Means-Based and Ends-Based Epistocracy:  
A qualified defence

Bouke de Vries, European University Institute

– Comments welcome

1 Introduction

This paper offers a qualified defence of epistocracy, which I understand to be the view that, other things equal, experts ought to have greater political power than non-experts. Focusing on states, I argue that, whilst (nearly) universal enfranchisement is necessary to avoid social subordination, the votes of citizens who complete political literacy programmes should carry greater weight in order to improve the quality of democratic decision-making. Such literacy programmes would teach citizens about the views of different political parties and inform them about the effects of cognitive biases on human decision-making. As those who undergo this kind of education would receive a greater say over the ends pursued by the state (or rather over the people who will choose those ends on their behalf), I will refer to this form of epistocracy as an example of ‘ends-based epistocracy’.

In addition to this, the paper defends a version of what I will term ‘means-based epistocracy’ or the view that experts ought to have greater influence over the ways in which public goals are pursued. More specifically, I argue that, under certain conditions, academics and those with particular (epistemically valuable) experiences must have greater say over how states pursue democratically-decided ends even if their views on this run counter to those of the majority.

Importantly, my defence of epistocracy does not consider the (i)legitimacy of judicial review, which is an example of epistocratic governance to the extent it is meant to improve the quality of political decision-making. Without denying the importance of asking whether (supreme) courts should be able to overturn the decisions of legislatures, space constraints do not make it possible to go into this here (for an entry into the debate, see Dworkin (xxx); Waldron (xxx) and Eisgruber (xxx)).

I will proceed as follows. Section 2 elaborates the distinction between means-based and ends-based epistocracy. Section 3 explains why the nearly universal enfranchisement of citizens that exists in liberal-democracies ought to be kept. Section 4 considers the main rationale for epistocracy in general before looking at a general objection to it in section 5. Sections 6 and 7 then argue that democratic-decision making ought to be supplemented with both types of epistocracy. Section 8 concludes.

1 Bouke.devries@eui.eu
Two kinds of epistocracy

In a helpful typology of epistocracies, Christine Holst distinguishes expert rule over “factual/technical” questions from expert rule over “ethical/moral” questions (Holst, xxx). Whereas the latter gives experts a greater say over the ends or values pursued by the state than non-expert citizens – call this ‘ends-based epistocracy’ – the former gives experts a greater say over how those ends are pursued – call this ‘means-based epistocracy’. Experts within ends-based epistocratic regimes may include philosopher kings, technocrats of various stripes, supreme justices, and, more broadly, those with certain educational qualifications (e.g. university or high school graduates, those who completed political literacy programmes). Possible experts in the means-based sense are criminologists, sociologists, health experts; all of these individuals are likely to know better than their fellow citizens how certain public goals (e.g. reducing crime rates, promoting social cohesion, containing a deadly virus) can be realised.

The distinction between ends-based epistocracy and means-based epistocracy is not an entirely clean one, to be sure. Not infrequently, questions how things ought to be done raise normative issues (cf. Holst, xxx). For example, the George W. Bush administration decided to subsidise organisations that promoted abstinence amongst youngsters raised the issue of whether certain religious-conservative outlooks were unduly favoured by the state. Data-collecting methods that help the state to identify (would-be) terrorists may be at tension with the protection of people’s privacy. Measures meant to protect the environment (e.g. prohibitions on whale-hunting) may affect the lifestyles of indigenous people. And so on.

Before defending particular kinds of ends-based and means-based epistocratic regimes and considering how states should deal with cases where ethical and technical questions are intertwined, I want to consider why we should not have a full-blown epistocracy, i.e. a regime where non-expert citizens have no political power whatsoever. This will be my next aim.

Why most adult citizens ought to be enfranchised

Within contemporary liberal-democracies, (resident) citizens are able to vote and run for elections with the exception of minors and, in some countries, groups of mentally handicapped individuals and criminal convicts. Without asking whether such exclusions are justified (this would take us beyond this paper’s scope), I want to consider here why it is desirable that the large majority of adult citizens have these rights.

