Sharing resources within the household: a multi-country microsimulation analysis of the determinants of intrahousehold "strategic weight" differentials and their distributional outcomes*

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Abstract

Equal intra-household sharing is still assumed by the vaste majority of applied analyses in welfare economics. Few pieces of work have tried to depart from the equal sharing hypothesis, but their impact has been limited by lack of data or restricted application to special cases. This paper proposes a new framework to derive sharing rules based on individual bargaining power. The latter is defined for each household member as the share of resources gained by the household due to his/her presence. The causes of power differentials and their impact on income distribution are analysed in four EU countries presenting significantly different tax-benefit systems: Finland, Italy, Germany and the United Kingdom.

Key Words : intra-household sharing, tax-benefit systems, microsimulation

JEL Classification : C70, D1, J16, H31.

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1 Introduction

The traditional approach to household decision making and intra household allocation processes has been challenged in the past 15 years by several contributions attempting to study such processes from both a theoretical and empirical perspective. Yet no agreement seems to emerge over a framework for modelling multi member household decision making and resource allocation. The analyses continue to be polarized between partisans of the unitary approach, who conceive the household as a single utility maximizing agent (Samuelson, 1956) or a group of individuals headed by an altruistic individual maximizing the collective welfare (Becker 1974), and partisans of a collective approach who prefer treating the household as a set of individuals with diverging as well as converging interests (Manser and Brown, 1980, McElroy and Horney, 1981, Bourguignon, 1984, Chiappori, 1988, 1992 and Bourguignon et al. 1993, Lundberg and Pollack, 1993).

The principal appealing feature of the collective model is that it provides a single framework for the analysis of decision making process and intra-household allocations. The spouses engage in a bargaining process which not only affects their behaviour, but also each spouse's well being. On the contrary, in the unitary approach, the intra-household allocations rely on exogenous (to the household decision process) assumptions concerning equivalence scales and equal sharing. These assumptions rely often on the equal sharing hypothesis that, as shown by several authors (i) has no theoretical foundation, (ii) does not a priori descend from the unitary model itself and (iii) has been rejected by statistical evidence (for a review, see Behrman, 2003).

Another appeal of collective approach is particularly evident inasmuch as the coexistence of converging/diverging interests and preferences within the household allows, differently from the unitary model, for an explanation of dynamic aspects of household formation and household dissolution.

Both unitary and collective models provide testable restrictions that guarantee the consistency of data with the underlying theoretical framework for decision-making. In studies adopting a unitary approach symmetry and negative semidefiniteness of the Slutsky matrix have been systematically rejected using both labor supply (Blundell and Meghir, 1986, and Blundell and Walker, 1986) and household consumption data (Blundell, 1988). The 'income pooling hypothesis' (implied by the unitary approach) has also been empirically rejected (Thomas, 1990, Schultz, 1990 and Fortin and Lacroix, 1997).

Collective models, on the other hand, tend to have less stringent Slutsky matrix implications (Vermeulen 2002). Empirical tests on restrictions have so far not been rejected (Browning and Chiappori, 1998), and although this result is far from conclusive, some authors advocate that it is time to shift the burden of the proof back to those favoring unitary approaches (Alderman et al, 1995).

Recently several empirical researches have explicitly adopted a collective household approach to analyze labour supply and welfare distribution effects of reforms in the tax-benefit system. Laisney et al., (2002) have developed an estimation technique that allows the identification of a collective model with caring

preferences and non participation. Bargain and Moreau (2002) use this methodology to simulate a tax reform on French data, Carrasco and Ruiz-Castillo (2002) analyze the impact of the 1999 Spanish tax reform and Beblo et al. (2002) simulate the labor supply and welfare impact of introducing the French tax-benefit system in Germany.

These recent papers represent an important contribution to the diffusion of alternative frameworks. Particularly in the field of welfare evaluation, where the unitary approach and the equal sharing hypotheses remain fundamentally unchallenged. Yet the proposed approach is not totally convincing: one of the crucial hypothesis in the model is that individuals in couples and singles have the same preference parameters, so that identification of household members' individual utility parameters relies on estimations on sub sets of single male and female households and on a calibration procedure (Laisney et al., 2002).

This paper provides an attempt to depart from the intra-household equal sharing hypothesis, using a very intuitive idea of intra-household power differentials, which is based on microsimulation techniques. Indeed the latter are powerful instruments whose analytical potentials in the different spheres of economic research have not yet been fully explored (Bourguignon and Spadaro, 2005).

The crucial issue is to derive the strategic weight of each household member, and hence its power in the resource sharing game. More importantly, we look at how power differentials depend on the tax-benefit systems across countries. To this extent we consider four European countries with profoundly different tax benefit systems.

Our approach is similar to what has been done in the game theory literature by Shapley (1953). His index (the Shapley value) captures the importance of adding (or subtracting) a player in a winning coalition of a game (and hence its strategic weight). In the same way, we are concerned with a definition of the strategic importance of each of the individuals in a given household[1].

The benefits of making use of such a measure are multiple: on the one hand it allows for a possible construction of an intra-household resources sharing rule (or at last of its boundary threshold); on the other hand it allows for a comparative analysis of the performance of redistribution systems in equalizing/disequalizing the "bargaining power" of the household members both within and across countries.

Both aspects have indeed crucial implications in terms of equality, gender issues, social justice, inequality measurement and poverty analysis. More interestingly, it may also reveal social planners' preferences about intra-household resources allocation.

The structure of the paper is the following. Section 2 introduces our definition of household members' strategic weight. Section 3 describes data selection and EUROMOD, the microsimulation model used to derive strategic weights. Section 4 presents the results: it analyses power differentials, focusing in par-

[1] The Shapley value has been also applied to the decomposition of inequality by Shorrocks (1999) and Sastre and Trannoy (2002).

ticular on the role of the tax benefit systems. Section 5 analyzes the potential effects of a resource allocation based on strategic weight differentials and section 6 concludes.

2 Determining individual strategic weight

In what follows, let us assume that households simply exist because it is convenient for individuals to aggregate into households, whatever the source of that convenience. Let us for the moment assume that there is no public good and that agents behave in purely egoistic terms. Agents will continue to be part of the household only to the point that this represents a "convenient strategy". In other terms, household members would not accept to "command" a share of resources which is inferior to their marginal contribution to global household welfare. The "power" of each individual within the household is hence determined by a hypothetical counterfactual: it corresponds to the share of resources that would be lost if he or she where to "withdraw" from the household.

In formal terms the power of an individual i may be defined as:

$$\lambda_i = \frac{YD(n) - YD(n-i)}{YD(n)}$$

where $YD(n)$ and $YD(n-i)$ are household disposable income with and without household member i.

Clearly, the individual power depends on two major factors: his/her own original income and the weight attached to him/her by the tax-benefit system. Since disposable income may be divided into gross income and net transfers, we have that:

$$\lambda_i = \frac{GY(n) + NT(n) - (GY(n-i) + NT(n-i))}{YD(n)}$$

or simply:

$$\lambda_i = \mu_i + \tau_i$$

where:

$$\mu_i = \frac{GY(n) - GY(n-i)}{YD(n)}$$

$$\tau_i = \frac{NT(n) - NT(n-i)}{YD(n)}$$

Here, we are not concerned with the power per se, but rather the power of each household member relative to the other household members. To this extent power indexes must be normalized in order to be interpreted as a sharing rule:

$$\overline{\lambda}_i = \frac{\lambda i}{\sum_{k=1}^{n} \lambda_k}$$

The following relation also holds:

$$\overline{\lambda}_i = \overline{\mu}_i + \overline{\tau}_i$$

where μ and τ have also been normalized with respect to $\sum_{k=1}^{n} \lambda_k$.

It is not the purpose of this paper to provide a plausible sharing rule. What we propose is rather a lower boundary to every sharing rule, in the sense that whatever sharing rule is actually applied between household members, no sharing rule is likely to produce a more unequal outcome than the one resulting from the pure application of sharing based on power[2] - no matter the degree of egoism of households members.

The previous decomposition allows us to capture the weight that a tax benefit system attaches to each individual in the household, given the prevailing roles in a society in terms of age and gender.

Obviously, the proposed approach suffers from several shortcomings. In the first place we assume that there are no public goods. The share of income devoted to the purchase of public goods is likely to vary across households and to decrease as income increases. Further, research on sharing rules should explicitly recognize the difference between public and private goods and adapt equivalence scales and sharing rules accordingly. Significant insights, in these respects, could come from household expenditure surveys.

