

Sell, Friedrich L.; Öllinger, Michael

**Working Paper**

## Towards equilibrium in income distribution: Theoretical background and empirical evidence for European countries

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**WORKING PAPERS IN ECONOMICS**

Friedrich L. Sell und Michael Öllinger

Towards equilibrium in income distribution: theoretical background and empirical evidence for European Countries

## Autoren/Authors

### **Friedrich L. Sell**

Universität der Bundeswehr München / Bundeswehr University Munich  
Institut für Ökonomie und Recht der globalen Wirtschaft  
Werner-Heisenberg-Weg 39  
85577 Neubiberg  
Germany  
friedrich.sell@unibw.de

### **Michael Öllinger**

Universität der Bundeswehr München / Bundeswehr University Munich  
Institut für Controlling, Finanz- und Risikomanagement  
Werner-Heisenberg-Weg 39  
85577 Neubiberg  
Germany  
michael.oellinger@unibw.de

## Herausgeber/Editors

Prof. Dr. Stefan D. Josten  
Prof. Dr. Karl Morasch  
Prof. Dr. Friedrich L. Sell

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# **Towards equilibrium in income distribution: theoretical background and empirical evidence for European Countries**

## **Abstract**

The paper first aims at showing that personal income distribution – at least after government intervention – tends to be a stationary variable for many European countries. This finding backs earlier results achieved by Ramser (1987). Furthermore, personal incomes follow a log-normal distribution, regardless of time and location. The authors set up a theoretical equilibrium concept for personal income distribution which is located in status theory and which can explain why a certain or likewise “optimal” degree of inequality is warranted in the society. In the empirical section of the paper, the authors present an in-depth analysis of personal income distribution (before and after government intervention) in 17 European countries (2004-2012). Linear regression exercises - which make use of Gini coefficients “ex-ante” and Gini coefficients “ex-post” - show that the total sample can be clustered into three subgroups. The main group of 10 countries (Germany, Czech Republic, Denmark, Finland, Belgium, Slovenia, Estonia, France, Luxembourg and Austria) seems to have already achieved equilibrium in income distribution. The other two, smaller groups (the so-called “GIIPS”: Greece, Ireland, Italy, Portugal, Spain on the one hand and Poland and Slovakia on the other hand) seem to be on the way to let their personal income distribution converge towards equilibrium, either “from below” or “from above”.

**JEL Categories:** D63, H23, O15

**Key Words:** Personal Income Distribution, Redistributive Policies, Globalization

## **1. Introduction**

The main hypothesis that shall take the reader through this paper is the idea of equilibrium in income distribution. This idea of equilibrium in income distribution is not new at all: following Blümle (1992), already famous Vilfredo Pareto (1895) held the view that social distribution of incomes was situated in a stable over time equilibrium. He based his statement on the observation that the dispersion of incomes did not fluctuate, neither internationally or intertemporally. Ramser (1987), in turn, detected stationarity in his empirical research in the secondary (that is, net of government intervention with taxes and transfers) distribution of incomes, but not so in the primary (that is, out of the market process) distribution of incomes (Hypothesis 1). The time span covered by his research was 1927–87 and the countries investigated were mostly developed.

The possible existence of equilibrium in income distribution has quite interesting implications: on the one hand, it would mean that the preservation of a specific degree of income inequality is not accidental, but intentional: the existing skewness of income distribution could be interpreted as a display of overall social preferences (Blümle 1992, p. 224). In a democracy, such an outcome can only endure if it is backed by corresponding majorities in the parliament. On the other hand, this result would in principle contradict the assumption made by Anthony Downs (1968), according to which democracies tend to achieve in the long run an equitable distribution of incomes, provided this process is not interrupted by external problems/shocks of the society in question. Also, equilibrium in income distribution would raise doubt as to whether some degree of inequality in income distribution has to be taken always as something that reduces welfare (Blümle 1992, p. 212). Distributional justice continues to be an economic goal for economic policy, but not in the strict sense of a perfect equitable income distribution. Now, also in the long run, some degree of inequality is accepted, if not warranted (see Blümle 1992, p. 225).

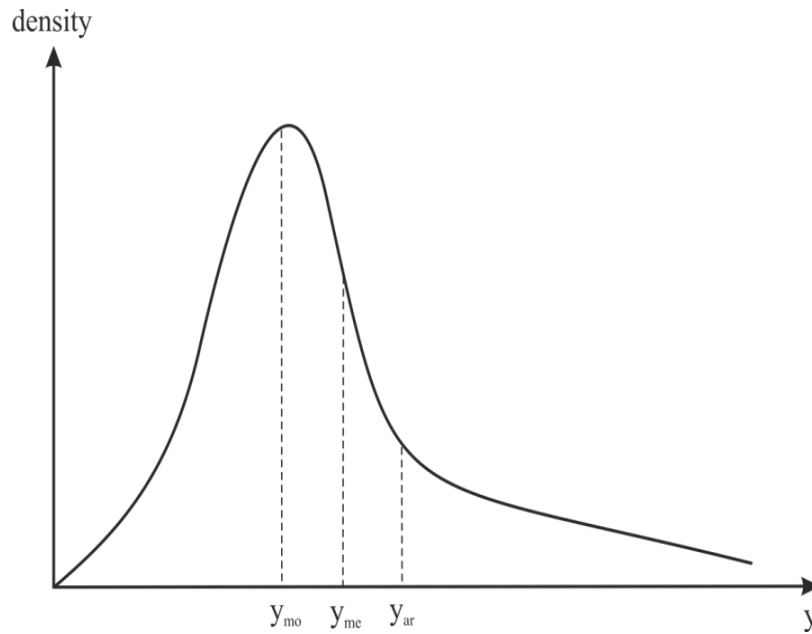


Figure 1: The time-invariant distribution pattern of personal incomes. Source: Blümle (2005)

The paper is organized as follows: in the next section, we introduce a theoretical framework for equilibrium in income distribution which is followed by a status theory of personal income distribution. In section four, we test empirically all in all five theoretical hypotheses won in the theoretical part of the paper. In section five, we discuss policy implications of our theoretical and empirical results. A summary and some conclusions end our exposition.

## 2. Introducing a theoretical framework for equilibrium in income distribution

Let us become a little more specific: if one looks at the distribution of incomes, no matter what definition of income is supposed, no matter which economy is regarded and no matter what time period is under consideration, it is surprising to see that distribution of incomes are skewed to the right and to be left-steep (Hypothesis 2). This has important consequences for the parameters of the density function. The maximum of this function – which is called modus ( $y_{mo}$ ) and is the most frequent event – will usually be located to the left of the median ( $y_{me}$ ) and the latter, in turn, is located to the left of the arithmetic mean ( $y_{ar}$ ). The characteristics of this sort of density function are depicted in Figure 1:

In order to verify and, at the same time, support this view, we look at some time-stable figures of Germany. In 1969 (the year in which the first coalition of the social democrats with the liberals was established), 64.8 per cent of total households received a (net) income lower than the arithmetic mean ( $y_{ar}$ ). At the same time, the modus of incomes ( $y_{mo}$ ) stood at around 65 per cent and the median ( $y_{me}$ ) at, by and large, 85 per cent of the average of incomes. This result is extremely stable over time and it strongly points to the stability of income distribution (Blümle 2005, pp. 2ff.).

What is the explanation for these findings? When economic agents perceive their general circumstances of life, it is very likely that the most frequent event – in our case the modus of incomes, ( $y_{mo}$ ) – will be taken as typical and representative (Hypothesis 3a). In other words, the average of incomes ( $y_{ar}$ ) will not achieve the degree of relevance as the modus. The consequence of this is far-reaching: according to Blümle (2005), a majority of economic agents will receive an income above the modus. Based on this observation, agents will have the impression of being well posed. Therefore, their attitude towards a redistribution of incomes should be quite critical. When the same agents were asked about their degree of satisfaction with their economic situation during the polls conducted both in 1990–95 and 1996–2000, 66 per cent of those polled answered that they were content. This figure corresponds almost exactly to the percentage of income receivers who earn an income above the modus. One may suppose that this outcome is a major reason for the political stability of income distribution in Germany (at least until the beginning of the new millennium) and it was a strong argument against tendencies to level the inequality of incomes, in particular, as the income distribution pattern found for the overall economy also applied to the different groups of income recipients (Blümle 2005, pp. 2ff.). Looking at the individual level, we find a synonymous effect: the modus of incomes of one's own peer group is decisive for our judgements, not the modus of total incomes in society. Closely watched, however, this difference is not as relevant. Why? The distribution of income in the respective subgroups of incomes follows the same pattern as the density

function in Figure 1. Even for the lowest income groups, we can say that their income is not too far away from the overall modus, given the left-steep and skewed to the right distribution of incomes. As a consequence, feelings of unfairness among the members of such low income groups are (at least were, see above) not widespread. Whenever the modus is lower than the median and the arithmetic average, one can expect a majority of the population to be satisfied, by and large, with their own status, given their group of reference (see Blümle 2005, p. 5).

There is an additional effect that tends to establish a sort of status theory of income distribution: when low income receivers compare their own income with the modus, they can be more or less satisfied the lower the modus is, *ceteris paribus*. In this case, the likelihood increases to be neighboring the modus income. In a sense, individuals are prepared to reduce their pretensions against their own income and thereby be 'happy' with a status of a rather low income. Status is perceived here as one's own relative income (in the sense of Duesenberry 1967), in this case relative to the modus income. Gains in status can be achieved the higher the relative income grows with respect to the reference income, the modus. At the same time, such a status theory of income distribution argues implicitly with 'bounded rationality': individuals do confuse the arithmetic mean with the modus of incomes (Hypothesis 3b). A major advantage of Blümle's approach is in its simplicity, plausibility and vividness. The limitations of his theory, though, are obvious. The equilibrium may not be unambiguous. According to Blümle (2005), the equilibrium in income distribution is reached when an overwhelming majority of individuals is pleased with its own household income. The share of satisfied agents did in fact correlate almost perfectly in the past with the share of income receivers that gained an income above the modus of incomes. As a consequence, one may say that this equilibrium is as stable as the modus of the underlying distribution of incomes. Over time, however, an increasing share of individuals whose income exceeds the modus will increase satisfaction in society and will make redistribution policies of the government less likely. But what if the opposite occurs? By how much must the degree of satisfaction decrease to make redistribution not only likely but



inevitable? In a sense, Blümle's concept of equilibrium is still quite provisional: the model is not yet 'closed' appropriately. We shall show in the following section how this deficiency can be healed.