Though this is obviously a very big question, I believe the answer should be sought in democracy’s unique ability to secure people’s interest in social equality, where social equality means that they are not subordinated to any of their fellow citizens qua individuals (Kolodney 2014a; 2014b) together with their interest in living under a state. The assumption behind the first conjunct, which I will not try to vindicate
here, is that it is valuable for citizens to be able to relate to each other as equals for various instrumental reasons, such as the conduciveness of such relations to social cohesion and personal well-being (cf. Rawls’s (xxx) discussion how equitable treatment by the state is necessary for protecting the “social bases of self-respect) and perhaps for various non-instrumental reasons also. Relevant for our purposes is that the ability to relate to one’s fellow citizens as equals seems to requires that states avoid making what Estlund calls “invidious comparisons” by designating some (but not all) groups of sane adult citizens as unfit for political participation or for participation on an equal footing (Estlund 2008, p. 36).

However, since social equality in general and political equality in particular may be achieved in a state of nature, i.e. a state without central government, there must be further reason for accepting democracy. I take it that this reason is captured by the second conjunct: unlike anarchy, democratic government is able to solve various collective actions problem, most notoriously the problem of domination among private individuals. As Hobbes (xxx) already saw, unless there is a state to prevent people from assaulting each other or taking the things others need for their survival, peaceful and stable living arrangements and the various social goods that depend on such arrangements (e.g. economic productivity, protection from foreign invaders) cannot be realised. In my view, it is this joint interest in living under a state and not being socially inferior to any individual citizen that justifies democracy.

Other arguments have been made to vindicate democracy, to be sure. Though I cannot address all of these here, let me mention the four influential ones.

For one thing, some try to justify democratic government (or governance) by reference to its supposed intrinsic value (cf. Anderson 2008, p. 136). There are two problems with such attempts. First, it is all but clear whether democratic rule is intrinsically valuable. Second, even if it is intrinsically valuable, it is not clear whether this offers an all-things-considered justification for it; indeed, if one is a political or neutrality-minded liberal (as most liberal theorists are), one would hold state policies and institutions can never be justified by reference to such contested value judgements, not even in a pro tanto way.

Others have cited people’s interests in correspondence between their preferences and the state’s policies. In my view, the idea that democracy’s raison d’être is to satisfy people’s has rightly sparked lots of criticism (see, for instance, Barry, 1995: 145-51; Rawls 1971, p.197; Dworkin, 1981). The main problem with it is that its implication that grossly depraved or unjust preferences may help to legitimate democratic rule is simply implausible. If this is so, then preference satisfaction cannot be what justifies democracy.

Yet another argument that has been proposed is that democratic decision-making is (relatively) unbiased amongst citizens. Whilst there may be some truth to this (democracy is certainly less biased than theocracy in terms of how it treats its citizens) this feature does not uniquely favour democracy. It does not because state policies could be chosen through a lottery rather than through democrating voting; in
fact, as Jason Brennan has pointed out, (fair) lotteries may be less biased than democratic voting due to their relative immunity to “rent-seeking, manipulation, corruption and demagoguery” (Brennan, 2011, p.712).

Finally, democracy has been said to be valuable because it reduces domination. I already suggested that democracy is capable of mitigating domination amongst private individuals. However, as Kolodney (xxx) has pointed out, the better the state is able to prevent private individuals from dominating one another, the greater its ability to dominate those individuals (this holds true even if the state never arbitrarily exercises its power over them, as domination does not require actual interference). If this is so, then insofar as domination is concerned, it is unclear whether democracy does better than a state of nature or alternative political arrangements.

So much for my synoptic defence of democracy. If one believes that democracy can be justified on other grounds than the ones I have defended, that is all fine. My argument for epistocracy in the remainder of this paper does not depend on my justification of a (nearly) universal franchise.

4 Why epistocracy?

Before considering how democratic decision-making ought to epistocratised, I want to consider the main rationale for epistocracy as well as an objection to it. The main reason for giving experts greater political power is that well-educated people will “other things equal, tend to rule more wisely” (Estlund 2009:4). ‘Wisely’ here means that the quality of the decisions will be higher than it would otherwise be, which is important to help states achieve their principal goal: creating and maintaining a just society.

How does a well-educated demos contribute to the quality of political decisions? There seem to be at least two ways. First, to the extent that one has learned to think critically and is politically literate, one seems more likely to recognise what justice requires and, relatedly, hold one’s political representatives accountable for failing to follow its precepts. Second, having knowledge of about cognitive biases may help to remedy systematic errors in our reasoning that we often fail to recognise (cf. Ahlstrom-Vij 2013), such as the bandwagon effect, status quo biases, stereotyping, anchoring, gambler’s fallacies, framing effects, loss aversion biases, worse-than-average biases, trait-ascription biases and self-serving biases.

