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**Working Paper**

## The Effect of Social Transfers in Europe: An Empirical Analysis Using Generalized Lorenz Curves

LIS Working Paper Series, No. 317

**Provided in Cooperation with:**

Luxembourg Income Study (LIS)

*Suggested Citation:* Hölsch, Katja (2002) : The Effect of Social Transfers in Europe: An Empirical Analysis Using Generalized Lorenz Curves, LIS Working Paper Series, No. 317, Luxembourg Income Study (LIS), Luxembourg

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# **Luxembourg Income Study Working Paper Series**

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**Katja Hölsch**

**August 2002**



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**Luxembourg Income Study (LIS), asbl**

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# **The Effect of Social Transfers in Western Europe: An Empirical Analysis of Five Countries Using Generalised Lorenz Curves**

Katja Hölsch\*

May 2004

## **Abstract**

This paper aims at examining the impact of different transfers on the income distribution in five Western European countries. Therefore an empirical analysis using generalised Lorenz curve comparisons is carried out. The obtained results are investigated by relating them to a classification of European social transfer systems. We conclude that clear differences can be found with regards to transfer arrangements and underlying strategies. But this does not necessarily mean that these differences result in clearly distinct transfer rankings for every country: some transfers like unemployment insurance and invalidity benefits have an obvious impact in countries with quite different underlying strategies and transfer arrangements.

*JEL:* I38, H55, H53

*Keywords:* Social Transfers, Generalised Lorenz Curve, Income Distribution, Classification

**Acknowledgements:** The author thanks Philippe Van Kerm (CEPS, Luxembourg), David Jesuit and Paul Alkemade (LIS, Luxembourg), Gerhard Wagenhals and Ulrich Scheurle (University of Hohenheim, Stuttgart), Margit Kraus (ZEW, Mannheim) and three anonymous referees for their helpful comments. This research was funded by a grant of the European Commission under the Transnational Access to major Research Infrastructures contract HPRI-CT-2001-00128 hosted at CEPS/INSTEAD (Luxembourg) and by the Fritz-Thyssen-Foundation.

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# 1 Introduction

The discussion about European social security takes place with unbroken intensity as is documented by many sources (cf. e.g. Boeri et al. 2001: 9). The public interest is due to the fact that European social security systems play an important role for the life of everybody and, simultaneously, they are faced with serious problems and challenges now and in the future (cf. European Commission, 1999, 3ff.). Various empirical analyses have been made in this field during the last few years with focus on redistribution effects of transfers. One aspect of redistribution is captured by analysing poverty and social exclusion which was done by e.g. Behrendt (2000), Tsakloglou and Papadopoulos (2002), Sainsbury and Morissens (2002), Barnes et al. (2002), Stewart (2003) or Kuchler and Goebel (2003). Another aspect of redistribution is the reduction of income inequality. This aspect is considered e.g. in Heady et al. (2001),<sup>1</sup> Beblo and Knaus (2001), Biewen (2000) or Goerlich and Mas (2001). This paper analyses the effect of different social transfer arrangements on welfare in five countries of the European Union<sup>2</sup> by using the concept of the so called generalised Lorenz curve. This concept allows welfare comparisons by capturing the aspects of income inequality and the level of income. As Kraus (2000, p. 2) stated ‘that the redistributive pattern of social transfer systems is heavily influenced by the adopted mixture of social security strategies’, this study aims at identifying a ranking for the considered transfers and to connect these findings with the classification of social security systems developed by Kraus. The concept of the generalised Lorenz curve will be used to compare the impact of social transfers graphically with regards to welfare. With help of this methodology we want to identify connections between the effect of the transfers on welfare and the underlying social security strategies. To achieve this aim

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<sup>1</sup> Heady et al. (2001) considered inequality and poverty aspects in their paper.

<sup>2</sup> When mentioning countries of the European Union, we refer to EU15 countries, i.e. countries that had already been members of the EU before 1<sup>st</sup> May 2004.

detailed cash transfers are compared to each other in five Western European countries. The empirical application of the concept of generalised Lorenz curves to compare different transfers distinguishes the approach used in this paper from other work using this methodology like e.g. Rostek (2000) who compared generalised Lorenz curves for different points in time in European countries. Furthermore, most of the articles dealing with effects of transfers cited above treat inequality or poverty effects only for the whole social transfer and/or tax system or for the total of means-tested transfers. Examples for the analysis of the influence of single transfers are e.g. Hölsch and Kraus (2002, 2004) who examined the effects of social assistance on inequality respective poverty. But a comparison of different detailed transfers applying the GLC methodology like presented in the following has not been employed up to now to the best of my knowledge.

The structure of the paper is as follows: The next section describes the theoretical background. The first step is to explain the nature of generalised Lorenz dominance. This technique provides a partial welfare ranking which means that for some pairs of income distributions no decision about a ranking can be made. The second part of this chapter deals with the different types of social transfer systems in the European Union. The classification developed by Kraus (2000) is briefly explained including a short characterisation of the four groups identified. The third section is dedicated to the empirical results. First we have a look at the methodology followed by the presentation of the actual results. Five European countries which have been chosen as representative for the clusters identified by Kraus are investigated. As we want to reveal a welfare ranking for the social transfers in each of the considered countries we present a pairwise generalised Lorenz curve comparison of the income distributions minus the concerning transfers. Afterwards, the results are summarised in so called Hesse diagrams and are discussed in connection with transfer arrangements and the underlying classification. Thus we can check if the different elements of the classification are

reflected in the presumed way by the examined transfers or if there exist notable differences at all. Finally we summarise our findings and present some ideas for further studies in this field.

## 2 Theoretical Background

### 2.1 The Concept of Generalised Lorenz Dominance

The Lorenz curve is a widespread graphical instrument for the inequality analysis of income distributions introduced by Lorenz (1905). It plots cumulative proportions of total income  $L(p)$  against cumulative population shares  $p$ .<sup>3</sup> When we want to compare income distributions we switch to Lorenz dominance. One of the first papers which dealt with Lorenz dominance orders was Atkinson (1970).<sup>4</sup> Atkinson stated that, assumed that two distributions have the same mean, one distribution is preferred to another by all additive, concave, symmetric and increasing social welfare functions  $W = W(x_1, \dots, x_n)$ ,<sup>5</sup> with  $x_i$  being the income of the  $i$ -th individual, if and only if the Lorenz curve for the first distribution lies completely above the curve for the other distribution:

$$L_X(p) \geq L_Y(p) \text{ for all } p \in [0,1] \Leftrightarrow W(x_1, \dots, x_n) \geq W(y_1, \dots, y_n),$$

with  $\mathbf{X} = (x_1, \dots, x_n)$  and  $\mathbf{Y} = (y_1, \dots, y_n)$  being two different income distributions with the same mean.

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<sup>3</sup> Income has to be ordered in increasing terms for this procedure.

<sup>4</sup> Other important work has been done by Dasgupta et al. (1973) or Rothschild/Stiglitz (1973).

<sup>5</sup> For a closer look at social welfare functions and their attributes see e.g. Boadway/Bruce (1984), Lambert (1993) or Cowell (1995).

The restriction of equal means causes problems for empirical research because in empirical work we often want to compare income distributions with unequal means (e.g. when comparing different countries). Atkinson remarked that the dominance relationship between social welfare and Lorenz curves is also valuable when the dominating distribution has the higher mean. But as two Lorenz curves often cross in practical research and no decision about a ranking can be made (cf. e.g. Shorrocks 1983) Atkinson's additional statement does not really remove the difficulty. Shorrocks (1983) proposed another methodology to solve part of this problem. He used the concept of the generalised Lorenz curve (GLC) which allows to compare income distributions with different means. It is constructed by scaling up the ordinary Lorenz curve by average income. Thus the GLC plots cumulative shares of mean income  $GL(p)$  against cumulative population shares  $p$ . Thistle (1989, p. 1) remarked that 'the height of the generalized Lorenz curve reflects the level of incomes, while the convexity of the generalized Lorenz curve reflects degree of income inequality', so it incorporates the wish for higher income and more income equality.<sup>6</sup> So we have to be aware of the fact that we not only consider the aspect of equality respectively inequality but also the level of income in a population. That clearly distinguishes this approach from simply comparing results of inequality or poverty measures. Shorrocks proved that generalised Lorenz dominance is corresponding to preference by all additive, symmetric, increasing and S-concave<sup>7</sup> social welfare functions:

$$GL_X(p) \geq GL_Y(p) \text{ for all } p \in [0,1] \Leftrightarrow W(x_1, \dots, x_n) \geq W(y_1, \dots, y_n)$$

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<sup>6</sup> Shorrocks (1983, p. 3) calls these aspects 'efficiency preference' and 'equity preference'.

<sup>7</sup> An increasing social welfare function is one interpretation of 'efficiency preference' and S-concavity corresponds to 'equity preference' (cf. Shorrocks 1983, p. 15).

The different types of concavity are described e.g. by Wagenhals (1981).

with  $\mathbf{X} = (x_1, \dots, x_n)$  and  $\mathbf{Y} = (y_1, \dots, y_n)$  being two different income distributions where the means are not necessarily equal.

So if two GLCs do not cross, the one with the higher mean income can be ranked higher in a welfare comparison. But if the curves intersect there is at least one possibility for two welfare functions as defined above which would not be unambiguous, so ‘the ranking will depend on the specification of the given social welfare function and more precisely, on the potential trade-off between more equality and more mean.’ (Rostek 2000, p. 7). Thus the GLC dominance check also yields an incomplete ranking like the ordinary Lorenz dominance but there are more cases for GLC where the curves do not cross (cf. e.g. Lambert 1993, pp. 61f. or Kakwani 1984).

In chapter 3 the GLC dominance criterion will be used to compare the impact of different transfers. For this purpose a pairwise comparison of the considered benefits is made and the results will be described and presented using Hesse diagrams.<sup>8</sup>

## **2.2 European Social Security Systems**

The most famous example for a classification of social security systems is Esping-Andersen (1990, 1999) who sees himself in the tradition of Titmuss (1958, 1974). These typologies implicated various efforts to classify welfare states, e.g. Lewis (1992), Castles and Mitchell (1993) or Ferrera (1996, 1998) to name only a few. Despite its popularity, Esping-Andersen’s typology seems not appropriate for the purpose of this paper for two reasons. First, it was developed for OECD countries but we want to limit the analysis to countries of the European Union. Second, old-age pensions play a prominent role in Esping-Andersen’s analysis. But in

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<sup>8</sup> Hesse diagrams allow to present partial orderings graphically. Compare chapter 3.2 for closer explanation.



the following, we want to focus on cash transfers that are received in unexpected situations<sup>9</sup> i.e. old-age pensions are excluded from the analysis.

A classification which overcomes these difficulties and fits our purpose was presented by Kraus (2000) who developed a classification of social security systems in the European Union. Her study concentrates on monetary transfers others than pensions ( $T^{op}$ ). A further advantage of the typology in comparison to most others is that it only focuses on social security strategies and does not include political factors like political orientation and the influence of labour unions. As we want to investigate the connection between applied strategy in form of specific transfers to their influence on welfare this seems a highly desirable feature. The classification was generated by applying cluster analysis<sup>10</sup> on a set of indicators. These indicators are (Kraus, 2000, p. 8):

- The share of transfers others than pensions ( $T^{op}$ ) in GDP
- The ratio of funding by state to funding by contributions
- The ratio of minimum income guaranteed to median equivalent income for single adults
- An indicator for income replacement rates of  $T^{op}$
- The share of means-tested benefits in social expenditures
- An indicator for the degree of coverage of  $T^{op}$

Kraus detects four clusters for the EU15 countries without Luxembourg.<sup>11</sup> They are presented with their main characteristics and the countries belonging to the clusters in *table 1*.

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<sup>9</sup> Compare chapter 3.1.

<sup>10</sup> Cluster analysis is a statistical method used to identify groupings of cases. For further information see e.g. Johnson/Wichern (2002).

<sup>11</sup> Luxembourg has been excluded because of inadequate data. The data for the other 14 EU countries refer to 1995.

