

Institutional determinants of justice evaluations

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Introduction

The sense of justice is one of the crucial features that distinguishes human beings from other creatures. The existence and satisfaction of this particular feeling is one of the basic conditions of societal existence. In practice the sense of justice, rather than requiring unconditional equality among individuals, implies ranking of inequalities: considering some of them fair and the others unfair (Alves & Rossi 1978:542). There are several crucial questions regarding the sense of justice as legitimate ranking of inequalities: what is the source of these evaluations? Do they change from one individual to another or do they remain constant within societies? To what extent sense of justice is shaped by institutional conditions of societies?

The empirical work on the determinants of sense of justice as legitimate ranking of inequalities has developed across two lines: first, there are studies which scrutinize the way in which individuals judge the fairness of earnings (for example: Alves & Rossi 1978, Jasso 1989, Kunowich & Slomczynski 2007), second, there is a literature on individual attitudes towards redistribution policies (for example: Alesina & Angeletos 2005, Osberg & Smeeding 2006). One may use both of these fields to scrutinize the sources of justice evaluations.

However, the outcome of research on attitudes towards redistribution policies seems to be based on assumptions which implicitly imply that the sense of justice prevailing in a society is aggregation of individual attitudes whose source either remain unexplained or considered to be indirectly and accidentally determined by decisions of some elites for whom, however, determinants of sense of justice remains obscure. Thus, the research on redistribution attitudes does not provide any analytical tool or conceptualization besides considering the characteristics of individuals as exogenous variables to be used in the scrutiny of sense of justice prevailing in a society. On the other hand, research on individuals' judgment about earnings' distribution points out existence of a societal normative consensus on justice which guides individuals. Findings suggest that although this consensus may differ, to some extent, across subgroups, it still remains influential for the entire societies, thus the implicit suggestion is that the prevailing sense of justice in a society, rather than being a mere aggregation of individual attitudes, might be generated by 'external conditions' to which all members of the society are exposed. This, of course, points out another analytical perspective than the one implied by redistribution attitudes research: the sense of justice is not mere aggregate of individuals' judgments, there is a societal consensus on justice, which seems to be not entirely determined by individuals' characteristics while influencing individuals' justice evaluations.

Therefore, instead of using individuals' characteristics to account for the sense of justice in a society, one may scrutinize the sources of societal normative consensus on justice in order to explain justice evaluations of individuals. In other words, explaining the source of societal consensus without referring to individuals' characteristics would allow us to account for the source of justice evaluations at individual level. This the goal of our paper.

We first review the literature and show that studies on judgments about earnings' distribution provide a useful analytical perspective for comprehending the sources of sense of justice by pointing out the existence of a normative societal consensus on justice. Second we identify some institutional conditions that might be used to account for the normative societal consensus: employment protection legislation, social expenditure, union density and education

system. Third, we develop some analytical tools which allow us to capture the societal consensus on justice quantitatively. These tools deconstruct the societal normative consensus on justice into two distinct components: actual norm and magnitude of consensus. Finally, we establish asymptotic models by using ISSP 1999 survey and OECD statistics in order to explain one of these components (magnitude of societal consensus on justice) by four institutional factors; employment protection legislation, social expenditure, union density and education system. We show that three of these factors do have significant impact on societal consensus on justice, namely, employment protection legislation, social expenditure and education system. The paper ends with detailed interpretation of these findings.

Theoretical Framework

The empirical work on the determinants of sense of justice as legitimate ranking of inequalities has developed across two lines: first, there are studies which scrutinize the way in which individuals judge the fairness of earnings, second, there is a literature on individual attitudes towards redistribution policies. One can argue that earning distribution in a society is the reflection of the stratification which is at least partly legitimized (Hermkens & Boerman 1989: 201-202) whereas redistribution policies are the remedy for those aspects of this stratification that are considered unfair. Thus, judgment of individuals about income distribution and their attitude towards redistribution policies are both crucial indicators of sense of justice. One may use both of these fields to scrutinize the sources of justice evaluations.

Attitudes towards redistribution policies

The scrutiny of the support for redistribution policies mainly focused on characteristics of individuals in order to seek an explanation for various attitudes towards redistribution policies (such as support or opposition). This line of thought appears to be premised on two different assumptions: firstly, there is the assumption that individuals' attitudes are mainly shaped by self-interest considerations, for example, it is argued that individuals who support redistribution policies are those who are most likely to be the beneficiaries of these policies (new 8 p.399). However, there is also "strong evidence that financial self-interest is an insufficient explanation for redistributive attitudes" (Fong 2001:227). Secondly, rather than self-interest, the belief as to the nature of the relationship between effort and outcome is considered to be the main determinant of the attitudes towards redistribution: those who believe the profound role of luck, connections and corruption for advancement in society are most likely to support redistribution policies (Alesina & Angeletos 2004:963). One may of course argue that self-interest based approach to and belief-oriented analysis of the sense of justice can be connected by explaining the former as the source of the latter (Fong 2001:228) . This connection, if considered valid, triggers a question: is it an intrinsic property of human beings to be aware of and act in accordance with their self-interest which, in turn, determines their beliefs and judgments about justice. Obviously, if one rejects this idea then, the source of beliefs about the connection between effort and reward, which shapes one's attitude towards redistribution too remains obscure.

It is clear that if we seek the source of the prevailing sense of justice in a society by appealing to individual level, the source of individual level assumptions would remain unexplained, leading to the ontological assumption that societies' overall position towards redistribution is simply the aggregation of individuals' attitudes which are to be treated as exogenous factors which are either intrinsically present (i.e., self-interest) or shaped by contingencies (i.e., beliefs).

To be sure, possible impact of macro level variables on individuals' sense of justice too has been studied in relation to the attitudes towards redistribution. However this line of argumentation comes short of making a thorough explanation which is qualitatively different from the models based on individual level assumptions. In this regard, the scrutiny of the impact of institutional structures on individuals' attitude has been an important area of research. Certain institutional characteristics of societies such as the type of welfare regime and features of the production system are considered to influence individuals' judgments (Linos & West 2003:394, Esping-Andersen 1997). However, the envisaged mechanism is once again self-interest considerations: "workers with specific skills" are, for example, expected to be "supportive of additional social protection" (Linos & West 2003:395) presumably due to the risk that market fluctuations in the labor market might reduce the demand for their specific skills and oblige them to seek financial aid. Thus, this line of thinking is actually based on individual level self-interest which is either considered as intrinsic property of human or remains as exogenous variable.

Institutional structures is also thought to be influencing individuals' judgment not due to their self-interest concerns but because of the close link between human perception and cognition: any persistent state of existence would be sooner or later normalized by individuals so that the judgment about what ought to be would be increasingly shaped by what is (Marshall *et al* 1999:351, Homans 1974). Obviously this idea, if carried to its logical conclusion, is bound either to lead to a complete denial of individuals' sense of independent evaluation of the surrounding environment thus to the disregard of agency (because such a primacy of the macro level implies that the environment surrounding the individuals is an exogenous/contingent variable emerging without any conscious input from individuals but shapes them gradually and entirely) or leads to a theory of elites which is marked by a contradiction: some individuals (i.e. elite minority) may shape certain institutional structures, such as employment procedures in order to, for example, favor merit based selection so as to generate more efficient market outcomes. The other individuals (i.e., non-elite majority), on the other hand, gradually internalize the logic and consequences of these institutional arrangements and adjust their sense of justice accordingly; considering what is as just. But there is an inevitable question: what makes the elites elite? If there are intrinsic individual qualities that determine whether one would be an elite we are squaring the circle: macro level structures which explain sense of justice at micro level are shaped by micro level intrinsic qualities (i.e., some individuals have an independent sense of judgment). Another question would be this: what determines which consideration (of elites) shapes the institutional structure? Why, for example, desire to create economically efficient institutions should guide the elites rather than yearning for establishing ethically sound structures; what is the source of elite's guiding principle in designing the institutional structure? In this case if it is the environment that determines the guiding principle then we are back to the denial of agency: all individuals at different levels are shaped by macro structures, if it is not the

environment then we have to extend the elite theory: this time one needs to distinguish some elites of elites which determine the guiding principle of elites!

It is clear from these observations that the study of sense justice does not gain a clear analytical framework from the scrutiny of the attitudes towards redistribution policies. In this subfield there is a difficulty in establishing a causal connection between micro (individuals' sense of justice) and macro (environment, institutions) level variables in a consistent way: it remains obscure whether and in which way the macro-level shape and is shaped by individuals' sense of justice.