Whilst these claims seem plausible enough, whether there is indeed a positive correlation between education and the quality of political decision-making would have to be shown empirically. For my purposes, however, I will simply assume that there is such a correlation and see what follows from this normatively.

[I am still looking for some empirical studies to back up the claim that there is a positive correlation between education and the quality of decision-making]

4
5 Potential biases: A general objection to epistocracy

For any defence of epistocracy to succeed, including my own, it has to address David Estlund's objection. This objection can be reconstructed as follows:

Potential-biases objection to epistocracy

1. *The general acceptability criterion*: “(N)o one has authority or legitimate coercive power over another without a justification that could be accepted by all qualified points of view” (Estlund 2008, p. 33)

2. *The demographic worry* “The educated portion of the populace may disproportionately have epistemically damaging features that countervail the admitted epistemic benefits of education” (Estlund 2009:6)

3. *The disqualification claim*: The possibility of such epistemically damaging features renders epistocracy unacceptable for some qualified point of view

4. ∴ States should not be epistocratic

Premise 1 is simply the claim that exercises of political power should be acceptable to citizens with certain kinds of comprehensive doctrines. Whilst it is often said that these doctrines should be those that are ‘reasonable’ in the Rawlsian sense, i.e. those that are committed to liberal-democracy and willing to justify (major) political decisions by reference to public values, Estlund’s notion of a “qualified point of view” leaves it open exactly what the appropriate range is (for my criticism, I need not take a view on this). Premise 2 describes the possibility that groups of (highly) educated citizens may hold certain biases or prejudices towards other groups, just as men may have biased opinions about women, whites about coloured people and Wall-street bankers about the poor (Mulligan 2015, p.464). Pertinently, Estlund’s argument does not depend on their being actual evidence that the (highly) educated are prone to such biases – it suffices that they may be prone to them. This mere possibility is what disqualifies epistocracy, as stated by premise 3.

The problem with this argument, as Mulligan (2015) has argued, is that it renders not just epistocracy but any political regime unjustified. In order to see this, notice that contemporary democracies are biased against certain groups; for example, in The Netherlands, biases against Moroccans are wide-spread (reference). If this is so, then insofar as there is reason for believing that certain (highly) educated groups are less likely to have such biases (e.g. university graduates), as seems quite plausible (I have to say more about this) it seems to follow that democracies would also fail to be acceptable to all qualified points of view. Assuming this conclusion to be a *reductio*, Estlund’s argument ought to be rejected.
6 A qualified defence of ends-based epistocracy

This section offers a conditional defence of ends-based epistocracy. Before discussing my approach, I want to look at three alternative approaches and show why they fail.

6.1 Graduate voting

First, there is John Stuart–Mill’s famous proposal to “two or more votes” to those who “labour with their heads”, such as (in most cases) “graduates of universities” (1991, 336). The reason why this proposal must be rejected is that it allows certain citizens to be permanently ruled by other groups of individuals. As I argued in section 3, such subordination is problematic for various instrumental reasons having to do with psychological well-being and instability that this may cause and possibly for non-instrumental reasons also (I will not repeat my arguments here). In addition to this, one might doubt whether university graduates are more likely to vote more wisely (even if they are, it seems that the below proposals are better proxies for the quality of people’s judgments than having university degrees, as many who went to university have no interest in politics). Yet another problem with Mill’s proposal is that it may incentivise universities or schools to fail students whom they wish to exclude from political participation; indeed, even when such ill intentions are not in play, implicit biases may have the same effect. Whilst there may be ways of addressing this last problem, I take it that this would not salvage Mill’s epistocracy as the first two problems would remain.

6.2 Voting tests

Second, there is Brennan’s proposal of making the right to vote conditional on passing a political literacy exams. Whether one makes the right to vote conditional on such exams or weights the votes of those who pass more heavily, I believe this proposal is plagued by the following dilemma: either the test will be so easy that no significant epistemic benefits are gained or it will be so difficult that large segments of the citizenry. Whereas the second horn would bring us back to the subordination problem (see section xxx), accepting the first would mean that too little is done to improve the quality of political decision-making. Of course, one might argue that weak epistemic benefits are still better than none; however, I will argue in section xxx that my approach does better in this regard without suffering greater set-backs. If this is so, then these tenuous epistemic benefits would not vindicate Brennan’s proposal against mine.