< place table 1 here >

Kraus shows that the four types of systems make use of various traditions and strategy mixes.<sup>12</sup> The prevalent strategy for the *Southern European Cluster* is Bismarck-type social insurance. This strategy implies that the claim on and extent of benefits depend on past contributions, i.e. only a specific group of people receives benefits, particularly workers. This Bismarck social insurance is complemented by additional measures of social assistance or allowances. The social assistance strategy aims at mitigating poverty and providing those in need with a socially acceptable minimum support whereas in the social allowance strategy benefits are granted because of certain demographic criteria like childhood or age.

The preponderance of the Bismarck-type social insurance can also be shown for the *Central European Cluster*. It is accompanied by social assistance measures to guarantee a minimum income for people who are not covered by social insurance and some social allowance strategy benefits regarding family.

In the *British Cluster*, the predominant strategy is Beveridge-type social insurance together with the social assistance tradition. In contrast to Bismarck-type social insurance Beveridge-type social insurance provides people with mainly flat-rate benefits. That means that the right to receive benefits also depends on past contributions but they do not determine the benefit level.

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<sup>12</sup> See Dixon (1999) or Hill (1996) for more information about social security strategies.

The countries of the *Northern European Cluster* provide recipients with measures of Beveridge-type social insurance accompanied with relatively high non-contribution-based social allowances.

After identifying the four clusters, Kraus analyses if the cluster affiliation of countries is reflected by specific redistributive effects. She found ‘that redistributive patterns are strikingly similar for countries belonging to the same cluster but differ markedly between groups’ (Kraus, 2000, p. 23). In the following, we want to go one step further and analyse not only redistributive effects of the social transfer system as a whole but of specific transfers which reflect the different strategies named above. We connect the arrangement of the transfers with the underlying strategies identified by Kraus and investigate which transfers play the most important roles in influencing welfare. The following empirical analysis does not account for all 14 European Union countries included above but restricts the number of examined countries to five to guarantee clarity and to be able to go into required detail. An analysis of all 14 countries would also be prohibited by data availability. Four of these countries are chosen as representative for the four identified clusters, namely Italy, Germany, the United Kingdom and Finland. France is also included as a borderline case.

### **3 Empirical Analysis**

#### **3.1 Methodological Aspects and Statistical Data**

The database used is the Luxembourg Income Study (LIS). The LIS database is a collection of harmonised household income surveys and can be used for comparative purposes.<sup>13</sup> The

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<sup>13</sup> For more information on the LIS data see <http://www.lisproject.org> and e.g. Smeeding (2002).

countries of interest are Italy, Germany, the UK, Finland and France (cf. chapter 2.2). The latest available LIS data for a comparison of all five countries is wave IV so that we work with data from 1994/95. Wave V data are only available for Italy, Germany, Finland and the UK, thus we calculate the GLC only for these four countries with data referring to the years 1999/2000.

Households are selected as units of analysis. The definition for *disposable income (dpi)* employed here is yearly disposable income as defined by LIS.<sup>14</sup> Furthermore, we apply the concept of equivalent household income which allows to compare households of different sizes. This concept takes account of economies of scale in household consumption. Equivalent household income is calculated by dividing household income through the equivalent number of household members which is determined by an equivalence scale.<sup>15</sup> That equivalent household income is assigned to every household member.

The social transfers we focus on are cash-transfers that are received in unexpected situations which are not a ‘normal’ part of the life cycle. Therefore we include:<sup>16</sup>

- *unemployment insurance*: cash social insurance benefits in case of unemployment which are not means-tested
- *unemployment assistance*: means-tested cash benefits in case of unemployment
- *sick pay*: cash sickness insurance benefits

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<sup>14</sup> See for definition of disposable income <http://www.lisproject.org/techdoc/summary.pdf>.

<sup>15</sup> The applied equivalence scale here is the square root of the household size. Cf. e.g. Biewen (2000, pp. 3f.), Atkinson et al. (1995, pp. 18ff.) for further information on equivalence scales.

<sup>16</sup> An overview of the exact contents of the used variables for the different countries is included in Appendix A. For more information about the considered transfer (financing, level, organisation etc.) we recommend e.g. MISSOC (1995, 1996) and MISSOC (2000, 2001).

- *accident pay*: cash accident or injury payments
- *invalidity benefits*: cash benefits for partial or total permanent invalidity or permanent injury
- *social assistance*: means-tested minimum income for living

Not all variables are included for every country in the LIS data. *Table 2* gives an overview of the availability of the concerned variables.

< place table 2 here >

As the aim of this paper is to rank these social transfers, the GLCs for the disposable income distribution minus the concerning transfers are compared for each country. In order to assure the clarity of the GLC comparisons only pairwise comparisons will be carried out. So if we compare for example unemployment assistance and accident pay we proceed as follows. We calculate one GLC for disposable income minus unemployment assistance and one GLC for disposable income less accident pay. Then we compare the two resulting GLCs. If they do not intersect we can decide which transfer dominates the other in terms of welfare comparisons as explained in chapter 2.1. So if for example the curve for disposable income less accident pay lies completely above the GLC for disposable income less unemployment assistance we can conclude that unemployment assistance dominates accident pay in the sense that everyone will be worse off when we withhold unemployment assistance in comparison to withholding accident pay. We stress that we compare the distributions of disposable income *less* the concerning transfers. In interpreting these dominance relations we have to be aware that first and foremost we want to make statements about the influence of the transfers on the income distribution as a whole. Our major aim is not to analyse targeting i.e. if the different transfers

reach the intended target groups.<sup>17</sup> But what we can do if pairs of GLCs intersect and we cannot decide that one transfer dominates the other is to check where the crossing points are. So we can decide in which income regions one transfer ‘dominates’ the other. In this case ‘dominance’ would mean that the average income of the share of the population belonging to the distribution corresponding to the curve lying above the other until they cross is higher for this share of the population. As mentioned our first aim and methodological setting is not to analyse targeting, so we will not try to connect these findings to targeting hypotheses in detail because this goes beyond the scope of this paper.

The analysis on the basis of GLC captures the two aspects of inequality and the level of income. Therefore, it might be useful to consider the expenditure for the different transfers for each country. In *table 3* the shares of the expenditures for the relevant transfers in GDP are reported for the years 1994/95.<sup>18</sup>

< place table 3 here >

When interpreting the dominance relations in chapter 3.2 these expenditure figures might give a hint whether the dominance relations might be due to larger shares of the corresponding transfers or due to better effects on inequality. Besides that they give hints on which transfers the different countries mainly focus on.

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<sup>17</sup> On transfer effects with regards to the aspect of targeting see e.g. Korpi and Palme (1998) or Castles and Mitchell (1992). This would require a different methodological approach: for example it would be absolutely necessary to include poverty measures when investigating social assistance which is intended for the poor.

<sup>18</sup> More recent data suitable for country comparisons fitting the content of the concerning LIS variables are not available at the moment.

### 3.2 Empirical Results

The first step for evaluating the results is to compare the pairs of GLCs for the distribution of disposable income less the social transfers for each country. Analysing the graphs we have two possible results: the two curves cross or do not intersect. *Figure 1* shows an example for a clear dominance relation using LIS data for Finland 1995 whereas in *figure 2* the two curves, generated on the basis of Finish data, cross and we cannot state a dominance relation:<sup>19</sup>

< place figures 1 and 2 here >

As we can see in *figure 2* the intersection of the two GLCs is not clearly visible. Especially when we want to compare the impact of transfers in one country it is quite possible that we are not able to distinguish which curves cross and which do not with the naked eye because the analysed income distributions less the transfers do not differ very distinctly. In order to represent graphically whether there is a crossing point of two curves we can plot the differences of the ordinates of the two concerning GLCs against the quantiles of the population i.e. the cumulative population proportions. The differences are calculated by subtracting the ordinates of the distribution with the lower from the ordinates of the distribution with the higher mean. Thus we have only positive values for the differences if the two curves do not cross (cf. *figure 3* which is based on 1994 German LIS data), if they intersect we also find negative values as shown in *figure 4* for disposable income less accident pay and sick pay in Finland where we can clearly identify the crossing point of the two curves now in contrast to *figure 2*.

< place figures 3 and 4 here >

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<sup>19</sup> The GLC graphs have been generated using the module 'glcurve7' programmed by P. Van Kerm and S.P. Jenkins for the statistical package STATA. For more details see Van Kerm/Jenkins (2001).

Thus we can use two graphical options of showing existing or non-existing GL dominance. All pairs of GLCs are depicted in Appendix B as long as it is visible if there exists a dominance relationship or not. The unclear cases are mapped as difference plots.

After examining all possible pairwise combinations we are able to depict the resulting partial orderings in form of Hesse diagrams for every country. The connected lines flowing downwards from higher ranked income distributions indicate a dominance relation. This would mean e.g. for *figure 5* that the distribution of *disposable income less social assistance* dominates *disposable income less invalidity benefits* but for the comparison of *disposable income less social assistance* with *disposable income less unemployment insurance* respectively *minus accident pay* no dominance relation can be stated because the corresponding GLCs all cross. The following Hesse diagrams (*fig. 5 to 11*) give an overview of the effects of the different transfers. If the GLC comparisons for the two used waves of LIS result in identical dominance relations for one country only one Hesse diagram is presented for the two years, otherwise two separate Hesse diagrams are shown for the different points in time.

< place figures 5, 6, 7, 8, 9, 10, 11 here >

When interpreting the resulting incomplete orderings we have to be careful because we look at the dominance of the distribution of disposable income *minus* a special transfer.<sup>20</sup> So if we can state e.g. that in Italy the distribution of *disposable income minus unemployment insurance* dominates the distributions of *disposable income minus invalidity benefits* this does not mean that unemployment insurance has a strong impact but that it has *less* impact with

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<sup>20</sup> Compare chapter 3.1.



regards to increasing welfare. When speaking of ‘increasing welfare’ we have to bear in mind that our statements are based on the welfare judgements made with regards to the GLC dominance criterion.

Now the influence of the transfers as indicated by the GL dominance check will be examined more closely. Therefore, we also add some information on the arrangement of transfers. Of course we cannot describe these arrangements in detail but we highlight the principal ways of organisation. When presenting the empirical results we proceed as follows: first we record the affiliation of the analysed country to one of the four Clusters with their characteristic strategies, second the arrangement of the considered transfers is briefly explained and connected with the attributes of the corresponding Cluster and third we discuss the empirical results of the GLC comparisons in connection with the first two aspects.

Before analysing the results for Italy we should remember that it is a member of the Southern European Cluster where Bismarck insurance is the prevalent strategy which is complemented by social assistance and allowance measures. Concerning the arrangement of the considered transfers we state that three (invalidity benefits, accident pay, unemployment insurance) of the four analysed transfers are Bismarck insurance transfers. The fourth considered transfer is social assistance which varies strongly between different regions on a comparatively low level as it is characteristic for the Southern European Cluster.<sup>21</sup> So we realize that the benefits themselves reflect the importance of Bismarck insurance which is complemented by the social assistance strategy.

The Hesse diagram for Italy 1995 and 2000 in *figure 5* shows that the distribution of *disposable income minus invalidity benefits* is clearly dominated by the other three available distributions whereas no other dominance relation can be found. Thus we can state a

considerable degree of influence for invalidity benefits. The clear impact of invalidity benefits suits the fact that the Italian expenditures for invalidity are higher than for the other three considered transfers.<sup>22</sup> Invalidity benefits in Italy are an instrument of Bismarck insurance as long as they are paid dependent on past contributions.<sup>23</sup> In 1995 the data only included these insurance invalidity payments and so we can clearly contribute this strong influence to a Bismarckian kind of transfer as indicated above. In 2000 these payments are complemented by transfers for those who do not have claims on insurance benefits i.e. by means-tested transfers which are social assistance measures as may be also found in Southern European countries as explained above. But as the impact of the insurance invalidity benefit in 1995 alone is very clear cut, we can state that invalidity pay has the highest impact even in comparison to other Bismarck insurance transfers. Moreover we have to bear in mind that invalidity pay may be granted as substitute for other benefits like unemployment transfers (cf. OECD 1997, p. 37). Concerning the relationship of the remaining three transfers social assistance, accident pay and unemployment insurance, no more dominance relations can be found, that means the GLCs for these pairs cross. So besides invalidity benefits we cannot find another transfer which has more impact on the income distribution as a whole like another transfer. But what we can do is to check the difference plots to see where the GLCs cross and how the difference between the two concerned curves is dispersed over the income distribution. For the comparison of the GLCs of *disposable income less accident pay and less unemployment insurance*<sup>24</sup> we can see that the curves cross twice: the first time very close to

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<sup>21</sup> The organisation of social assistance schemes in OECD countries is well described in Eardley et al. (1996).