Fairness of Income Research

The other strand in the sense of justice studies, that is, individuals' judgment on the fairness of earnings, seems to have tackled with the problem of macro-micro connection more directly by asking the question of "whether there is consensus on the norms that govern the distribution of rewards in a society"(Hermkens & Boerman 1989:202). The answer seems to be affirmative: "there is a clear pattern" in society "which reflects the existence of a normative consensus on fairness" (Alves & Rossi 1978:562). Indeed this normative consensus appears to be rather robust: although there are distinctions between subgroups in the way in which they judge fairness of incomes (Hermkens & Boerman 1989:212) vignette based studies do show that differences in the characteristics of individuals who make the judgment on fairness of a given income do explain only a small part of the variation (Alves & Rossi 1978:562). In short, there are differences across groups but still in general individuals in a given society regardless of their individual or group characteristics are guided by a normative consensus (or more accurately by a set of normative consensuses centered around a general one) as they make judgments about the fairness of a given income. This consensus (centered around or creating a general one) is expressed qualitatively and distinguishes the importance of various attributes of individuals in determination of their income, for example, there is an agreement at least in the USA that occupational attainments are to be valued and rewarded more than the educational attainments (Hermkens & Boerman 1989:212) or in judgment of households' income male partners' characteristics should be taken into account more than those of the female partner (Alves & Rossi 1978:562-563).

Against this back ground one may argue that not only individuals' judgment on fairness of income distribution but also their attitude towards redistribution policies may be influenced by a societal normative consensus on what is to be considered just. Indeed there are several principles such as desert (Marshall *et al* 1999:350), contribution (Fong 2001:226) and reciprocity (Fong 2001:242) that might be guiding individuals as they evaluate redistribution policies regardless of their individual circumstances.

Obviously, acknowledging that there is a normative consensus which guide individuals as they make justice related evaluations does trigger some questions: who or what generates this normative consensus? Obviously given the fact that individual characteristics do not play a significant role in subscribing to the normative consensus one may rule out the possibility that being guided by the societal consensus is a mere function of self-interest. However, the other question remains : Do individuals, as suggested by macro level study of attitudes about redistribution, subscribe to this normative consensus, due to the alleged link between cognition

and perception? If the answer is affirmative we face the same dilemma as before: complete denial of agency or an inconsistent theory of elites. We argue that this analytical problem may be tackled by specifying the temporal dimension of causality: the direction of causality for “present” time can be drawn from macro variables to micro variables, that is, at any particular moment it is the societal normative consensus on justice which determines individuals’ justice evaluations not entirely but to a large extent so that in “the long term” the latter to partly influence the former too remains as a possibility.

Having this specification in mind one can see that the idea of societal normative consensus provides an analytical strategy which, unlike the direct focus on individual level characteristics, offers a way to connect macro and micro levels: the sense of justice is not mere aggregate of individuals’ judgments, there is a societal consensus on justice, which seems to be not entirely determined by individuals’ characteristics while influencing individuals’ justice evaluations, thus, instead of using individuals’ characteristics to account for the sense of justice, one may scrutinize the sources of societal consensus on justice in order to explain justice evaluations of individuals. Thus, explaining the source of societal consensus without referring to individuals’ characteristics would also account for the source of justice evaluations at individual level. In this paper, we pursue this strategy.

Institutional determinants of normative consensus on justice

We argue that institutional structures which regulate the income and knowledge are crucial for emergence of a particular normative consensus in a society.

In fact the set of institutions which regulate income have been focus of research: it is, for example, well established the size of social expenditure in a country is positively correlated with the pervasiveness of the belief that contingencies rather than effort plays a crucial role in individuals’ success in life (Alesina & Angeletos 2004:961). Obviously one can argue that, under the light of the discussion above, the line of causality remains undetermined in this correlation. However, once one argues that it is not individual level beliefs that is to be explained but the normative consensus in the society which guides individuals, then it is safe to argue that the social expenditure may be considered as one of the factors which through its impact on income distribution, may be shaping the normative consensus which in turn generates the belief on the profound role of luck in success (of course, with a time-lag social expenditure itself might also be shaped by the normative consensus). In this paper we use share of social spending in GDP as the measure of the size of social expenditure in a country¹.

Of course, the way in which income is regulated in a society is not confined to direct transfers from social expenditure, the legislation which determines the conditions of employment, especially firing & hiring rules, too is of crucial significance for income. Thus, employment security should also be taken into account as one of the factors that might shape the normative consensus. In order to quantify the impact of legislation on regulation of income we use employment protection index².

¹ These numbers are provided by OECD statistics

² This index is estimated by OECD and publicly available in OECD website.

Finally, besides direct intervention of the state in the regulation of income through social expenditure and employment legislation, the bargaining structures may also have their own impact on income. Although one may capture the impact of bargaining structures by examining many different factors (directly by examining bargaining coverage and centralization or indirectly by scrutinizing the role of central banks or procedures of tripartite commissions) we argue that trade unions as non-state institutions that play a role in determination of incomes might capture something quite distinctive, namely, combination of institutional features with a sense of agency. Hence we argue that the level unionization too should be regarded as one of factors that might shape normative consensus in the society³.

Astonishingly the influence of the regulation of knowledge on the sense of justice, and thus, the impact of education systems on normative consensus prevailing in societies seems to have attracted a little attention. To be sure, there is a vast literature on influence of education in society. However, the dominant perspective is rather pragmatic: reducing the influence of education to financial advantages or disadvantages granted to individuals due to their recognized degrees and thereby, in the final analysis, perceiving the impact of education solely through educational attainment of individuals (see Hall & Soskice 2001, Kunivich & Slomczynski 2007:651, [add more](#)). This approach substantially underestimates the possible influence of education as an institution for it only takes into account (only a part of) the impact of the education systems on the educated. However, education systems do not only grant diplomas and thereby create legitimate rankings between individuals but they also shape the collective knowledge and perception by disseminating certain patterns of reasoning while discrediting others (Meyer 1977). Therefore they also influence and shape the thinking process of those individuals who are not educated (i.e. individuals who do not acquire high degrees). Actually, the ability of education systems to legitimize the status of the educated results from their ability to indirectly shape the reasoning of the uneducated. Finally, and more subtly, education systems also grant, at least to those who are educated, a capacity of evaluating the environment, not due to particular choices of content of education, but because of the inevitable gap between what is taught about society within education institutions and what is practiced in real life. One may argue that this gap provides a permanent opportunity for comparison and thus evaluation (it may be this particular gap which in long term allows individuals to challenge and reshape the normative consensus in society). Because of all these arguments our central hypothesis in this paper that education system is one of the most crucial macro level factors in a society that influence or shape the general normative consensus on justice. In order to operationalize the education systems as continuous independent variables we use two indices which show the magnitude of tracking in a system (level of tracking), and its orientation towards occupational education (occupational orientation) (Werfhorst 2009:10-11)

Our aim is to explain the source of societal consensus by using these institutional variables. However there is still a problem, as mentioned above, the normative consensus on justice is expressed qualitatively. Obviously in order to establish an analytical model we need to have a quantifiable expression of normative consensus. Therefore, before we establish our models, we first develop some analytical instruments which would serve this purpose.

³ We use union density figures provided by the OECD statistics

Analytical tools

Osberg and Smeeding (2006), by using a set of questions in the ISSP survey, developed a new approach in order to capture individuals' sense of fairness of perceived income distribution. In the ISSP survey a set of professions which range from the least skilled/low prestige to high skilled /high prestige are listed and respondents asked to mention their opinion about the actual and ideal wage for each given profession. In other words respondents are asked about their perception of "what is" for ten different professions' income and then requested to replace this with "what ought to be". Osberg and Smeeding by using these answers proposed to use the following equation in order to quantify individuals' sense of overall fairness of the perceived income distribution

$$Y^{ought} = \beta_0 + \beta_1 Y^{is}$$

The crucial element in this equation is the slope coefficient β_1 which summarizes respondents' sense of fairness in income distribution. Obviously, $\beta_1 = 1$ means that according to the respondent every single profession is paid what it deserves, that is, what is equals to what ought to be, thus existing inequality in income distribution is fair. On the other hand, $\beta_1 > 1$ hints that according to the respondent some professions (which are already in the relatively high-paid part of the distribution) are paid less than they deserve thus there should be increase in the higher end of the income distribution while the others (which are already in the relatively low-paid part of the distribution) should receive even less⁴. In other words, existing inequality in the income distribution is not sufficiently unequal to be fair thus more inequality is required. Finally $\beta_1 < 1$ hints that respondent is of the opinion that those professions which are currently paid relatively high wages should receive less and the others which receive relatively low wages should be paid more. This means that existing inequality in the income distribution is unfair and more equality is required to reach fairness.

