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Working Paper

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Diskussionsbeiträge, No. 2015-07

Provided in Cooperation with:

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Suggested Citation: Dold, Malte (2015) : Condorcet's jury theorem as a rational justification of soft paternalistic consumer policies, Diskussionsbeiträge, No. 2015-07, Albert-Ludwigs-Universität Freiburg, Wilfried-Guth-Stiftungsprofessur für Ordnungs- und Wettbewerbspolitik, Freiburg

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Diskussionsbeiträge / Discussion Paper Series

No. 2015-07

Condorcet's Jury Theorem as a Rational Justification of
Soft Paternalistic Consumer Policies

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November 2015

Condorcet's Jury Theorem as a Rational Justification of Soft Paternalistic Consumer Policies^{*}

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To appear in: K. Mathis (ed.): Nudging – Theory and Applications, Economic Analysis of Law in European Legal Scholarship, Vol. 3, Springer, Cham/Heidelberg/New York/Dordrecht/London, 2015.

Abstract

The objective of this note is to revisit the meaningfulness of the Condorcet Jury Theorem (CJT) and apply it to the recent debate on liberal paternalism and consumer protection. The CJT consists of two parts, (a) stating that a jury of experts is always more competent than a single expert given a certain level of competence, and (b) asserting that for large juries, the collective competence approaches infallibility. This note argues that these insights suggest the application of a Condorcet jury voting procedure to the case of nudging boundedly rational consumers. The note proposes a simple calculus for finding an optimal jury size and advocates consumers' meta-preferences as the jury's evaluative dimension for designing soft paternalistic policies.

JEL Classification: B41, D03, D63, D71

Keywords: Bounded Rationality, Condorcet Jury Theorem, Consumer Policy, Educative Nudges, Hierarchical Preferences, Knowledge Problem, Liberal Paternalism

^{*} I thank Manfred J. Holler for an in-depth discussion on the draft of the paper and I am grateful for the valuable comments of Christian Schubert, Jan Schnellenbach and the participants of the 4th Law and Economics Conference in Lucerne on Nudging. All errors, of course, remain mine.

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1 Introduction

“The individual at a point in time is assumed to be both a farsighted planner and a myopic doer.”¹

Consumers often do not make rational decisions, either due to natural constraints (uncertainty about the future), a lack of cognitive ability (slow or wrong information processing) or systematic decision biases (loss aversion, anchoring and framing effects, status quo bias, overconfidence, etc.). Recurrent systematic decision biases are especially ubiquitous and often lead to serious economic and psychological welfare losses.² Evidence from behavioural and experimental economics show that our preferences are often unstable, context-dependent and inconsistent with our own long-term preferences.³ We shortly depict incoherent preferences. Being in the role of consumers, we, for example, often overrate our forecasting abilities and underestimate the likelihood of contingent charges such as overdraft fees for bank accounts, lagged payment fees for credit cards, minibar charges in a hotel rooms or roaming charges for international mobile calls.⁴ In such cases, the *ex-ante* overconfidence in our own consuming abilities repeatedly leads to severe *ex post* welfare losses. Therefore, consumers’ cognitive limitations and psychological biases are (besides the classic market failures) another potential source of market inefficiency.

One possible way of tackling the problem of incoherent preferences and systematic decision biases was introduced by Thaler and Sunstein (2003, 2008).⁵ Although not fundamentally new, their approach of libertarian paternalism (which in the literature sometimes also appears under headings like soft, asymmetrical or new paternalism) argues for a purposefully designed choice framing, so called “nudging”, in cases of boundedly rational individuals. Optimally, these nudges are non-monetary incentives in choice situations that de-bias consumers decisions in a predictable and desired way. Thaler and Sunstein think of themselves as advising a choice architect who is in charge of framing the decisions of the individuals that could be “anyone who must design plans for others, from human resource directors to bureaucrats to kings.”⁶ They argue in favour of such an interference with individual decision making when the shaping of

¹ Thaler and Shefrin 1981, 39.

² Kahneman 2011.

³ Camerer, Loewenstein and Rabin 2004; Rabin 2002.

⁴ Armstrong and Vickers 2012.

⁵ Sunstein and Thaler 2003; Thaler and Sunstein 2003, 2008.

⁶ Sunstein and Thaler 2003, 1190.

the choice architecture is in the “best interest” of the affected individuals, and the freedom of choice is preserved, i.e. individuals have the liberty to opt out of the recommended choices at no or only little costs. Thus, libertarian paternalism takes the individual’s own subjective welfare as the basis for regulatory recommendation: soft paternalistic policies shall be designed with the intention that the framings imposed on each individual improves the welfare of that individual as judged by their own light. Therefore, the definition of nudging explicitly excludes legislation or interventions that are dedicated at regulating external effects by directly altering relative prices, i.e. economic (monetary) incentives, through taxes, subsidies or bans.