<sup>22</sup> Compare chapter 3.1.

<sup>23</sup> The variable includes invalidity pay out of insurance for 1995, 2000 the 'pensione per invalidi civili' which is flat-rate, means-tested and independent of contributions (cf. e.g. Balandi/Renga, 2000, pp. 127-131) is also included, cf. Appendix A.

<sup>24</sup> Cf. Appendix B, *fig. A4 and A10*.

the origin and the second time very close to the end point. So the distribution of *disposable income less accident pay* ‘dominates’ the one for *less unemployment insurance* in the whole region of middle incomes. So we cautiously conclude that unemployment has on average more impact on middle incomes and less on extreme incomes. But, at least for the year 1995, as the crossing points are very close to the endpoints, the unclear situation with regards to GL dominance could also be due to data inaccuracy. When comparing unemployment insurance and social assistance<sup>25</sup> we also find a crossing point very near to the origin. After that intersection the distribution of *disposable income less social assistance* dominates the one *less unemployment insurance*. This is plausible as social assistance is focussed on low incomes. The only striking point is that there is a second crossing point in 1995 in the highest income regions. We find the same striking crossing points for the comparison of accident pay and social assistance<sup>26</sup> in 1995. The crossing point near the origin is found for both years<sup>27</sup> and might have the same reason than stated in the comparison of social assistance with unemployment insurance: social assistance has more influence in the lowest income region and afterwards accident pay leads to better results with regards to a comparison of GL ordinates. As the second crossing point near the end point appears in 1995 for both the comparison of social assistance with unemployment insurance and accident pay but this is clearly not the case for 2000 this ‘problem’ might be due to a data problem.<sup>28</sup>

So what we can after all conclude for Italy is that the transfer arrangements clearly reflect the preponderance of Bismarck insurance characteristically for the Southern European Cluster.

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<sup>25</sup> Cf. Appendix B, *fig. A3* and *A9*.

<sup>26</sup> Cf. Appendix B, *fig. A6*.

<sup>27</sup> Cf. Appendix B, *fig. A6* and *A12*.

<sup>28</sup> If we compare the mean incomes (which are the end points of the GLCs) of these distribution we state that they are very close together: 22174.18 thousand Lira for disposable income less unemployment insurance,

When comparing the three identified Bismarckian transfers we find that invalidity benefits yield the strongest effects. As already discussed this clear effect is not necessarily due to the underlying strategy and arrangements but to other effects like substituting insufficient other transfers. For the other three transfers the empirical results show that social assistance somewhat influences the lowest income regions. This emphasizes the significance of social assistance as a complement to Bismarckian transfers.

The French social system is a borderline case of the Southern and Central European Cluster in the classification presented in chapter 2.2. What is common to these two Clusters is the preponderance of the Bismarck insurance strategy complemented by social assistance and social allowance measures. In the Central European Cluster we find on average higher expenditures and higher earnings replacement rates than in the Southern European Cluster and social assistance is more limited and more variable between different regions in the Southern European Cluster. In France, we can find two Bismarck-type transfers namely unemployment insurance and sick pay. As indicated in *table A1* in Appendix A we cannot separate single invalidity benefits from occupational accident pensions. Therefore we find the Bismarck-type occupational accident pension, the means-tested allowance for handicapped adults and the non means-tested benefits for education of handicapped children which are granted independently of contributions. So we have a mixture of Bismarck insurance strategy, social assistance and social allowance measures. Social assistance in France consists of the *revenu minimum d'insertion (RMI)* and *aide sociale*. The first transfer is a nationally regulated minimum income whereas the second is a transfer granted from local institutions with different levels. RMI is more closely related to social assistance in countries of the Central European Clusters like Germany whereas *aide sociale* reminds of the Southern European

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22173.88 thousand Lira for disposable income less accident pay and 22171.33 thousand Lira for disposable income less social assistance.

fragmented systems. When comparing the level of the considered French transfer expenditures as share in GDP with the expenditures in Italy and Germany we state that France spends most on unemployment transfers whereas the expenditures for social assistance are the lowest ones.

When analysing the empirical results we find that the distribution of *disposable income less unemployment insurance* is dominated by all other transfers as is visible in *figure 6*. The only other dominance relation which could be found for France is between the distribution of *disposable incomes less sick pay* and *less invalidity benefits* where the first dominates the second. Thus invalidity benefits seem to have a stronger impact on the distribution of disposable income than sick pay. When interpreting this result we have to be careful because the used LIS variable<sup>29</sup> not only comprises invalidity benefits but also pensions for occupational accidents as mentioned above. So we have a combination of occupational accident pensions and two benefits which are granted in case of invalidity independently of past contributions. So we have three very different transfers included which makes it very difficult to assign the impact of this ‘constructed’ invalidity benefit to a certain strategy. For social assistance vs. sick pay respectively invalidity benefits no dominance relation can be stated because the GLCs cross. When comparing the GLCs of *disposable income less social assistance* and *less sick pay*<sup>30</sup> the difference plot shows that the crossing point for the two curves is situated in the lower middle. Below that crossing point the first named distribution lies below the latter. That means that in this income area people are better off without sick pay than without social assistance. After the crossing point the relation switches. For the comparison of social assistance and invalidity pay<sup>31</sup> the crossing point is close to the origin, afterwards the curve for the distribution of *disposable income less social assistance* lies above

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<sup>29</sup> Compare *table A1*, Appendix A.

<sup>30</sup> Cf. Appendix B, *fig. A18*.

<sup>31</sup> Cf. Appendix B, *fig. A16*.

the GLC for *disposable income less invalidity benefits*. Thus, despite for the lowest incomes invalidity benefits make the considered share of the population ‘better off’ than social assistance.

So altogether we can state that a strong influence of Bismarck insurance is outstanding for France. This strategy is typical for both the Southern and Central European Cluster. But this kind of insurance is supplemented by various other measures as is shown in the case of invalidity benefits. We also find some special elements of the Southern European Cluster like the locally granted *aide sociale*. Together with the RMI, the nationally guaranteed social assistance, it shows influence in the lower income regions.

Germany is a country of the Central European Cluster with its preponderance of Bismarck insurance strategy complemented by social assistance and allowance measures. In comparison to the Southern European Cluster we find higher expenditures and earnings replacements and more uniform minimum income schemes. As Germany is the ‘home country’ of Bismarck insurance we naturally find a strong representation of this kind of contribution-based transfer in the German social system. The arrangement of the considered transfers clearly reflects the importance of Bismarck insurance: unemployment insurance, invalidity pension, accident pay and sick pay are organised this way. Unemployment assistance also depends on past contributions and earnings but it is a means-tested transfer which is tax-financed so that it is not typically Bismarckian. In 1994 care insurance was introduced. This transfer is financed by contributions but the level of these flat-rate benefits depends on the need for care and not on previous income. Thus it is not strictly Bismarckian but rather points in the direction of Beveridge insurance. Social assistance complements these transfers. It is a guaranteed minimum income for everybody in need which does not differ that much between different regions like in Italy. Altogether we recognize the clear dominance of Bismarck-type insurance when looking at the transfer arrangements.

For Germany we have different empirical findings for 1994 and 2000, therefore two Hesse diagrams are depicted in *figure 7* and *figure 8*. We begin by interpreting the results for 1994. The GLC for *disposable income less accident pay* dominates all other transfers indicating a comparably weak influence of accident pay on the income distribution. But the comparison of the curves for the other three transfers among each other does not reveal any other dominance relation because the GLCs cross. The crossing points<sup>32</sup> are all in the lowest income regions i.e. for the population share with the lowest income. What can be derived is that apart from the lowest income regions the population is better off without unemployment assistance or social assistance than without unemployment insurance and it is better off without social assistance in comparison to without unemployment assistance. So altogether we might cautiously conclude that the unemployment transfers have a stronger impact on the whole income distribution. In 2000 one more transfer is available (invalidity benefits) which was not included in the 1994 data. The distribution of *disposable income less invalidity benefits* is dominated by all other considered distribution. Thus we can clearly state that invalidity benefits have the strongest impact. When looking closer to the contents of the corresponding variable<sup>33</sup> we see that invalidity insurance and care insurance are included in the variable for invalidity benefits. The distributions of *disposable income minus social assistance* and *less unemployment assistance* are dominated by the one *less accident pay*. *Disposable income less unemployment insurance* is not dominated by any other transfer. But the crossing points with *disposable income minus accident pay*<sup>34</sup> and *minus social assistance*<sup>35</sup> are that close to the origin that this also might be a problem of accuracy so that we can state that apart from this crossing point *disposable income less unemployment insurance* is dominated by the latter

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<sup>32</sup> Cf. Appendix B, *fig. A20* to *A22*.

<sup>33</sup> Compare Appendix A.

<sup>34</sup> Cf. Appendix B, *fig. A25*.

<sup>35</sup> Cf. Appendix B, *fig. A26*.

distributions. The crossing point with *disposable income less unemployment assistance*<sup>36</sup> is not that close to the origin but also in the lower income regions, after that crossing point the GLC for *disposable income less unemployment insurance* lies below that for *disposable income less unemployment assistance*. To summarize we observe that the strongest effects result from omitting invalidity benefits followed by unemployment insurance. For both years accident pay has the least impact on the income distribution. When connecting these findings with the expenditure data in *table 3* we see that the expenditures for invalidity benefits and unemployment insurance have relatively high shares in GDP in comparison to the other transfers what might explain part of the stated impact, but the highest share is spent on social assistance. The low effect of accident pay might be explained by the low share of GDP spent for this transfer: it is only about one fifth of the share spent on unemployment insurance!

Altogether we observe that elements of Bismarck insurance are incorporated in all observed transfers besides social assistance which corresponds to the characteristics stated by Kraus for the Central European Cluster. Out of these Bismarck transfers invalidity benefits and unemployment insurance yield the strongest effects.

The United Kingdom is assigned to the British Cluster. In contrast to the other presented Clusters we find Beveridge-type insurance together with the social assistance tradition to be the predominant strategies. The considered transfers are all relatively typical for the British Cluster because they are all flat-rate benefits. Part of the transfers depends on past contributions,<sup>37</sup> but there is also a considerable tax-financed part,<sup>38</sup> which is also typical for

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<sup>36</sup> Cf. Appendix B, *fig. A27*.

<sup>37</sup> Unemployment insurance 1994, job seeker's allowance (contribution-based) 1999, invalidity benefit 1994, incapacity benefit 1999.

<sup>38</sup> Accident benefit, job seeker's allowance (income-based) 1999, social assistance. Sick pay is financed by a mixture of contributions and tax.



the British Cluster. The strong impact of the social assistance tradition is reflected by the high share in GDP spent on social assistance which is by far the highest expenditure share for this transfer under the five considered countries.