Obviously β_1 reveals the extent to which a respondent desires leveling in income distribution. Hence it may be called *leveling coefficient*.

The kernel density of leveling coefficients, when estimated on country basis, provide a visual and concise description of the general view of the way in which a society evaluates the fairness of perceived income distribution: the modalities in the density distribution reflect various groups in or segments of the society which agree on the required magnitude of leveling in order to reach a fair income distribution. Obviously, under ideal circumstances of societal existence one would expect just a single modality to appear on the point 1 in the density distribution, implying that majority of people in the given society think that income distribution

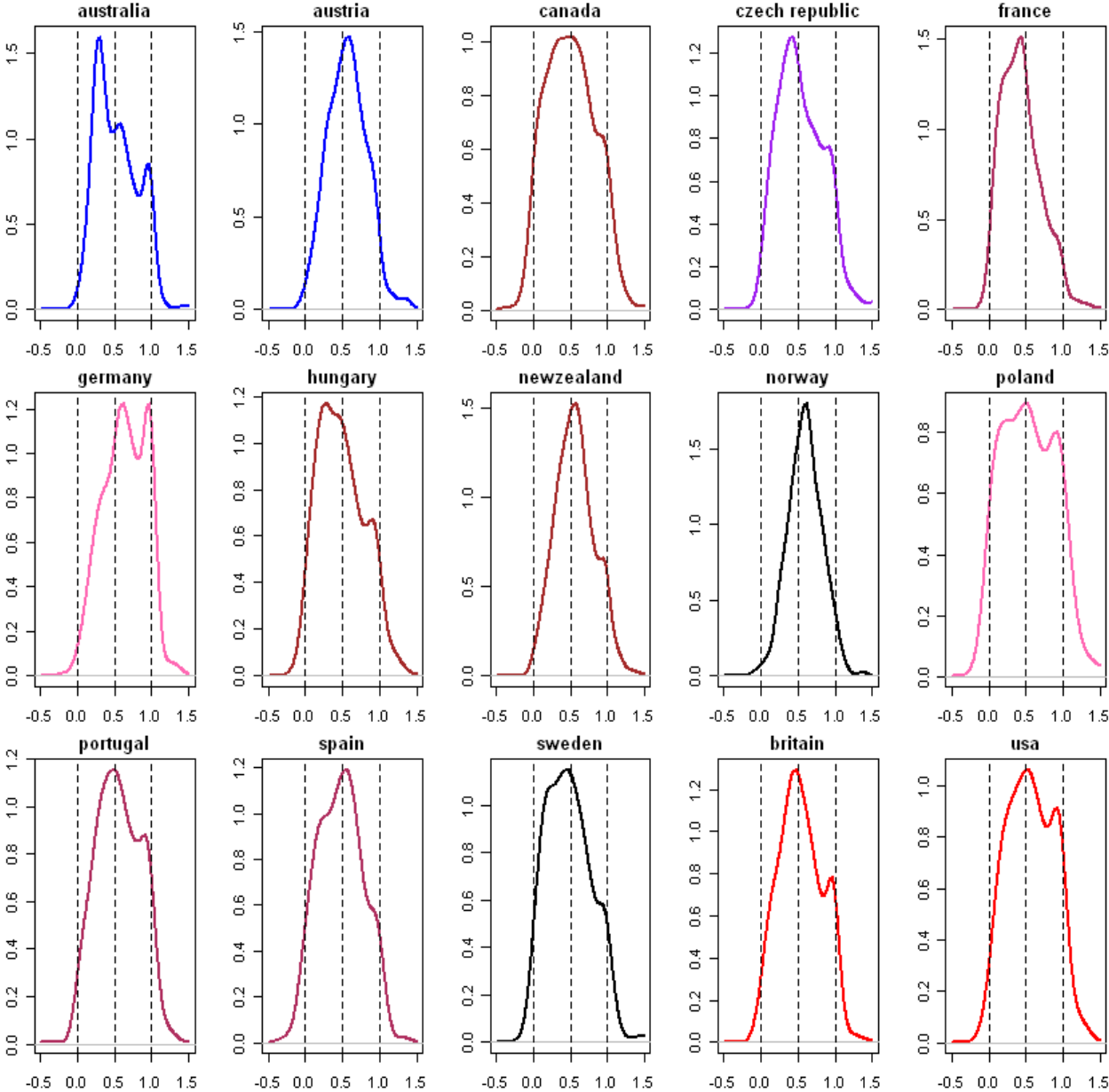
⁴ Those professions whose perceived actual income is lower than

$x = \frac{\beta_0}{1 - \beta_1}$ are relatively low-paid and those professions whose perceived actual income is higher than this value

are relatively high paid professions. This cut-off point is obtained by evaluating the value of x at the intersection between "what is" equals to "what ought to be" line, that is, $Y^{ought} = Y^{is}$, and the line created by the respondents' answers, that is, $Y^{ought} = \beta_0 + \beta_1 Y^{is}$.

as it is perceived is as it ought to be. Therefore modalities in a country-based kernel density of leveling coefficients when they appear on points different from 1 reveal collectively agreed sense of unfairness that is to be corrected by a degree of leveling. Figure 1 depicts the kernel densities of leveling coefficients that we have estimated for 15 countries for which we have data on four institutional variables.

Figure 1: Kernel Densities of leveling coefficients for 15 countries



By reflecting on the kernel densities of leveling coefficients, one may think of two types of tensions in a society: First people may generally agree on the degree of unfairness in income

distribution. This would be seen by emergence of a single modality on top of a point different from 1. Secondly, there may be more than one general opinion as to the degree of unfairness in income distribution. This would result in several modalities in the density of leveling coefficients. Special case of this contingency which is indicative of particularly tense societal existence, would be that modalities would emerge in different sides of 1 (or one of them would be on 1) implying that different groups have qualitatively rather than quantitatively different agreements on the degree of unfairness and thus the required magnitude of leveling in income distribution. Figure 1 shows our estimation of kernel densities of leveling coefficients for 15 countries.

We propose to develop the tool of leveling coefficient further by connecting it to the normative consensus idea and by exploring the analytical properties of country-based kernel densities of leveling coefficients

We argue that normative consensus is actually a two dimensional phenomenon composed by an “actual norm” and a “consensus”: the first component, that is “actual norm” implies a degree of deviation of a group of people from an absolute “normal” in the way in which they perceive the fairness of income distribution in the society whereas the second component, that is, “consensus”, informs us as to the relative size of this group of people compared to the entire society. For the sake of analytical purposes we imagine a completely harmonious society as the one in which all inequality rankings coincide with each other and with the actual situation, then this society’s norm on fairness of income distribution might be stated as “ what is equals to what ought to be”. The kernel density distribution of leveling coefficients provides a set of analytical devices that could be used in operationalization of these conceptualizations:

The modalities in any country-based leveling distribution, as mentioned above, reflect the degree to which various groups perceive the fairness of income distribution. One may argue that each single modality is actually created by combination of two values: distance between the center of the modality (i.e. orthogonal line dropped from the highest value of the modality) from 1 in the x-axis and the distance of this central x-value from the top of the modality which is placed on it, that is, y-value which corresponds to the highest point of the mode. The difference between the first number (central x- value) and 1 , that is $1 - X$ can be perceived as the deviation of the modality from the ideal norm ($x = 1$), which represents absolute normality that captures the judgment that “what is equals to what ought to be” thus $1 - X$ can be used as proxy for “actual norm” of those individuals which create the modality. The second number (i.e., height of the modality), on the other hand, provides a sense of the relative size of the group of individuals who have the actual norm captured by $1 - x$ relative to the entire society⁵. In other words the following entities uniquely capture any particular normative consensus:

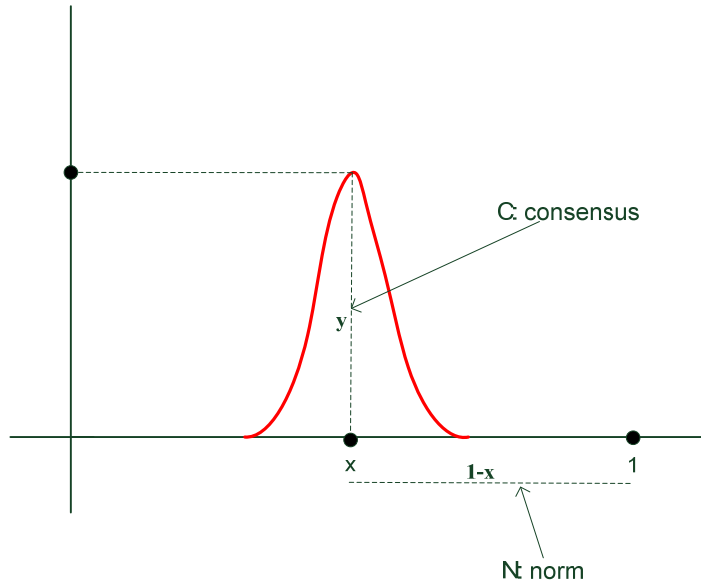
⁵ At first glance the best proxy for capturing the relative size of a group whose actual norm is $1 - X_1$ appears to be the area under the modality. This measure would require to estimate the definite integral for the density function $L(x)$ for the range between a and b where $X_1 \in (a, b)$, that is, $\int_a^b L(x) dx$. This means that one should choose two values (a and b) around X_1 . However any choice of values other than $a=b=0$ would be arbitrary for two reasons:

Firstly, any deviation from the normative point X_1 implies the existence of new normative points. Thus one needs to define neighborhoods around X_1 in which the real norm (i.e. distance from 1) is to be treated as not different from $1 - X_1$ despite the fact that actual norm belongs to the interval $[1 - a, 1 - b]$. This, as we can see, would compel us to

y : Magnitude of consensus $1 - x$: Actual norm (see Figure 1)

As we show in the next section both of these entities can be effectively used in establishment of multivariate models.

Figure 2: actual norm and consensus depicted in a kernel density of leveling coefficients



It is important to keep in mind that y is a relativity measure whose meaning is closely related to the range of the given density that may wildly vary across populations (i.e., subgroups, countries) and susceptible to the impact of extreme values. In other words the magnitude of y is defined by the range of given distribution. Thus two y values obtained from two different densities are not directly comparable. In order to make a robust and meaningful comparison between various y

make an arbitrary definition of normative neighborhood. Secondly, once (and however) this is done another ambiguity would emerge: two normative centers X_1 and X_2 would claim the same neighborhoods around four points (a,b and c, d where $a < c < b < d$) leading to fuzzy measures for consensus, that is: $\int_a^b L(x) dx$ and

$\int_c^d L(x) dx$ would estimate overlapping areas. The solution is to reduce the size of neighborhoods until fuzziness disappears. Only neighborhood with no fuzziness is obviously provided by $a=b=0$. Then the area under $L(x)$ given by the definite integral would vanish into a single line which is the maximum height of the modality, that

is, $\lim_{a \wedge b \rightarrow 0} \left(\int_a^b L(x) dx \right) = Y_{at X_1}$. Hence is our measure.

values one should use $\frac{1}{y}$ in comparative/multivariate statistical models as an indirect measure.

$\frac{1}{y}$ captures a robust information that remains constant across populations: the relative size of any given y compared to 1 unit of x -axis. This particular observation conveys an important fact: whenever y is used as a dependent variable in a model the impact of any given independent variable on y would not be constant. For

the indirect model to be estimated is $\frac{1}{y} = \alpha_0 + \alpha_1 x_1 + \dots + \alpha_i x_i + \dots + \alpha_k x_k$

but what we are interested is the implicit structure that is embedded in this indirect model, namely,

$$y = \frac{1}{\alpha_0 + \alpha_1 x_1 + \dots + \alpha_i x_i + \dots + \alpha_k x_k}$$

and derivative of y in this implicit structure with respect to any given independent variable would include the values of all given independent variables adjusted by their coefficients, that is,

$$\frac{\partial y}{\partial x_i} = \frac{-\alpha_i}{(\alpha_0 + \alpha_1 x_1 + \dots + \alpha_i x_i + \dots + \alpha_k x_k)^2} \text{ (see the footnote}^6\text{)}$$

⁶ It might be useful to reveal this more explicitly in a simple model let $\frac{1}{y} = \alpha_0 + \alpha_1 x_1$. This can be rewritten

as $y = \frac{1}{\alpha_0 + \alpha_1 x_1}$ then we proceed with the usual definition of derivative as limit:

$$\begin{aligned} \frac{\partial y}{\partial x_1} &= \lim_{\Delta x \rightarrow 0} \left(\frac{\Delta y}{\Delta x} \right) = \lim_{\Delta x \rightarrow 0} \left(\frac{y(x + \Delta x) - y(x)}{\Delta x} \right) = \lim_{\Delta x \rightarrow 0} \left[\frac{1}{\Delta x} \left(\frac{1}{\alpha_0 + \alpha_1 (x_1 + \Delta x)} - \frac{1}{\alpha_0 + \alpha_1 x_1} \right) \right] \\ &= \lim_{\Delta x \rightarrow 0} \left[\frac{1}{\Delta x} \left(\frac{\alpha_0 + \alpha_1 x_1 - \alpha_0 - \alpha_1 x_1 - \alpha_1 \Delta x}{(\alpha_0 + \alpha_1 x_1 + \alpha_1 \Delta x)(\alpha_0 + \alpha_1 x_1)} \right) \right] = \lim_{\Delta x \rightarrow 0} \left[\frac{1}{\Delta x} \left(\frac{-\alpha_1 \Delta x}{(\alpha_0^2 + \alpha_0 \alpha_1 x_1 + \alpha_1 x_1 \alpha_0 + (\alpha_1 x_1)^2 + \alpha_1 \Delta x \alpha_0 + \alpha_1 \Delta x x_1)} \right) \right] \\ &= \lim_{\Delta x \rightarrow 0} \left[\frac{1}{\Delta x} \left(\frac{-\alpha_1 \Delta x}{(\alpha_0^2 + 2\alpha_0 \alpha_1 x_1 + (\alpha_1 x_1)^2 + \Delta x(\alpha_1 \alpha_0 + \alpha_1 x_1))} \right) \right] \\ &= \lim_{\Delta x \rightarrow 0} \left[\frac{1}{\Delta x} \left(\frac{-\alpha_1 \Delta x}{(\alpha_0 + \alpha_1 x_1)^2 + \Delta x(\alpha_1 \alpha_0 + \alpha_1 x_1)} \right) \right] = \lim_{\Delta x \rightarrow 0} \left[\frac{-\alpha_1}{(\alpha_0 + \alpha_1 x_1)^2 + \Delta x(\alpha_1 \alpha_0 + \alpha_1 x_1)} \right] = \frac{-\alpha_1}{(\alpha_0 + \alpha_1 x_1)^2} \\ \frac{\partial y}{\partial x_1} &= \frac{-\alpha_1}{(\alpha_0 + \alpha_1 x_1)^2} \text{ hence is the outcome in the main text} \end{aligned}$$

In this expression the change in the sign of the coefficient α_i in numerator is important and should be kept in mind.

In the next section we will first refine our analytical approach and then establish some multivariate models in order to explain magnitude of societal consensus with four institutional variables: employment protection legislation, social expenditure, union density and education system (operationalized by two different indices).

Multivariate analysis

Instead of thinking that institutional conditions in a country generate a single normative consensus for all subgroups, it is more realistic to argue that institutional conditions influence all subgroups in a slightly different way and together with specific characteristics of these groups (such as group's actual norm), they generate a particular normative consensus for each subgroup which are, due to overlaps between subgroups, in close proximity. It is this set of close values which generates the general normative consensus in the society. In other words, because of the differences between subgroups a set of institutional variables generate more than one normative consensus, however, these normative consensus values are quite close to each other due to the inevitable overlap between subgroups.

From a more technical perspective this implies that the overlap between subgroups in a given society accounts for the emergence of a general societal normative consensus as a result of institutional conditions but distinctness of subgroups still generate a variance around this common value. Thus, in order to create a reasonable multivariate model which would explain the influence of institutional factors on normative consensus one should take this variance into account. We argue that by estimating leveling-coefficient densities for a set of partly overlapping and sufficiently distinct subgroups one may scan the range of consensus values prevailing in a society and capture the variance around the main consensus.