Secondly, the treatment of children is not fully satisfactory. The possibility of terminating the household contract is in fact an option available to adult household members, but not to children, especially the younger.

Further research should probably address the issue of how parents bargain over the children's power. It seems a priori likely that the parent who is most likely to obtain the parental responsibility would in some way incorporate children's power. Yet, this opens the issue of how much is actually given to the children. Alternatively, children may be conceived as a sort of public good into which both parents pour resources, before bargaining over how to share residual income.

3 Data selection and microsimulation software

As explained in the previous section, the sharing rule is based on a counterfactual situation. Therefore, in order to determine the sharing rule we need a set of disposable incomes that correspond to household disposable income once each member has been dropped. For this purpose we use EUROMOD, an integrated microsimulation model for the EU-15 countries, which allows the simulation of tax systems and most of those benefits which are not related to past employment

[2] Of course, the previous statement must be interpreted cautiously: young children are not likely to easily withdraw from the household, meaning that one of the parents might incorporate their power, in accordance to which of them is most likely to hold the parental responsibility.

records (mostly family benefits, housing allowances and income maintenance schemes)[3].

Table 1: Total population and selected sub-sample (weighted)

Before selection	Finland	Germany	Italy	United Kingdom
# of individuals	5,086,139	78,956,258	57,206,842	57,443,762
# of households	2,355,000	32,289,963	19,816,115	24,490,138
Afeter selection				
# of individuals	3,046,674	57,934,344	40,976,950	39,245,363
# of households	992,192	19,507,731	12,470,477	13,304,952
Share of total sample				
individuals	59.9	73.4	71.6	68.3
households	42.1	60.4	62.9	54.3

Source: Authors' calculations based on EUROMD

The present paper focuses on four EU countries, namely Finland, Germany, Italy and the UK. The selection of the countries was mainly inspired by the desire to have a sufficiently large variation of tax benefit systems and social models, intended as gender distributions of market and home production roles.

Finnish data are provided by the Income Distribution Survey, which contains a combination of register data and information gathered through interviews by Statistics Finland. The dataset refers to 1998 and contains detailed socioeconomic information for $25,010$ individuals living in $9,345$ households. German data come from the German Socioeconomic Panel (GSOEP) initiated by the German Institute for Economic Research (DIW) in 1984. Unlike Finland, the data are collected yearly through interviews only. The 1998 dataset contains information on $18,772$ individuals living in $7,677$ households. Italian data are collected each two year in the Survey of Household Income and Wealth (SHIW) by the Bank of Italy. In this paper we use the 1995 dataset which contains information for $23,924$ individuals living in $8,135$ households. Finally, data for the UK comes from the Family Expenditure Survey, and is provided by the Office for National Statistics. It collects information over $15,586$ individuals and $6,797$ households over the period 1995-1996.

For each country, we have selected a sample of married and cohabiting adult couples (i.e. aged at least 18) with and without children, irrespective of their activity status. The latter are defined as single persons living with their parents and aged less than 30. The very broad definition is meant not to exclude a significant number of households with grown-up children in Italy. For simplicity

[3]For an detailed description of EUROMOD see Sutherland, (2001)

we excluded single parents and three-generation households. tab.1 shows the sample size for the three countries before and after selection. The share of individuals included into the selection varies from 71.6% in Italy to 59.9% in Finland. The latter is in fact the country with the highest share of single households.

Table 2: Descriptive statistics (selected weighted sample)

	Finland		Germany		Italy		United Kingdom	
	Males	Females	Males	Females	Males	Females	Males	Females
# of adult individuals	989,338	989,338	17,487,514	17,481,694	12,467,897	12,467,897	13,303,374	13,303,374
average age	49.8	47.5	50.1	47.4	50.6	46.8	48.4	45.9
% adults in employment	74.5	69.7	0.67	0.49	65.8	35.8	64.4	53.5
% secondary education	35.09	36.82	39.9	40.0	58.8	54.5	71.5	72.1
% tertiary education	29.57	30.24	33.1	21.8	7.3	6.0	22.2	22.7
% no children	43.9		53.8		28.7		48.8	
% one child	22.2		20.5		27.6		20.2	
% two children	21.8		19.4		32.6		21.9	
% three or more children	12.1		6.3		11.1		9.2	

Source: Authors' calculations based on EUROMOD

Tab. 2 shows some descriptive statistics for the selected samples in the four considered countries. Having selected only heterosexual couples the number of females correspond to the number of males. The average age appears to be very similar across the panel, with females aged around two years less than their male partners. When it comes to the share of males and females in employment, we notice significant variation across the different "social models". Finland's male employment rate is almost 10% higher than that in Italy and in the UK. However, it is in female employment rate that differences are most striking: in Finland the rate of female employment is almost twice than that of Italy, while Germany and the UK are in an intermediate position. Let us recall that the above data refer to a period from the mid to the late 90ties, and that female employment rates have significantly increased over the past years in all countries but Finland. When it comes to household typologies, we notice that childless households are the dominant household typology in all countries but Italy[4]. Indeed, Italy is characterized by a particularly high incidence of households with grown-up children. Finland, Germany and the UK have similar shares of household with one and two children. Finland and Italy, moreover, have a significant share of households with three or more children (above 11%).

[4]It should be noted that childless household may be composed younger couples as well as older couples where children have already left the household.

4 Power index: some results

Tab 3 shows the average (normalized) power index for females, males and children (average power per child). The male-female power differential appears to be lowest in Finland and highest in Italy (the normalized power index for females and males is respectively 0.426 and 0.573 in Finland and 0.345 and 0.655 in Italy), which is broadly in line with our expectations, given the differential in employment rates. The results are more surprising for Germany and the UK. Employment rates in the two countries were quite similar for males, whereas the British female employment rate is somewhat higher than the German one and yet the relative power index for German females is always higher than that of the British women. This is especially true in households with one and two children, where the average power of female spouses is .302 and .265 against .252 and .211 respectively in Germany and in Britain. Evidently other features in the system play at least as an important role as employment rate in explaining gender power differentials. This is especially evident when it comes to children. With the significant exception of Italy, in fact, the latter have almost no original income, so their power is essentially derived from the weight assigned to them by the tax-benefit system. German children enjoy the highest degree of power, whereas Italian children have a power index which is less than half that of German children, in the case of a two-children household (.128 against .059). For a similar household, the power of British and Finnish children lies between such extreme values, with Finland just slightly above Italy. Indeed, British children seem to enjoy a significant degree of power in single-child households, whereas in two and three children household they have significantly less power. This is also the case in Italy, where children in single-child household "command" a share of resources which is almost twice that of children in two or more child households. Germany and Finland show more of a constant pattern.

Average power index differentials, nevertheless, tend not to be very informative, given fundamental heterogeneity of employment statuses and earning capacities in the sampled households. An interesting question concerns the pattern of power differentials with respect to total income. fig.1 and fig.2 show respectively the pattern of power indexes by household disposable income in households without and with children. The profile appears flatter than expected: male spouses in Germany and UK present slightly N-shaped pattern, matched by a slight U-shaped pattern of female spouses. The latter is probably due to means tested benefits in the bottom of the distribution (which takes into account the number of dependants), and to progressively higher female employment rates, as household income increases. Finland, is characterized by a somewhat flatter profile, possibly linked to the homogeneous distribution of female employment rates across all income deciles, except for the last one. Italy, on the other hand, starts with a particularly low female power index, probably due to the lack of income support scheme and low employment rates. The power increases in the second and third deciles, then it decreases, and then it increases again, converging in the last two income deciles towards the level in the other

Table 3: Average power index according to household typology

	Finland			Germany		
	Male	Female	Children	Male	Female	Children
Couples without children	0.574	0.426	-	0.630	0.370	-
Couples with children						
One child	0.528	0.373	0.098	0.542	0.302	0.156
Two children	0.519	0.339	0.071	0.479	0.265	0.128
Three or more children	0.485	0.274	0.067	0.333	0.179	0.142
	Italy			United Kingdom		
	Male	Female	Children	Male	Female	Children
Couples without children	0.655	0.345	-	0.641	0.359	-
Couples with children						
One child	0.636	0.263	0.101	0.586	0.252	0.162
Two children	0.654	0.227	0.059	0.607	0.211	0.091
Three or more children	0.647	0.170	0.056	0.542	0.178	0.080

Source: Authors' calculations using EUROMOD

European countries considered.

When children are present in the household, differences across countries become more evident, and at the same time difficult to interpret. Children's power tend to be quite high in the very bottom income deciles, probably due to a combination of means tested child benefits and tax allowances which represent a significant share of income when the latter is low. As income increases, however, the role of net transfers (reduced tax liabilities and child allowances) come to play a smaller role, and the power of children decreases.