The Hesse diagrams for the UK in 1994 and 1999 show identical results despite considerable changes in the organisation of unemployment insurance and invalidity benefits. So only one Hesse diagram is depicted in *figure 9* for both years. It shows, that the distributions for *disposable income minus accident pay* and *disposable income less sick pay* dominate the distributions of *disposable income less invalidity benefits, minus social assistance* and *less unemployment insurance*. The distribution of *disposable income less invalidity benefits* is dominated by all other transfers except by the distribution of *disposable income less social assistance*. Thus we conclude that invalidity pay is more welfare increasing than the other transfers except social assistance whereas accident pay and sick pay cause less effects than the other transfers. Flat-rate invalidity benefits are a typical element of the British Cluster as mentioned above. This high impact is paid with relatively high costs: 2.77% of GDP is spent for these payments in contrast to 0.19% for unemployment payments or 0.1% for sick pay. In the mid-nineties the UK had to fight with fast rising beneficiary numbers: 570,000 in 1980/81 and 1,809,000 in 1994/95 (cf. Kalisch et al., 1998, p. 52). So the clear influence of invalidity pay might be assumed quite expected for the British Cluster. Another very typical element for the British Cluster is social assistance. When examining the crossing points with the GLCs for *disposable income less unemployment insurance*<sup>39</sup> respectively *less invalidity benefits*<sup>40</sup> we can state intersections very close to the origin – afterwards *disposable income less social assistance* is clearly ‘dominated’ by the latter distributions. The only exception to this is the comparison with invalidity benefits in 1999: there we have two intersections – one near the origin and one in the middle. After the second intersection point the GLC for *disposable*

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<sup>39</sup> Cf. Appendix B, *fig. A36* and *A46*.

<sup>40</sup> Cf. Appendix B, *fig. A40* and *A50*.

*income less social assistance* lies above the GLC for *disposable income less invalidity benefits*. Altogether we might cautiously conclude that when examining the difference plots social assistance seems to cause more effects than observable in the Hesse diagram.

To summarize the findings for the UK, we state that the arrangements of transfers clearly reflect the Beveridge insurance strategy and the social assistance tradition. When comparing the four Beveridge-type transfers we identify invalidity benefits as most influential which might be caused by the high number of recipients and the high level of expenditures for these transfers. Social assistance also plays a notable role reflecting the importance of the social assistance tradition.

Finland is assigned to the Northern European Cluster. The countries affiliated to this Cluster typically favour Beveridge insurance complemented by relatively high non-contribution-based social allowances. The high degree of state funding and the high level of expenditures differentiate these countries from the countries assigned to the other three Clusters. When examining the transfers for Finland we find as a typical element of the Northern European Cluster the high expenditure shares which sum up to 8.34 % for the considered transfers which is not reached by other countries.<sup>41</sup> Funding consists of a mixture of contribution- and tax-financing. The transfers differ from the ones examined in the other countries: sick and accident pay depend on past earnings and contributions and are therefore ‘normal’ Bismarckian insurance transfers, but invalidity pensions and unemployment insurance consist of a basic flat-rate and an earnings-related part. Unemployment assistance is a means-tested flat-rate benefit financed by the state. So we also find Bismarck elements which complement Beveridge insurance.

For Finland, two different Hesse diagrams have to be drawn (cf. *figure 10* and *11*) because the two years do not yield identical results. In Finland, unemployment transfers seem to have

most influence with regards to the increase of welfare because the distribution of *disposable income less unemployment insurance* is dominated by all other possible distributions of disposable income minus transfer and *disposable income less unemployment assistance* is dominated by all other distributions except the one *less unemployment insurance* for 1995 and in 2000 both distributions are dominated by all other transfers but not by each other. In the mid-nineties, rising unemployment could be stated for all countries in the European Union – the unemployment rate for the EU15 amounted to 11.1 % in 1994 (cf. Eurostat/European Commission, 2001, p. 10). Finland was one of the most affected countries with 16.6% unemployed in 1994 – only Spain topped this figure with 24.1 %. This fact helps to explain the extremely high impact of unemployment insurance on the income distribution. But as we can also observe a considerable effect for 2000 where the unemployment rate was at only 9.8 % (cf. Eurostat/European Commission, 2003, p. 135) the influence of unemployment transfers cannot only be caused by very high unemployment rates of the mid-nineties but also by the principal arrangement of the transfers which is, as stated above, a mixed system out of Beveridge-type social insurance with its flat-rate payments typical for the Northern European Cluster supplemented by earnings-related elements in the unemployment insurance and non-contribution based elements for unemployment assistance. In this context we also have to note the comparably high expenditure shares for unemployment insurance. In 1995 the distribution of *disposable income less invalidity pay* dominates all other distributions, i.e. invalidity pay seems to have less influence what is somewhat astonishing when considering the very high expenditure shares spent on invalidity benefits. But in 2000 this distribution only dominates *disposable income minus unemployment insurance* respectively *less unemployment assistance*. The other GLC comparisons show intersections and no more dominance relations. When considering the difference plots we see that for the comparisons with *disposable*

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<sup>41</sup> Compare e.g. 4.38 % of GDP for Germany or 5.74 % of GDP in the UK. Basis for these sums is *table 3*.

*income less accident pay*<sup>42</sup> where the GLCs cross, the intersection point is always near or very near the origin and afterwards this distribution lies always above the others. Thus we might conclude that the influence of accident pay is rather limited. For *disposable income less sick pay*<sup>43</sup> we find for the comparisons with the distributions where the GLCs cross that after a crossing point the GLC for this distribution always ends below the corresponding other. The intersection points are in the region of low incomes for the comparison with accident pay and in the middle to higher income regions for the comparison with social assistance and invalidity pay (only 2000). So we cannot clearly assign an influence of social assistance for the lowest income regions.

The empirical results clearly show the highest impact for unemployment transfers which are a combination of Beveridge and Bismarck insurance elements. Thus we find some influences from the central European countries in form of Bismarck insurance in Finland besides the Beveridge strategy. The high expenditure shares are typical for the Northern European Cluster.

When comparing the empirical results for the five countries we find some analogies but also considerable differences concerning the impact of different transfers. Firstly, we can compare the results in each country for the two considered points in time. In Italy and the UK the ranking did not change when comparing the two waves. In Germany we have two different Hesse diagrams but that is first of all due to an additional variable (invalidity benefits) and second to a minor change in the dominance relation between *disposable income less accident pay* and *less unemployment insurance* which does not exist any more in 2000. The Finish Hesse diagrams show changes with respect to the impact of invalidity pay and unemployment insurance but the preponderance of unemployment transfers as a whole remains clearly

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<sup>42</sup> Cf. Appendix B, fig. A67, A69, A82, A83, A84.

<sup>43</sup> Cf. Appendix B, fig. A61, A67, A74, A76, A82.

visible. Thus, altogether the rankings seem to be relatively stable for the two years so that we might cautiously conclude that if we could analyse newer data for France we would also recognize a strong impact of unemployment insurance.

When comparing the results for the examined countries, we notice as a similarity that in none of the countries accident pay strongly influences welfare, it is rather of minor importance which is also reflected in the low shares in GDP spent for this transfer as indicated in *table 3*.

We examined three countries with an emphasis on Bismarck insurance that is to say Germany (Central European Cluster), Italy (Southern European Cluster) and France (borderline case between these two Clusters). In Germany, we could identify a strong impact of unemployment transfers on welfare whereas in Italy invalidity benefits are more important. For France we could also state that unemployment insurance yields the strongest welfare effects. This could indicate a closer ‘relationship’ of France to the Central Cluster than to the Southern European Cluster if we only consider the examined transfers. In the framework of the British Cluster represented by the UK we found a strong impact of invalidity benefits which reflects the Beveridge insurance part and a considerable influence of social assistance which is in the British tradition of the poor laws. In Finland which represents the Northern European Cluster we stated a mixture of various strategy elements which are even implemented in one kind of transfer like for unemployment transfers which clearly influenced welfare more than the other transfers.

## 4 Conclusion

This study analysed the impact of different transfers on the income distributions in five countries of the European Union. We applied the technique of generalised Lorenz dominance and performed a pairwise comparison for all possible pairs of transfers in each country. The examined countries are Italy, France, Germany, the United Kingdom and Finland which were chosen because they represent four types of European social transfer systems identified by Kraus (2000). Finally we evaluated the results of the GLC comparison and related it to the underlying classification of social transfer systems where we also considered the arrangement of the various transfers and the expenditures spent on them. So when presenting the results for the considered countries we first connected the transfer arrangements with the underlying strategies and the Cluster affiliation. Thus we found that the transfer arrangements are different for the countries and reflect the affiliation to the corresponding Clusters. We stated a clear preponderance of Bismarck insurance in Italy and Germany as expected for the affiliation to the Southern respectively Central European Cluster. Clear differences for these two Clusters could be found in the organisation of social assistance and concerning the expenditure level for transfers which is higher in Germany. France as a borderline case between those two Clusters includes elements of both. The transfer arrangements in the UK are clearly dominated by Beveridge insurance and the strong social assistance tradition. The Finish transfers show a mixture of various elements especially from Beveridge and Bismarck insurance. The high expenditure level characteristic for the Northern European Cluster is also reflected. The GLCs provide partial orderings meaning that some transfers cannot be ordered unambiguously. But nevertheless we could state that some transfer effects reflected special attributes of the associated clusters especially when also analysing the difference plots for the GLCs. For the detailed ranking of transfers, the only country where we find social assistance as an influential transfer in our sense is in the UK. This clearly reflects the strong impact of

the social assistance tradition which developed in the UK. Unemployment transfers represent the most important benefits according to our methodological setting of welfare comparisons in Germany which is part of the Central European Cluster and stands for a Bismarckian tradition, in Finland which is a country of the Northern European Cluster and created unemployment transfers as a mixture out of different traditions, and unemployment transfers lead the ranking in France which is a borderline case between Central and Southern European Cluster. Furthermore invalidity benefits yield the most impressive results as a Bismarckian benefit in Italy as a country of the Southern European Cluster and in the UK which is part of the British Cluster and created this benefit as a ‘classical’ means-tested transfer. So we can see that independently of the applied strategy, specific transfers like unemployment transfers can be ‘successful’ within the framework of the overall strategy which is accepted in one country despite the identified differences between arrangements of this specific transfer in various countries. The impact of transfers might also be influenced by other factors than the underlying strategy like e.g. the ‘flight’ to invalidity benefits in Italy because of the insufficient arrangement of other transfers.

The present paper can only give some first ideas of the effects of transfers in the analysed countries. For further examination we would have to consider

- more aspects of and more calculations on the income distribution and
- more details on the arrangements in the different social systems.

The first point could contain a further inequality analysis with scalar measures like the Atkinson family of inequality measures or the family of generalised entropy measures etc. Another possibility would be to include a poverty analysis i.e. how the transfer systems are connected with this aspect. That would entail the application of various poverty measures.

The second prospect involves more details on the way the social transfer systems are arranged in the countries examined. This implies the historical development and statutory regulations in

every country. Another aspect is the consideration of the costs for the benefits. We recognized e.g. for the United Kingdom and Italy that the visible influence of invalidity benefits are ‘bought’ at a comparatively high price. Thus it would be useful to consider also the costs for the benefits in a measure of distributive efficiency.<sup>44</sup>

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<sup>44</sup> Cf. e.g. Hölsch/Kraus (2002, 2004) who analysed distributive efficiency in European countries for social assistance with regards to inequality and poverty effects.



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## **Appendix A**

### **Content of the used LIS variables**

< place table A1 here >

## **Appendix B**

### **Generalised Lorenz curve comparisons**

The following figures show the pairwise comparison of the generalised Lorenz curves for the income distributions without transfers ordered by countries. If the difference of two curves is not visible, difference plots have been generated and are depicted instead of GLCs; the distribution of dpi – transfer with the higher mean is mentioned first in the description. When looking at some GLCs it may appear to the observer that there might perhaps be a crossing point in the lowest income regions; these cases have been checked for crossing points and if the curves intersected a difference plot would be shown instead of the GLCs. The source for all these figures are own calculations based on LIS data.