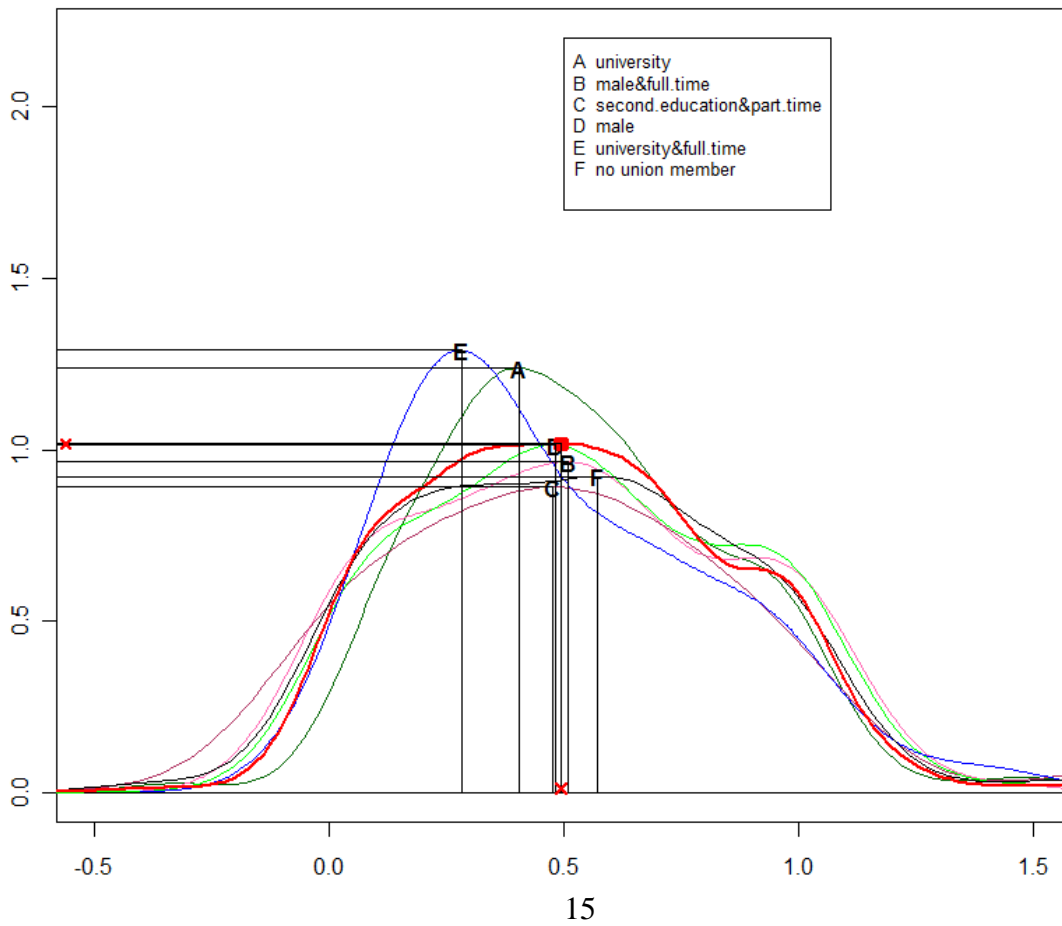
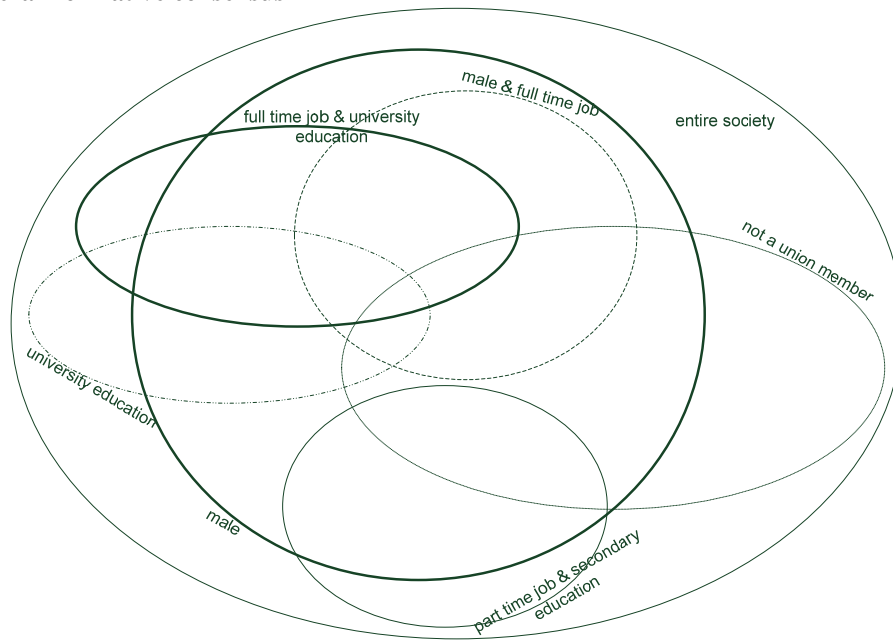
Therefore we choose the following six partly overlapping groups and estimate their leveling coefficient densities for these subgroups in each of the 15 countries:

- A. individuals with university education,
- B. male employees with full time job ,
- C. individuals with secondary education who are employed in part-time jobs,
- D. all male persons,
- E. individuals with university education who are employed in full time job,
- F. individuals who are not affiliated with trade unions

We argue that degree of overlap and distinctness of these subgroups allow us to scan entire range of normative consensus values so as to capture the variation around the general normative consensus in each country. Figure 4 is a simple illustration of the representative capacity of these six groups. Figure 4 illustrates leveling coefficient densities of six subgroups mentioned above in Canada. Note that dots depict the top point of overall density (from which we estimate the common normative consensus) for each country and letters (A, B, C, D, E, F) show the top points of subgroup's leveling coefficient densities . From each top point lines are dropped to x-and y axes to clarify the variation around common norm and consensus values (that are marked by crosses).

For each of the 15 countries which are included in this analysis we estimated separate leveling-coefficient densities for these six subgroups together with the general leveling-coefficient density (i.e., the graph in the lower panel of figure 4 is estimated for all countries). Then we plotted norm values (1-x values) and consensus values (y-values) obtained from all of these densities into a norm/consensus space and created 105 data points which are depicted in the upper panel of figure 5. This means that from each country's institutional setting we generated 7 points in the norm/consensus space, a central value and 6 subgroup values , so as to capture the variation around the normative consensus. This variation is depicted in the lower panel of figure 5 by connecting subgroup values to the central value, the identity of each subgroup can be seen by matching the designation letters with group names as indicated in the legend. As one can see in some countries, such as Germany, variation is quite large while in others such as France it is rather low. It might be of interest to examine the coincidences in this picture: for example, it is clear that normative consensus among university graduates in Sweden coincides quite well with the normative consensus among those individuals in Australia who have secondary education and part time job.

Figure 4: scanning the society by using overlapping subgroups in order to capture the variance around the general normative consensus