### 3. A Status Theory of Personal Income Distribution

The aim of the following is to develop further Blümle's thoughts so as to design a complete model for equilibrium in income distribution, based on status theory.

This density function can be approximated rather accurately by a log-normal distribution of incomes (Hypothesis 4):

$$Y = \exp(X) \text{ with } X = N(\mu, \sigma^2)$$

The expected or likewise average wage rate is then given by (see Beichelt and Montgomery 2003, pp. 46–8):

$$E(y) = y_a \exp\left(\mu + \frac{1}{2}\sigma^2\right)$$

Taking the full differential of this expression from left to right leads to:

$$dE(y) = dy_a = (d\mu + \sigma d\sigma) \exp\left(\mu + \frac{1}{2}\sigma^2\right)$$

**Proposition 1:** with an increasing  $\sigma$ , the arithmetic mean will be shifted to the right.

Furthermore, we have:

$$y_{mo} = \exp(\mu - \sigma^2)$$

Taking the full differential yields:

$$dy_{mo} = (d\mu - 2\sigma d\sigma) \exp\left(\mu + \frac{1}{2}\sigma^2\right)$$

**Proposition 2:** with an increasing  $\sigma$ , the modus will be shifted to the right.

Finally, we have:

$$y_{me} = \exp(\mu)$$

$$dy_{me} = (1 \cdot d\mu) \exp\left(\mu + \frac{1}{2} \sigma^2\right)$$

**Proposition 3:** with an increasing  $\sigma$ , the median will not be affected.

Furthermore, it holds for  $\sigma^2 > 0$ :  $y_{mo} < y_{me} < y_{ar}$ .

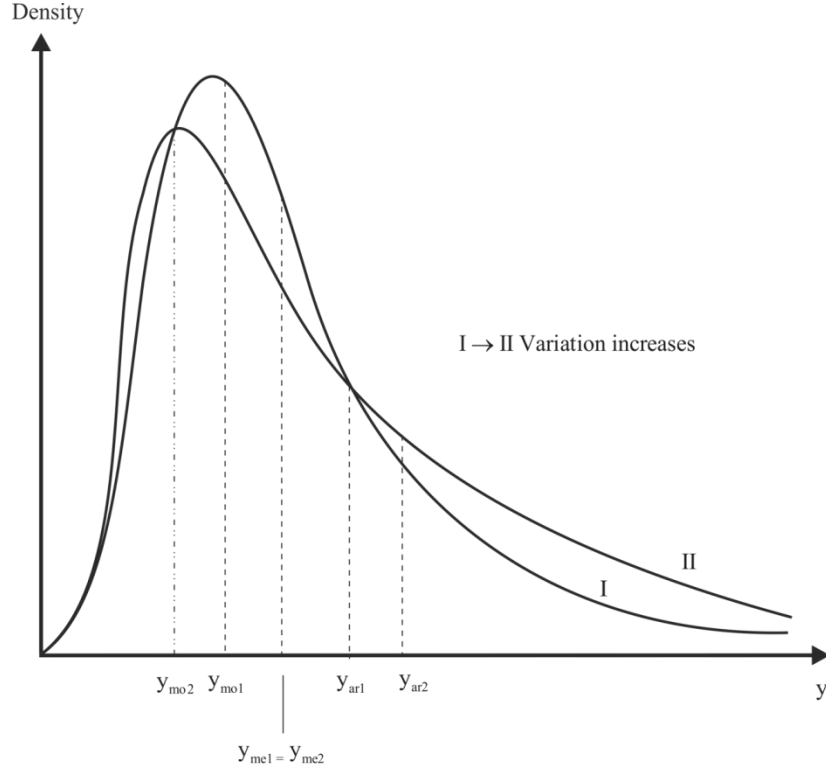


Figure 2: Increasing the standard deviation in the distribution of personal incomes. Source: Sell (2015)

Going beyond Blümles original contribution, we now assume that a higher concentration of incomes is perceived by individuals as a loss of utility as it signals an increase in inequality. The utility function then reads:

$$U_i = U_i(y_i - y_{mo}; \sigma)$$

where

$$\frac{\partial U_i}{\partial y_{mo}} < 0; \frac{\partial U_i}{\partial \sigma} < 0$$

Let there be a law of 'diminishing increases of damage':

$$\frac{\partial^2 U_i}{\partial y_{mo}^2} > 0; \frac{\partial^2 U_i}{\partial \sigma^2} > 0$$

Hence, the corresponding iso-damage curves are concave. In order to determine an optimal solution, we are in need, so to say of a 'budget constraint'. Such a budget constraint can be found in the properties of the log-normal distribution. In principle, it would be kind of 'ideal', if the log-normal distribution offers a trade-off between a low dispersal of incomes on the one hand and a low value of the modus on the other hand. Therefore, we have analyzed above in detail main characteristics of the log-normal distribution. We found that with an increasing dispersion of incomes, the median of the distribution remains unchanged (proposition 3), while the modus will be shifted to the left (proposition 2). Hence, the share of households which possess an income above of the (new) modus will increase.

In the following diagram (Figure 3), we can determine an equilibrium in personal income distribution. On the axes, we have the modus ( $y_{mo}$ ) and the dispersion of incomes ( $\sigma$ ). The non-linear budget constraint, representing the log-normal distribution of incomes, is labeled  $VV$ . This schedule is confronted with a troop of iso-damage curves ( $I_i$ ). The latter are concave to the origin of the coordinate system. The farther away these curves are located from the origin, the higher is the loss of utility of the individuals concerned. Point  $P$  symbols a situation where a preferably low iso-damage curve is tangential to  $VV$ . In a sense,  $P$  stands for equilibrium in income distribution. In comparison, points  $Q$  and  $R$  represent sub-optimal solutions. They do fulfill the 'budget constraint' of the log-normal distribution, but are located on the less favorable iso-damage curve  $I_2$ .

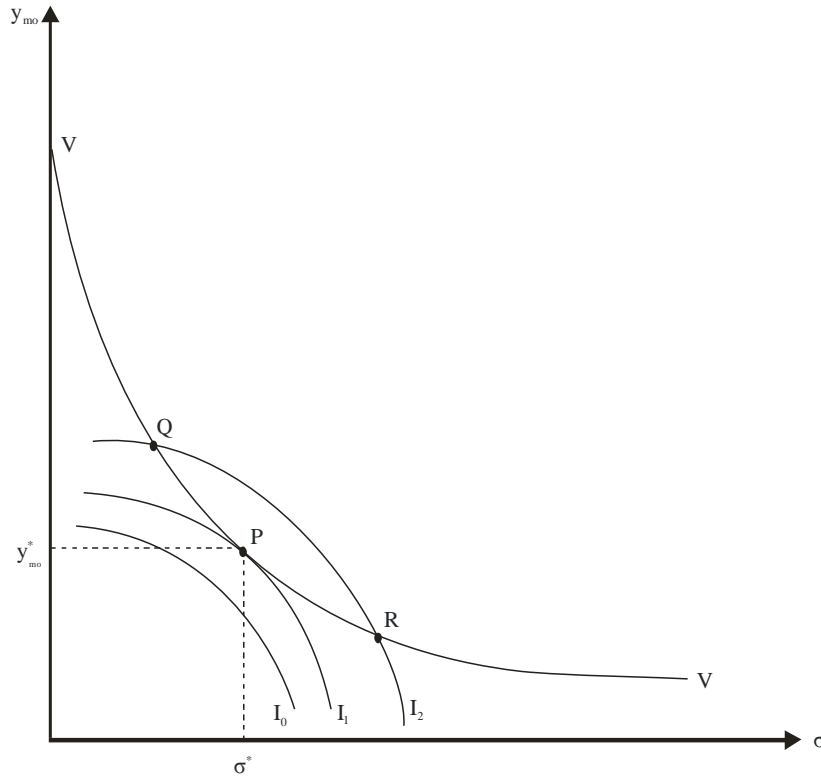


Figure 3: Equilibrium in distribution pattern of personal incomes. Source: Sell (2015)

If we extend our equilibrium approach to other countries (of comparable per capita GDP), three scenarios can at best emerge: we may find subsamples of countries with rather stationary Gini coefficients ex-post which tends to point at the achievement of equilibrium. We may secondly also find subsamples of countries, which tend to converge to a future equilibrium from above that is at declining Gini coefficients ex-post. Thirdly, it is as well an option to find a subsample of countries which tend to approach a future equilibrium from below that is at increasing Gini coefficients ex-post. Such findings would not only support the notion of equilibrium in the distribution of personal incomes, but furthermore a concept of convergence in the distribution of incomes (Hypothesis 5). In the following empirical part of the paper, we intend to test (directly or indirectly) the 5 hypotheses put forward in the theoretical section. Problems arise with testing hypotheses 3a and 3b: the data available do not allow calculating directly the modus of the corresponding distribution of incomes. The often available median, in turn, is only a weak substitute for the modus when it comes to test the message of the status model from above.

#### 4. Empirical Research

Corresponding to the ordering of hypotheses collected in the theoretical part, we may at first show that it is worthwhile to test the validity of the log-normal distribution hypothesis using data from selected European countries.

Figure 4 shows the relation between the mean and the median for 15 countries of the euro area and therefore validates Hypothesis 2 introduced in the beginning of this paper. Despite the high variance when comparing the absolute numbers, Table 1 includes the information that the proportion of the median and the mean of the listed European incomes are very similar. The values of the 15 countries lie in the range between 67.94% for Belgium and 88.58% for the Netherlands with an average value of 75.61% in the euro area.