#### **Italy 1995**

< place figures A1 to A6 here >

#### **Italy 2000**

< place figures A7 to A12 here >

#### **France 1994**

< place figures A13 to A18 here >

#### **Germany 1994**

< place figures A19 to A24 here >

#### **Germany 2000**

< place figures A25 to A34 here >

#### **UK 1994**

< place figures A35 to A44 here >

#### **UK 1999**

< place figures A45 to A54 here >

#### **Finland 1995**

< place figures A55 to A69 here >

#### **Finland 2000**

< place figures A70 to A84 here >

	<b>Southern European Cluster</b>	<b>Central European Cluster</b>	<b>British Cluster</b>	<b>Northern European Cluster</b>
<i>Expenditures T<sup>op</sup></i>	medium/low	medium/high	medium/low	high
<i>Funding of expenditures</i>	contributions, additional state support	contributions, minor state support	more than 50% state funding	state funding to large degree
<i>Earnings replacements</i>	small	medium/high	flat-rate	comparatively high
<i>Guaranteed minimum income</i>	limited/local or regional variation	medium/high	high	comparatively high
<i>Coverage</i>	fragmented	medium/low	medium/high	high
<i>Significance of means-tests</i>	medium	varying	high	varying
<i>Affiliation of countries</i>	Greece, Portugal, Italy	Germany, Belgium, Austria	Ireland, UK	Finland, Sweden, Denmark
	France, Spain		Netherlands	

table 1: The four clusters for EU15 without Luxembourg

	Italy 1995/2000	France 1994	Germany 1994/2000	UK 1994/99	Finland 1995/2000
Unemployment insurance	+	+	+	+	+
Unemployment assistance	-	n.a.	+	-	+
Sick pay	n.a.	+	n.a.	+	+
Accident pay	+	n.a.	+	+	+
Invalidity benefits	+	+	n.a. (1994) + (2000)	+	+
Social assistance	+	+	+	+	+

*table 2: Availability of variables for social transfers in LIS*

+ variable available

n.a. variable not available

- transfer does not exist



	Italy 1995	France 1994	Germany 1994	UK 1994	Finland 1995
Unemployment insurance	0.37	1.24	0.89	0.19	2.78
Unemployment assistance	-	1.11	0.48	-	0.66
Sick pay	0.74	0.49	0.46	0.10	0.78
Accident pay	n.a.	0.25	0.17	0.18	0.25
Invalidity benefits	0.66	0.38	0.98	2.77	3.47
Social assistance <sup>1</sup>	0.60	0.20	1.40	2.50	0.40

*table 3: Expenditure on the transfers as percentage of GDP 1994/95*

*n.a. variable not available*

*- transfer does not exist*

*Source: OECD Social Expenditure Database, data for social assistance Eardley et al. (1996)*

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<sup>1</sup> Unfortunately reliable data on social assistance expenditures suitable for inter-country comparisons are unavailable for the reporting year of 1994/95. The reported data refer to the year 1992.

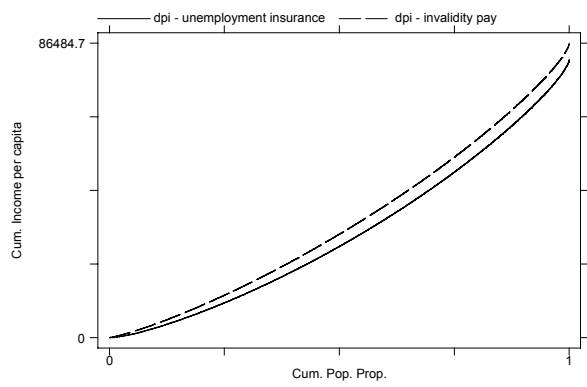


fig. 1: GLC comparison Finland 1995, dpi – unemployment insurance vs. dpi – invalidity pay

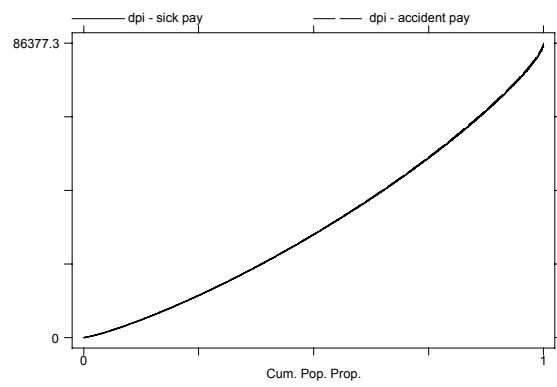


fig. 2: GLC comparison Finland 1995, dpi – sick pay vs. dpi – accident pay

Source: Own calculations from LIS data

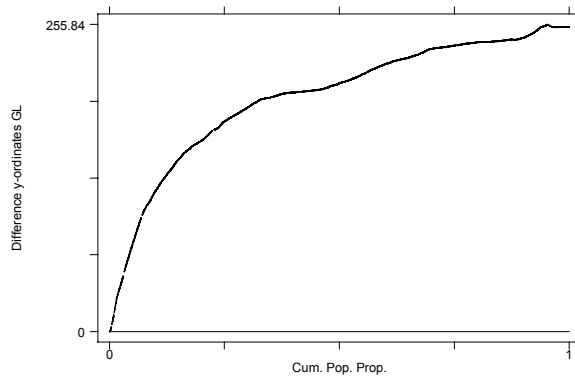


fig. 3: difference plot Germany 1994,  $dpi -$  accident pay vs.  $dpi -$  unemployment assistance

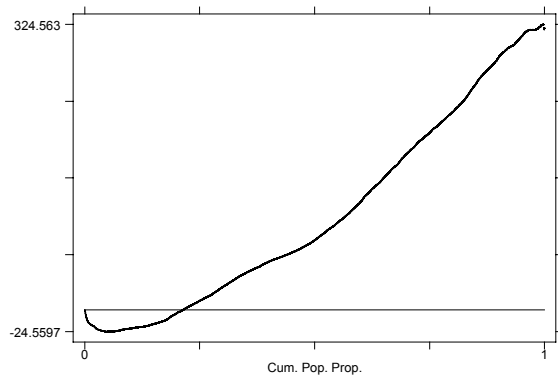


fig. 4: difference plot Finland,  $dpi -$  accident pay vs.  $dpi -$  sick pay

Source: Own calculations from LIS data

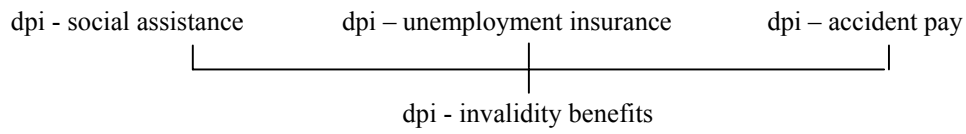


fig.5: Hesse diagram Italy 1995 and 2000

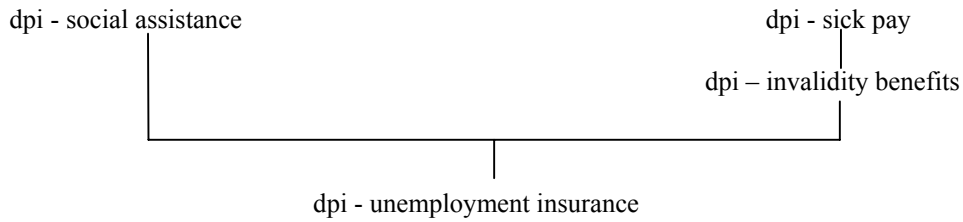


fig.6: Hesse diagram France 1994

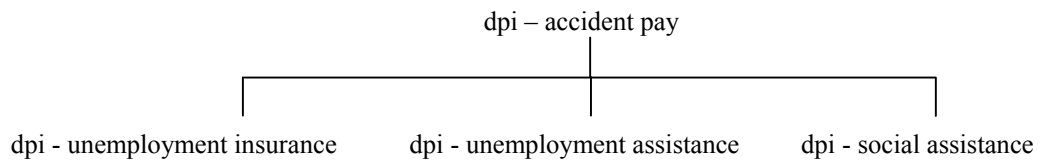


fig.7: Hesse diagram Germany 1994

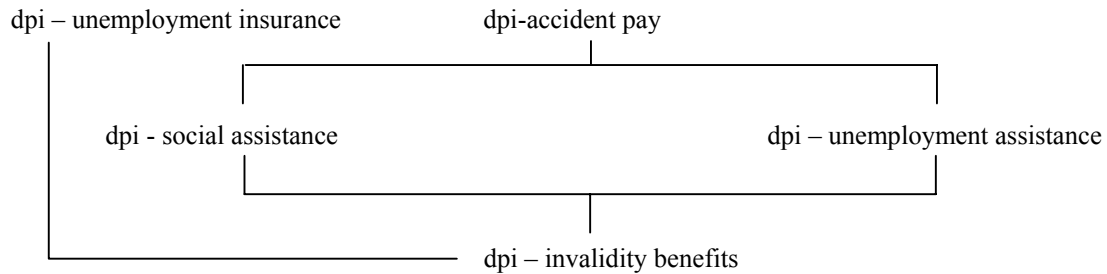


fig.8: Hesse diagram Germany 2000

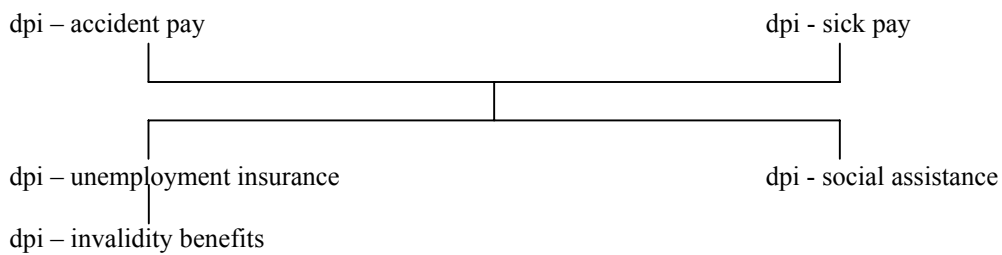
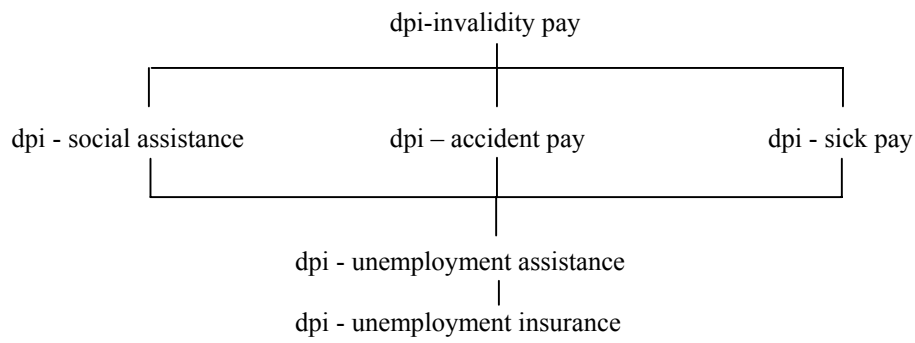
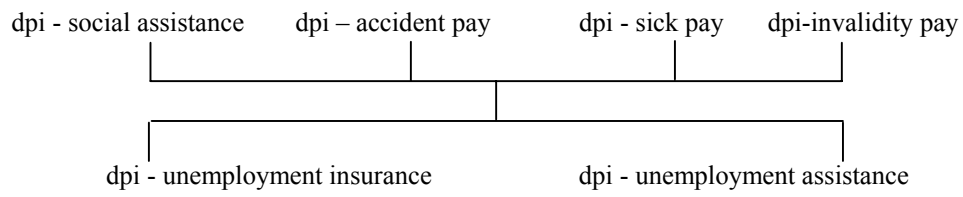


fig.9: Hesse diagram United Kingdom 1994 and 1999



*fig.10: Hesse diagram Finland 1995*



*fig.11: Hesse diagram Finland 2000*

<b>Transfer</b>		<b>Content</b>
Unemployment insurance	I	unemployment insurance (ordinary and extraordinary)
	F	unemployment insurance
	D	unemployment insurance
	UK	1994 unemployment insurance, 1999 Job Seeker's Allowance
	Fin	unemployment insurance (basic and earnings-related)
Unemployment assistance	D	unemployment assistance (1994 re-training allowance also included)
	Fin	job market support, unemployment allowances
Sick pay	F	sick pay
	UK	1994 sickness benefit and statutory sick pay, 1999 statutory sick pay
	Fin	sick pay
Accident pay	I	accident insurance (INAIL)
	D	accident insurance
	UK	industrial disablement benefit, constant attendance allowance, exceptionally severe disablement allowance
	Fin	accident allowance
Invalidity benefits	I	invalidity insurance (2000 Pensione per invalidi civili also included)
	F	allowance for handicapped adults, benefit for education to handicapped children, invalidity pension for occupational accidents
	D	invalidity insurance and care insurance (only 2000)
	UK	disability living allowance, severe disability allowance, attendance allowance, invalidity benefit (1994)/incapacity benefit (1999)
	Fin	national basic pension, care allowance, disabled persons allowance
Social assistance	I	all forms of economic support from public bodies (central government, regional government, provincial government, municipal government, local health unit and other local government bodies)
	F	aide sociale, RMI
	D	continuous aid for living, aid in special circumstances (second not included in 2000)
	UK	income support
	Fin	toimeentulotuki

table A1: Content of the used LIS variables

Source: LIS technical documentation available on <http://www.lisproject.org>

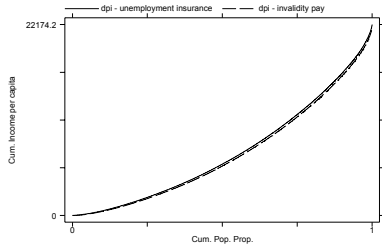


fig. A1: GLC comparison Italy 95, dpi - unemployment insurance vs. dpi - invalidity pay