Thaler and Sunstein’s position evoked a debate on how far policy makers shall go in shaping the choice situation of other people. One of the critics’ main argument is that choice architects, who are in charge of soft paternalist policymaking, might be prone to the very same systematic decision errors, biased beliefs and cognitive flaws like the consumers themselves, just in a more complex way and on a higher organizational level.⁷ Above all, due to the Hayekian “knowledge problem”, policy-making agents cannot know what is in the best interest of the affected individuals, rather the individuals themselves should know their preferences far better than any third party does.⁸

The following note will mitigate this argument against the concept of nudging by pointing to the implications of the Condorcet Jury Theorem (CJT). Given we have a situation of uncertainty and there is a true welfare maximizing means for an individual then the CJT states that (under certain conditions) a jury of experts, whose decision procedure is simple majority voting without any group deliberation, is more competent in finding the welfare maximizing means than the respective individual herself. So the CJT defends Thaler and Sunstein’s notion of liberal paternalism against the critique of the knowledge problem and enriches their approach in two ways: (a) it can be taken to normatively justify soft paternalistic interventions and (b) it gives a hint who should be in the position to make suggestions about paternalistic consumer protection policies, namely, a jury of experts.

Most of the recent work on the Jury Theorem only deals with its formal robustness when altering the theoretical assumptions but not with the very fundamental question of the jury size.⁹ Since this is a crucial issue for practical implementation, this note offers some initial reasoning on the optimal jury size when considering expected transaction costs in form of individual decision error costs and monetary compensation for the jurors.

⁷ Glaeser 2006.

⁸ Rizzo and Whitman 2009; Schnellenbach 2012; Sugden 2008.

⁹ Kaniovski 2010; Kaniovski and Zaigraev 2011; Peleg and Zamir 2012.

The structure of the note is as follows: After presenting the knowledge problem as a widespread point of criticism against the notion of soft paternalism in part 2, part 3 introduces the Condorcet Jury that can sidestep most of the difficulties emanating from the knowledge problem. Part 4 then discusses a simple model for finding the optimal jury size and advocates educative nudges in order to minimize expected social costs. Before concluding, part 5 proposes consumers' meta-preferences as the jury's evaluative dimension in order to rebut some possible critique.

2 Libertarian Paternalism and the Knowledge Problem

In the aftermath of Thaler and Sunstein's articles, many authors have raised objections to the use of behavioural economics to normatively justify paternalism. From a philosophical point of view, some critics complain that libertarian paternalism circumvents attempts of rational persuasion in that it does not appeal to critical thinking of consumers but simply "shapes" their choices in a predefined direction.¹⁰ Furthermore, many critics believe that libertarian paternalism lacks a clear welfare criterion that a paternalistic policymaker could follow to define the desired choice direction.¹¹ Some critics also question the political legitimacy of nudging. They argue that libertarian paternalistic policies shift the responsibility of policymakers to the level of individual decision-making. Therefore, nudging can be seen as a form of "obfuscation policy" that circumvents democratic control.¹²

Taking a traditional economic viewpoint, critics doubt the efficiency-enhancing character of soft paternalistic interventions since, in the long run, such interventions would hinder learning processes and reinforce the status quo.¹³

One of the most serious points of criticism, however, concerns the problem of knowledge collection or information aggregation. Critics argue that Thaler and Sunstein do not sufficiently answer the question who should be in the position to frame individual decisions and how these policymakers should have access to the knowledge needed to implement soft paternalist policies.¹⁴

For instance, Sugden (2008) argues that Thaler and Sunstein's libertarian paternalism presupposes a wise social planner with the ability to collect information about individuals' true

¹⁰ Hausman and Welch 2010.

¹¹ Grüne-Yanoff 2009; Grüne-Yanoff 2012; Mitchell 2005.

¹² Holler 2015.

¹³ Glaeser 2006; Schnellenbach 2012.

¹⁴ Rizzo and Whitman 2009; Schnellenbach 2012; Sugden 2008.

points of views that reflect “complete information, unlimited cognitive abilities, and no lack of self-control.”¹⁵ So the planner needs to know about the individuals actual preferences to identify what stimulates her welfare and what does not. Then, guided by that information, she would be able to install the right decision framework to promote the individual good from a neutral point of view – in Smithian terms: the view of an impartial spectator.¹⁶ Yet, Sugden argues that such a planner notoriously will fail since no person or organizational body can distinguish between a person’s expressed preferences that potentially could be biased and her true desires. Similarly, Rizzo and Whitman (2009) propose that policymakers do not have access to the kind of knowledge needed to impartially implement welfare-enhancing paternalist policies and quote Hayek that such kind of knowledge does usually not

“[...] exist[s] in concentrated or integrated form, but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess.”¹⁷

In line with Hayek, most of these authors argue for the market as the best welfare creating mechanism since it establishes conditions under which the necessary information is more likely to be mobilized and used. By tacitly approving market transactions, individuals give their rational consent and hereby decentrally maximize overall welfare, which no social planner would be capable of achieving.

However, in putting up this *principle of mutual advantage*, these critics of libertarian paternalism depict an inconsistency in their argument. They believe in welfare maximizing (or enhancing) decisions of individuals on markets *although* substantial findings of behavioural economics demonstrate that consumers on markets repeatedly and systematically behave in irrational ways due to cognitive biases (in the form of loss aversion, anchoring and framing effects, status quo bias, overconfidence, etc.). This irrationality leads to severe individual and collective welfare losses.¹⁸ So given this empirical evidence, consumer sovereignty and market transactions alone should not be the methodological utensils of welfare economics since they cannot answer the question of good, i.e. welfare-enhancing, policies.

In what follows, this note will show that the CJT provides the missing link to circumvent the knowledge problem in paternalistic welfare economics while acknowledging the insights of behavioural economic theory. If its conditions hold, the Condorcet jury is a tool to approach the

¹⁵ Sunstein and Thaler 2003, 1162.