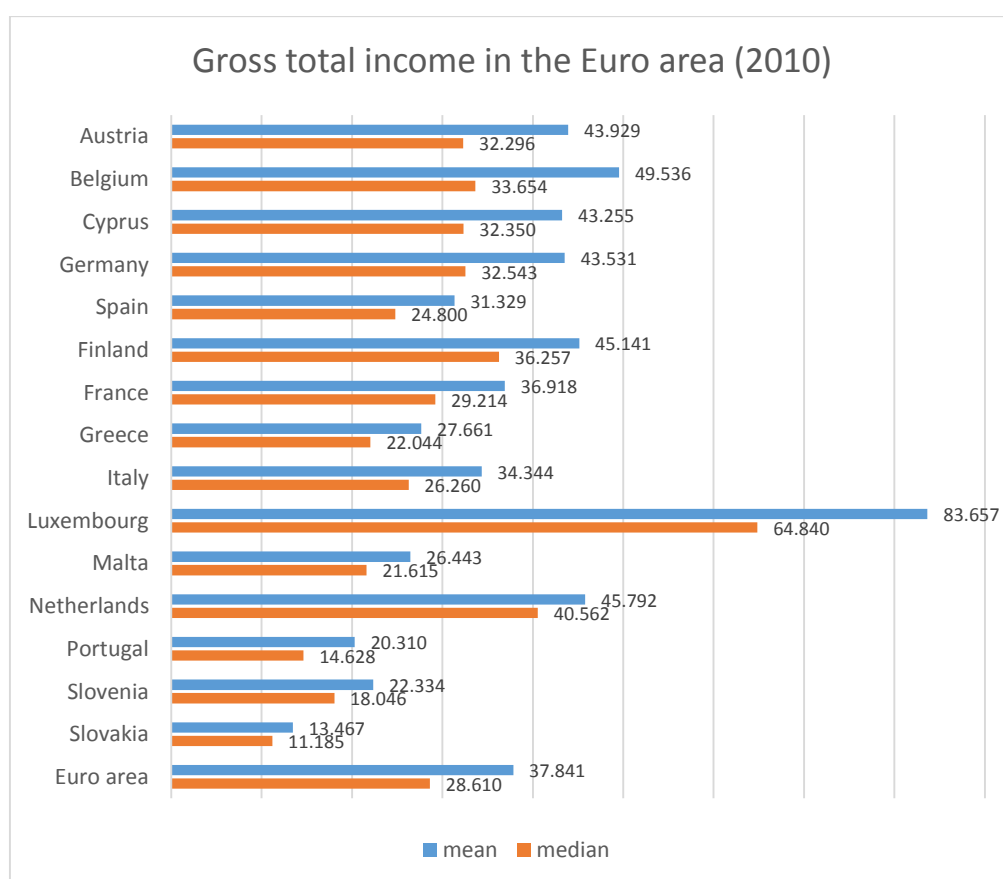


Figure 4: Mean and median of 15 countries of the euro area in 2010. Source: HFCS/ECB (2013)

	Gross total income		
	Mean	Median	Median/Mean
Austria	43,929	32,296	73.52%
Belgium	49,536	33,654	67.94%
Cyprus	43,255	32,350	74.79%
Germany	43,531	32,543	74.76%
Spain	31,329	24,800	79.16%
Finland	45,141	36,257	80.32%
France	36,918	29,214	79.13%
Greece	27,661	22,044	79.69%
Italy	34,344	26,260	76.46%
Luxembourg	83,657	64,840	77.51%
Malta	26,443	21,615	81.74%
Netherlands	45,792	40,562	88.58%
Portugal	20,310	14,628	72.02%
Slovenia	22,334	18,046	80.80%
Slovakia	13,467	11,185	83.05%
Euro area	37,841	28,610	75.61%

*Table 1: Proportion of the median and the mean of 15 countries of the euro area in 2010.*

Concerning the assumption of log-normal distributed incomes, it can easily be seen that the mean is always larger than the median which results from a positive skewness. Therefore, the always right-tailed log-normal distribution as underlying model corresponds to this characteristic of income distributions and indicates Hypothesis 4 of a log-normal distributed income.

Besides the relationship between the mean and the median income, the Q-Q-Plots as well as the P-P-Plots in Figure 5 and 6 show clearly the similarities of the theoretical log-normal distribution and the empirical distribution. They result from the approximated quantiles of the empirical income data after taxes and transfers for 2013 (available at Eurostat). Another derived graphical indicator is the approximated empirical income distributions, e.g., Germany in Figure 7. The typical right-tailed graph holds for the rest of the euro zone (see the data for other countries in the appendix for comparison). These are additional clear indicators for log-normal

income distributions, regardless of which country is examined and therefore for Hypothesis 4, introduced in Chapter 3.

Our theoretical model suggests that economic policies aim at correcting the income distribution which is the outcome of market processes (Gini coefficient before government intervention) in order to achieve ‘equilibrium’ in income distribution. Governments may use taxes and transfers to achieve the presumed equilibrium in income distribution (Gini coefficient after government intervention).

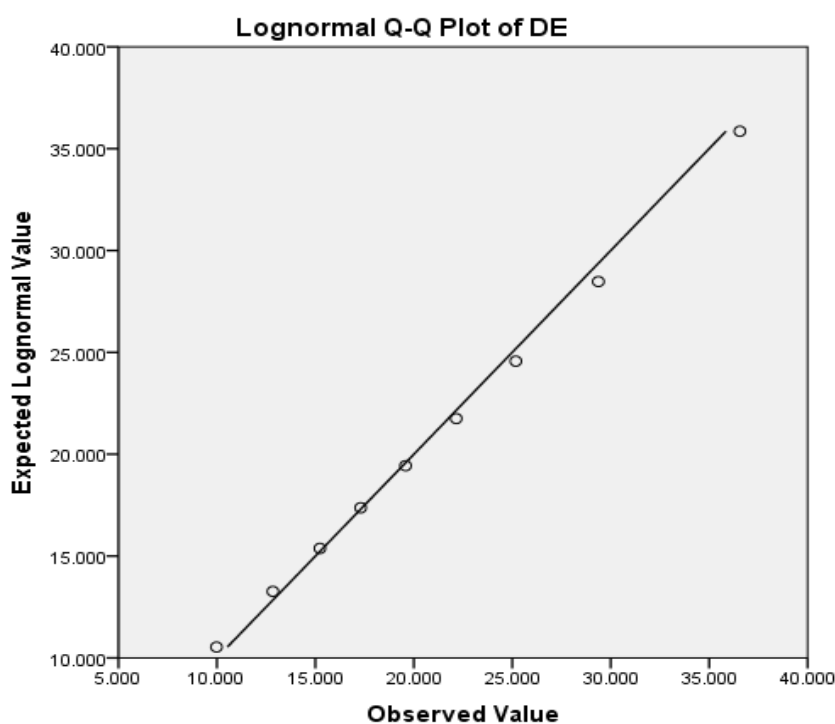


Figure 5: Log-normal Q-Q-Plot of the empirical income distribution of Germany (2013).

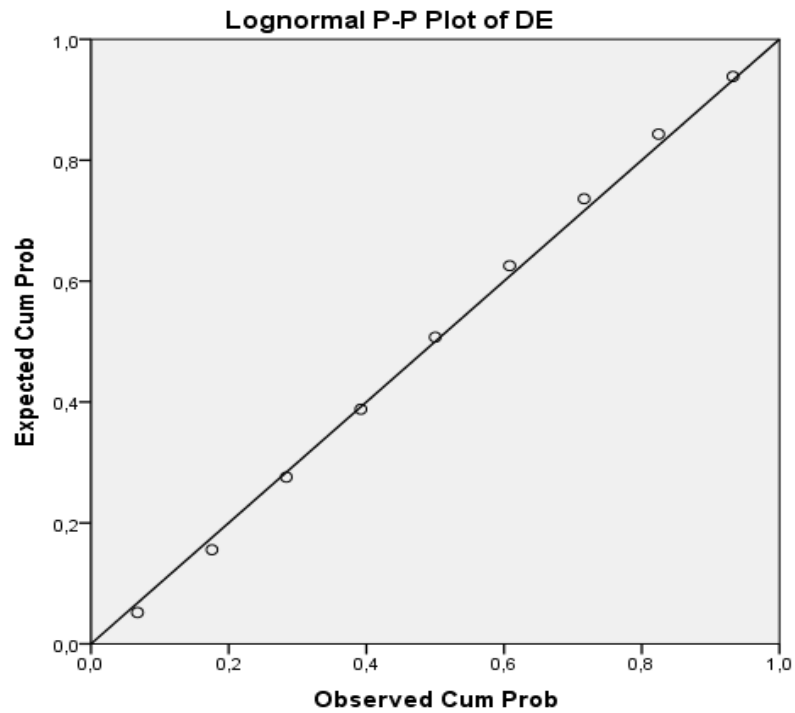


Figure 6: Log-normal P-P-Plot of the empirical income distribution of Germany (2013).

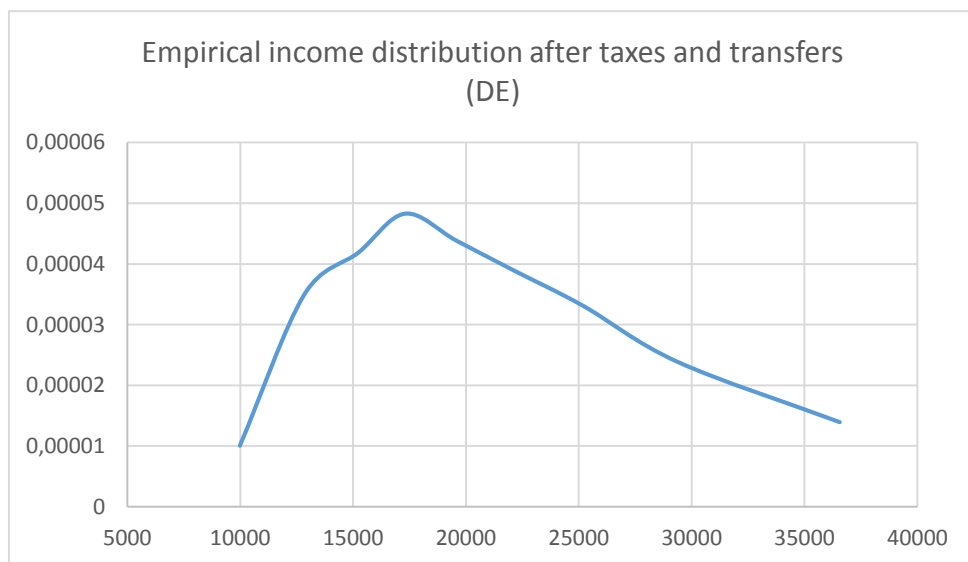


Figure 7: Approximated density of the income distribution after taxes and transfers for Germany (2013).



The analyzed data in the next step originates from the OECD Income Distribution Database. It consists of data before and after government intervention represented by the Gini coefficient before and after taxes and transfers. It shows that, as explained in Hypothesis 1, the income distributions in the European Union converge to a common equilibrium. This will be presented by the following steps.

At first, our results lead to a possible classification of the analyzed 17 countries in three different groups in terms of the linear trend between 2004 and 2012 of the difference between the Gini coefficient before and after government intervention.

Secondly, the results regarding the corresponding development of the Gini coefficient before taxes and transfers indicate that an increasing gap between the two Gini coefficients results from an increasing Gini coefficient and a decreasing gap vice versa from a decreasing Gini coefficient before intervention.