The analysis of the pattern of power indexes across deciles reveals some interesting features:

1. Italy shows the greatest variation of gender power differential: starting from very low levels of power, Italian females recover some power starting from the 5th decile, determining an inverse trend in male power. However, male power in the bottom of the distribution is extremely high, probably due to the lack of public transfers targeting poor households;

2. Finland has an almost constant pattern of power indexes for both males, females and children. The power of the children appears to be somewhat lower than that of children in the other countries, probably owing to greater equality in household income distribution. The gender power differential, on the other hand, is the lowest across the examined countries;

3. Germany is also characterized by a rather flat profile in power indexes. The greatest variation is in the power of children which starts very high and decreases constantly, mainly to the advantage of males. The power of females spouses, on the other hand, increases only slightly across deciles;

4. UK shares a similar pattern with Germany: here however, the progressive

loss of power by children goes hand in hand with a widening of the power gap between male and female partners, probably owing to a fundamentally individualized tax system.

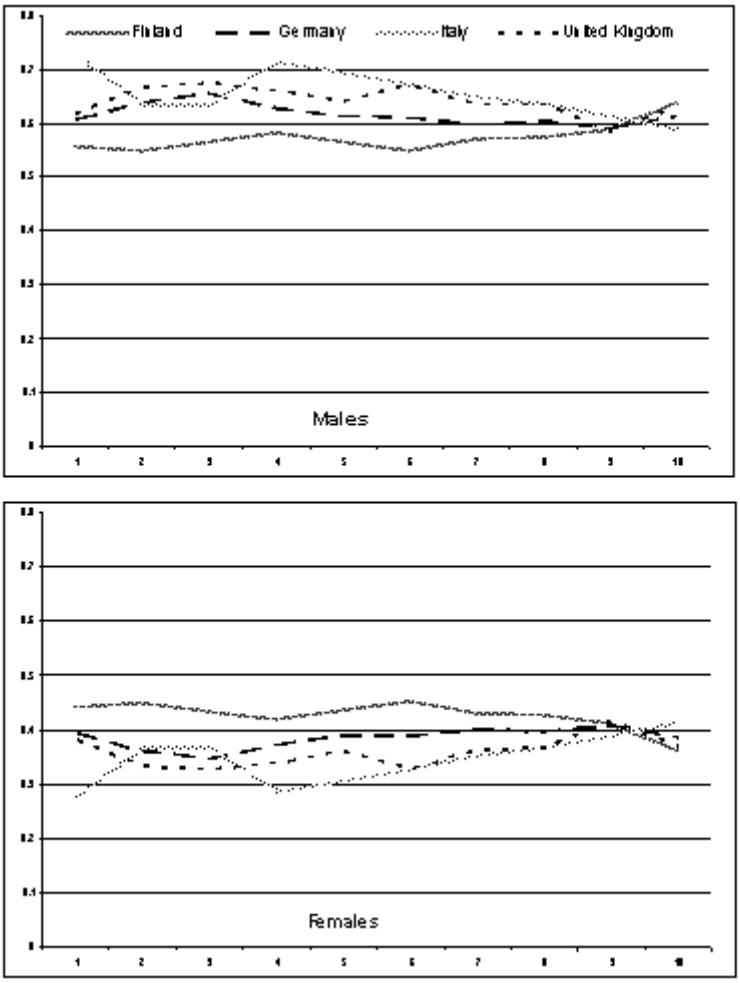
As we can see, such features are mainly driven by differences in the tax benefit system. However, differences in employment rates are also very significant, for both males and females - although differences in the employment rates of the latter are also remarkable. In order to better separate the role of market and state institutions in determining power differentials, it is of interest for households of working age only, to look at power differentials related to female employment status.

4.1 Gender power differentials and female employment

As shown in tab.4, although the relative weight of different household types varies significantly across the countries, spouses and children in similar situations enjoy significantly different degrees of power. For example, females out of employment in Finland enjoy a significant share of power (.356), although the latter could of course be related to previous activity on the labour market. In Germany, also the power index of inactive women is relatively high (.282), whereas in Italy and in the UK, who share an individualized tax system, the power of inactive women is modest (around .20). As expected, when both spouses are in employment, the pattern of power differentials in childless couples is very similar across countries. Observed differences are probably due to gender differences in working hours as well as in the hourly wage, which may penalize women.

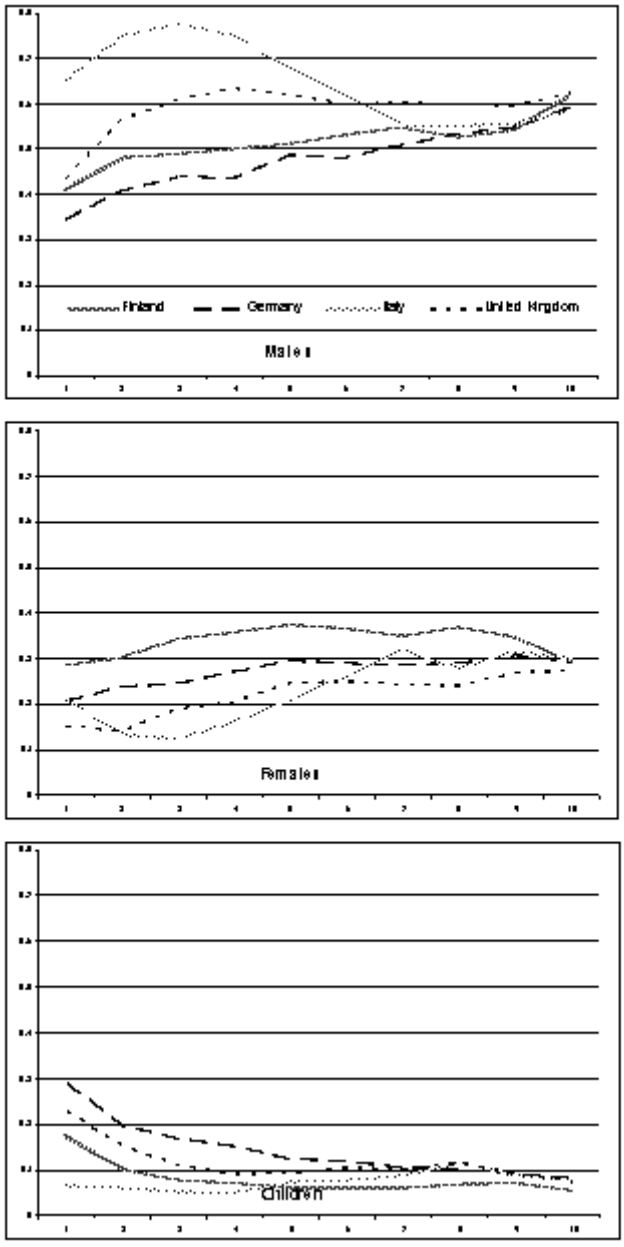
In households with children the relative power of spouses is reduced. Interestingly, however, the presence of children seem to have more of a negative impact on the female than on male spouse. In households where the female spouse is inactive the negative impact is probably due to the relative generosity of the tax benefit system with respect to dependent spouses and dependent children, whereas it is at least likely that in households where females are active, the female partner reduces to some extent her labour supply when children are born, thus reducing her relative power in the household. The figures are relatively similar for Germany and the UK (just above .30), whereas in Finland and especially in Italy females enjoy a somewhat higher degree of power (.363 and .407 respectively), which is consistent with data showing lower part-time female employment rates in the above countries.

The previous table is further disaggregated in the appendix: average power indexes are decomposed according to equivalent household income decile. The following paragraph will look into some detail at the role of net transfers in altering the power differentials that arise from the market.