¹⁶ Sugden 2008.

¹⁷ Hayek 1945, 519.

¹⁸ Camerer et al. 2003.

knowledge of a benevolent wise planner that can nourish decentral market transactions of the individuals with soft paternalistic nudges to improve the welfare of individuals by their own standards. Following a Condorcet jury procedure, individuals might be steered away from erroneous consumption decisions while preserving their individual freedom of choice.

3 The Condorcet Jury as a Wise Social Planner

The Condorcet Jury Theorem (CJT) goes back to Marquis de Condorcet and his seminal work *Essai sur l'application de l'analyse á la probabilité des décisions rendues á la pluralité des voix* from 1785. Therein Condorcet argues for a calculus – later called the Condorcet Jury Theorem – that provides a proper guarantee for majority decisions of a parliament or an assembly being correct. In its classic interpretation the CJT is applied to find a common social or moral good,¹⁹ however in this note the new focal point is the quest for “the right” means to achieve individual welfare in consumption decisions. In line with the general logic of libertarian paternalism,²⁰ this note considers a nudge always to be means-oriented, it does not attempt to alter individuals’ ends but rather helps them to order their short-term preferences to achieve their given long-term goals.

In order to grasp the framework of the CJT when it comes to consumption, let us make the following assumptions: There is a group of consumers in which everyone is striving for their own welfare and there are no external effects of consuming goods. Let us simplify and say all individuals are identical and have the same welfare goal Π which shall be a long-term goal like life satisfaction, health, or material welfare. Now there is a finite set of consumption options $C = \{c_1, c_2, \dots\}$ to achieve Π . These options are means to reach the welfare goal and could include daily activities such as spending, saving, insuring, fasting, running, etc. This set C is the same for all the individuals, i.e., it is collectively congruent. The exact identity of the subset $C^* \subset C$ that represents the optimum alternatives is unknown to the individuals. Although the individuals have clear preferences over Π , they themselves are unsure about which subset of C fits best their long-term welfare goal.

Let us now consider a group of experts $N = \{1, 2, \dots, n\}$ and call them “the jury”. The members of this jury also face uncertainty about the best means to bring about Π , yet each juror can rank any pair of means out of the set of consumption options C with respect to what she believes

¹⁹ See, for one, Grofman and Feld 1988.

²⁰ Sunstein 2014, 61.

are their respective effectiveness for fulfilling Π (*criterion of the possibility to rank-order of CJT*). With respect to the choice between any pair of alternative means, every juror $i \in N$ has a probability p_i to be correct in picking the one option that promotes good Π relatively better. With respect to each juror's competence, we assume $p_i > 0.5$, so that a juror is better than a fair coin flip to pick the better option (*criterion of competence of CJT*). Each member of the jury is equally competent, i.e. $p = p_i$ for all i in N (*criterion of homogeneity of CJT*).

The jury's decision procedure is a simple majority rule, i.e., the jury decides between any two alternatives by means of a majority vote. There is no group communication or deliberation among the jurors in order to avoid correlation between the individual votes of the jurors, i.e., the probability that any juror $i, i \neq j$, votes for the better alternative is independent from j 's voting behaviour (*criterion of independence of CJT*). In addition, there is no strategic voting behaviour of the jurors, i.e., each juror votes sincerely in the sense that she reveals her true expert knowledge about the matter and not her personal preferences when deciding about the better alternative (*criterion of truthfulness of CJT*). Moreover, it exists the possibility of a "correct" ordering of means (for example, from best to worst in efficiently bringing about Π), i.e. the jury votes upon matters that contain truth-value (*criterion of truth-aptness of CJT*). In order to make this possible, the ultimate welfare goal Π of the individuals must first be signaled by the individual to the jury. Based on these signaled evaluative parameters, the jury then can vote on the consumption means to best reach welfare goal Π . Hence, the jury's decision is about practical wisdom around the right means to bring about a given end (in Kantian terms: the jury members express a hypothetical imperative in their votes).

If these conditions hold, the CJT states that any jury of odd number of jurors is more likely to select the correct consumption options C^* from C than any single juror, i.e. the probability that a jury majority may vote for the relatively better alternative exceeds p_i (*non-asymptotic theorem*) and the likelihood of picking the correct alternative tends to 1 as the size of the jury approaches infinity (*asymptotic theorem*). So, if there exists a welfare goal that can be signaled to a jury and the jury knows about the available but unsecure consumption options, the outcome of a jury majority voting process is an effective way of identifying the best means of maximizing individual welfare. That is, under our assumptions, the same as collective welfare.