While the countries in the group of decreasing Gini coefficients originate from a relatively unequal income distribution before government intervention, the countries in the group of increasing Gini coefficients have a relatively low Gini coefficient in the first year 2004 of the time series.

The analyzed 17 countries can be clustered into three different group by observing the change in their income distribution expressed by their Gini coefficient before and after taxes. To gather the results, the linear trend of the difference between the Gini coefficient before and after taxes and transfer between 2004 and 2012 for every country has been evaluated.

Regression of Gini ex-ante – Gini ex-post 2004-2012					
country	slope	intercept	p-val slope	p-val intercept	R <sup>2</sup>
Poland	-0.0040	8.2079	0.37%	0.33%	72.24%
Slovakia	-0.0029	5.9630	2.23%	1.97%	54.96%
Germany	-0.0003	0.8314	70.94%	62.16%	5.30%
Czech rep	-0.0001	0.3673	92.04%	82.65%	0.15%
Denmark	0.0008	-1.3788	57.55%	61.83%	5.52%
Finland	0.0013	-2.4292	15.71%	18.88%	26.40%
Belgium	0.0014	-2.4968	20.43%	23.83%	21.87%
Slovenia	0.0017	-3.2077	20.62%	23.19%	21.71%
Estonia	0.0018	-3.3918	24.20%	26.13%	18.92%
France	0.0021	-4.0566	10.30%	11.53%	52.57%
Luxembourg	0.0023	-4.3903	1.72%	2.07%	57.93%
Austria	0.0026	-5.0765	0.67%	0.82%	67.37%
Italy	0.0048	-9.4348	0.34%	0.38%	72.83%
Spain	0.0059	-11.7654	0.02%	0.02%	88.17%
Portugal	0.0098	-19.5110	0.00%	0.00%	92.85%
Greece	0.0116	-23.1166	0.00%	0.00%	91.94%
Ireland	0.0139	-27.7090	0.01%	0.01%	89.39%

*Table 2: Parameters of the linear trend of Gini before taxes and transfers minus Gini after taxes and transfers for 17 european countries (2004-2012).*

In Table 2, Countries such as Greece, Ireland, Italy, Portugal and Spain especially affected by the financial crisis show an increasing gap of the Gini coefficient before and after taxes and transfer in the time series from 2004 to 2012. In contrast, Poland and Slovakia show a decreasing gap in the same time span, expressed by a negative slope of the linear trend. The trends of Poland and Slovakia also pair with good p-values. That underlines the estimation done by the linear regression. The other analyzed countries (Germany, the Czech Republic, Denmark, Finland, Belgium, Slovenia, Estonia, France, Luxembourg and Austria) can be assigned to the group of countries which have already reached an equilibrium. This is expressed by a constant difference between the Gini coefficients before and after taxes between 2004 and 2012 with

low variance. Besides the classification of the slopes, the corresponding intercepts behave almost perfectly contrary (see Table 2 and Figure 8).

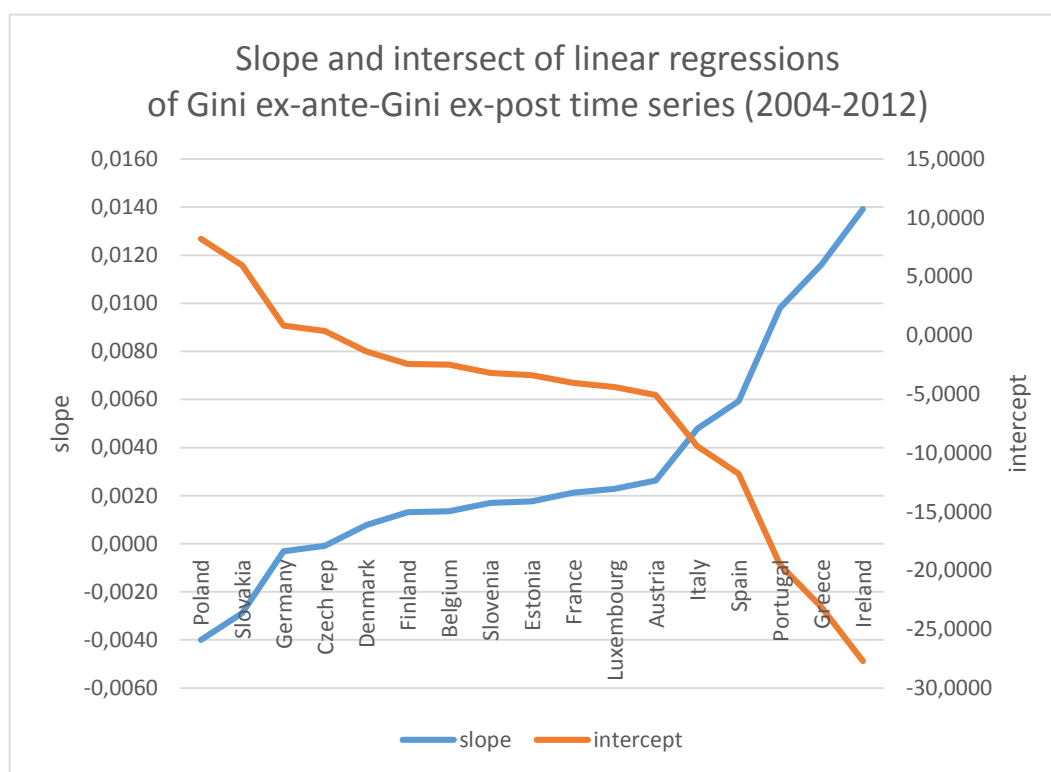


Figure 8: Slope and intersect of linear regressions of 17 European countries.

This means that the analyzed countries with a shrinking gap like Poland and Slovakia have a high baseline difference in the Gini coefficients while the increasing gap derives from a low initial gap in 2004. Continuing with the focus on these three groups, we examined the origin of the resulting slopes. An increase of the difference between the Gini coefficients could result from an increase of the Gini after taxes and transfers or from a decrease of the Gini before taxes and transfers or both.

Regression of Gini ex-ante 2004-2012					
country	slope	intercept	p-value slope	p-value intercept	R <sup>2</sup>
Poland	-0.0112	22.9174	0.19%	0.17%	76.75%
Slovakia	-0.0045	9.5020	2.56%	2.11%	53.26%
Czech rep	-0.0016	3.5715	9.38%	6.16%	34.91%
Belgium	-0.0011	2.6599	38.87%	29.83%	10.76%
Estonia	-0.0009	2.3207	68.61%	61.17%	2.47%
Germany	0.0004	-0.2164	75.85%	92.52%	3.64%
Finland	0.0006	-0.7248	44.45%	64.09%	8.57%
Slovenia	0.0022	-3.8668	25.90%	30.77%	17.73%
Denmark	0.0032	-5.9888	5.85%	7.22%	47.53%
Portugal	0.0040	-7.4733	0.93%	1.28%	64.34%
Luxembourg	0.0043	-8.2277	0.96%	1.25%	64.02%
Italy	0.0044	-8.3760	0.16%	0.21%	78.13%
Austria	0.0046	-8.7823	0.35%	0.47%	72.58%
France	0.0052	-9.9701	1.70%	2.00%	79.48%
Spain	0.0082	-15.9212	0.11%	0.13%	80.32%
Ireland	0.0110	-21.4440	0.09%	0.11%	81.12%
Greece	0.0115	-22.6127	0.01%	0.01%	89.26%

Table 3: Parameters of the linear trend of Gini before taxes and transfers for 17 european countries (2004-2012).

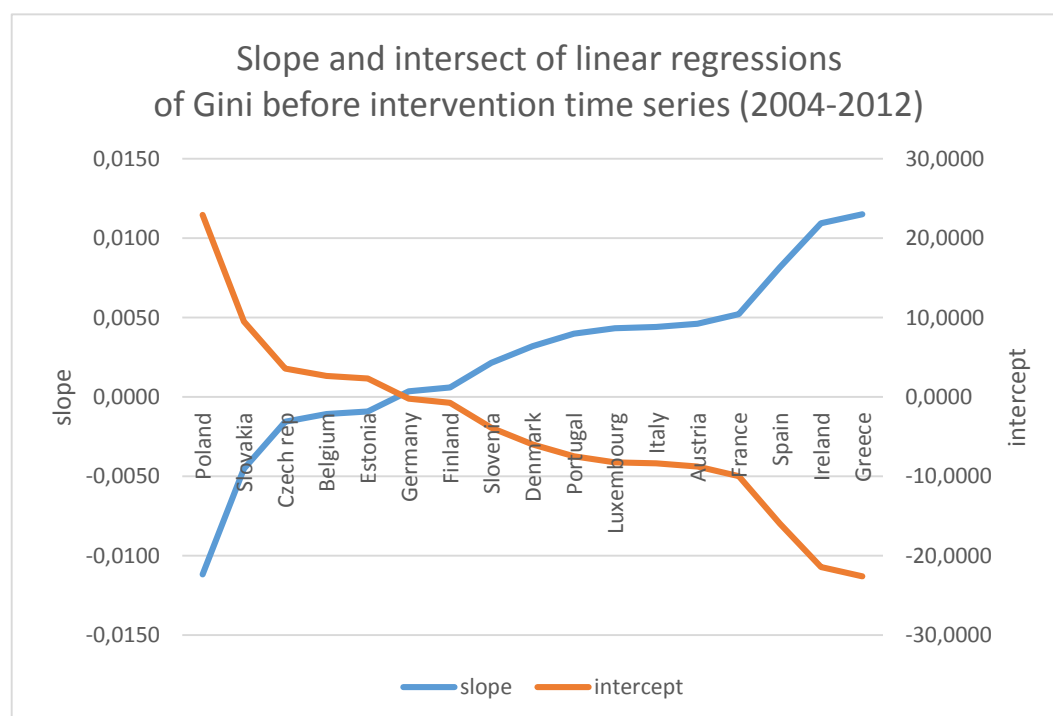


Figure 9: Slope and intersect of linear regressions of the Gini before intervention of 17 European countries (2004-2012).