Source: Authors' calculations using EUROMOD

Figure 1: Pattern of power differentials by household disposable income (households without children)



Source: Authors' calculations using EUROMOD

Figure 2: Pattern of power differentials by household disposable income (households with children)

Table 4: Power indexes (and frequencies) by female employment status

	Finland				Germany			
	Male	Female	Children	*f*	Male	Female	Children	*f*
Childless household								
- female spouse not in employment	0.644	0.356	-	*4.0*	0.718	0.282	-	*12.8*
- female spouse in employment	0.548	0.452	-	*23.9*	0.549	0.451	-	*25.9*
Households with children								
- female spouse not in employment	0.560	0.196	0.132	*10.1*	0.502	0.163	0.183	*23.0*
- female spouse in employment	0.512	0.363	0.069	*62.0*	0.481	0.334	0.115	*38.3*
	Italy				United Kingdom			
	Male	Female	Children	*f*	Male	Female	Children	*f*
Childless household								
- female spouse not in employment	0.817	0.183	-	*6.7*	0.784	0.216	-	*8.9*
- female spouse in employment	0.524	0.476	-	*7.4*	0.566	0.434	-	*24.6*
Households with children								
- female spouse not in employment	0.771	0.085	0.081	*48.5*	0.684	0.076	0.133	*25.4*
- female spouse in employment	0.528	0.407	0.039	*37.4*	0.537	0.311	0.098	*41.1*

Source: Authors' calculations using EUROMOD

4.2 Net public transfers and power

An interesting question at this stage is how much power differentials are affected by the original distribution of incomes, and how much by the tax and benefit system. Following the framework set out above, normalized power indexes have been decomposed for each group into a market component (original income) and into public transfers component (net transfers)[5]. tab.5 shows such decomposition for the four countries.

Italy stands out for the significant role of net transfers in defining the power index in households with no children. This does not come as a surprise: as children tend to stay longer with their families than in the rest of Europe, and family formation tends to be considerably delayed, households with no children are on average older than in the other European countries considered. The net transfer here is positive (on average) for both female and male spouses, although the size of the transfer tend to reinforce power differential of original income. Again, this is not surprising: as old age benefits are employment related they tend to reproduce similar power differential patterns based on original income. This seems to be the case also in Finland. This intuition, nevertheless, should be confirmed by further analysis. In Germany and in the UK, on the other hand, net transfers tend to have a very small average effect.

When it comes to households with children, net transfers tend to be negative. Also in this case, the age structure of the two populations is likely to have an effect, since adults in households with children tend to be active on the labour

[5] Replacement incomes in this case have been treated as net transfers, although arguably, they could be considered as deferred wages.

market.

Germany stands out for the significant role of net transfers in defining the power index. In particular it appears that taxes strongly reduce the relative power of males, whereas the reduction of the relative power of females is much lower, owing to lower labour market participation. At the other opposite, we find Italy, where public transfers seem to play a marginal role in households with children. The size of relative power index basically corresponds to that based on market incomes. This is also consistent with Italian welfare state system, which is highly biased towards pensions. The United Kingdom and Finland, on the other hand, share similar patterns when it comes to households with children: in both cases transfers reduce the relative power of females and males to increase that of children, but females are much less affected than men. Again this is probably due to the interaction of employment rate and earning differentials with progressive taxation.

As in the previous paragraph, it is possible to analyze the role of transfers and original income across income deciles. Fig.3 and fig.4 and 5 show the profile of power indexes by income decile before and after public transfers for households without and with children respectively.

Each decile power index has been decomposed into a market and net transfer component. The figures show how the power index is modified by net transfers: the dotted line represents power index as computed on gross income, whereas the solid line represents the power index as computed on disposable income, i.e. gross income plus net public transfers. When looking at fig.3, the pattern is very similar across all countries: public transfers "stabilize" individual power by increasing the power of individuals in the bottom deciles and slightly decreasing the power in the top deciles. The decile point where the switch in the effect takes place is different across countries: in Italy, for example, net transfers are positive for both men and women up to the ninth decile, this household typology being on average older than the correspondent typologies in the other countries analyzed. In the UK, on the other hand the switch in the effect is in the 5th and 6th decile - probably as a consequence of smaller role of old age benefits. In Finland and Germany the switch come between the 6th and the 8th decile. In a gender perspective, net public transfers have an ambiguous effect. As shown in tab.5, the increase in power is positive for both males and females, but except for the UK, the increase for male spouses is greater than that of female spouses, both in absolute and relative terms. When we analyze the decile patterns, we see that net public transfers constantly increase power differentials based on original income in Finland and in Germany. Original labour market differences are hence replicated through employment related benefits. In the case of Italy, however, net transfers tend to contrast power differentials based on original income in the very bottom and top deciles. In the UK, on the other hand, net transfers reduce gender power differentials in the first two income deciles and increases it in the rest of the distribution.

When it comes to fig.4 and 5, we observe a similar pattern for male and female spouses. Except that now the effect of transfers switches from positive to negative earlier in the distribution. The latter is again due to the different

age structure of households with and without children. Net transfers tend to increase the power of female spouses in all income deciles. Indeed the pattern of female power index is only slightly modified by net transfers, the only exception being Finland, probably due to the high female employment rate.

In the case of children, finally, the previous intuitions are confirmed: in Finland, Germany and the UK public transfers significantly affect the power of children in the first income deciles. However the importance of family benefits shrink in relation to household income as we move across higher income deciles, thus reducing the power of children. Italy has a different pattern: transfers play indeed a limited role in defining their power, which is mostly driven by their own gross income.

Yet, it is not clear how and to what extent each specific element of the tax benefit system is responsible for the observed pattern. This aspect will be clarified in the following section.

4.3 The role of taxes and benefits

In this sub-section we will explore in details how the different instruments in the considered tax benefit systems affect within household power differentials. To this extent we have recurred extensively to the microsimulation model. Instruments have been classified into broad groups: (i) taxes and social security contributions, (2) social assistance and housing benefits, (3) family benefits, (4) old age and sickness benefits and (5) unemployment benefits. For each group of measures we have simulated what the power differentials within the household would be if the measures did not exist. This allows us to estimate the specific contribution of each element of the tax benefit system. Again the analysis was performed on households with and without children.

Tab.6 and tab.7 present the results of such decomposition for households with and without children respectively. The tables have differently shaded ares: pale gray corresponds to positive and negative variations in the interval [0, 0.05], gray corresponds to the interval (0.05,1] and dark grey intervals correspond to variations in the interval $(1,\infty]$. This allow us to immediately see which instruments play a significant role in reshaping intra-household power differentials.

The tax system does not play such a central role: in Finland it appears to be totally neutral, whereas even in Germany, where a joint tax system is in place, the effects seem to be quite modest. This is probably due to an age effect: as this groups include quite a large number of households with pension income, income taxation and especially social security contributions do not play a major role in determining power differentials.

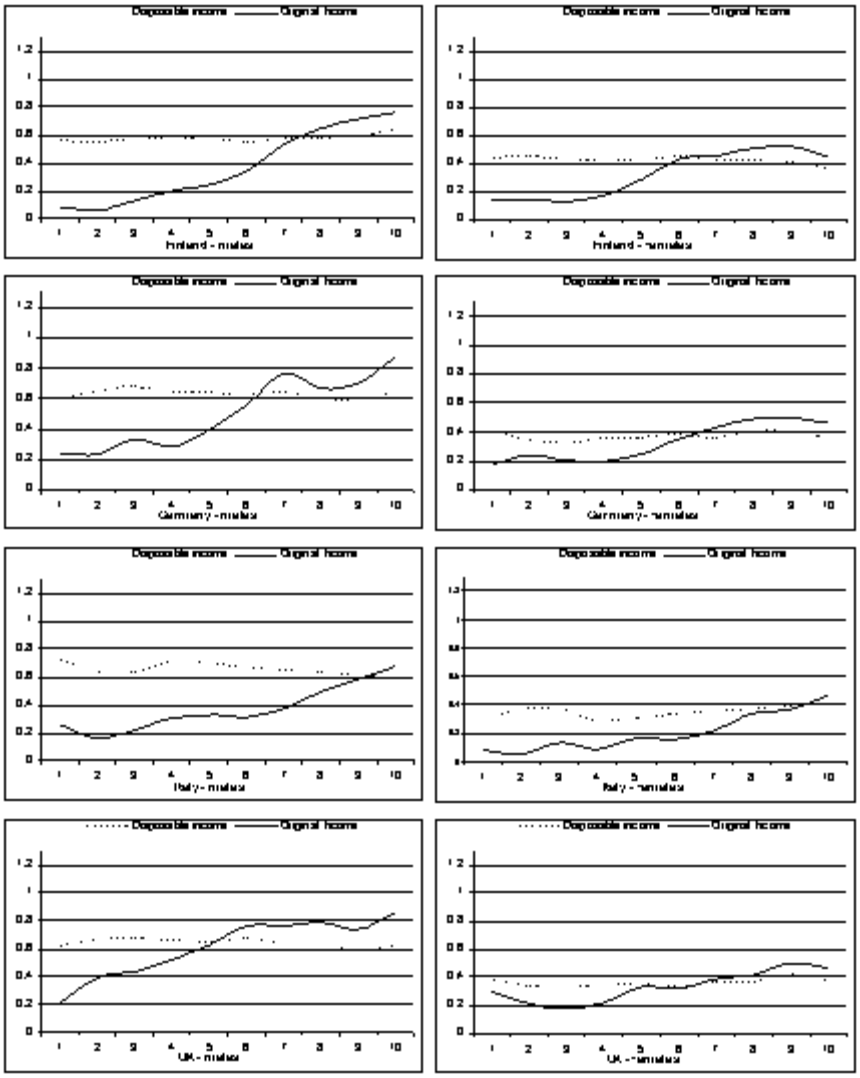
Housing and social assistance benefits also play a smaller role in households without children. As expected, the effect is concentrated in bottom deciles and tend to favor the female spouse (probably due to lower earnings). When it comes to sick, invalidity and old age benefits, strong differences across countries