(A further possible worry about Brennan’s proposal is that the design of voting exams is likely to become a political minefield and, as a result, lead to much instability. I take it though that that this
problem may be avoided when the exams would merely test knowledge of the views of different political parties rather than on more contentious matters).

6.3 The franchise-lottery

Third, there is Claudio Lopez-Guerra’s ingenuous proposal to subject a representative sample of the population to “an exhaustive informative program designed to acquaint them with the alternatives regarding the ballot” who afterwards cast their votes to determine the outcome of the election (xxx). These samples would be chosen through a lottery and be made large enough to adequately represent the population and reap the (putative) benefits of Condorcet’s theorem, according to which the probability that a group of voters correctly makes binary decisions tends asymptotically to 1 if each voter has more than 50 percent chance of making the right decision as the size of the group increases. To the extent that this theorem is true (more on this below), Lopez-Guerra’s franchise lottery can easily approximate the benefits of this mechanism – as he points out, a group of 600 persons with an average individual competence of only 0.55 already realises a collective competence of 0.99 (Lopez-Guerra, xxx).

Important advantages of this way of improving the quality of political decision-making are that it is cheap (at least compared to trying to educate or examine all citizens that seek to cast their vote) and may be less likely to lead to social instability, as no-one is denied a chance to vote on the basis of their educational background or ability to pass a test.

To the objection that his franchise-lottery is likely to exclude the views of very small minorities from the sample, I believe Lopez-Guerra is right to point out that even under a proportional electoral system, these minorities would have had an extremely tiny influence anyways so that their exclusion will have a negligible impact on their political influence (Whilst very small minorities would clearly have a complaint when they were denied a chance of becoming enfranchised altogether, this is not the case – they have the same chance of being selected as all other citizens).

Despite these advantages, Lopez-Guerra ultimately rejects his own proposal on grounds of stability. One important problem that he discusses is how reducing the number of voters raises the spectre of state manipulation. “The smaller the electorate, the easier it is for abusive rulers to make voters their cronies and stay in power”, as a “large electorate is more difficult to buy out” (Lopez-Guerra, xxx)”.

Even if the enfranchised can be shielded from these and other subversive influences, Lopez-Guerra notes that the use of lotteries is more likely to be perceived as unfair than universal suffrage due to the former’s reduced transparency. When states use true random number generators, they will have a hard time showing these devices to be fair, as even scientists do not fully comprehend the quantum-mechanic processes on which they rely. And whilst pseudo-random number generators based on software programming or old-fashioned
extracting-balls-from-containers may mitigate this problem, as their workings are easier to understand by
the public, these methods are still more prone to accusations of unfairness than the universal franchise; not
only have such lotteries often been manipulated in the past, people’s susceptible to the well-known
gambler’s fallacy may cause them to be suspicious even when suspicion is not warranted. Therefore, even
if ordinary elections are far from perfect, the fact that they are less likely to raise suspicions of vote
rigging due to the difficulties of (successfully) manipulating elections on a nation-wide scale suggests that
they are much less likely to undermine the social order than Lopez-Guerra’s franchise-lottery.

There is one but. Insofar as Condorcet’s Jury theorem adequately models decision-making in
contemporary democracies, I believe Lopez-Guerra’s proposal may indeed be preferable to universal
enfranchisement, including my own version which adds epistocratic elements to the universal franchise
(more on this shortly), as well as to the epistocratic procedures discussed so-far. In that case, the almost
complete certainty that the demos will either make all correct decisions (if the average voter is more likely
to get it right) or false decisions (if average voter is more likely to get it wrong) would suggest that states
have sufficient reason to try to bring about the former scenario (the assumption being that democracy is
not just meant to be secure procedural fairness but also substantive fairness). Given that Lopez-Guerra’s
proposal is most likely to do so by ensuring that all voters undergo a political literacy training, it would
then appear that we ought to favour his approach..

However, the Jury theorem does not seem to be generally applicable. Without being able to go into
detail, the fact that many decisions in contemporary democracies are not binary (cf. Estlund xxx) and the
independence requirements on which the jury theorem relies are frequently not met (cf. Goodin, 2008,
p.84) means that the scope of this principle is severely limited. I thus conclude that we ought to reject
Lopez-Guerra’s proposal also (as he himself does).