Following Grofman, Owen and Feld (1983), the *CJT calculus* can be formally illustrated as follows.²¹ Let P_N be the probabilistic accuracy that the majority of a jury of size N picks the better means for our group's welfare goal Π in a pairwise comparison of alternatives. If we

²¹ Grofman, Owen and Feld 1983.

assume N to be odd, simple majority m is $(N + 1)/2$. Let p be the individual accuracy level of the jurors. Then, if the jurors vote independently, following the binomial distribution, the jury's probabilistic accuracy is

$$P_N = \sum_{h=m}^N \binom{N}{h} (p)^h (1-p)^{N-h}.$$

If $p > 0.5$, then the majority's probabilistic accuracy is

$$\lim_{N \rightarrow \infty} P_N \rightarrow 1.$$

And if $p < 0.5$, the majority's probabilistic accuracy is

$$\lim_{N \rightarrow \infty} P_N \rightarrow 0,$$

while when $p = 0.5$, then, of course,

$$P_N = 0.5.$$

This shows that when the jurors' have the same accuracy level p , and $p > 0.5$, a jury decision following majority voting is better than a single juror's decision, i.e. $P_N > p_i$ for all N greater than 1. The outcome of the majority vote gets better if one adds more members to the jury since $\lim_{N \rightarrow \infty} P_N \rightarrow 1$. Yet, if the accuracy level of the jurors is $p < 0.5$, i.e. any single jury is more likely to vote *incorrectly*, then it generally holds that adding more jurors makes things worse since $\lim_{N \rightarrow \infty} P_N \rightarrow 0$. In this case the optimal jury would consist of a single member.

The same logic can be applied to the quest for the true best nudging policy. Let us assume that there is a finite set of possible nudging policies $P = \{p_1, p_2, \dots\}$. Such a nudging policy p_i depicts an incentive structure that makes it more likely for an individual to choose a certain consumption bundle from C . We further assume that the jury faces uncertainty about the best $p^* \in P$ that brings about C^* most effectively. Then, if each juror can rank any pair of means out of P with respect to their effectiveness for realizing C^* , and every juror has a probability $p_i > 0.5$ of being correct, then the same *CJT calculus* holds. This time, the best consumption bundle C^* would be the given end, and the right nudge policy p_i the identifiable means. Although this quest for the right nudging policy might require some more expertise on behalf of the jury about how individuals react to incentive structures, there is no fundamental argument against applying the depicted (instrumental) calculus to this question, too.

Even when relaxing some assumptions, the main implications of the CJT still hold. For one, if we assume the jurors to have different competence levels (i.e. a varying p), but average accuracy level is $\bar{p} > 0.5$, and judgmental competence is normally distributed, then the probability of the jury making the correct choice under majority rule still increases to 1 as the group

gets large.²² Further, Kirstein and Wangenheim (2010) illustrate that situations exist in which the individual jurors' accuracy level is smaller than 0.5 but the jury decision generates a higher expected welfare than an individual decision.²³ Kaniovski (2010) demonstrates that allowing for correlation between the jurors voting behaviour, i.e. dropping the criterion of independence, leads to a trade-off so that the probability of the jury voting in favour of the better option increases with the jurors' competency but decreases with positive correlation among their competencies.²⁴

The limitation of the CJT to binary choice settings is much less important than it might first appear. In situations with more than two alternatives, the decision procedures can be decomposed into sequences of pairwise choices without any loss of information.²⁵ In any case, the criterion of truthfulness has to hold, otherwise the main results of the theorem would not necessarily follow anymore.²⁶

For the purpose of this note, let us consider the CJT in its very restrictive version where the jury is homogeneous and there is no correlation since the main implications of the CJT also hold under heterogeneous jury competencies.²⁷ Accepting these assumptions, the convergence of the majority's probabilistic accuracy P_N is strong, e.g. if the individual probability of the jury members is only $p = 0.7$ (which might be a reasonable assumption since we deal with experts) and there are $n = 11$ jurors, then there is a probability P_N larger than 0.9 that the jury picks the correct alternative under majority vote.

Experimental studies of simple majority jury decision rules support these theoretical predictions in the laboratory. Guarnaschelli, McKelvey and Palfrey (2000) find strong experimental evidence for the effectiveness of small juries to find "the truth" (in their study they call it "the signal"). If $p_i = 0.7$, $n = 6$ and there is no group deliberation, then "[u]nder majority rule, the subjects voted the same direction as their signals more than 94% of the time."²⁸ Another experimental study by Ladha, Miller and Oppenheimer (1996) illustrates that judgmental accuracies of majority rule are empirically robust and real juries do even better than predicted by the theoretical results of the CJT. They also show that groups do clearly better than single individuals,

²² Grofman, Owen and Feld 1983.

²³ Kirstein and Wangenheim 2010.

²⁴ Kaniovski 2010. For an in-depth discussion of the criterion of independence, see Berg 1993; Ladha 1993; or Peleg and Zamir 2012.

²⁵ Berg 1996.

²⁶ Feddersen and Pesendorfer 1998.

²⁷ Grofman, Owen and Feld 1983; Berg 1996.

²⁸ Guarnaschelli, McKelvey and Palfrey 2000, 413.

even in an experimental setting that was designed to maximize the advantages of uninformative voting by individuals.²⁹

Given these results, the CJT has found its way back into academic discussion mainly to normatively justify majority decision procedures within representative democratic institutions.³⁰ However, as already indicated by the illustration of the CJT calculus, its insights can also be applied to questions of consumer protection and give reasons to consider jury decisions in cases of boundedly rational individuals. Apart from hard regulatory effort, consumer protection policies are typically designed to nudge consumers so that they are better-off. However, such policies often lack any clear welfare criteria and, above all, miss any evaluative procedure on how to find the right decision framings for welfare-enhancing consumption. Following the implications of CJT, policymakers acknowledge that there are different long-term welfare criteria Π , which they do not decide upon, but which can be signaled to them by the consumers. Given this, a Condorcet jury may be a good evaluative instrument to filter available consumption options C so to best reach the given Π and to subsequently identify an appropriate nudging policy p^* , such that the individuals are more likely to consume C^* .