Table 5: Impact of original income and transfers on the average power of household members per household typology

	Finland			Germany		
	Male	Female	Children	Male	Female	Children
No children	0.574	0.426	-	0.630	0.370	-
Original Income	0.374	0.325	-	0.509	0.331	-
Transfers	0.200	0.101	-	0.121	0.039	-
% change	*53.554*	*31.058*	-	*23.789*	*11.793*	-
One child	0.528	0.373	0.098	0.542	0.302	0.156
Original Income	0.723	0.493	0.050	1.117	0.394	0.075
Transfers	-0.195	-0.120	0.048	-0.575	-0.092	0.081
% change	*-26.924*	*-24.349*	*95.590*	*-51.482*	*-23.374*	*106.993*
Two children	0.519	0.339	0.071	0.479	0.265	0.128
Original Income	0.803	0.471	0.021	1.393	0.370	0.036
Transfers	-0.284	-0.132	0.050	-0.913	-0.105	0.091
% change	*-35.402*	*-28.083*	*241.681*	*-65.571*	*-28.340*	*250.957*
Three or more children	0.485	0.274	0.067	0.333	0.179	0.142
Original Income	0.766	0.377	0.014	1.405	0.292	0.037
Transfers	-0.281	-0.103	0.054	-1.072	-0.113	0.105
% change	*-36.737*	*-27.347*	*393.219*	*-76.296*	*-38.647*	*283.630*

	Italy			United Kingdom		
	Male	Female	Children	Male	Female	Children
No children	0.655	0.345	-	0.641	0.359	-
Original Income	0.373	0.206	-	0.612	0.332	-
Transfers	0.282	0.138	-	0.029	0.026	-
% change	*75.610*	*67.123*	-	*4.814*	*7.905*	-
One child	0.636	0.263	0.101	0.586	0.252	0.162
Original Income	0.675	0.280	0.116	0.863	0.333	0.114
Transfers	-0.040	-0.017	-0.015	-0.277	-0.081	0.048
% change	*-5.854*	*-6.210*	*-12.575*	*-32.121*	*-24.417*	*42.272*
Two children	0.654	0.227	0.059	0.607	0.211	0.091
Original Income	0.775	0.276	0.052	1.026	0.278	0.041
Transfers	-0.121	-0.049	0.007	-0.419	-0.067	0.050
% change	*-15.598*	*-17.608*	*13.333*	*-40.887*	*-24.012*	*121.317*
Three or more children	0.647	0.170	0.056	0.542	0.178	0.080
Original Income	0.748	0.200	0.040	0.850	0.232	0.020
Transfers	-0.101	-0.029	0.016	-0.308	-0.054	0.060
% change	*-13.444*	*-14.617*	*38.764*	*-36.230*	*-23.255*	*305.883*

Source: Authors' calculations using EUROMOD



Source: Authors' calculations using EUROMOD

Figure 3: Power indexes computed on gross market income and disposable income, by income decile (households without children)

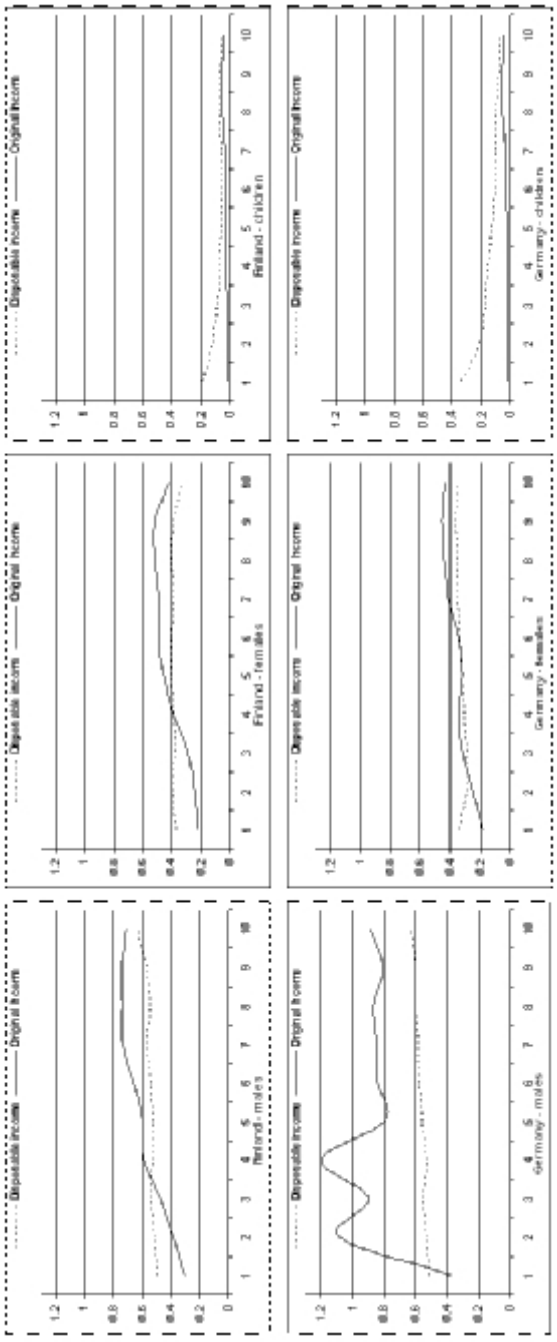


Figure 4: Power index computed on gross market income and disposable income, by income decile (households with children)

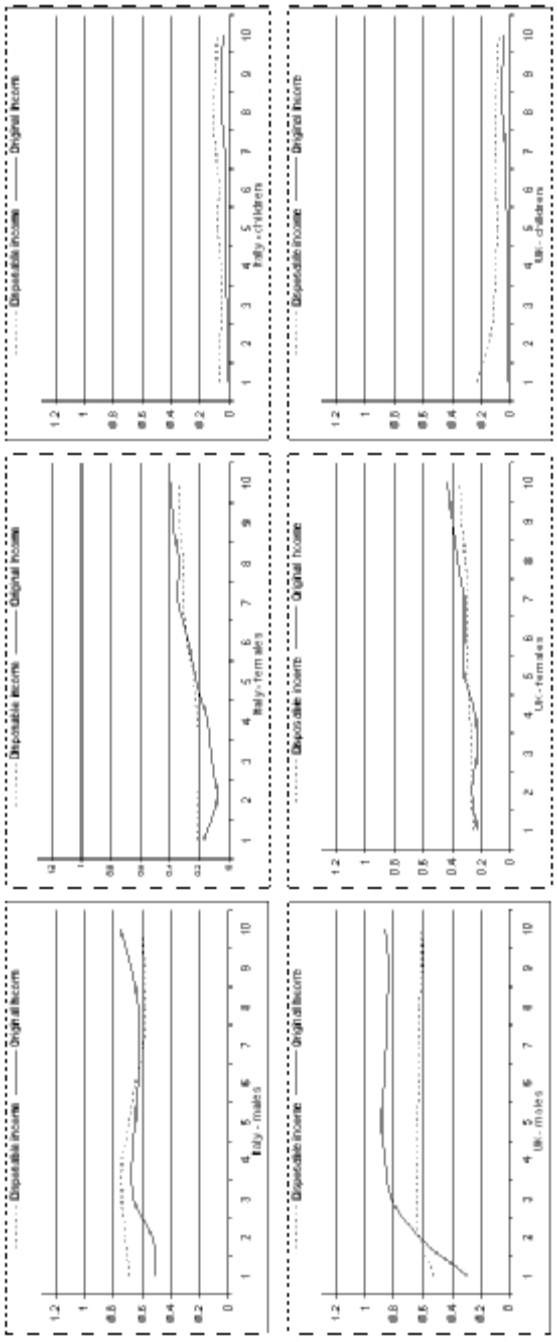


Figure 5: Power index computed on gross market income and disposable income, by income decile (households with children)