6.4 My approach: political literacy programmes

Having rejected Mill’s graduate voting, Brennan’s voting tests, and Lopez-Guerra’s franchise lottery, I
want to defend a different form of ends-based epistocracy. My proposal is to give greater weight to the
votes of citizens who have undergone a free political literacy training provided by the state (I will leave
open how much additional weight). These trainings would last at least a few hours and take place about a
week before the elections so as to allow people to process what they have learned. Importantly, states
would have to ensure that everyone is able to attend these trainings by requiring employers to give them
time of when necessary and by reimbursing poor individuals for certain expenses (e.g. travel costs, baby
sitters). During these trainings, citizens would be made to read about or listen to the views of different
political parties. In addition to this, they would be informed about the distorting influences of cognitive
biases on human decision-making (see above). As was suggested, both of these forms of information can reasonably be expected to turn them into better voters (see section xxx).

[I have to say more about this approach; any suggestions/criticism would be more than welcome!]

A somewhat similar proposal has been made by Bruce Ackerman and James Fishkin (2002) who have suggested a national deliberation day (a new public holiday) prior to the US federal elections. In a nutshell, citizens who sign up to Ackerman and Fishkin’s scheme will

“listen to a live, televised debate between the national candidates, then discuss it in groups of 15, then listen to local party leaders respond to questions before a group of 500, then discuss again in their group of 15. Participants will then each receive $500 if they come and also vote the next week” (Ackerman and Fishkin, xxx)

The main difference with my own political literacy scheme is that this approach gives money to participants rather than extra votes (there are also content-related differences, to be sure; most notably, Ackerman and Fishkin do not consider the possibility of teaching citizens about cognitive biases during deliberation day. However, I take it that such lectures could easily be added to their scheme).

I believe my own approach does better for two reasons. First, Ackerman and Fishkin’s approach seems prohibitively expensive; according to their estimations, their deliberation day would cost almost US$10 billion for a turnout of 50 million deliberators within the Unites States (US$7.5 billion for the stipends and another US$2 billion for operation costs). Now, my own approach obviously also has its costs; just as Ackerman and Fishkin’s approach, it involves the hiring of teachers and suitable venues. Further costs are incurred by my requirement that states reimburse poor participants for certain expenditures (see above). However, unlike Ackerman and Fishkin’s approach, my approach does not pay each participant 500 dollars, which means that its costs are still likely to be significantly lower.

Some may reply that the greater costs of the former are justified by the fact that this approach does not deny anyone a less than equal vote. Indeed, they may maintain that its less exclusionary character gives us a reason to prefer Ackerman and Fishkin’s approach.

I think this would be a mistake. Insofar as my scheme can be said to be exclusionary at all, its exclusions can be justified. Under my scheme, states have a duty to ensure that all adult citizens of sound mind have adequate access to the political literacy programmes. When this condition is met, no one is involuntarily denied the greater political power to which those who complete the programme are entitled. Accordingly, to say that my scheme is objectionally exclusionary would be like saying that a parent who offers each of their two (equally able) children a new hat if they shuffle the snow in front of their house are objectionably denying a hat to the one who declines the offer.
In fact, not only do I believe that the denying extra votes to those who forego the political literacy programmes can be justified, doing so seems morally desirable. To see this, notice that those who undergo such trainings are acting altruistically; even when they are given 1 or 2 extra votes, their influence is still likely to be extremely small. In my view, the service these individuals provide to the public is properly recognised by giving them additional votes. Whilst paying them 500 dollars would also be a form of recognition, the fact that they would still have equal power with those who do not bother to inform themselves about politics (and rationally so according to some) means that the symbolic signal is much weaker. Furthermore, as we saw, counting the votes of the better educated more heavily has epistemic benefits and also avoids the huge expenditures required by Ackerman and Fishkin’s approach. I thus conclude that my approach is preferable to theirs.

7 A qualified defence of means-based epistocracy

As was mentioned, there is another type of epistocracy that gives certain kinds of experts (e.g. academics, skilled practitioners) greater influence over how the state pursues various public goals, namely means-based epistocracy. Sometimes, these ‘how questions’ are purely technical; for example, whether the state ought to build more traffic lights or roundabouts to improve road safety or whether vaccine x or y ought to be developed to combat deadly disease x need not be ones where different sets of value clash (assuming that there are no normatively relevant differences between them, such as aesthetic differences or differences in their efficacy/costs ratio). However, in many other cases, ‘how questions’ are normative as well. For example, whether teen pregnancies should be reduced through abstinence campaigns or free distribution of anti-conception are normatively contentious issues. Idem for the question of how the economy can be best be stimulated (which may give rise to ideological conflicts between laissez-faire capitalists and socialists) and how terrorists ought to be tracked down (which may lead to disagreements about the importance of privacy).