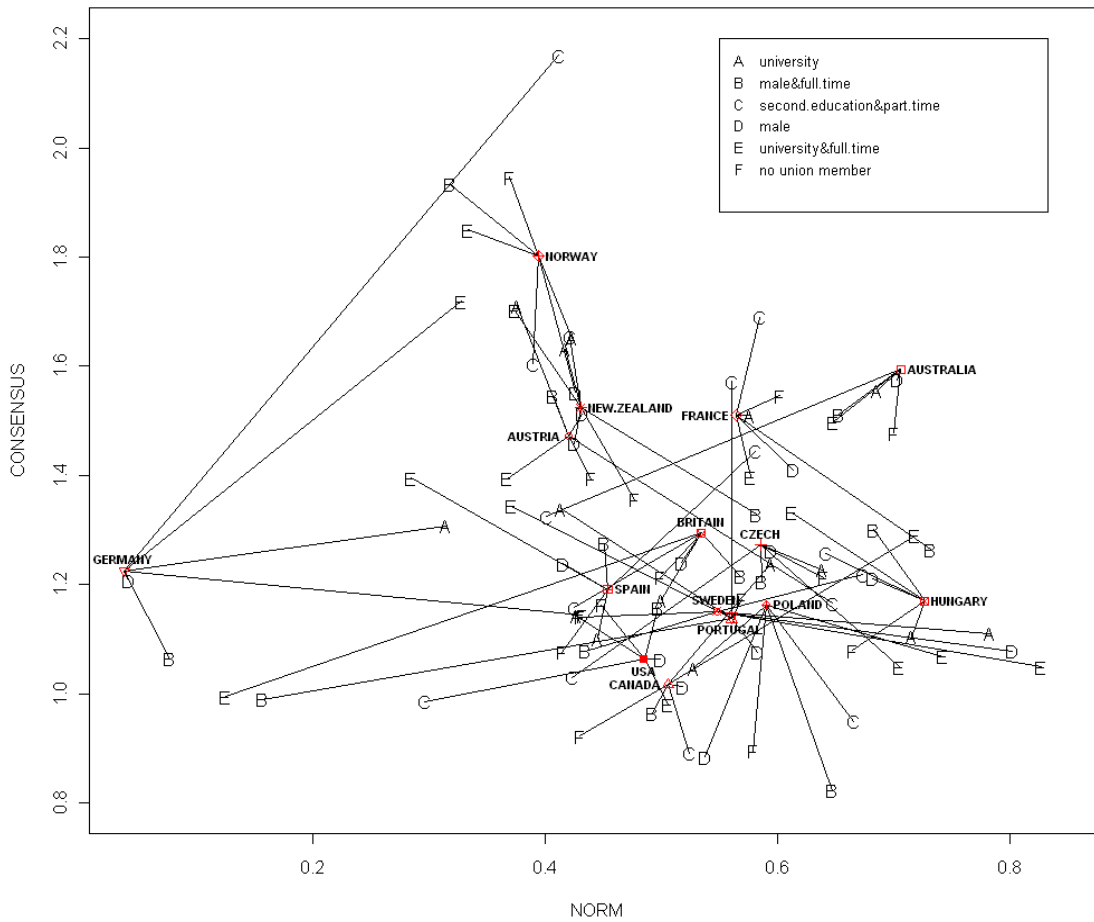
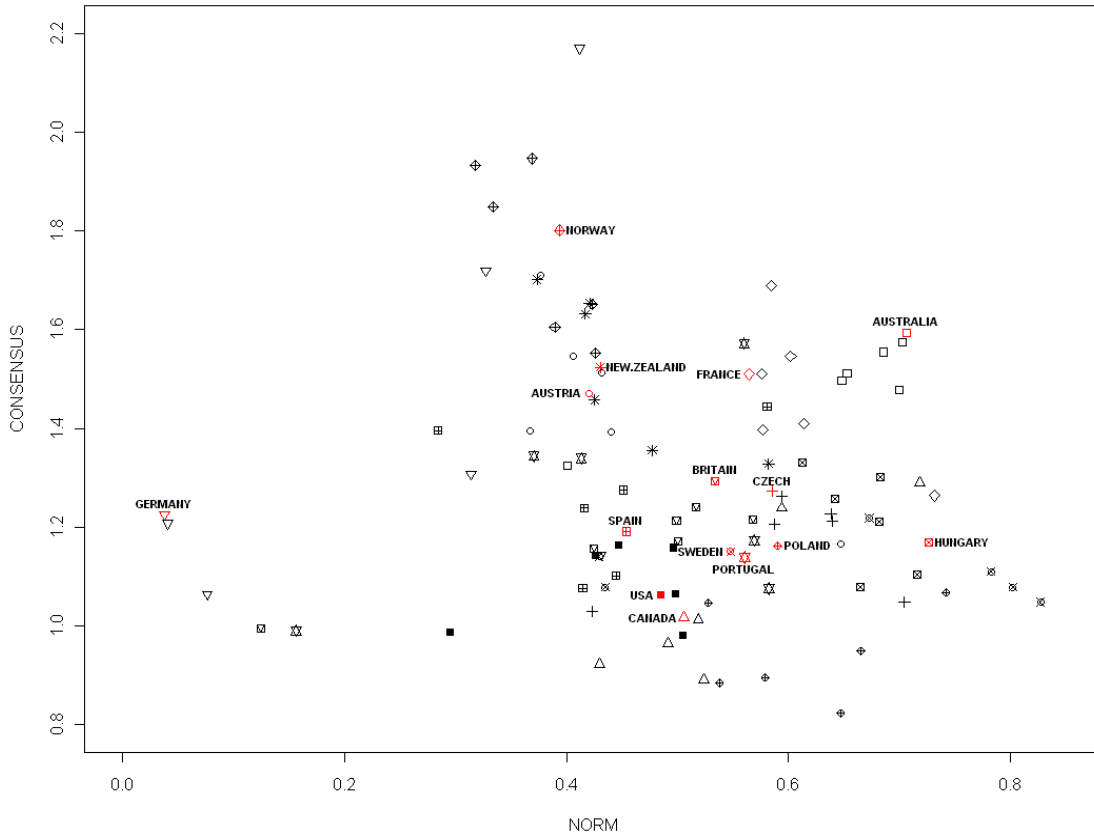
Consensus values (more correctly, the reciprocal of consensus values)⁷ in this space are our dependent variable values which are to be explained by four main institutional variables. However there is a potentially serious problem with the validity of these dependent variable values: we defined 6 sufficiently distinct but overlapping subgroups in order to capture the variation around the general consensus in each country. However, one might argue that neither distinctiveness nor overlap of these subgroups do remain identical across countries, therefore in one country these subgroups may indeed capture the variation around the general consensus quite well while in another country they may just account for a small part of this variation. Thus this particular choice of subgroups (actually any particular choice) is bound to remain to some extent arbitrary.

In order to overcome this problem we used an asymptotic modeling approach, namely instead of using all 105 available values in order to create a single model and interpreting the significant coefficients of this model we used the following procedure in order to obtain limit models:

- i. We selected 80 observations from the norm/consensus space at random
- ii. Estimated an OLS model by regressing consensus values in this set against the corresponding independent variables and subgroup dummies
- iii. Repeated first two steps 1000 times
- iv. Collected probabilities and estimates of each coefficient in each of these 1000 models and created estimate and probability densities for all coefficients
- v. Determined the probability and estimate values corresponding to the asymptotic centers of these densities for each coefficient
- vi. Noted down these values as the asymptotic estimate and asymptotic probability of each coefficient
- vii. Determined the significant variables in accordance with these asymptotic values

⁷ Recall the relativity of consensus value mentioned in the previous section.

Figure 5 : Data points in the Norm & Consensus Space



This procedure filters out all coincidental findings (resulting from, for example, the possibility that chosen subgroups are not capturing the variation in one country but they are too much affected by the variation in another one) and reveals the underlying robust relationship between dependent variable and independent variables.

By using this asymptotic modeling procedure we established four limit models which are depicted in table 1. The first two models in table 1 are established under the assumption that when subgroup differences are neglected we obtain the general consensus value which is entirely generated by the institutional variables, consequently in these models there is no intercept and no dummy (i.e. entire society dummy) for capturing general consensus values. In the second model, besides the institutional factors, we also included the NORM variable⁸ which contains x-values of the data points in the norm/consensus space in figure 5. The idea is that not only macro level variables but also the norm about which a consensus emerges contributes to the magnitude of this consensus. The last two models are more conventional: third one includes intercept but excludes the entire society dummy (for capturing general consensus values) and the fourth one instead of having intercept includes this dummy. It is worthwhile reiterating that the dependent variable in these models is the reciprocal of consensus values obtained from figure 5, thus the impact of independent variables on consensus are not the constant values of estimates mentioned in the table, instead the impact of each independent variable changes in accordance with the values of all independent variables adjusted by the opposite signed coefficient estimates in the table⁹. Therefore the impacts of independent variables are evaluated separately for all four limit models. Here we only give those of the significant variables in second limit model which we think captures the reality best (see figure 6.1 and 6.2). However it should be noted that in all four models at least one of the variables capturing the impact of education system (i.e., level of tracking and occupational orientation index) on emergence of consensus is significant. Thus this general finding validates our central hypothesis that education as an institution is crucial for the normative consensus and thus for the sense of justice.

⁸ It is important to mention an important observation: institutional variables do not explain NORM variable. Applying a similar asymptotic modeling procedure by using NORM as dependent variable generates insignificant asymptotic coefficients for all institutional variables with exception of social expenditure. However this limit model with a single significant coefficient is not stable. Therefore one can safely argue that inserting the NORM variable as independent variable into the models does not create any identification problem.