So, in practice, the Condorcet jury voting procedure would be three-staged when it comes to consumer protection. First of all, consumers have to signal their *long-term* welfare goals to the jury. Secondly, the jury has to elect the best *short-term* consumption bundle by majority rule and, thirdly, the jury votes upon the best choice architecture to frame individual behaviour, again following majority voting. In both of the latter stages, the Condorcet voting procedure is applicable since the underlying evaluative dimensions, i.e. the welfare goal Π and the consumption bundle C^* , are fixed and the assessing issue is truth-apt inasmuch as we deal with questions of practical wisdom. Given uncertainty, at both the second and the third stage, a jury might be the better judge compared to the individuals themselves if the jurors all have a certain level of expertise with respect to the underlying normative dimensions. Then, it follows – even in a situation in which a single consumer might have a higher competence than a single member of the jury – it is reasonable to entrust the framing of the decision to a jury since the jury's majority accuracy level will mostly be higher than the one of the single individual.

Consequently, the CJT can be considered as a rational justification for soft paternalistic framing of consumption decisions. The Condorcet jury approximates a rational self in identifying the best consumption bundle and, by means of the nudging policy, rules out problems of

²⁹ Ladha, Miller and Oppenheimer 1996.

³⁰ Black 1958; Grofman and Feld 1988; List and Goodin 2001; Miller 1986.

bounded willpower or present bias consumption. Therefore, the CJT delivers a counterargument to the critique that a soft paternalistic planer is prone to the very same decision biases as the nudged individual herself.

4 The Optimal Jury Size and Educative Nudges

Given the theoretical insights of the CJT, it would be optimal to establish large juries following the maxim: the bigger, the better. The more experts there are, the more likely a jury would approach infallibility. However, it does not need a lot of skepticism to see that this would be an impractical suggestion. Self-evidently, experts cause economic costs. It is very unlikely that they will give their information pro bono. Installing a jury will cause transaction costs since the jurors want to be compensated monetarily for their expertise and time. Accordingly, a bigger group of jurors N will cause higher costs for the individuals who have an interest in self-regulatory nudging. On the other hand, if we had a bigger jury, the economic costs from decision flaws could be reduced since a larger jury is more likely to install the right kind of decision framework to nudge the individuals to a welfare maximizing behaviour. Considering these aspects, the costs of decision flaws and the transaction costs, we can model both expenses for the individuals depending on the size of the jury of n experts.³¹

Let Φ denote the monetary damage of an individual's decision errors ("the error costs"), whereas a given parameter α indicates the cognitive ability of the respective individual, i.e. a higher α shows that the individual has an adequate expertise in making the right consumption decisions with respect to her welfare goal and so reduces the likelihood of the occurrence of individual decision errors. The probability of the jury members P_N voting correctly is given. It is also homogeneous and significantly higher than 0.5.

Since the likelihood of decision flaws decrease with an increase of jury members, $\Phi(n; \alpha)$ is a probability function decreasing in n , so $\frac{d\Phi}{dn} < 0$. Let us further assume $\frac{d^2\Phi}{dn^2} < 0$, indicating the positive but decreasing effects resulting from the right kind of nudges implemented by a larger jury. This seems to be a realistic assumption since a larger jury approaches a better result but does so in an asymptotic way (see the *asymptotic theorem* above).

³¹ This idea is based on Calabresi's seminal work *The Costs of Accidents* (1970) which deals with efficiency analysis of tort law. Therein, Calabresi argues that the goal of tort law is the minimization of total expected accident costs, which include both the expected cost of the accidents and the spent costs for avoiding the accidents.

Let Ψ denote the transaction costs of the jury experts (“the jury costs”) and β be a parameter that indicates the monetary aspiration level of the experts. Straightforwardly, let us assume $\Psi(n; \beta)$ to be strictly increasing and linear in n , with $\Psi(0) = 0$, reflecting the basic assumption of a homogeneous jury, i.e. $\frac{d\Psi}{dn} > 0$ and $\frac{d\Psi}{dn} = \text{const.}$ For simplification, we assume that there are no other costs for the individuals apart from error costs and the jury costs. Consequently, we can sum up these two forms of costs to get the total costs for the group of individuals, denoting it as Θ :

$$\Theta(n; \alpha; \beta) = \Phi(n; \alpha) + \Psi(n; \beta).$$

The competence effect of a larger jury is depicted in the falling decision error curve $\Phi(n; \alpha)$ and the increasing costs of a larger jury is shown by the ascending jury cost function $\Psi(n; \beta)$. The total cost curve Θ is obtained by summing vertically the two functions $\Phi(n; \alpha)$ and $\Psi(n; \beta)$ at every level of jury size n . Although the negative effects of decision errors would diminish when installing larger juries, the jury costs would naturally increase. So there is a trade-off between the error costs emanating from decision flaws and transaction costs emanating from a larger jury. At small jury sizes, there were almost no transaction costs, but a high likelihood for the occurrence of decision errors. Because the total cost curve $\Theta(n; \alpha; \beta)$ is U-shaped, there is a cost minimizing team size of n individuals, denoted n^* , which follows from the first-order condition:

$$\frac{d\Psi}{dn} = -\frac{d\Phi}{dn}.$$

So at the optimal team size n^* , the marginal costs of one more jury member equals the marginal benefits of a reduction in one monetary unit of the decision errors. Facing this trade-off, individuals will have to accept a certain threshold of decision error costs when designing the optimal size of a jury. The first-best solution in a transaction-cost free world would be at $n \rightarrow \infty$, but considering the positive transaction costs in form of monetary compensating for jurors’ information, n^* turns out to be the second-best solution in the set of achievable jury sizes.