In my view, such value-laden how-questions should in many, but not all cases be settled by democratic decision-making. The will of the demos ought to prevail when the policy selected by it has a reasonable chance of realising a permissible purpose in ways that do not infringe on people’s basic rights. When these criteria are not met, courts may have sufficient reason to step in. What I want to suggest here is that when policies are overturned on the basis of their expected ineffectiveness, courts should be required to cite expert evidence. For this system to work, means-based experts would need channels to voice their worries about the effectiveness of policy proposals, both to the general public and to courts (think of advisory committees).
I believe two criteria are relevant for deciding how much deference to expert opinion is appropriate: (i) the importance of the issue, (ii) the absolute and relative expertise of experts. Regarding (i), greater deference seems due when decisions are made about, say, fighting global warming and containing deadly virtues than over the construction of a new art centre or, to take an even clearer example, what the new letterhead of governmental agencies should look like. In the former cases, the fact that the implications for people’s lives are more serious means that getting things right is more important. Regarding (ii), I take it that the stronger the experts’ reasons for believing that a particular policy will fail to secure its aim(s), the stronger the reason to defer to their opinion, provided that the difference between their chances of getting it right and that of the public is sufficiently large. When this difference is small (as may be in the case with many economic issues), there may be good reason for going with the will of majority in order to increase the state’s democratic legitimacy. Similarly, even if experts are much more likely to get it right, if their chances are still very small, there would also be little reason to defer to them (this may be the case when deciding to invade a country if there are just too many relevant considerations that bear on this decision).

[in the remainder of the article, I consider possible objections to the kind of means-based epistocracy just outlined]

**Argument from subordination/domination**

1. Means-experts will have greater political influence under my scheme
2. This influence is not within the reach of all citizens, as differences in citizens’ natural talents and social circumstances will prevent many from becoming means-experts
3. These inequalities in political influence will lead to subordination and domination amongst citizens
4. States should fight subordination and domination amongst citizens
5. ∴ States should not to rely on means-experts

Two replies:

a. It is unclear whether there is subordination and domination. Is one subordinated to or dominated by one’s doctor when one relies on their advice? One might say that in those cases, the deference is voluntary, which is not the case when courts overrule the demos on the basis of expert opinion. However, I submit that what matters is not people’s consent to the state’s reliance on means-experts but on whether there is good reason for such reliance; when there is, there does not seem to be subordination, as people are not given more power on the basis of arbitrary or otherwise unjustifiable criteria. Furthermore, even when there is some
domination involved, it seems that we would not be better of domination-wise if the state were to ignore the decision of means-experts.

b. To the extent that relying on means-experts leads to objectionable forms of subordination and domination, the use of algorithms may solve this problem in increasingly more cases. This is because algorithmic technology not only tends to outperform the problem-solving capacity of experts, but is also increasingly more beyond the latter’s ken as a result of machine-based learning. When this development continues, the differences in the ability of experts and non-experts to understand the workings of this kind of technology will become negligible, thereby reducing the potential for subordination and domination.

Two comments on (b):

(I) The fact that the workings of algorithmic devices become unfathomable to citizens may be held to violate the public justification requirement of state policies (cf. Rawls 2005, Quong 2011, Gaus 2011). The assumption here is that unless (some) citizens can understand how such devices work, their use cannot be justified. I do not think this is the case; though it may be somewhat undesirable when citizens lack an understanding of algorithmic technology (the reason being that this renders them more vulnerable to fraud) I believe this is outweighed by the increased effectiveness of many state policies (e.g. think of the increased ability of states to detect terrorists or tax avoiders or to boost the efficiency of renewable energy sources). A more plausible condition on the use of algorithmic devices is that the public must have access to statistics about cases where those devices are not used in order to determine whether they indeed lead to greater efficiency (though such causation may not always be ascertainable, it seems important that the public has access to some evidence for it).

(II) That being said, I believe the use algorithms to convict people without human interference is unjustifiable. Even if such convictions would be reliable (and perhaps even more reliable than sentencing by humans), the possibility for fraud would mean that the convicts would not be given enough assurance that justice had been done. Accordingly, I believe Article 15 of the European Directive 95/46/EC (the Data Protection Directive) is right to require that there be “human review of any automated data-processing system that could have a substantial impact on an individual's life” (xxx). This is so because

8 Conclusion

[...]

12