⁹ Recall that for the model

$$\frac{1}{y} = \alpha_0 + \alpha_1 x_1 + \dots + \alpha_i x_i + \dots + \alpha_k x_k$$

The impact of any independent variable on y (i.e., the derivative of y with respect to given x) is not a constant value but function of all other independent variables in the model. This function is as follows:

$$\frac{\partial y}{\partial x_i} = \frac{-\alpha_i}{(\alpha_0 + \alpha_1 x_1 + \dots + \alpha_i x_i + \dots + \alpha_k x_k)^2}$$

Note the change in the sign in the numerator.

TABLE 1			Continuous Independent Variables					Dummy Independent Variables									
Dependent Variable (Consensus) ⁻¹			<i>Intercept</i>	<i>Employment Protection</i>	<i>Social^{K1} Expenditure</i>	<i>Union Density</i>	<i>Level of tracking</i>	<i>Occupational orientation</i>	<i>Norm^{K2}</i>	<i>University degree</i>	<i>Male & Full-time</i>	<i>part time job & secondary education</i>	<i>male</i>	<i>full time job & university education</i>	<i>no union member</i>	<i>Entire society</i>	
Limit Model I for 1000 submodels	$R_a^2 > 0,9$ Df:69, 11	<i>Asymptotic coefficients</i>		-0.606	0.038	0.0001	0.04	-0.120		0.11	0.171	0.143	0.157	0.117	0.168		
		<i>Center of Asymptotic Probability</i>		0.029	0.000	0.894	0.146	0.000		0.116	0.018	0.033	0.029	0.096	0.019		
		<i>Significance</i>		**	***			***			**	**	**	*	**		
Limit Model II for 1000 submodels	$R_a^2 > 0,9$ Df:68, 12	<i>Asymptotic coefficients</i>		-0.0402	0.0264	0.0001	0.0510	-0.1218	0.5144	0.0628	0.1374	0.1115	0.1082	0.0784	0.1240		
		<i>Center of Asymptotic Probability</i>		0.090	0.000	0.843	0.035	0.000	0.000	0.346	0.032	0.062	0.083	0.191	0.053		
		<i>Significance</i>		*	***		**	***	***		**	*	*		**		
Limit Model III for 1000 submodels	$R_a^2 < 0,8$ Df:67, 13	<i>Asymptotic coefficients</i>	0.3758	-0.0294	-0.1659	0.0018	0.0736	-0.0873	0.0921	-0.0151	0.0468	0.0203	0.0316	-0.0062	0.0460		
		<i>Center of Asymptotic Probability</i>	0.000	0.113	0.000	0.104	0.001	0.000	0.440	0.898	0.324	0.876	0.546	0.883	0.344		
		<i>Significance</i>	***		***		***	***									
Limit Model IV for 1000 submodels	$R_a^2 < 0,8$ Df:67, 13	<i>Asymptotic coefficients</i>		-0.0217	-0.0072	0.0017	0.0706	-0.0752	0.0786	0.9260	0.9897	0.9613	0.9721	0.9337	0.9869	0.9413	
		<i>Center of Asymptotic Probability</i>		0.202	0.203	0.126	0.001	0.001	0.793	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		<i>Significance</i>					***	***		***	***	***	***	***	***	***	***

K1 : Heteroskedasticity problem generated by this variable is solved by an operation of expansion of the entire data matrix by this variable's (8/10)th power in each 4000 submodels

K2: inclusion of this variable into the submodels further stabilizes the error structure

note: all four limit models are significant in their entirety
(see also R_a^2 , that is, asymptotic coefficient of determination values and degrees of freedom for F-statistics)

Figure 6.1 & 6.2 depicts the impact functions of (i.e., varying values of the impact of) significant variables in the second limit model on consensus. Obviously, in reality all independent variables moves at the same time thus it is not possible to observe the relationship between the values of the independent variable and its impact function clearly. Therefore in order to generate comprehensible pictures, as we estimate the values of an impact function we set all independent variables to their overall mean values except the one for which the function is evaluated. In this way we could isolate the relationship between independent variables and their corresponding impact functions and generate Figure 6.1 & 6.2. Note that in each graph the impact is estimated separately for each subgroup and also for the entire society. These specifications provide quite interesting observations.

However, it first useful to be aware of the signs of these impact functions: only employment protection index and occupational orientation of education systems do generate positive valued impact functions while the other variables generate negative valued functions. Positive valued impact function implies that as the independent variable increases it is likely to generate higher levels of consensus at a normative point. This means that there will be a higher point in the density of leveling coefficient due to the increase in this variable. Negative valued impact function, on the other hand, hints the opposite: as the independent variable increases it is likely to degenerate the consensus, that is, the peak (or peaks) in the density of leveling coefficient would be smaller.

The intuition here is this: unless the actual norm about which there is consensus equals to zero (that is x value in the density equals to 1 which implies that income distribution as it satisfies the majority, thus $1-x = 0$), variables with positive valued impact function should be regarded as increasing the tension in the society: for as the value of these variables increases the larger number of individuals do disagree with the existing income distribution in society. That is, the sense of justice does not coincide with the reality for increasingly more people. Thus, under these conditions (that is unless the actual norm is not 1) variables with negative impact function should be considered to ease the tension in the society by preventing high number of individuals to agree on a single actual norm. According to this logic increases in the social expenditure and tracking in education systems contribute to reduction of tension in society but increases in occupational orientation and employment protection index do generate more tension. Of course it is essential here to note that the norm variable itself generates a negative valued impact function. This hints an interesting phenomenon: as the actual norm gets closer to zero (i.e., distance of a peak in the leveling coefficient density from point 1) its value is lower (i.e, it is 'more' negative). This means that it is quite unlikely for large number of people to agree that the income distribution as it is satisfactory. Therefore one may argue that the "unless" condition attached to preceding interpretation of negative and positive valued impact functions is quite robust.

Another important observation about the impact functions is their convexity /concavity: it is clear that employment production index and occupational orientation variables generate convex impact functions, that is, the increase in their impact function is larger than the increase in these variables. This means that as these variables assume higher values they generate more consensus on a normative point (and thus unless this normative point equals to zero, more

tension in the society) compared to their lower values. This is especially evident in occupational orientation variable. Therefore one can argue that increasing occupational orientation of education systems is likely to generate increasingly more tensions in a society. On the other hand, social expenditure and level of tracking variables generate concave impact functions, that is, the increase in their impact functions is less than the increase in these variables. This means that as these variables assume higher values they become less effective in preventing the emergence of high consensus values (thus less effective in preventing tension in society). The fact that concavity is more visible in social expenditure variable implies that after a threshold increasing social spending would be less influential for avoiding societal tension.

[here comes interpretation of the subgroup differences in impact functions]

Conclusion

[summary of the argument and reiteration of findings, ideas for further research]