Table 6: Effect of different instruments of the tax benefit system on intra-household power differentials (households without children)

	Finland		Germany		Italy		United Kingdom	
	Male	Female	Male	Female	Male	Female	Male	Female
Taxes/ SSC								
1	0.00	0.00	-0.01	0.01	-0.03	0.03	0.00	0.00
2	0.00	0.00	-0.02	0.02	-0.01	0.01	-0.01	0.01
3	0.00	0.00	-0.02	0.02	-0.02	0.02	-0.02	0.02
4	0.00	0.00	-0.01	0.01	-0.03	0.03	-0.02	0.02
5	0.00	0.00	-0.03	0.03	-0.03	0.03	-0.02	0.02
6	0.00	0.00	-0.01	0.01	-0.03	0.03	-0.02	0.02
7	0.00	0.00	0.00	0.00	-0.03	0.03	-0.02	0.02
8	0.00	0.00	-0.02	0.02	-0.02	0.02	-0.01	0.01
9	0.01	-0.01	-0.01	0.01	-0.02	0.02	-0.01	0.01
10	0.01	-0.01	-0.03	0.03	-0.03	0.03	-0.01	0.01
Housing/SA benefits								
1	-0.01	0.01	-0.03	0.03	-0.09	0.09	-0.04	0.04
2	0.00	0.00	-0.02	0.02	-0.05	0.05	-0.03	0.03
3	0.00	0.00	-0.01	0.01	-0.03	0.03	-0.01	0.01
4	0.00	0.00	-0.01	0.01	-0.01	0.01	0.00	0.00
5	0.00	0.00	-0.01	0.01	-0.01	0.01	-0.01	0.01
6	0.00	0.00	0.00	0.00	-0.01	0.01	-0.01	0.01
7	0.00	0.00	0.00	0.00	-0.01	0.01	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Old age/ sickness benefits								
1	0.01	-0.01	0.09	-0.09	0.23	-0.23	0.02	-0.02
2	0.01	-0.01	0.15	-0.15	0.15	-0.15	0.04	-0.04
3	0.01	-0.01	0.13	-0.13	0.19	-0.19	0.01	-0.01
4	0.01	-0.01	0.09	-0.09	0.20	-0.20	0.00	0.00
5	0.01	-0.01	0.08	-0.08	0.16	-0.16	0.00	0.00
6	0.00	0.00	0.07	-0.07	0.15	-0.15	0.01	-0.01
7	0.01	-0.01	0.04	-0.04	0.14	-0.14	0.00	0.00
8	0.00	0.00	0.04	-0.04	0.10	-0.10	0.00	0.00
9	0.00	0.00	0.04	-0.04	0.05	-0.05	0.00	0.00
10	0.00	0.00	0.02	-0.02	0.04	-0.04	0.00	0.00
Unemployment benefits								
1	0.00	0.00	0.01	-0.01	0.01	-0.01	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.02	-0.02	0.00	0.00	0.00	0.00
5	-0.01	0.01	-0.01	0.01	0.00	0.00	0.00	0.00
6	0.00	0.00	0.01	-0.01	0.00	0.00	0.00	0.00
7	-0.01	0.01	0.01	-0.01	0.00	0.00	0.00	0.00
8	0.00	0.00	0.01	-0.01	0.00	0.00	0.00	0.00
9	-0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Authors' calculations using EUROMOD

Table 7: Effect of different instruments of the tax benefit system on intra-household power differentials (households with children)

	Finland			Germany			Italy			United Kingdom		
	Male	Female	Children	Male	Female	Children	Male	Female	Children	Male	Female	Children
Taxes/ SSC												
1	-0.05	-0.04	0.05	-0.11	0.04	0.05	-0.02	0.00	0.01	-0.02	0.00	0.01
2	-0.03	-0.02	0.02	-0.13	0.09	0.05	-0.03	0.01	0.01	-0.03	-0.01	0.02
3	-0.02	-0.02	0.01	-0.11	0.03	0.04	-0.04	0.01	0.01	-0.03	0.00	0.01
4	-0.01	0.00	0.00	-0.17	0.05	0.07	-0.03	0.01	0.01	-0.04	0.02	0.01
5	0.01	-0.01	0.00	-0.10	0.06	0.02	-0.02	0.01	0.00	-0.03	0.02	0.01
6	0.02	-0.01	-0.01	-0.09	0.04	0.02	-0.02	0.01	0.00	-0.03	0.02	0.01
7	0.03	-0.02	0.00	-0.05	0.03	0.01	-0.01	0.01	0.00	-0.02	0.01	0.01
8	0.02	-0.01	0.00	-0.07	0.05	0.01	-0.01	0.02	0.00	-0.02	0.01	0.01
9	0.03	-0.02	-0.01	-0.05	0.03	0.01	-0.02	0.02	0.00	-0.02	0.01	0.01
10	0.07	-0.05	-0.01	-0.05	0.04	0.01	-0.02	0.02	0.00	-0.02	0.01	0.01
Housing/SA benefits												
1	-0.1	0.0	0.1	-0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.1	-0.1
2	0.0	0.0	0.0	-0.2	0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.0
3	0.0	0.0	0.0	-0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	-0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Family benefits												
1	-0.04	-0.03	0.04	-0.10	-0.03	0.03	-0.09	0.00	0.05	0.03	-0.02	-0.01
2	-0.10	-0.02	0.06	-0.11	0.00	0.07	-0.03	0.00	0.04	-0.02	-0.04	0.04
3	-0.05	-0.04	0.04	-0.05	-0.03	0.05	-0.06	0.00	0.03	-0.04	-0.04	0.04
4	-0.05	-0.03	0.04	-0.07	-0.03	0.06	-0.02	0.00	0.01	-0.03	-0.03	0.03
5	-0.05	-0.02	0.03	-0.04	0.01	0.02	-0.01	0.00	0.00	-0.02	-0.02	0.03
6	-0.03	-0.02	0.03	-0.03	0.01	0.02	-0.01	0.00	0.00	-0.02	-0.02	0.02
7	-0.03	-0.02	0.02	-0.04	0.01	0.01	0.00	0.00	0.00	-0.02	-0.01	0.02
8	-0.02	-0.01	0.02	-0.03	0.01	0.01	0.00	0.00	0.00	-0.01	-0.01	0.01
9	-0.02	-0.01	0.01	-0.01	0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	0.01
10	-0.01	0.00	0.01	-0.01	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	0.01
Old age/ sickness benefits												
1	0.00	0.00	0.00	0.02	0.00	-0.01	0.03	-0.03	0.00	0.01	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.03	-0.02	-0.01	0.01	0.01	-0.01
3	0.00	0.00	0.00	0.00	0.00	0.00	0.04	-0.04	0.00	0.00	0.02	-0.01
4	0.00	0.00	0.00	0.00	0.00	0.00	0.04	-0.03	-0.01	0.00	0.02	-0.01
5	0.00	0.00	0.00	0.00	0.01	-0.01	0.03	-0.03	-0.03	0.00	0.01	-0.01
6	0.00	0.00	0.00	0.00	0.00	-0.01	0.07	-0.02	-0.04	0.00	0.01	0.00
7	0.00	0.00	0.00	0.01	0.00	-0.01	0.05	0.00	-0.04	0.00	0.00	0.00
8	0.00	0.00	0.00	0.01	0.00	0.00	0.07	0.00	-0.05	0.00	0.01	0.00
9	0.00	0.00	0.00	0.00	0.01	0.00	0.06	-0.01	-0.04	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	-0.02	0.00	0.00	0.00
Unemployment benefits												
1	0.03	0.03	-0.03	0.02	0.01	-0.02	0.01	-0.01	0.00	0.00	0.00	0.00
2	0.01	0.03	-0.02	0.00	0.01	-0.01	0.01	-0.01	0.00	0.00	0.00	0.00
3	0.00	0.02	-0.01	0.01	0.00	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.01	-0.01	0.01	0.01	-0.02	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.02	-0.01	0.00	0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Authors' calculations using EUROMOD

emerge: Italy appears to be a true "pension state": pension benefits significantly increase the power of the male spouse, especially in the very bottom deciles (where other sources of income are less likely to be found). Germany has a similar structure, but Finland and the UK differ substantially: here pension transfers are less important. Pension benefits continue to favour male spouses, but the their impact is rather marginal and concentrated in the bottom deciles. Finally, unemployment benefits do not have a clear cut effect and their overall impact is indeed quite small.

