12515	0.4044
Uruguay	2013	2.8405	0.0390	2.7641	2.9168	0.4708	7280	13726	0.3704	13756	0.3716
Uruguay	2016	3.0665	0.0463	2.9758	3.1571	0.4723	7566	14318	0.3602	14338	0.3609
Vietnam	2011	2.7132	0.0671	2.5817	2.8446	0.4333	4129	7372	0.3702	7285	0.3630
Vietnam	2013	2.5156	0.0562	2.4055	2.6257	0.4060	4431	7484	0.3507	7459	0.3488