This very stylized discussion shall illustrate the following. First, since the costs arising from decision errors and the jury costs will differ with the individuals cognitive abilities α and the jurors’ monetary aspiration level β , there is not one optimal jury size *for all* soft paternalistic issues. Secondly, these parameters α and β indicate regulating screws, i.e. the political scope, for reducing the total costs.

On the one hand, one can try to get a juror’s information at a lower per unit cost, e.g. by subsidizing the jury’s work, so that β decreases. Then the jury cost function $\Psi(n; \beta)$ turns to

the right and the optimal jury size n^* gets bigger, but the total social costs Θ are reduced in the optimum. Yet, this approach would be inefficient over time since the subsidies themselves have to be constantly financed somehow (e.g. by taxing people), and, more importantly, the error costs of the people would stay the same.

Therefore, a better – i.e. dynamically more efficient – solution for reducing the total costs would be to directly improve the consumers’ cognitive abilities α . If α increases, the error cost function $\Phi(n; \alpha)$ turns to the left and both the jury size n^* and the social costs Θ get smaller so that the need for a jury and the overall social costs are gradually reduced.

In order to increase α , the jury can implement *educative nudges*.³² Contrary to mere manipulative nudging, where individuals are unaware of the nudging process, educative nudges (in form of feedbacks or reminders) promote learning and address the information level of the consumers directly. Consider, for example, decisions in which consumers have difficulty linking their actions with the later outcomes: Here, the implementation of a feedback nudge can provide better information about the link between actions and outcomes. Such a feedback nudge would be educative in the sense that it depicts an investment in consumers’ “stock of knowledge” about the consequences of their own behaviour.³³ In a meta-analysis, Darby (2006) shows that providing consumers with feedback on home energy consumption (e.g., a real-time energy use display monitor) reduces energy consumption by 5–15%.³⁴ Such feedback information induces consumers to rethink their short-term preferences: by pointing to the medium- or long-term choice consequences, these educative nudges *debiases* individuals’ choices. Naturally, there are costs emerging from implementing these educative nudges. Yet, this form of nudging is more efficient than constantly subsidizing the jury’s work, since they reduce the error costs of the consumers over time by increasing the consumer’s cognitive ability α gradually.

Another good example for an educative nudge is a Fair trade label for clothing.³⁵ This labeling informs consumers about the labour conditions in the production process, makes the channel of distribution more transparent and explains the composition of the end prices to the consumers. In doing so, such a nudge goes beyond the mere price signal and informs the consumer about the shrouded attributes of the product.³⁶ Consumers are able to learn something about the product in their act of consumption. This “moment of education” makes it more likely that individuals align their preferences with the true (i.e. long-term) value they attach to that good.

³² Sunstein 2015, 18.

³³ Gigerenzer 2014.

³⁴ Darby 2006.

³⁵ For example in form of the well-known FLO International’s Fairtrade certification.

³⁶ Loureiro and Lotade 2005.

Educative nudges bring actual individuals closer to the hypothetical version of themselves that has fully informed preferences about the world.³⁷ When nudging consumers in this way, they themselves increase their knowledge and understanding of decision biases (in this case, for example, impulsive buying of low-cost products), so that they are able to make better choices for themselves (in this case, for example, buying products that meet their moral standards).

5 Rebutting some Critique: Thinking in Hierarchical Preference Structures

Let us sum up: If the welfare criterion Π can be signaled to a group of jurors (stage 1), effective means to reach Π might be identified using the Condorcet jury procedure (stage 2). Based on the consumption bundle found, the jury can frame the individuals' choice in such a way that it is easier and more likely for the individual to pick the most effective consumption option(s) (stage 3). The optimal jury size will then depend on the individual's cognitive abilities and the jurors' monetary aspiration level. In order to reduce overall costs, educative nudges might be efficient since consumers can make better choices for themselves, which in turn reduces the need for the jury over time.

Critics might struggle with the idea that individuals are able to express their welfare criterion in the first place. How should consumers be able to signal their long-term goal Π to the jury, if they have contradictory and context-dependent preferences as demonstrated by various behavioural and experimental economic insights?

A way out of this dilemma is a richer understanding of human reasoning in hierarchical preference structures.³⁸ In Thaler and Shefrin's (1981) terms:

“The individual at a point in time is assumed to be both a farsighted planner and a myopic doer.”³⁹

On the one hand, in daily consumption decisions individuals are myopic doers. They often express outcome-oriented desires that can be contradictory and prone to many decision biases resulting from, what Kahneman (2011) calls, System 1 thinking.⁴⁰ This is an automatic, emotional and mostly intuitive way of thinking that requires only little cognitive engagement, is driven by impulsive desires and marked by direct responses to incentives in the environment.

³⁷ The individual with “complete information, unlimited cognitive abilities, and no lack of willpower” is the normative benchmark individual for Thaler and Sunstein (2003, 176).

³⁸ Frankfurt 1971; Thaler and Shefrin 1981.