When it comes to households with children the picture gets more complicated. Taxes and social security contributions now do play a larger role: the power of female spouses is slightly increased in Italy in the UK and, especially, in Germany. The power increase is somewhat stronger in bottom deciles, which is probably due to increasing female employment rates when moving towards higher deciles of household disposable income. Children also benefit from the tax system. This is particularly true in Germany for households in the bottom deciles. In Finland the picture is partially different: the tax system has a negative effects on female power in upper deciles, while the effect of the tax system is positive in bottom deciles.

The effect of family benefits is not surprising: Italy's means tested benefits clearly come out, as the impact is concentrated in the bottom deciles. Furthermore, in Italy and Germany the increase in children's power, related to the presence of family benefits, mainly reduces the power of males (probably due to the very small share of female spouses' earnings in some households with children).

For old age and sickness benefits, as well as for unemployment benefits, the conclusion reached above still hold, except that for this age group the relative importance of the two benefits is reversed. Apart from Italy, very few households with children receive pension incomes. In Finland and in Germany unemployment benefits play a more significant role: they increase the power of both spouses, mainly to the disadvantage of children.

5 The "strategic weight" sharing rule: outcomes

In this section we turn to the consequences of intra-household power differentials. In particular, we have computed inequality and poverty indexes. As stated in the introduction we are not claiming that intra-household sharing is realistically based on power differentials only. Solidarity between household members generates some reallocation from the most powerful to the less powerful individuals. It is nevertheless realistic to interpret the sharing rule based on power differentials as an upper boundary: no matter the degree of egoism of households members, it is unlikely that the actual sharing rule agreed between household members will be more unequal than the sharing of resources

Table 8: FGT indexes for equal and unequal intra-household sharing (households without children)

	Finland			Germany		
	a=0	a=1	a=2	a=0	a=1	a=2
Equal sharing	0.004	0.000	0.000	0.021	0.006	0.002
Male adults	0.004	0.000	0.000	0.021	0.006	0.002
Female adults	0.004	0.000	0.000	0.021	0.006	0.002
Unequal sharing	0.028	0.009	0.005	0.104	0.042	0.027
Male adults	0.012	0.005	0.004	0.026	0.008	0.004
Female adults	0.046	0.012	0.006	0.182	0.076	0.050
	Italy			UK		
	a=0	a=1	a=2	a=0	a=1	a=2
Equal sharing	0.031	0.010	0.006	0.025	0.003	0.001
Male adults	0.031	0.010	0.006	0.025	0.003	0.001
Female adults	0.031	0.010	0.006	0.025	0.003	0.001
Unequal sharing	0.133	0.075	0.049	0.102	0.046	0.031
Male adults	0.018	0.011	0.008	0.026	0.014	0.009
Female adults	0.248	0.138	0.089	0.178	0.079	0.053

Source : Authors' calculations based on EUROMOD

Table 9: FGT indexes for equal and unequal intra-household sharing (households with children)

	Finland			Germany		
	a=0	a=1	a=2	a=0	a=1	a=2
Equal sharing	0.060	0.006	0.001	0.038	0.007	0.002
Male adults	0.019	0.002	0.000	0.025	0.004	0.001
Female adults	0.019	0.002	0.000	0.025	0.004	0.001
Children	0.032	0.003	0.001	0.033	0.005	0.001
Unequal sharing	0.472	0.235	0.141	0.383	0.180	0.103
Male adults	0.021	0.006	0.003	0.071	0.023	0.012
Female adults	0.104	0.027	0.012	0.226	0.078	0.037
Children	0.899	0.462	0.280	0.650	0.328	0.192
	Italy			UK		
	a=0	a=1	a=2	a=0	a=1	a=2
Equal sharing	0.168	0.050	0.023	0.184	0.040	0.012
Male adults	0.066	0.020	0.010	0.066	0.011	0.003
Female adults	0.066	0.020	0.010	0.066	0.011	0.003
Children	0.093	0.028	0.014	0.113	0.018	0.004
Unequal sharing	0.499	0.386	0.321	0.458	0.254	0.164
Male adults	0.031	0.020	0.016	0.034	0.017	0.012
Female adults	0.413	0.274	0.206	0.255	0.124	0.081
Children	0.804	0.648	0.550	0.778	0.439	0.283

Source : Authors' calculations based on EUROMOD

Table 10: Gini indexes under equal and unequal sharing

	Finland	Germany	Italy	UK
Total income inequality (equal sharing)	0.333	0.262	0.367	0.331
Total income inequality (unequal sharing)	0.528	0.441	0.613	0.529
Within group inequality (equal sharing)				
- Male adults	0.338	0.262	0.366	0.329
- Female adults	0.338	0.262	0.366	0.329
- Children	0.305	0.222	0.359	0.309
Within group inequality (unequal sharing)				
- Male adults	0.408	0.311	0.354	0.355
- Female adults	0.349	0.360	0.552	0.442
- Children	0.364	0.405	0.736	0.502

Source: Authors' calculations based on EUROMOD

according to power differentials.

With this caveat in mind, it is interesting to look at differentials across countries. Tab.8 and tab.9, present FGT indexes for households without and with children. The poverty line has been computed once as 60% of median individual income when income is shared equally across members. In fig.8, male and female head count ratios, income gap and income gap squared all have the same value under the equal sharing hypothesis. Poverty rates differ significantly from official statistics as incomes have not been equivalized. When shifting to unequal income sharing, poverty rates go up in all countries. In absolute terms the increase is modest in Finland, but very high in Germany and in the UK and especially in Italy. Interestingly, in Finland, the shift to unequal distribution would make both male and female partners worse off - on average. Poverty risk increases for both members. In the UK average poverty risk is almost unchanged (although the severity of poverty actually increases for men as well), whereas in Germany the increase is hardly significant. In Italy, on the other hand, average poverty risk for male adults decreases, whereas that of females increases substantially.

As it is shown in tab.9, poverty risk increases substantially in households with children: poverty rates vary from 3.8% in Germany to 18.4% in the UK. In the UK and in Italy children present a significant poverty risk even under the equal sharing hypothesis, whereas Finland and Germany have particularly low child poverty rates.

When it comes to unequal sharing, poverty risk and intensity of poverty are highest in Italy, which is followed closely by Finland and the UK. Higher poverty rates are linked to the extremely high poverty rates faced by children. Only the German system seems to attach higher weights to children: poverty risk here is 65%, against almost 90% in Finland and 80% in Italy and in the UK. What is

also surprising, is the poverty risks faced by female adults in Germany: despite the lower participation rates, females face a lower poverty risk in Germany than in the UK. Yet females adults face from three (Finland) to thirteen times (Italy) the poverty risk of male partners.

While in theory the effect of unequal sharing of resources within the household may have ambiguous effects on poverty rates, inequality indexes always increase when the intra-household distribution of resources is unequal. Tab.10 presents Gini indexes under the two sharing hypothesis for both the whole population and population subgroups. Germany presents the lowest level of income inequality, whereas the UK, Finland and Italy have significantly higher Gini coefficients. It is interesting to analyze inequality amongst children: when incomes are shared unequally, inequality amongst German and British children is very high: this is probably due to the relatively important share of resources that children "command" in worse off households (due to the generous income assistance supplements for children). In Finland inequality amongst children is lower, but in Italy it is extremely high: this is probably linked to the heterogeneity of situations amongst children: some of them indeed continue to live with their parents although economically active.

6 Conclusions

This paper has introduced a new framework to analyze intra-household power differentials and sharing rules. The concept of power as strategic weight that is developed is intrinsically connected to the interest of each individual in forming a household: if the level of egoism of some household member were to push towards a more unequal sharing rule than that produced by the power differential, the household member could threaten to leave the household. In this sense the power concept may be useful in determining a lower bound to the inequality that may arise from unequal distribution within the household. Yet the framework is not totally satisfying: not all children have the option of leaving the households, so that one of the parents could end up benefiting from the power of his/her child. Also the proposed framework is completely static: when calculating the power of one of the partners, for example, we did not consider that the other partner could adjust his/her behavior on the labour market. Also, economies of scale in consumption have not been accounted for: although income is shared unequally, it is likely that a part of it will be spent on public goods. It would be reasonable to assume that one part of total household income is consumed for the purchase of non-private goods and services, and that only the residual share is allocated in accordance to power differentials.