Regression of Gini ex-post 2005-2012					
country	slope	intercept	p-value slope	p-value intercept	R <sup>2</sup>
Poland	-0.0072	14.7096	1.11%	1.00%	62.62%
Portugal	-0.0058	12.0376	0.00%	0.00%	92.21%
Ireland	-0.0030	6.2650	1.69%	1.36%	58.10%
Estonia	-0.0027	5.7125	11.14%	9.48%	32.14%
Belgium	-0.0024	5.1567	1.22%	0.95%	61.65%
Slovakia	-0.0016	3.5391	37.85%	34.42%	11.21%
Czech rep	-0.0015	3.2042	0.27%	0.17%	74.65%
Finland	-0.0007	1.7044	7.45%	4.22%	38.52%
Italy	-0.0004	1.0588	66.81%	54.05%	2.78%
Greece	-0.0001	0.5039	90.86%	73.06%	0.20%
Slovenia	0.0005	-0.6590	45.83%	58.49%	8.09%
Germany	0.00066	-1.04781	22.0734%	31.3128%	44.22%
Austria	0.0020	-3.7058	8.88%	10.87%	35.78%
Luxembourg	0.0021	-3.8374	13.59%	16.03%	28.85%
Spain	0.0022	-4.1559	7.91%	9.88%	37.60%
Denmark	0.0024	-4.6100	1.70%	2.09%	64.07%
France	0.00309	-5.91346	1.2245%	1.4469%	82.49%

Table 4: Parameters of the linear trend of Gini after taxes and transfers for 17 european countries (2004-2012).

Table 3 shows that the decrease of the gap between the two Gini coefficients for Poland and Slovakia result from a falling Gini coefficient over the years 2004 to 2012. On the other side, the group of countries with an increasing gap have an increasing Gini coefficient before intervention. Like before, the relation between slope and intercept is contrary. Countries like Poland with a negative slope origin from a high initial level for the Gini coefficient, while countries like Greece origin from a much lower initial level of the Gini coefficient.

In the next step, Table 4 and Figure 10 show the Gini coefficients for the selected 17 European countries after government intervention, after taxes and transfers, respectively. The data shows a significant (to the 5%-level) slope only for six countries unequal zero and even these values range from -0.007 to 0.002. Therefore, the Gini coefficients after government intervention have changed little or not statistically measureable. This indicates that the increasing and decreasing gaps result mainly from increasing and decreasing Gini coefficients before taxes and transfers.

The results indicate a European income distribution equilibrium with countries having a nearly unchanged Gini coefficient after taxes and transfers, even if the Gini coefficient before taxes and transfers has changed significantly.

The determined groups show by numbers the different categories of income distribution and

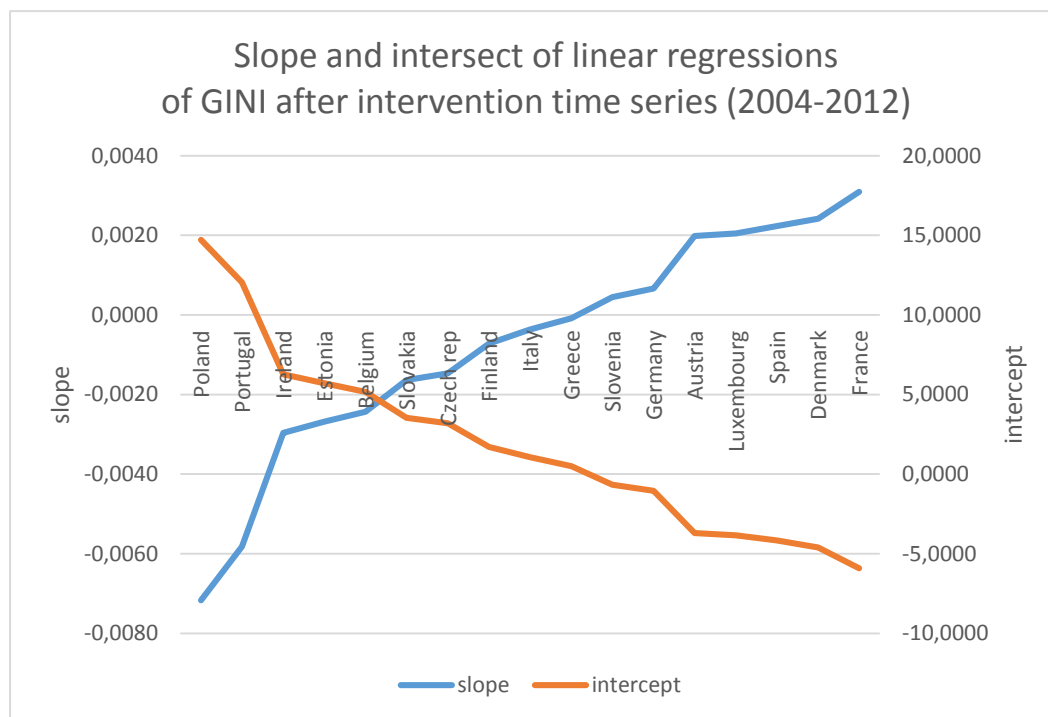


Figure 10: Slope and intersect of linear regressions of the Gini ex-post of 17 European countries (2004-2012).

income equality. Group one, consisting of Poland and Slovakia represents countries in the European Union with an increasing income equality before intervention, originating from an unequal income distribution, compared to the other European countries. Group two consists of Greece, Ireland, Italy, Portugal and Spain with a decreasing income equality before intervention, originating from a more equal income distribution. The third group consisting of Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Luxembourg and Slovenia represents the countries already achieved an income equilibrium as the Gini coefficient before and after taxes and transfers hasn't changed in the last years.

The underlying equilibrium expressed by the group consisting of Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Luxembourg, and Slovenia range from 24.24% to 32.43% (see Table 5).

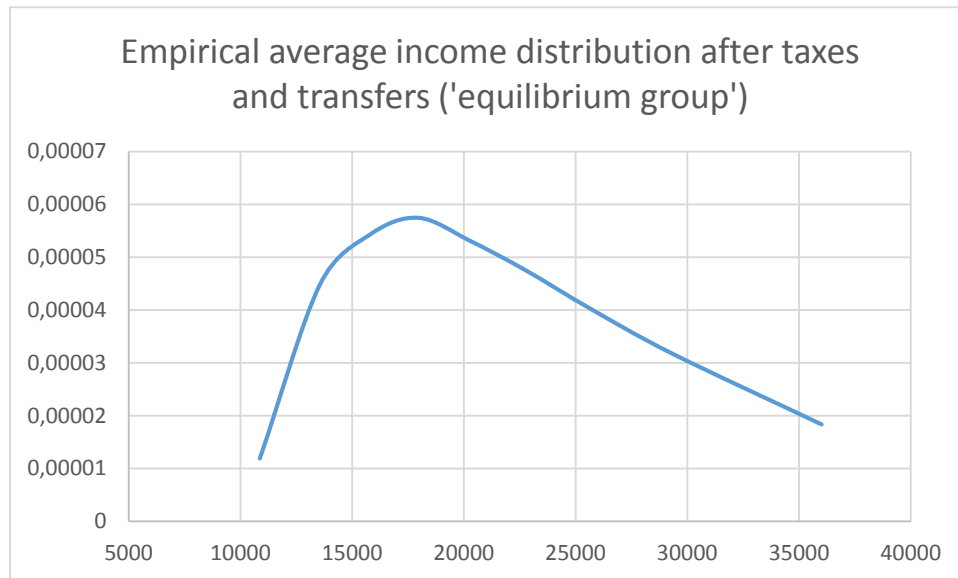
	Ex-ante		Ex-post	
	Average Gini (2004-2012)	StDev	Average Gini (2004-2012)	StDev
Austria	48.80%	1.48%	27.68%	0.91%
Belgium	48.46%	0.90%	27.06%	0.85%
Denmark	41.89%	1.07%	24.20%	0.89%
Estonia	48.00%	1.60%	32.43%	1.30%
Finland	48.18%	0.75%	26.48%	0.33%
France	49.93%	1.45%	29.87%	0.85%
Germany	49.82%	0.58%	28.82%	0.31%
Luxembourg	47.37%	1.48%	27.90%	1.05%
Slovenia	45.04%	1.40%	24.46%	0.43%
Mean	47.50%	1.19%	27.66%	0.77%
StDev	2.41%	0.35%	2.43%	0.32%

*Table 5: Gini coefficients ex-ante for the group representing the equilibrium.*

Table 5 lists the average Gini coefficient after taxes and transfers with 27.66% and a standard deviation of 2.43% in the group representing the countries with a stable Gini coefficient between 2004 and 2012.

2012	DECILE1	DECILE2	DECILE3	DECILE4	DECILE5	DECILE6	DECILE7	DECILE8	DECILE9
Austria	11630	14844	17245	19597	21807	24550	27597	31642	39379
Belgium	10706	13200	15406	17625	20280	22666	25369	28820	34203
Denmark	14579	18284	20985	23728	26580	29435	32781	37083	44208
Estonia	2870	3737	4458	5143	5987	7054	8367	9916	12590
Finland	12608	15447	17944	20350	22699	25191	28206	32036	38796
France	11289	13977	16364	18462	20603	23118	26253	30458	39072
Germany	9913	12871	15094	17320	19595	22148	25116	29039	35731
Luxembourg	17641	21322	24950	28440	32779	37183	42516	48566	60354
Slovenia	6614	8377	9772	10954	12122	13378	14826	16753	19826
Mean	10872	13562	15802	17958	20272	22747	25670	29368	36018

*Table 6: Deciles of the income distributions in the 'equilibrium group'. Note: Data from Eurostat (2013)*



*Figure 11: Empirical average income distribution after taxes and transfers in the group representing the income equilibrium, consisting of Austria, Belgium, Denmark, Estonia, Finland, France, Germany, Luxembourg, and Slovenia (2012).*

Referring to the first part of this chapter, the income distribution follows a log-norm distribution which can be seen in Figure 11. While the Gini coefficient shows that an equilibrium exists, this also leads to Hypothesis 1 of a stationarity in the secondary distribution of income. The stationarity holds especially for the secondary distribution of income as the mean and the standard deviation of the parameters of the regression analysis in this group are much smaller and therefore correspond to a higher stability or a stationarity in comparison to the Gini coefficients before intervention.

Table 6 shows the deciles for the countries in the corresponding group. Even if the income levels obviously differ between the selected countries, the average of the deciles again form a log-normal shaped income distribution and represent this equilibrium in detail.