³⁹ Thaler and Shefrin 1981, 39.

⁴⁰ Kahneman 2011.

On the other hand, in long-term considerations individuals are farsighted planners. They can name stable, non-contradictory, long-term wishes like health, wealth, or happiness.⁴¹ These considerations result from System 2 thinking, which is an effortful, logical and conscious way of making decisions based on knowledge about facts and values. This kind of thinking portrays our values and intentions which requires focused cognitive effort. In line with Kahneman's distinction of two cognitive modes, one can relate short-term preferences to System 1 and long-term preferences to System 2 thinking.

This explains why daily preferences are myopic and prone to decision biases and long-term preferences are thoughtful, stable and well-defined. Myopic preferences can be called first-order preferences and long-term preferences can be named second-order or meta-preferences to indicate the hierarchical relation between these two types of preferences. Since the latter ones are reflective and well-defined they should – from a normative point of view – overrule the first-level ones.

An example for a conflicting hierarchical preference structure is a “shopaholic” person who maximizes her short-term, myopic utility by impulsively buying all sorts of new goods to get a thrill from the act of consuming but whose second-order, long-term preference is such that she would in fact prefer to not surrender to her addiction and smooth her consumption path over time.⁴² Another example for a conflicting hierarchical preference structure would be a person who despite her long-term wish to lose weight, still buys the chocolate bar at the checkout in the supermarket and thus violates her meta-preference for a healthy lifestyle.

Of course, such consuming decisions can also reflect a conscious act by an individual who values short-term pleasures in life more highly than their health.⁴³ However, if it reflects a non-deliberate, impulsive act that is accompanied by feelings of *ex post* regret, the individual might be better off, if she had listened to her long-term wishes since they more likely reflect her true intentions. Some economists deny this fundamental, normative gap between values or intentions on the one hand, and affective, impulsive behaviour on the other hand.⁴⁴ They argue that especially System 1 behaviour would depict the true costs and benefits of decisions and long-term preferences would systematically be biased towards all sorts of utopian wishes. However, after compulsive System 1 acts of consumption many people express severe *ex post* regrets for what they have done.⁴⁵ There is an actual (and often material) welfare loss people suffer due to

⁴¹ Strack and Deutsch 2004.

⁴² Mueller et al. 2010.

⁴³ On the importance of pleasure, see Dolan 2014.

⁴⁴ Schnellenbach 2012.

⁴⁵ Mueller et al. 2010; Sunstein 2015.

present biased decisions emanating from System 1 thinking. Since second-order preferences reflect System 2 thinking that is consistent over time, there is an additional normative argument that they should have authority. Further, their level of information is higher and the *ex-ante* estimation of costs and benefits is more in line with the factual *ex post* realization.⁴⁶ Kirchgässner rightly states that

“[...] the fact that human persons, reflecting on themselves, usually take on the long-run perspective rather provides evidence for the long-run preferences, as does the fact that individuals often heavily underestimate the costs of the actions that are guided by their short-run preferences. Otherwise it is difficult to understand why people regret their own earlier behaviour when foreseeable consequences become obvious that were not taken into account before.”⁴⁷

Depending on the choice context, individuals depict different, contradictory short-run preferences. Referring to one of these preferences does not make sense when searching for the true preference signals for designing the right nudge. Short-run preferences imply a multitude of possible nudges. It would never be possible for a jury to pick one of these and name it superior to all the others if they had no superior criterion to judge the right preference.⁴⁸

Yet, if we accept the fact that individuals have stable long-term preferences resulting from System 2 thinking, we can also assume that individuals are able to signal them coherently to a jury of experts.⁴⁹ The fact that the problem of incoherent short-term preferences can be handled by the non-contradictory meta-preferences of individuals is puzzling for some critics of libertarian paternalism.

Consumers might express their meta-preferences in reflective situations that activate deliberate System 2 thinking, e.g. in polls, through questionnaires, or in public debates. Based on the expressed meta-preference (e.g. for ethical clothing) the jurors are in charge of aligning the available short-term consume options (e.g. low-cost shirt vs. locally produced shirt vs. overseas Fair trade shirt) by means of nudging (e.g. by Fair trade labelling) with the individuals' long-term wishes.

Having in mind this distinction of preference expression, the notion of libertarian paternalism is still compatible with methodological individualism. The individual herself is the one who

⁴⁶ Sunstein 2015.

⁴⁷ Kirchgässner 2014, 15.

⁴⁸ Kirchgässner 2013.

⁴⁹ For empirical arguments backing the existence of stable long-term preferences, see: Kahneman 2001; or Strack and Deutsch 2004.

autonomously expresses her long-term preferences, it is only the jury who implements the right incentive structure so that the individual is capable of aligning her short-term preferences with her long-term welfare goals. The individual herself stays the bearer of preferences and can always opt out at no costs from the incentivized consumption bundle. The jury, on the other hand, is committed to sincerely voting on means and therefore does not interfere with the realm of individual values. Applying the CJT respects consumer sovereignty over long-term preferences, and helps consumers to behave rationally in the short run by giving and framing information. These framings of the individual choice architecture can be understood as individual self-imposed rules established via the rational means-end calculation within the Condorcet jury. In its voting procedure, the jury focuses on means (i.e. choice framings to circumvent biases), not ends (i.e. individuals' long-term preferences).