With all this limitations in mind, the proposed approach has allowed us to cast some additional light on how resources could potentially be shared within a household, and how sharing arrangements might be influenced by external/internal conditions. Internal conditions mostly concern individuals' labour supply strategies. These definitively play a significant role in determining earning capacity and hence power differentials. However, differences in employment

rates, especially female employment rates, are only one of the factors affecting intra-household sharing. Net transfers, positive or negative, also play a significant role in reshaping power differentials. Tax benefit systems play a positive role in re-balancing power differentials. While some measures are substantially neutral, others tend to reduce existing inequalities and others yet tend to exacerbate the power differentials within the household.

The framework we have developed may therefore represent in itself a straightforward tool to analyze the impact of tax benefit systems on relative strategic weight, compare their effect across countries and - for example - assess the direction of reforms in tax benefit systems that may differently affect the power of individuals within the household.

This approach could also be implemented as a possible way to test and validate sharing rules obtained through estimates from consumption data. If econometric estimates produces more unequal output than the power index (in principle, this should never happens), then it would be interesting to understand the reasons of that.

In a more ambitious perspective, the framework we have developed could be used as a starting point for a more realistic sharing rule that account for dynamic strategies (i.e. responses of individuals to the threat of household splitting), adults' control over younger children and economies of scale in the purchase of public goods and services. These aspects are left for further research.

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7 Appendix

Tab.11 shows the pattern of male and female spouses power indexes by income decile, according to the female spouse employment status in households without children, whereas tab.12 looks at the same pattern in households with children.

Table 11: Power patterns by household income decile and female spouse employment status (households with no children)

		Finland		Germany		Italy		United Kingdom	
		Male	Female	Male	Female	Male	Female	Male	Female
1	Female spose does not work	0.452	0.548	0.435	0.565	0.236	0.764	0.320	0.680
	Female spose works	0.627	0.373	0.524	0.476	0.631	0.369	0.471	0.529
	% change	*0.17*	*-0.17*	*0.00*	*-0.00*	*0.30*	*-0.30*	*0.15*	*-0.15*
2	Female spose does not work	0.392	0.608	0.302	0.698	0.146	0.854	0.207	0.793
	Female spose works	0.509	0.491	0.542	0.458	0.498	0.502	0.578	0.422
	% change	*0.12*	*-0.12*	*0.24*	*-0.24*	*0.35*	*-0.35*	*0.37*	*-0.37*
3	Female spose does not work	0.385	0.615	0.305	0.695	0.125	0.875	0.262	0.738
	Female spose works	0.494	0.506	0.482	0.518	0.767	0.233	0.533	0.467
	% change	*0.11*	*-0.11*	*0.18*	*-0.18*	*0.64*	*-0.64*	*0.27*	*-0.27*
4	Female spose does not work	0.356	0.644	0.225	0.775	0.130	0.870	0.203	0.797
	Female spose works	0.502	0.498	0.511	0.489	0.695	0.345	0.445	0.555
	% change	*0.15*	*-0.15*	*0.29*	*-0.29*	*0.53*	*-0.53*	*0.24*	*-0.24*
5	Female spose does not work	0.360	0.640	0.227	0.773	0.182	0.818	0.145	0.855
	Female spose works	0.495	0.505	0.460	0.540	0.490	0.510	0.438	0.562
	% change	*0.14*	*-0.14*	*0.23*	*-0.23*	*0.31*	*-0.31*	*0.29*	*-0.29*
6	Female spose does not work	0.362	0.638	0.203	0.797	0.167	0.833	0.161	0.839
	Female spose works	0.422	0.578	0.443	0.557	0.444	0.556	0.390	0.610
	% change	*0.06*	*-0.06*	*0.24*	*-0.24*	*0.28*	*-0.28*	*0.23*	*-0.23*
7	Female spose does not work	0.312	0.688	0.220	0.780	0.232	0.768	0.214	0.786
	Female spose works	0.454	0.546	0.454	0.546	0.450	0.550	0.415	0.585
	% change	*0.14*	*-0.14*	*0.23*	*-0.23*	*0.22*	*-0.22*	*0.20*	*-0.20*
8	Female spose does not work	0.360	0.640	0.059	0.941	0.227	0.773	0.174	0.826
	Female spose works	0.454	0.546	0.452	0.548	0.473	0.527	0.426	0.574
	% change	*0.09*	*-0.09*	*0.39*	*-0.39*	*0.25*	*-0.25*	*0.25*	*-0.25*
9	Female spose does not work	0.249	0.751	0.240	0.760	0.257	0.743	0.174	0.826
	Female spose works	0.413	0.587	0.448	0.552	0.444	0.556	0.448	0.552
	% change	*0.16*	*-0.16*	*0.21*	*-0.21*	*0.19*	*-0.19*	*0.27*	*-0.27*
10	Female spose does not work	0.122	0.878	0.228	0.772	0.159	0.841	0.113	0.887
	Female spose works	0.374	0.626	0.404	0.596	0.435	0.565	0.406	0.594
	% change	*0.25*	*-0.25*	*0.18*	*-0.18*	*0.28*	*-0.28*	*0.29*	*-0.29*

Source: Authors' calculations using ELROMOD

Table 12: Power patterns by household income decile and female spouse employment status (households with children)

		Finland		Germany		Italy		United Kingdom	
		Male	Female	Male	Female	Male	Female	Male	Female
1	Female spose does not work	0.224	0.448	0.182	0.312	0.137	0.704	0.114	0.501
	Female spose works	0.352	0.373	0.310	0.324	0.551	0.366	0.244	0.255
	% change	*0.13*	*-0.08*	*0.13*	*0.01*	*0.41*	*-0.34*	*0.13*	*-0.25*
2	Female spose does not work	0.180	0.606	0.176	0.471	0.057	0.820	0.071	0.662
	Female spose works	0.354	0.460	0.317	0.414	0.456	0.437	0.360	0.409
	% change	*0.17*	*-0.15*	*0.14*	*-0.06*	*0.40*	*-0.38*	*0.29*	*-0.25*
3	Female spose does not work	0.179	0.617	0.177	0.431	0.041	0.863	0.071	0.722
	Female spose works	0.380	0.465	0.331	0.430	0.413	0.511	0.299	0.530
	% change	*0.20*	*-0.15*	*0.15*	*0.00*	*0.37*	*-0.35*	*0.23*	*-0.19*
4	Female spose does not work	0.183	0.639	0.158	0.517	0.048	0.857	0.080	0.754
	Female spose works	0.374	0.508	0.327	0.444	0.395	0.526	0.328	0.550
	% change	*0.19*	*-0.13*	*0.17*	*-0.07*	*0.35*	*-0.33*	*0.25*	*-0.20*
5	Female spose does not work	0.159	0.676	0.149	0.571	0.075	0.796	0.049	0.784
	Female spose works	0.397	0.506	0.342	0.475	0.403	0.535	0.319	0.567
	% change	*0.24*	*-0.17*	*0.19*	*-0.10*	*0.33*	*-0.26*	*0.27*	*-0.22*
6	Female spose does not work	0.124	0.701	0.117	0.565	0.084	0.737	0.052	0.818
	Female spose works	0.372	0.535	0.347	0.516	0.408	0.532	0.298	0.576
	% change	*0.25*	*-0.17*	*0.23*	*-0.05*	*0.32*	*-0.20*	*0.25*	*-0.24*
7	Female spose does not work	0.236	0.642	0.131	0.667	0.096	0.652	0.050	0.743
	Female spose works	0.372	0.533	0.365	0.486	0.432	0.522	0.313	0.545
	% change	*0.14*	*-0.11*	*0.23*	*-0.18*	*0.34*	*-0.13*	*0.26*	*-0.20*
8	Female spose does not work	0.173	0.599	0.162	0.695	0.121	0.634	0.050	0.806
	Female spose works	0.367	0.525	0.331	0.540	0.397	0.542	0.287	0.571
	% change	*0.19*	*-0.07*	*0.17*	*-0.15*	*0.28*	*-0.09*	*0.24*	*-0.24*
9	Female spose does not work	0.229	0.702	0.149	0.742	0.141	0.726	0.072	0.834
	Female spose works	0.331	0.564	0.334	0.535	0.383	0.551	0.311	0.568
	% change	*0.10*	*-0.14*	*0.18*	*-0.21*	*0.24*	*-0.17*	*0.24*	*-0.27*
10	Female spose does not work	0.123	0.782	0.175	0.715	0.162	0.666	0.062	0.834
	Female spose works	0.305	0.624	0.316	0.609	0.366	0.567	0.329	0.568
	% change	*0.18*	*-0.16*	*0.14*	*-0.11*	*0.20*	*-0.16*	*0.27*	*-0.27*

Source: Authors' calculations using ELROMOD