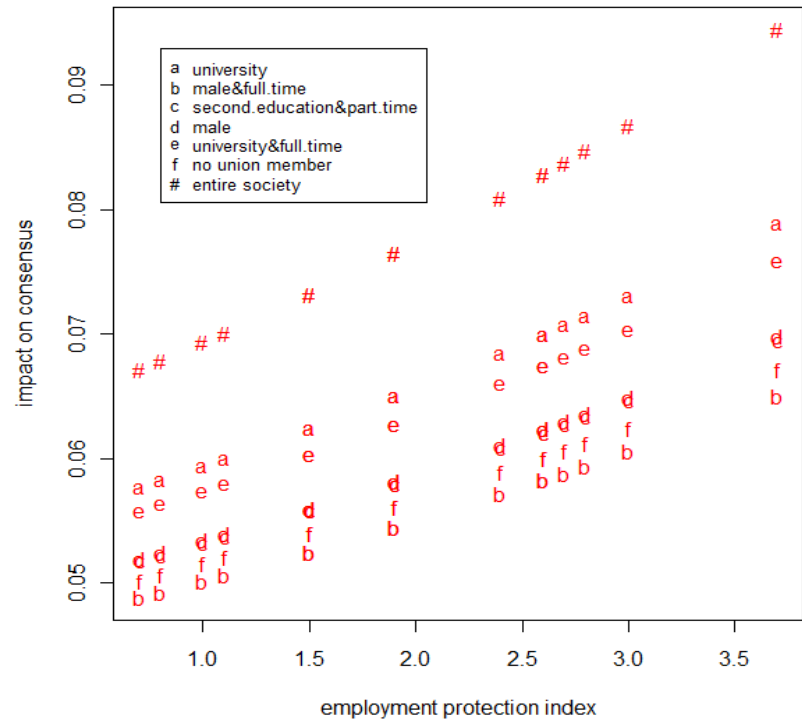


Figure 6.1

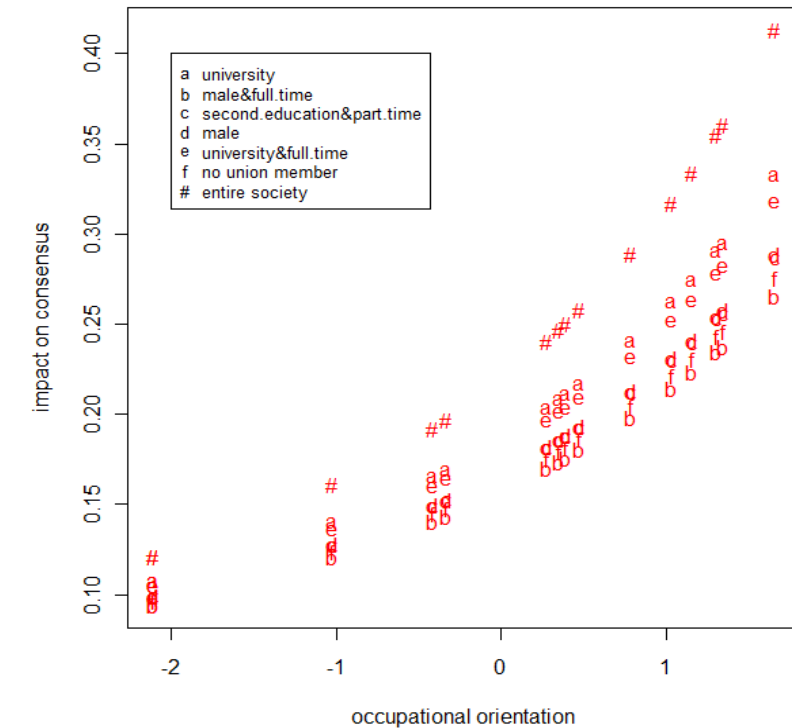
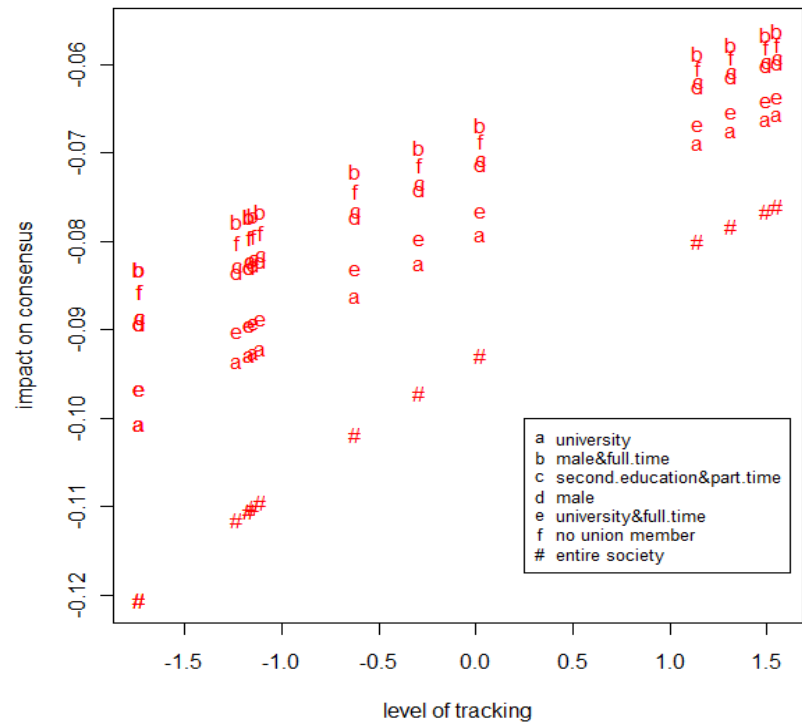
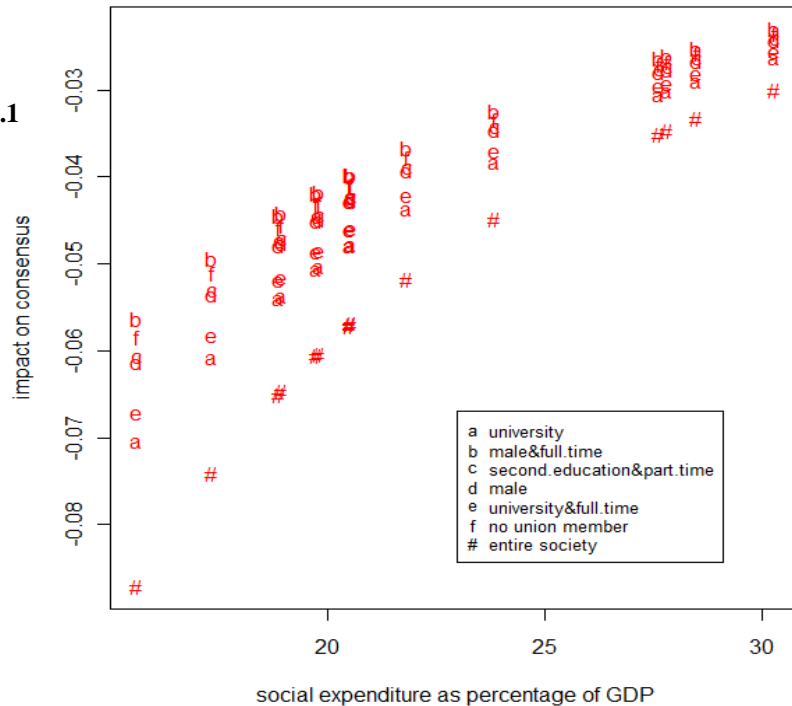
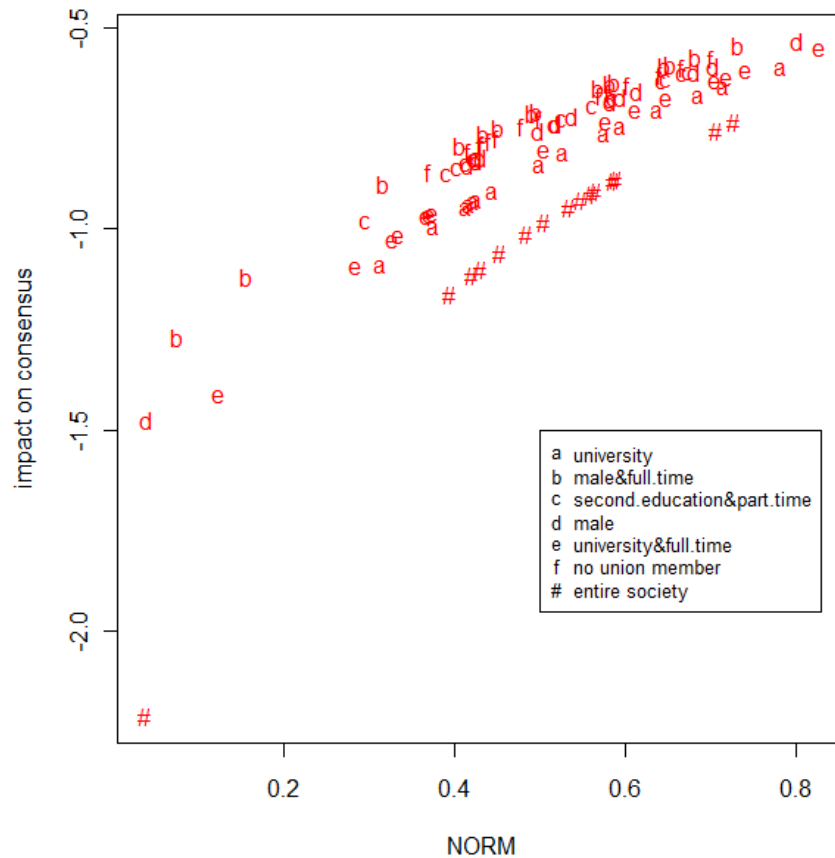


Figure 6.2



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