In general, besides labelling, a jury could think of a wide variety of nudging policies to make individuals' choices more likely to fit their long-term welfare goals: providing palatable information about what others are doing ("social norm feedback"), telling risk narratives to accompany dangerous products, changing a passive default rule to an active choice scenario, including cooling-off periods before making complex market transactions, or altering habitual and expected product placements.⁵⁰ This non-inclusive list of examples give a first hint how a jury might effectively frame decisions by accepting that System 1 thinking is dominant in consumption decisions, but System 2 intentions need to be executed through the right choice architecture to fulfill the individual's actual long-term welfare goals.

Of course, identifying the right nudges requires expertise on the part of the jurors about how an individual reacts to modifications of incentives in her consumption environment. In this regard, recent, neuro-economic and psychological research might support the hypothesis that experts are quite good at empathizing with the thinking of third-party individuals.⁵¹ Moreover, as illustrated above, this process of empathizing does not need to be ideal. It is completely sufficient, if the members of a jury do it in a way that their single probability to make a correct assessment stays larger than 0.5. Taking these two points together, we should not focus too much on the "empathizing problem" in the debate.

⁵⁰ Camerer et al. 2003; Thaler and Sunstein 2008.

⁵¹ Fehr and Singer 2005; Singer and Hein 2012.

6 Concluding Remarks

Consumers make daily choices under uncertainty that are subject to systematic decision biases. Based on this observation, Thaler and Sunstein (2003, 2008) have proposed an effective framing of the choice architecture in order to help individuals to make better decisions.⁵² However, in their notion of soft paternalism they make no suggestion as to who should be in the position to design the choice architecture and they also do not give an answer to the knowledge problem many critics associate with it. This note has mitigated both points of criticism by considering implications of the Condorcet Jury Theorem. The theorem offers majority voting as an effective means for electing the right nudging policies to frame individuals' consumption options. Considering the costs arising from decision errors and the jury implementation, this note has shown, on a very general level, how to compute the optimal jury size and advocated meta-preferences as a welfare criterion upon which the jury can base its calculus for educative nudges. In times when many are against experts or regulatory measures, and mainly favour the plain outcome of markets, this note argues for jury panels to improve the choice architectures of consumers within markets.

This note has discussed the theorem and the respective issue of the optimal jury size in a stylized way. The assumptions of the original version of the Jury Theorem are restrictive and assume independence among the jurors. Some authors have shown that dependence among jurors need not make the Condorcet Jury irrelevant, only negative correlation between the voters is crucial for its applicability.⁵³ However, as Holler and Leroch (2010) rightly point out,⁵⁴ negative correlation is a questionable condition since empirical evidence suggests that opinions within juries often tend to move towards extreme views.⁵⁵ This alludes to the need for further studies on the issue of the right institutional design to reach the outcome of an *unbiased* Condorcet jury. Here, the combination of economic thinking around incentive structures and psychological work about judicial juries could lead to further and essential suggestions for unbiased Condorcet juries in the field of soft paternalistic policy-making.

The first experimental evidence on Condorcet juries support the proposition of the CJT and display that the main results of the theorem hold in the laboratory.⁵⁶ Other recent experimental studies underpin the view that it is often more rational if external third parties make decisions

⁵² Thaler and Sunstein 2003, 2008.

⁵³ Kaniovski 2010.

⁵⁴ Holler and Leroch 2010.

⁵⁵ See also Sunstein 1999.

⁵⁶ Guarnaschelli et al. 2000; Ladha, Miller and Oppenheimer 1996.

when uncertainty or risk is involved.⁵⁷ In this context, further empirical and experimental studies should be conducted, especially on the question whether a group of jurors is able to show enough empathy to effectively nudge the decision of consumers in a desired direction while preserving the latter's freedom of choice.

The effectiveness of using educative nudging in real-life consumption needs to be further assessed in field studies. Many traditional approaches in consumer protection depend on making appeals to System 2 thinking.⁵⁸ Based on providing reasonable information, the goal is to change beliefs and attitudes by explaining the prospects of future benefits. Still, at the most, these efforts have been modestly effective in changing consuming patterns.⁵⁹ Therefore, when implementing educative nudges one might also address System 1 thinking, since then information is processed and translated into action much more easily. This means educative nudges should be accompanied by sound emotional framings like graphic warnings or reminders⁶⁰ and effective default rules.⁶¹

Allowing for heterogeneous consumers, jury nudging procedure does not have to be the gold standard in every branch of consumer protection. Here, Camerer et al. (2003) give some powerful ideas when a jury might be a good way to go. According to the authors, a nudging policy should only be applied if its implemented incentive structure works asymmetrical, i.e. those can be helped who are prone to decision biases but the rational consumers must not be disturbed or fined in their consumption patterns. By considering this rule of thumb, one is able to circumvent the problem that nudging might only help the irrational consumers and relatively weaken the position of the wise ones.⁶² One should also be very cautious to democratically legitimize juries by the affected consumers to not undermine their normative and factual force.⁶³ Above all, expert decision procedures should always be transparent and open to public scrutiny.

⁵⁷ Brock, Lange and Ozbay 2011.

⁵⁸ Marteau et al. 2011.

⁵⁹ WHO 2008; Willis 2011.

⁶⁰ Jolls 2013.

⁶¹ Johnson et al. 2002.

⁶² Armstrong and Vickers 2012.

⁶³ Dold and Holler 2015.

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