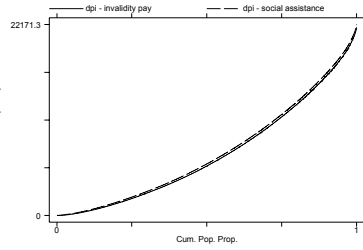


fig. A2: GLC comparison Italy 95, dpi - invalidity pay vs. dpi - social assistance

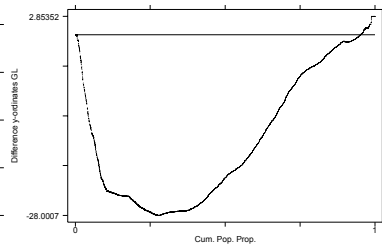


fig. A3: Difference plot Italy 95, dpi - unemployment insurance vs. dpi - social assistance

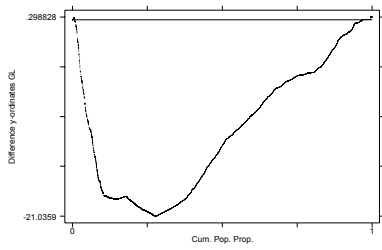


fig. A4: Difference plot Italy 95, dpi - unemployment insurance vs. dpi - accident pay

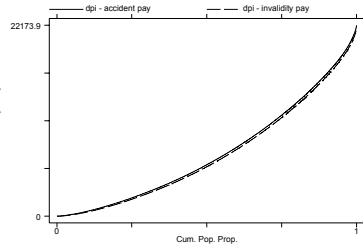


fig. A5: GLC comparison Italy 95, dpi - invalidity pay vs. dpi - accident pay

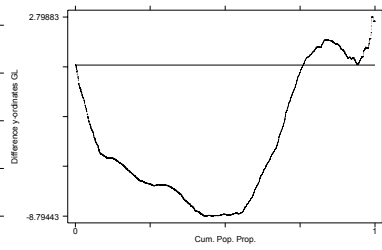


fig. A6: Difference plot Italy 95, dpi - accident pay vs. dpi - social assistance

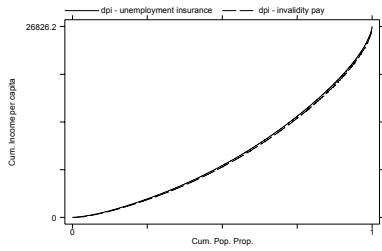


fig. A7: GLC comparison Italy 00, dpi - unemployment insurance vs. dpi - invalidity pay

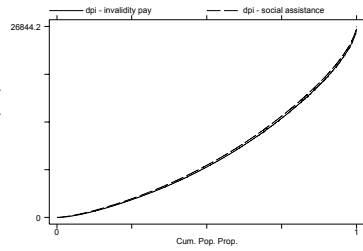


fig. A8: GLC comparison Italy 00, dpi - invalidity pay vs. dpi - social assistance

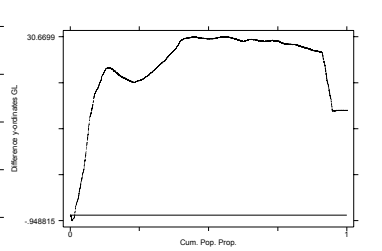


fig. A9: Difference plot Italy 00, dpi - unemployment insurance vs. dpi - social assistance

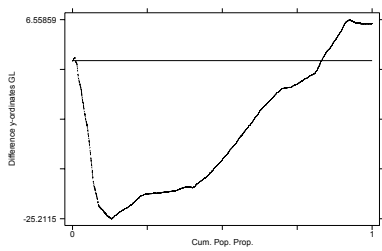


fig. A10: Difference plot Italy 00, dpi - unemployment insurance vs. dpi - accident pay

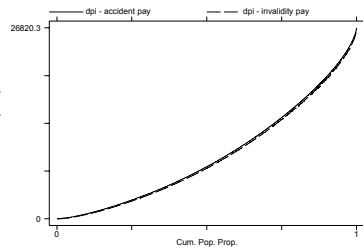


fig. A11: GLC comparison Italy 00, dpi - invalidity pay vs. dpi - accident pay

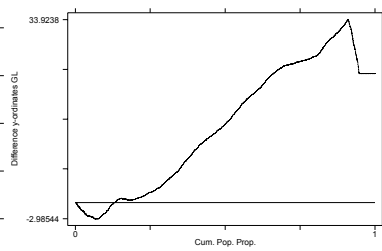


fig. A12: Difference plot Italy 00, dpi - social assistance vs. dpi - accident pay

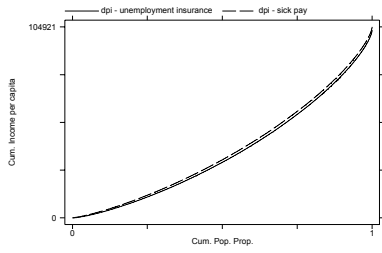


fig. A13: GLC comparison France, dpi - unemployment insurance vs. dpi - sick pay

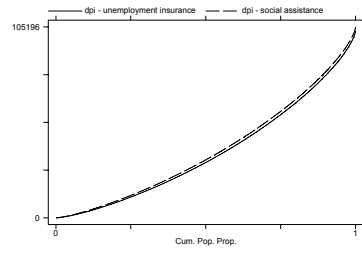


fig. A14: GLC comparison France, dpi - unemployment insurance vs. dpi - social assistance

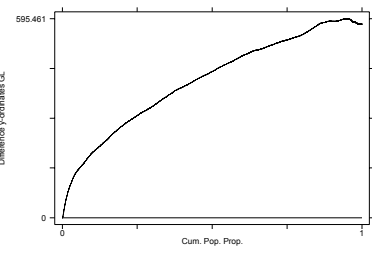


fig. A15: Difference plot France, dpi - sick pay vs. dpi - invalidity pay

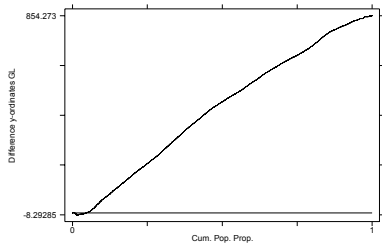


fig. A16: Difference plot France, dpi - social assistance vs. dpi - invalidity pay

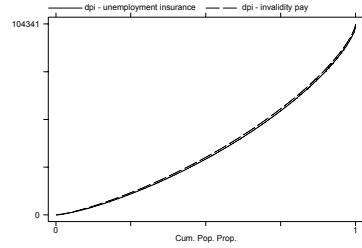


fig. A17: GLC comparison France, dpi - invalidity pay vs. dpi - unemployment insurance

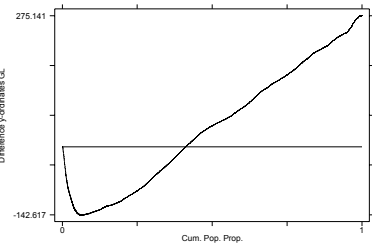


fig. A18: Difference plot France, dpi - social assistance vs. dpi - sick pay

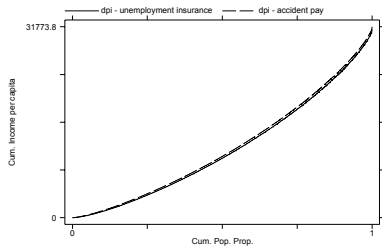


fig. A19: GLC comparison Germany 94, dpi - unemployment insurance vs. dpi - accident pay

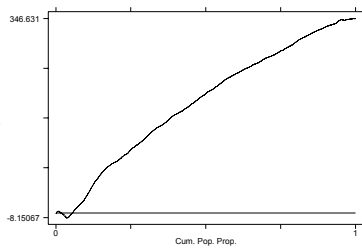


fig. A20: Difference plot Germany 94, dpi - social assistance vs. dpi - unemployment insurance

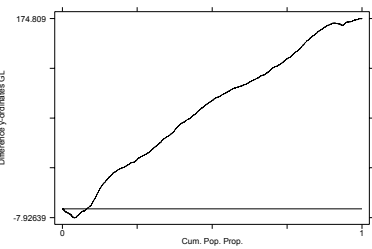


fig. A21: Difference plot Germany 94, dpi - unemployment assistance vs. unemployment insurance

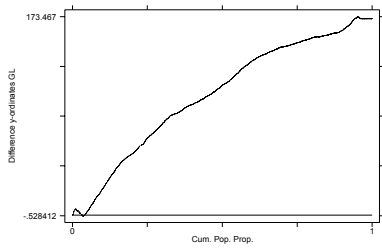


fig. A22: Difference plot Germany 94, dpi - social assistance vs. dpi - unemployment assistance

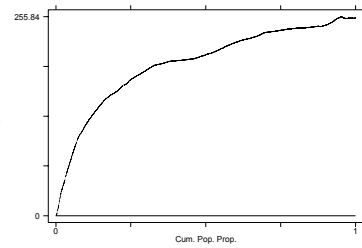


fig. A23: Difference plot Germany 94, dpi - accident pay vs. dpi - unemployment assistance

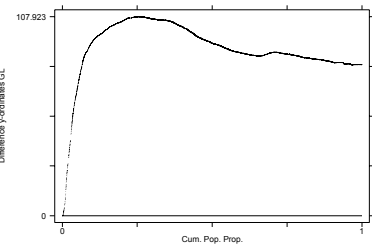


fig. A24: Difference plot Germany 94, dpi - accident pay vs. dpi - social assistance



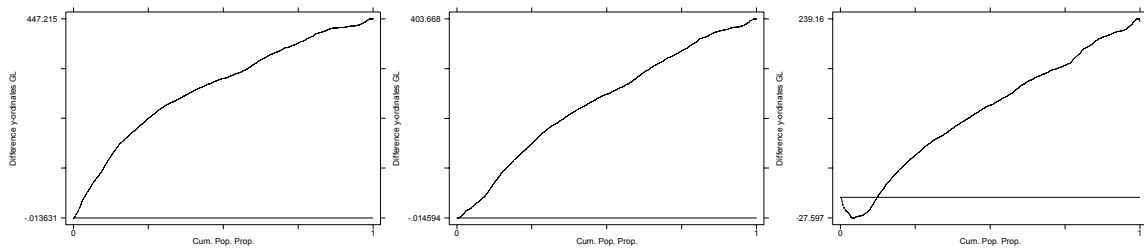


fig. A25: Difference plot Germany 00, dpi - accident pay vs. dpi - unemployment insurance

fig. A26: Difference plot Germany 00, dpi - social assistance vs. dpi - unemployment insurance

fig. A27: Difference plot Germany 00, dpi - unemployment assistance vs. unemployment insurance