## **5. Policy Implications**

European governments' policy, now as it stands, is still willing to correct significantly market determined personal income distribution. This applies to countries – like Poland and Slovakia – which come from rather high Gini coefficients (after taxes and transfers) in their recent past and whose actual Gini coefficients tend to decline. As opposed to this, the group of countries labeled “GIIPS” (Greece, Ireland, Italy, Portugal, Spain) during the crisis of the Eurozone had to dismantle their over-dimensioned social systems in the last years. This is reflected in a significant increase of their respective Gini coefficients (after taxes and transfers). For a majority of the European countries considered here (Germany, Czech Republic, Denmark, Finland, Belgium, Slovenia, Estonia, France, Luxembourg and Austria), we have detected a sort of “mission accomplished” with regard to the goal of equilibrium in personal income distribution. As a result for our total sample, a process of convergence cannot be rejected statistically. This had been already identified within our theoretical considerations.

## **6. Summary and Conclusions**

On the background of the intense discussion in Europe on the alleged increasing skewness in the distribution of incomes and wealth, we put forward an equilibrium concept of personal income distribution rooted in status theory and an econometric analysis of personal income distribution in selected European countries (2004-2012). The criterion to be selected as a country relies primarily on the availability of a consistent data set. The paper shows that (i) earlier findings of Ramser (1987) on the stationarity of personal income distribution after government intervention can be confirmed with recent data for European countries; (ii) we could also demonstrate for our set of 17 European countries that in the distribution of personal incomes the mean is always larger than the median; (iii) a direct test of the status theory hinges upon the availability of information on the modi of the personal income distribution under analysis. Such data, however, have not been at our disposal; (iv) the hypothesis of a log-normal distribution of personal incomes (before government intervention) received strong support by our empirical findings; (v) our most striking result, however, lies in the detection of convergence processes in personal income distribution among the set of European countries which we have analyzed. Three groups of countries could be identified: a larger group of countries (ranging from Germany to Austria) which seems to have achieved already its equilibrium in personal income distribution. There is a second small group of countries (Poland, Slovakia) with a tendency to reduce inequality given relatively high concentration measurement in the beginning towards equilibrium). And finally, there is a third group of countries (basically the Eurozone crisis sample: GIIPS) where we observe a tendency to increase somehow the beforehand existing rather low inequality of personal incomes. This seems to mirror their over dimensioned pre-crisis public sector.

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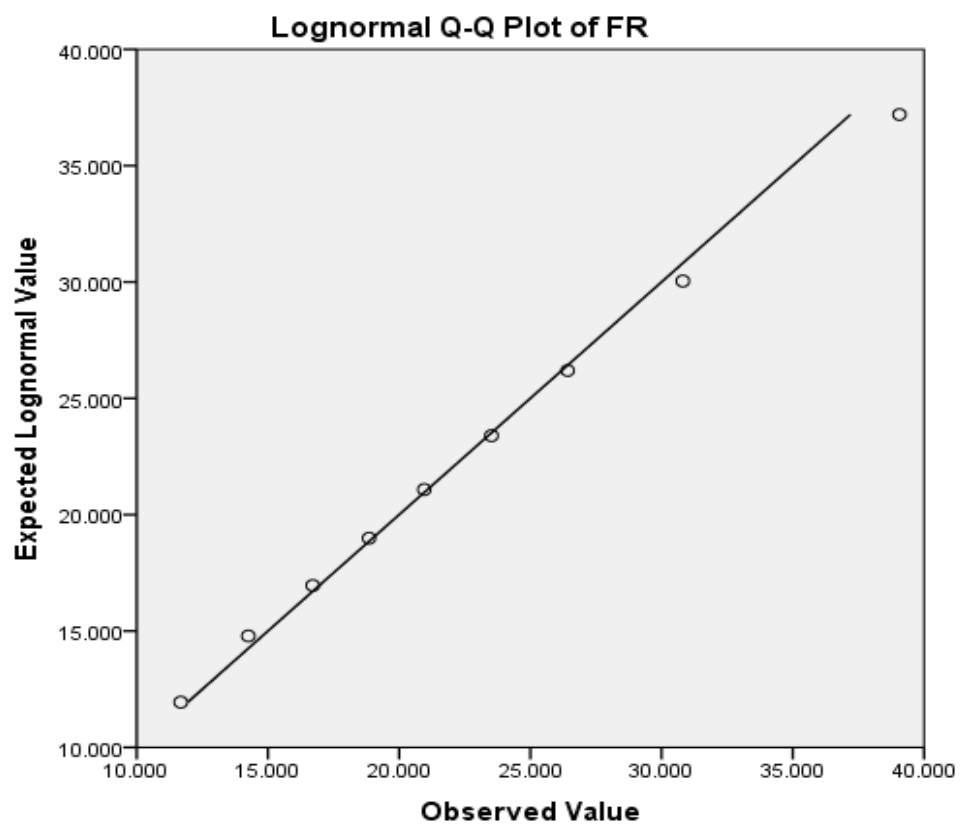
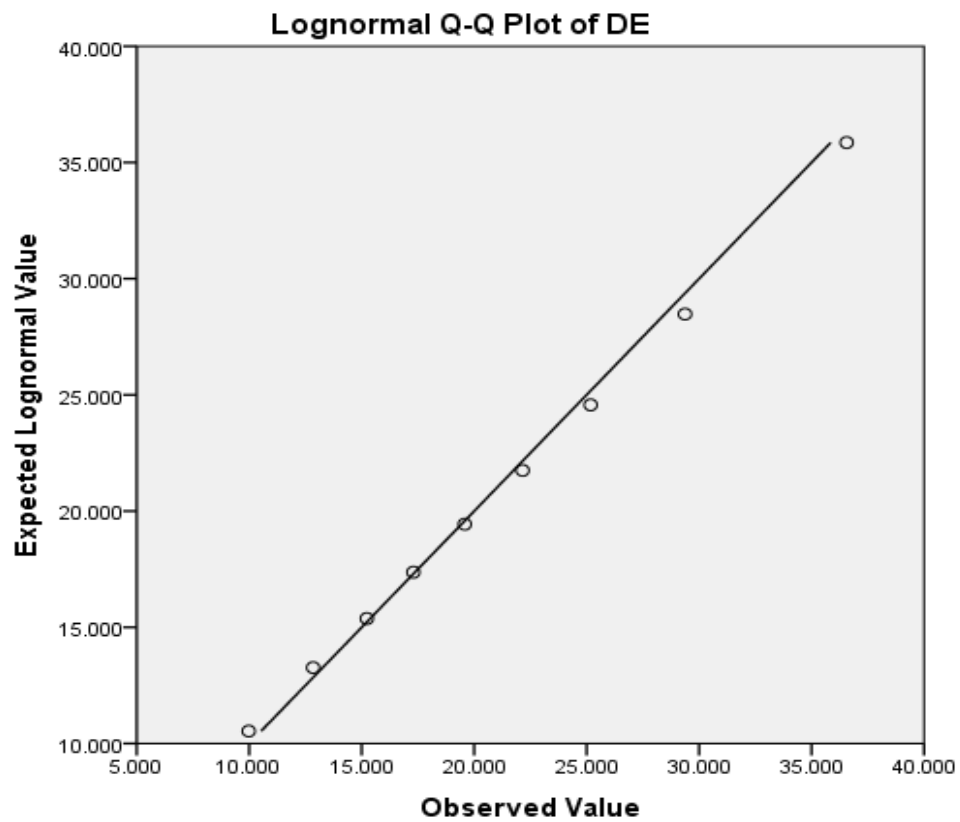
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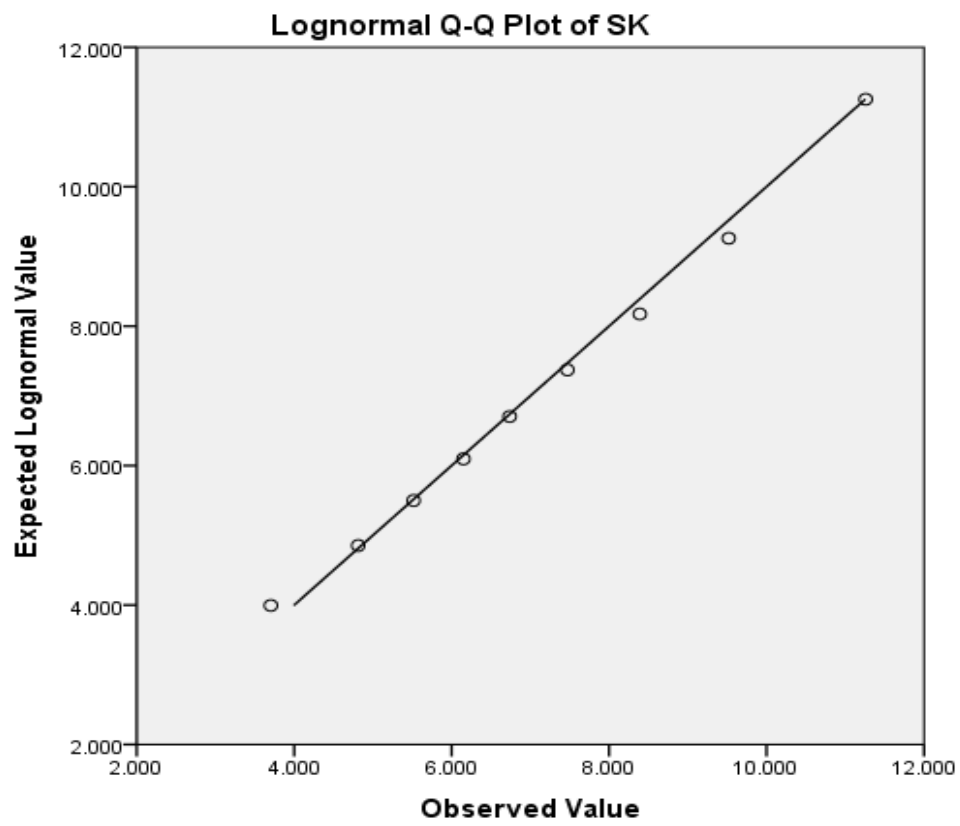
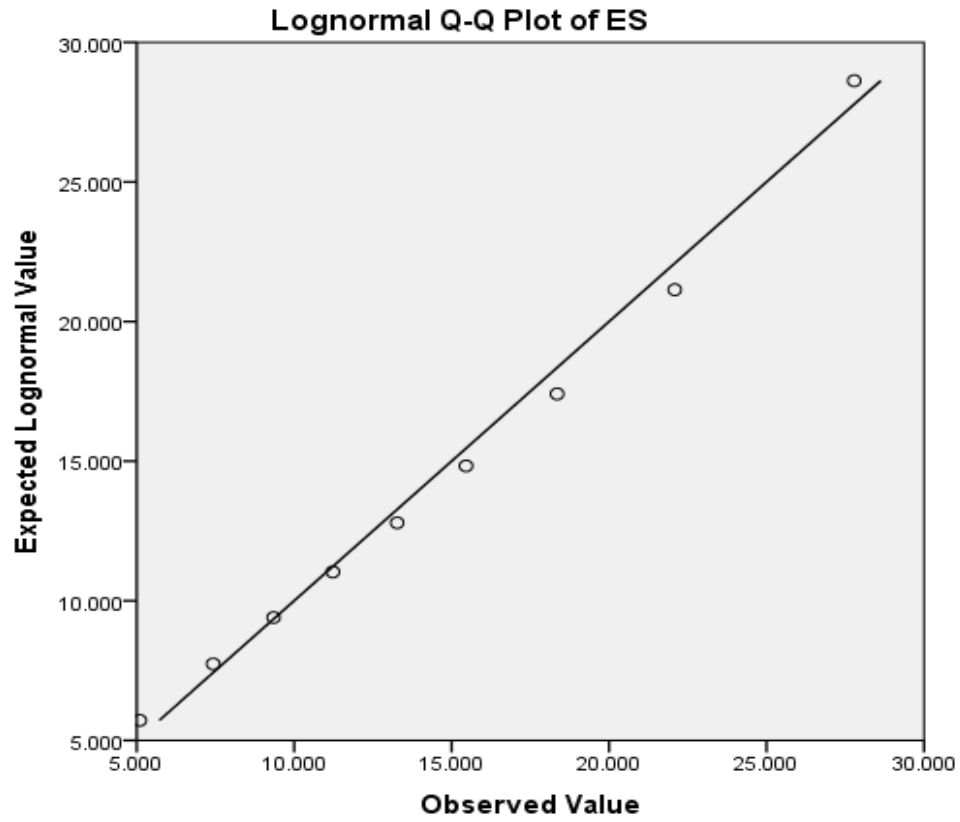
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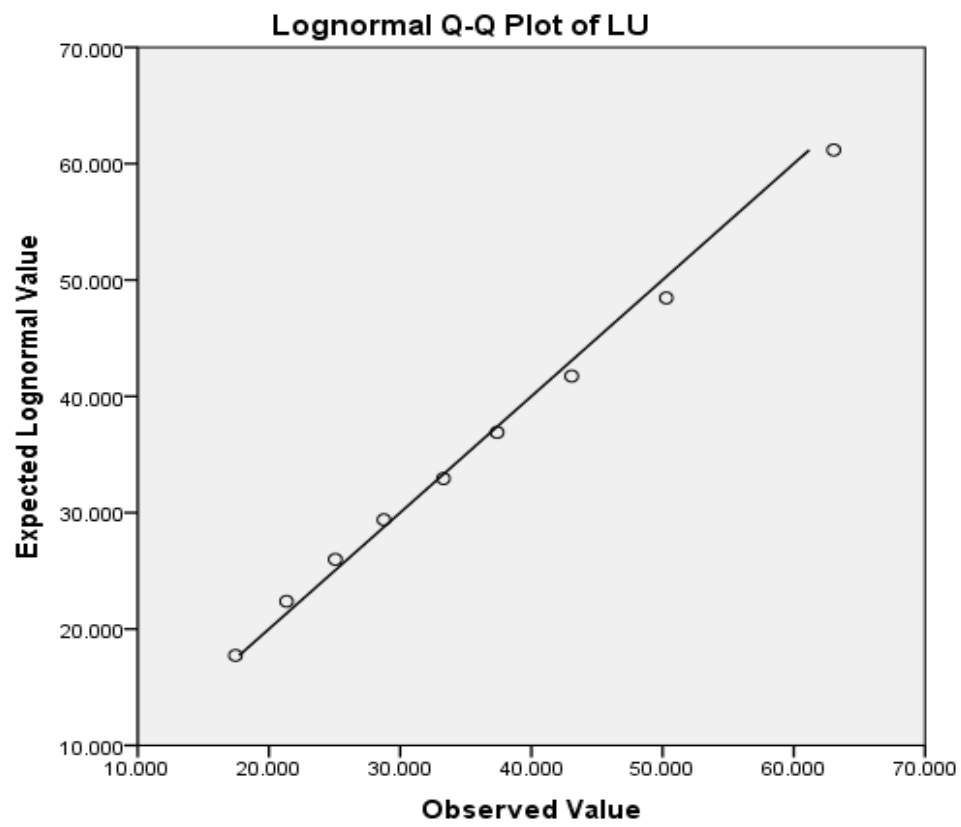
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## 8. Appendix