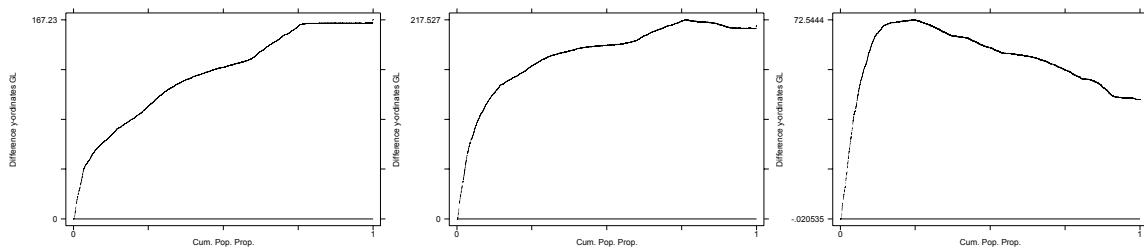


fig. A28: Difference plot Germany 00, dpi - social assistance vs. dpi - unemployment assistance

fig. A29: Difference plot Germany 00, dpi - accident pay vs. dpi - unemployment assistance

fig. A30: Difference plot Germany 00, dpi - accident pay vs. dpi - social assistance

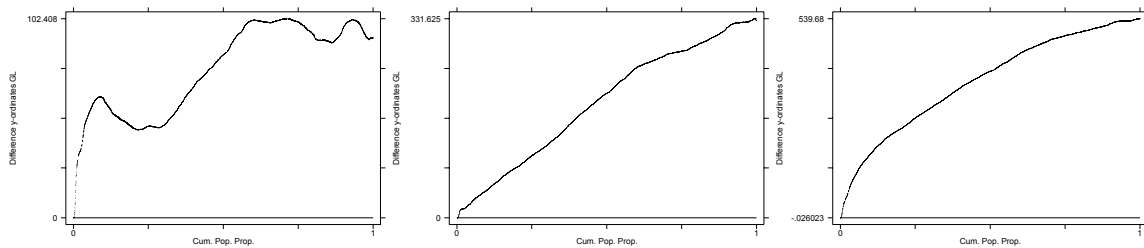


fig. A31: Difference plot Germany 00, dpi - unemployment insurance vs. dpi - invalidity benefits

fig. A32: Difference plot Germany 00, dpi - unemployment assistance vs. dpi - invalidity benefits

fig. A33: Difference plot Germany 00, dpi - accident pay vs. dpi - invalidity pay

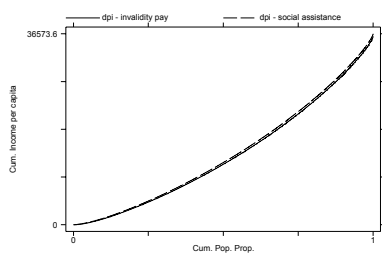


fig. A34: GLC comparison Germany 00, dpi - social assistance vs. dpi - invalidity benefits

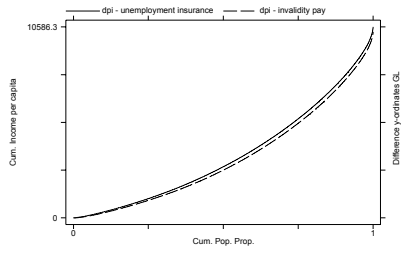


fig. A35: GLC comparison UK 94, dpi - unemployment insurance vs. dpi - invalidity pay

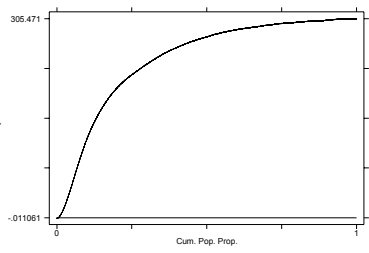


fig. A36: Difference plot UK 94, dpi - unemployment insurance vs. dpi - social assistance

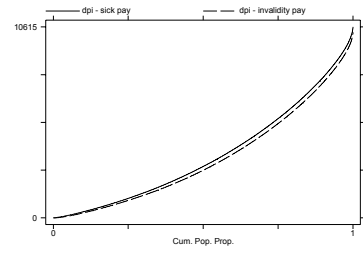


fig. A37: GLC comparison UK 94, dpi - sick pay vs. dpi - invalidity pay

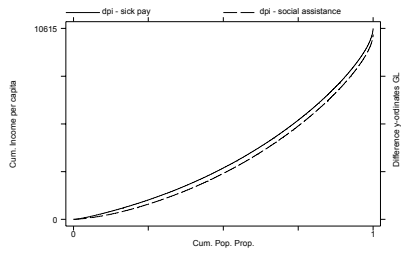


fig. A38: GLC comparison UK 94, dpi - sick pay vs. dpi - social assistance

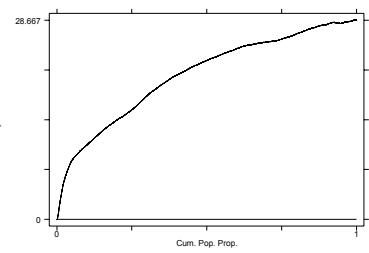


fig. A39: Difference plot UK 94, dpi - sick pay vs. unemployment insurance

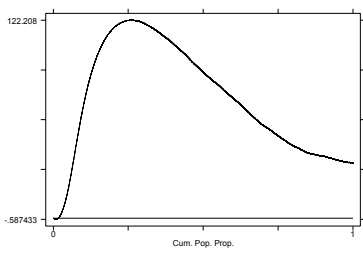


fig. A40: Difference plot UK 94, dpi - invalidity pay vs. social assistance

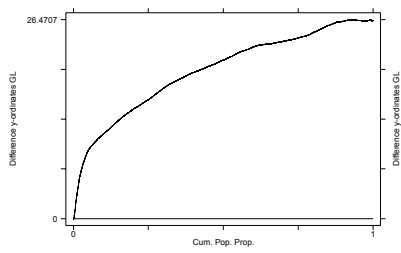


fig. A41: Difference plot UK 94, dpi - accident pay vs. dpi - unemployment insurance

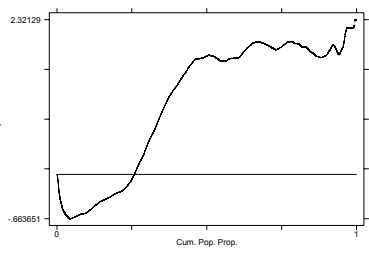


fig. A42: Difference plot UK 94, dpi - sick pay vs. accident pay

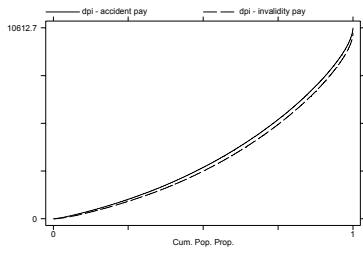


fig. A43: GLC comparison UK 94, dpi - invalidity pay vs. accident pay

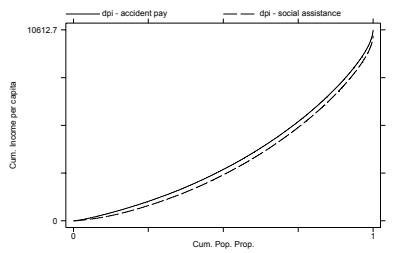


fig. A44: GLC comparison UK 94, dpi - accident pay vs. dpi - social assistance

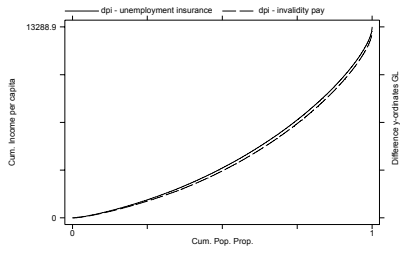


fig. A45: GLC comparison UK 99, dpi - unemployment insurance vs. dpi - invalidity pay

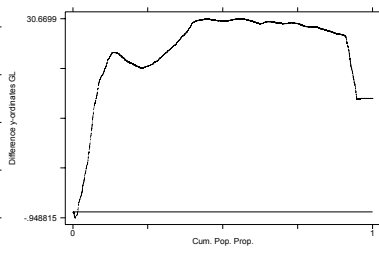


fig. A46: Difference plot UK 99, dpi - unemployment insurance vs. dpi - social assistance

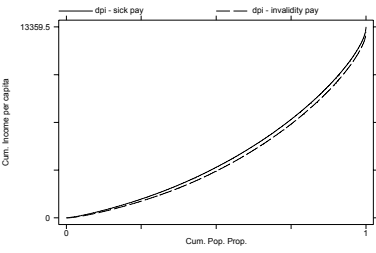


fig. A47: GLC comparison UK 99, dpi - sick pay vs. dpi - invalidity pay

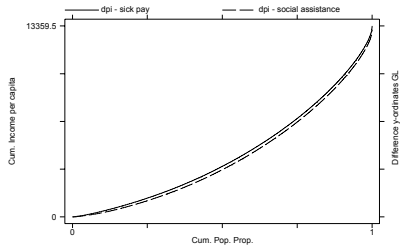


fig. A48: GLC comparison UK 99, dpi - sick pay vs. dpi - social assistance

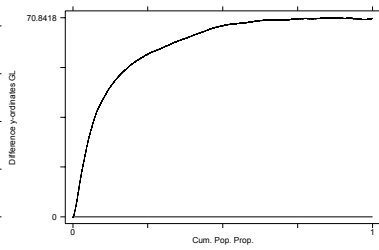


fig. A49: Difference plot UK 99, dpi - sick pay vs. unemployment insurance

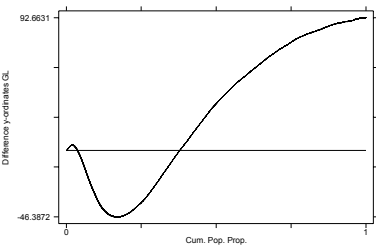


fig. A50: Difference plot UK 99, dpi - social assistance vs. invalidity pay

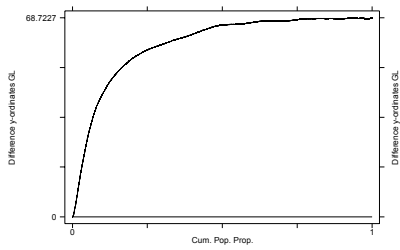


fig. A51: Difference plot UK 99, dpi - accident pay vs. dpi - unemployment insurance

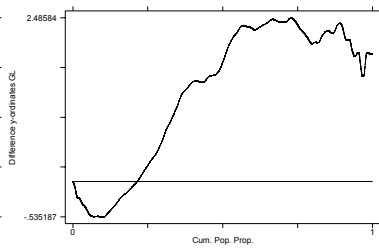


fig. A52: Difference plot UK 99, dpi - sick pay vs. accident pay

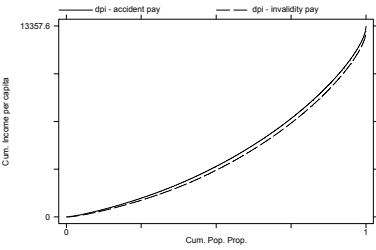


fig. A53: GLC comparison UK 99, dpi - invalidity pay vs. accident pay

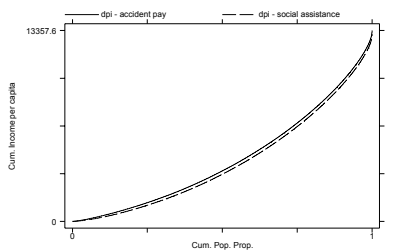


fig. A54: GLC comparison UK 99, dpi - accident pay vs. dpi - social assistance

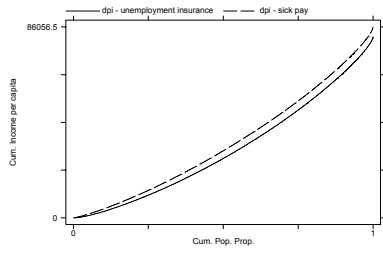


fig. A55: GLC comparison Finland 95, dpi - unemployment insurance vs. dpi - sick pay

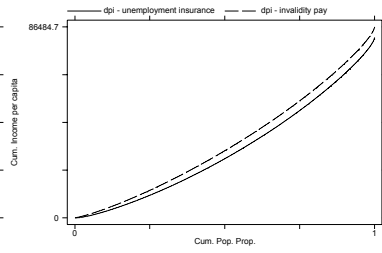


fig. A56: GLC comparison Finland 95, dpi - unemployment insurance vs. dpi - invalidity pay