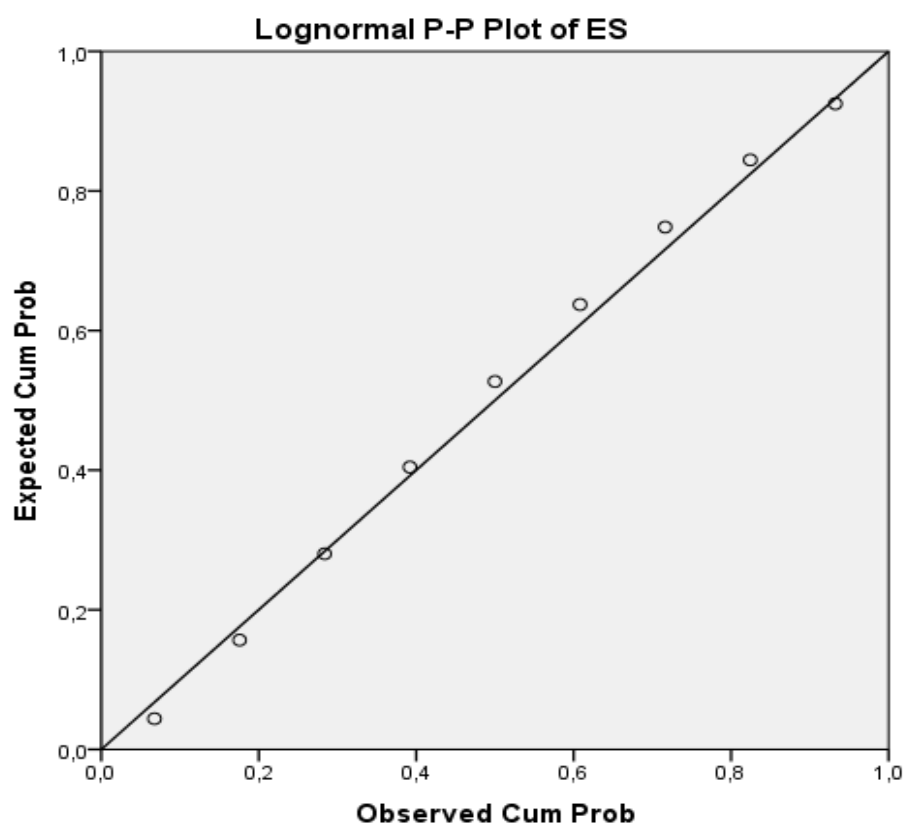
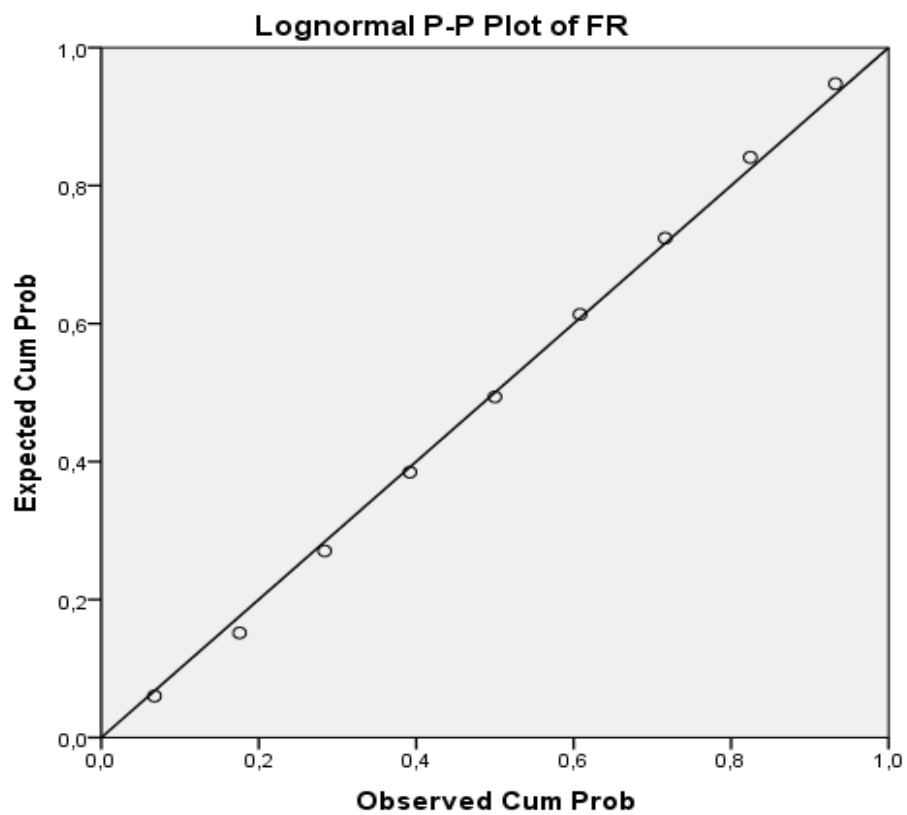
A. Q-Q-Plots of the income distribution of selected European countries.



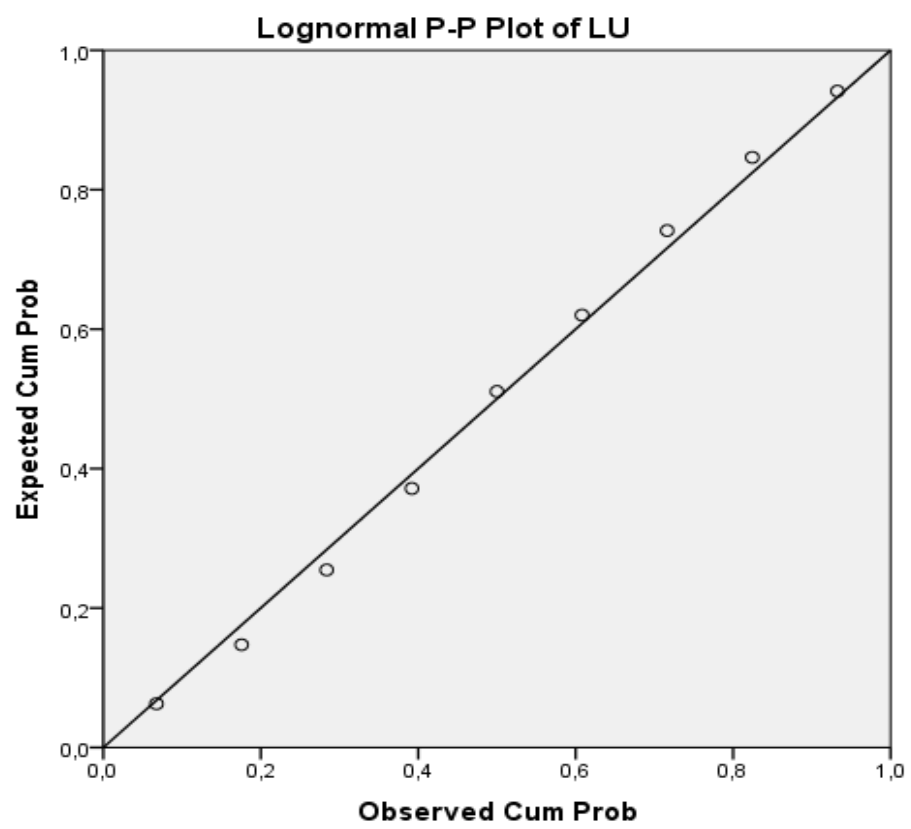
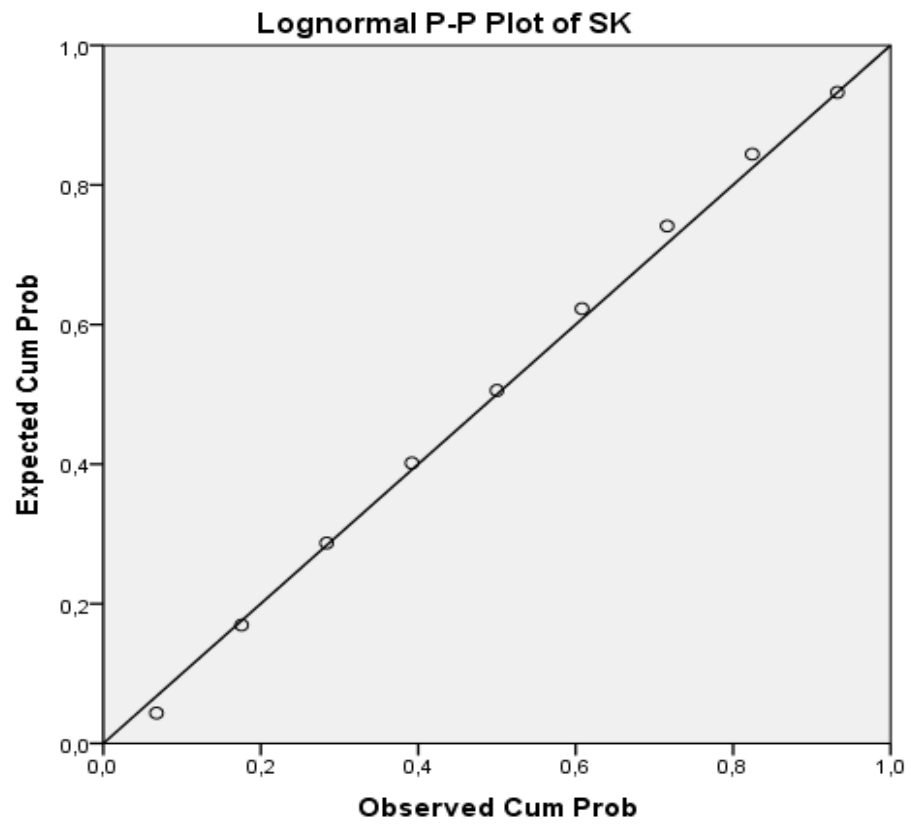




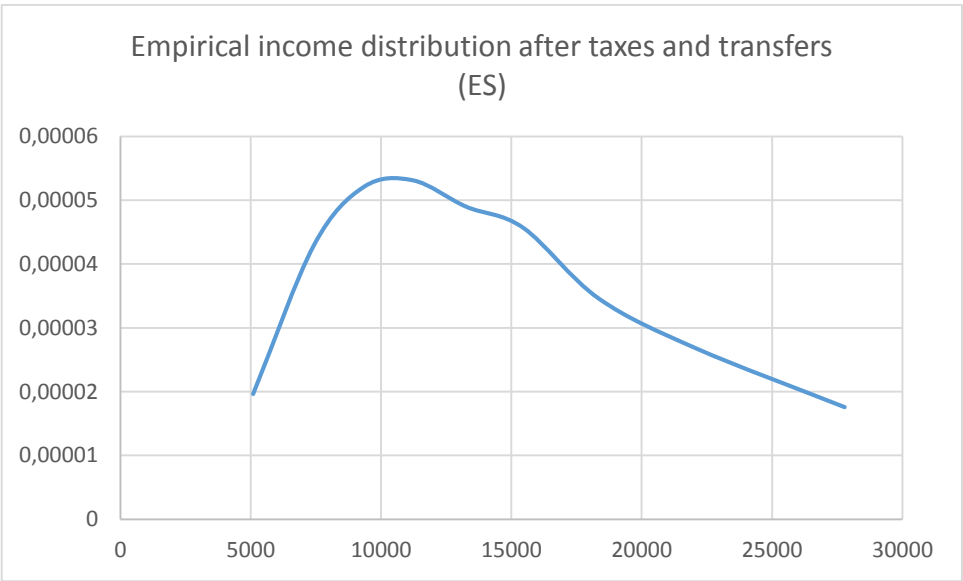
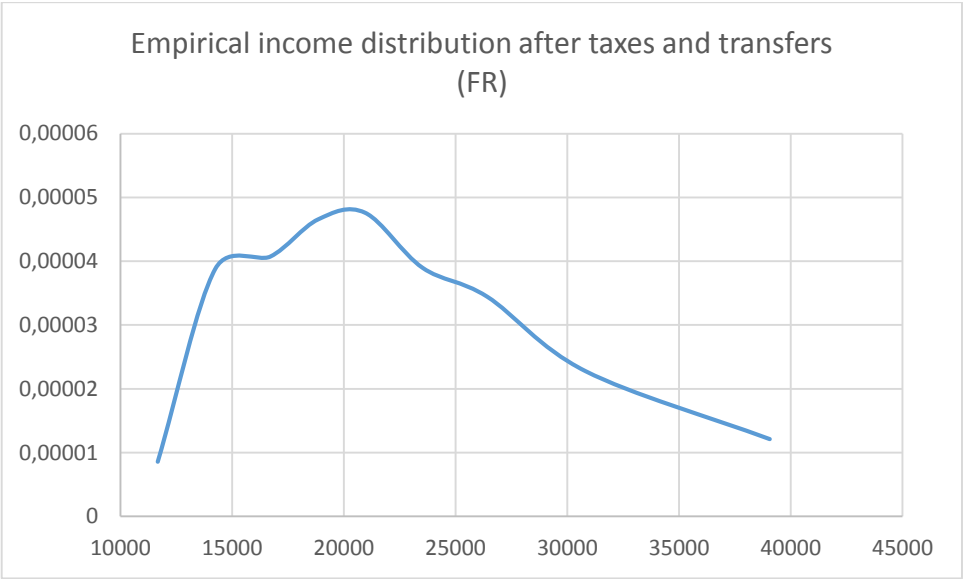
B. P-P-Plots of the income distribution of selected European countries.



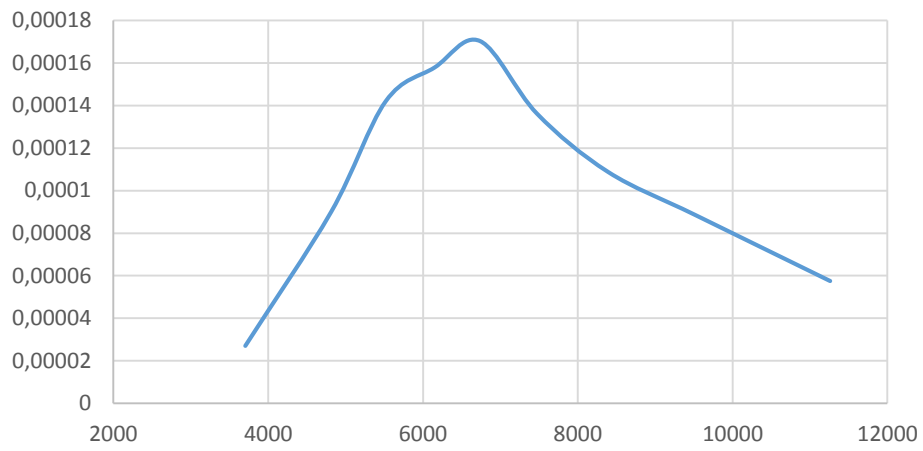




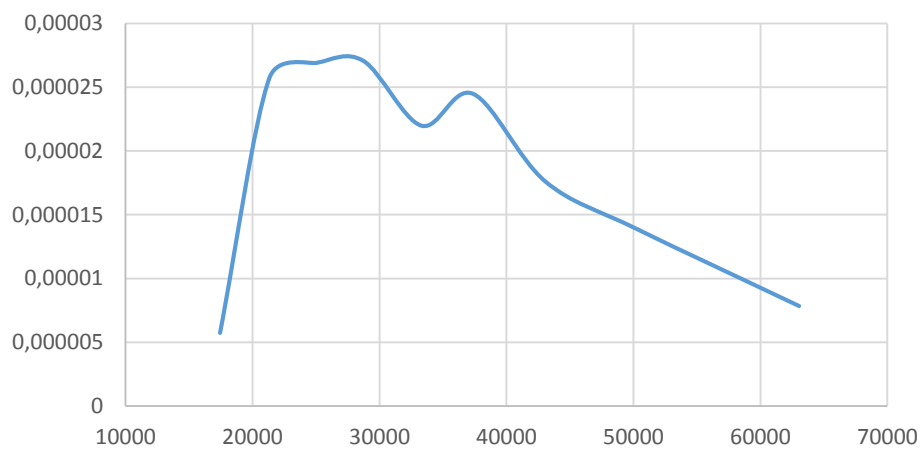
C. Approximated density of the income distribution after taxes and transfers of selected European countries.



Empirical income distribution after taxes and transfers  
(SK)



Empirical income distribution after taxes and transfers  
(LU)



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