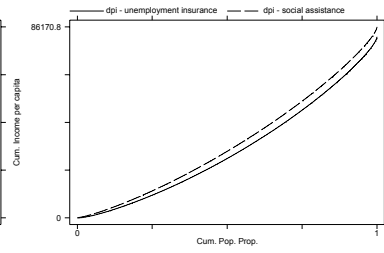


fig. A57: GLC comparison Finland 95, dpi - unemployment insurance vs. dpi - social assistance

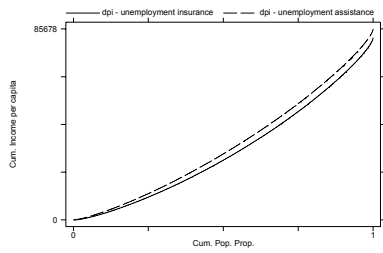


fig. A58: GLC comparison Finland 95, dpi - unemployment insurance vs. dpi - unemployment assistance

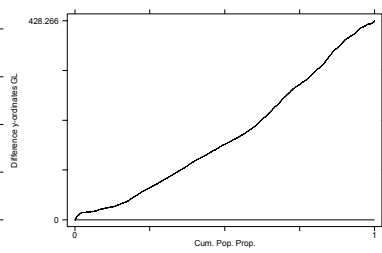


fig. A59: Difference plot Finland 95, dpi - invalidity pay vs. dpi - sick pay

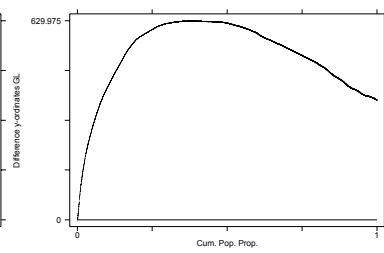


fig. A60: Difference plot Finland 95, dpi - sick pay vs. dpi - unemployment assistance

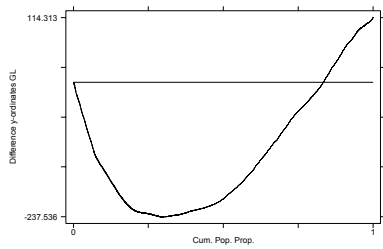


fig. A61: Difference plot Finland 95, dpi - social assistance vs. dpi - sick pay

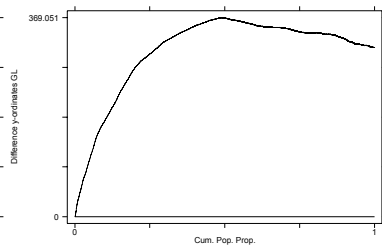


fig. A62: Difference plot Finland 95, dpi - invalidity pay vs. dpi - social assistance

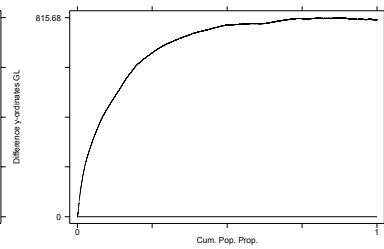


fig. A63: Difference plot Finland 95, dpi - invalidity pay vs. dpi - unemployment assistance

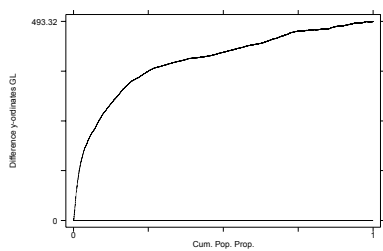


fig. A64: Difference plot Finland 95, dpi - social assistance vs. dpi - unemployment assistance

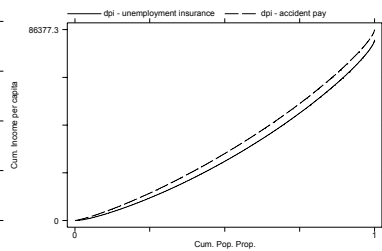


fig. A65: GLC comparison Finland 95, dpi - unemployment insurance vs. dpi - accident pay

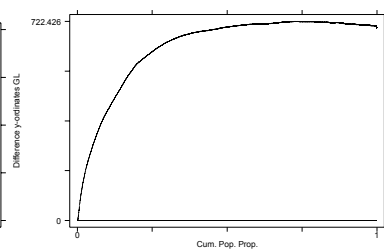


fig. A66: Difference plot Finland 95, dpi - accident pay vs. dpi - unemployment assistance

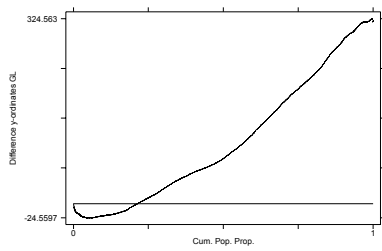


fig. A67: Difference plot Finland 95, dpi - accident pay vs. dpi - sick pay

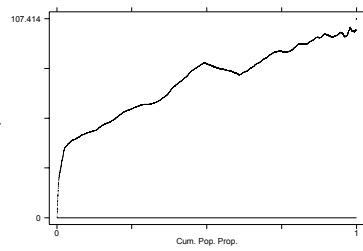


fig. A68: Difference plot Finland 95, dpi - invalidity pay vs. dpi - accident pay

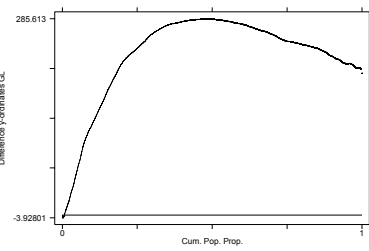


fig. A69: Difference plot Finland 95, dpi - accident pay vs. dpi - social assistance

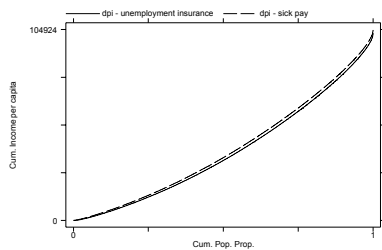


fig. A70: GLC comparison Finland 00, dpi - unemployment insurance vs. dpi - sick pay

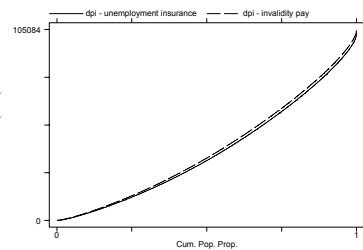


fig. A71: GLC comparison Finland 00, dpi - unemployment insurance vs. dpi - invalidity pay

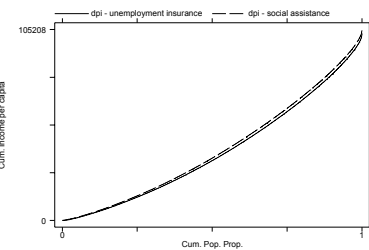


fig. A72: GLC comparison Finland 00, dpi - unemployment insurance vs. dpi - social assistance

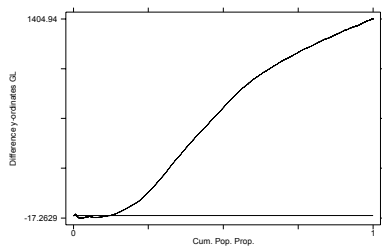


fig. A73: Difference plot Finland 00, dpi - unemployment assistance vs. dpi - unemployment insurance

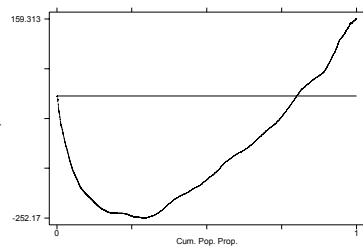


fig. A74: Difference plot Finland 00, dpi - invalidity pay vs. dpi - sick pay

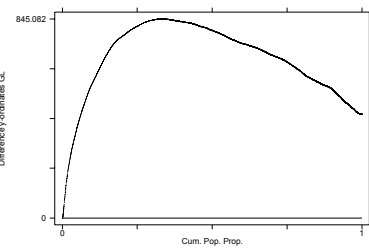


fig. A75: Difference plot Finland 00, dpi - sick pay vs. dpi - unemployment assistance

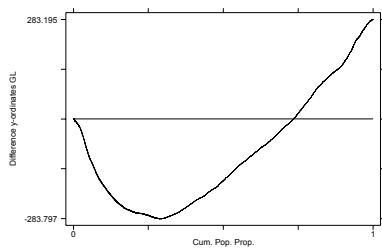


fig. A76: Difference plot Finland 00, dpi - social assistance vs. dpi - sick pay

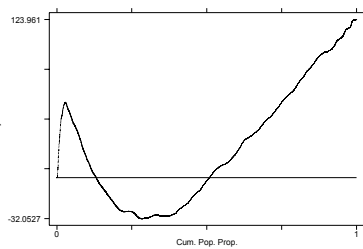


fig. A77: Difference plot Finland 00, dpi - social assistance vs. dpi - invalidity pay

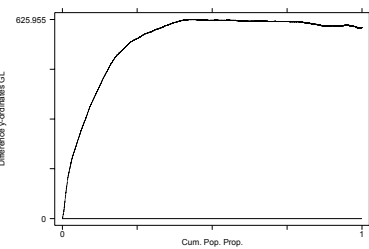


fig. A78: Difference plot Finland 00, dpi - invalidity pay vs. dpi - unemployment assistance

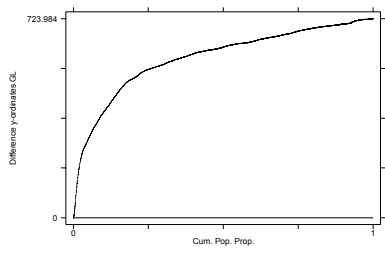


fig. A79: Difference plot Finland 00, dpi – social assistance vs. dpi – unemployment assistance

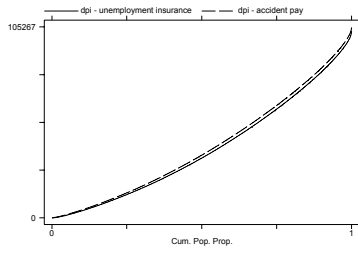


fig. A80: GLC comparison Finland 00, dpi – unemployment insurance vs. dpi – accident pay

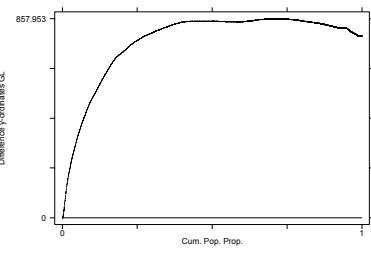


fig. A81: Difference plot Finland 00, dpi - accident pay vs. dpi - unemployment assistance

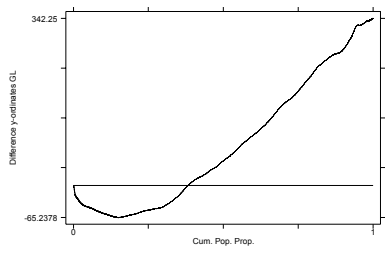


fig. A82: Difference plot Finland 00, dpi – accident pay vs. dpi – sick pay

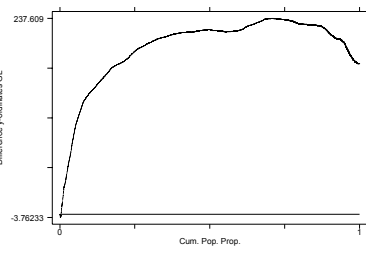


fig. A83: Difference plot Finland 00, dpi – accident pay vs. dpi – invalidity pay

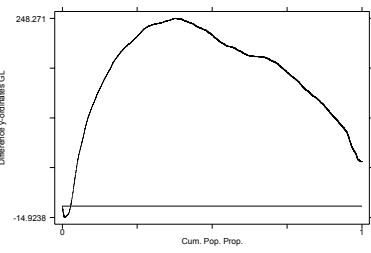


fig. A84: Difference plot Finland 00, dpi - accident pay vs. dpi - social assistance