

Egalitarianism, option luck and insurance markets

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Abstract

It is argued here that individuals should never be held responsible for being lucky or unlucky, so that the notion of option luck is *prima facie* unacceptable. But applying the Conditional Equality and Egalitarian Equivalence criteria to problems of allocation under risk provides a rationale for policies which are sometimes similar to policies based on the notion of option luck. Dworkin's concept of option luck plays a key role in the development of his idea of a hypothetical insurance market that can help in calibrating the transfers between unequally talented individuals. The allocation criteria analyzed here enable us to make a critical examination of the performance of insurance markets in general, and to show that Dworkin's hypothetical insurance is highly problematic.

1 Introduction

One of the intuitively challenging features of theories of equal opportunities is that, when individuals take risks and are especially unlucky, it seems harsh to consider that they should bear the full consequences of their behavior. The penalty may be out of proportion with the fault. Consider a motorbiker who just wants to have a taste of the wind in one's hair for a while and has an accident just at this moment, putting him in a coma and in need of a very costly operation that would not have been necessary had he worn a helmet. In a sense he can be held responsible for his fate, because the cost is directly due to this decision not to wear a helmet. But one feels a reluctance to let

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him bear the full cost, which may be death in this case if he cannot afford the operation.

There may be several elements in our reluctance to let responsibility play its full role here. One element is that the victim is really below a threshold of decent life, and that one could argue in favor of guaranteeing everyone a minimum threshold of subsistence independently of past responsible decisions that may have caused the situation. Another element, which will be the topic of this essay, is that the motorbiker has been *unlucky*. His decision was not to have a cranial traumatism, but only not to wear the helmet for a while. With a reasonable amount, indeed a minimum, of luck, nothing bad would have happened. Several authors (e.g. Arneson, Cohen, Roemer) in the field of responsibility-sensitive egalitarianism are attracted by the idea that individuals should be held responsible only for what really lies under their control. Now, nobody controls one's luck and that might be the paradigmatic example of something that is not controlled. "Luck-egalitarianism" has even become the catchword for responsibility-sensitive egalitarianism in a part of the literature, with the idea that all circumstances (i.e. non-responsibility characteristics) in general can be brought under the heading of luck.

If, in this perspective, it is decided that no individual is ever responsible for being lucky or unlucky, one must deduce that individuals should never bear the consequences of risky decisions, such as low-stake gambling. Some authors, such as Le Grand (1991), do accept this conclusion and consider that individuals should be fully insured and should only bear the consequences of their decisions over the expected value of their well-being. For instance, if the smokers have a lower expected value of well-being as a result of smoking, the unlucky among them who develop related diseases should be helped in order to reach the average well-being of all smokers, while the lucky would pay the corresponding taxes.

Other authors do not take this line of reasoning, because it amounts to imposing full insurance to all individuals in all (insurable) cases. All those undertaking a risky activity would pay a special tax that would fund the indemnity paid to the unlucky among them, so that ex-post they all end up with the same well-being. Applied to smoking or mountaineering, this does not sound totally unreasonable. Applied to low-stake gambling, however, this seems equivalent to a prohibition. Dworkin, for instance, argues that 'if winners were made to share their winnings with losers, then no one would gamble, as individuals, and the kind of life preferred by both those who in the end win and those who lose would be unavailable.' (2000, p. 75) He proposes to distinguish between option luck, i.e. 'accepting an isolated risk he or she should have anticipated and might have declined' (p. 73) and brute luck, i.e. risks 'that are not in that sense deliberate gambles' (ibid.) He immediately

acknowledges that this distinction may be a matter of degree and may be hard to apply in concrete cases. But he cites the example of sick smokers as individuals who may be considered to have taken an unsuccessful gamble...

Here we will examine this difficult issue under the light of the conceptual apparatus developed in the theory of fairness among responsible individuals, as it is surveyed e.g. in Fleurbaey and Maniquet (2007). This theory has in particular proposed two criteria for the evaluation of social situations, namely, Conditional Equality and Egalitarian Equivalence. I will defend the principle that individuals should never be held responsible for being lucky or unlucky, so that the notion of option luck is *prima facie* unacceptable. But applying the Conditional Equality and Egalitarian Equivalence criteria to problems of allocation under risk will provide a rationale for policies which are sometimes similar to policies based on the notion of option luck. This will allow us to see how the intuition underlying the notion of option luck can be reinterpreted in terms of liberal reward.

Dworkin's concept of option luck plays a key role in the development of his idea of a hypothetical insurance market that can help in calibrating the transfers between unequally talented individuals. The allocation criteria analyzed here will enable us to make a critical examination of the performance of insurance markets in general, and to show that Dworkin's hypothetical market is highly problematic.

2 The luck factor

The general framework in which risk will be discussed here is one in which there are several possible states of the world, and only one of them is the true state. Individuals do not know the true state and must make many decisions in this state of ignorance, but this ignorance is reduced over time and this has consequences over their well-being. For instance, depending on whether the coin falls on heads or tails some may win and others lose. In general individuals may have different beliefs about the likelihood of the various states of nature. They may even be unable to form coherent subjective probabilities about the states. They may also fail to have rational decision criteria under risk. Our problem here is to construct criteria for the evaluation of social situations involving risk, and such criteria should not depend on assuming too much about individual rationality. Three guiding principles will help us here.

The first principle is that individuals should not be held responsible for the "luck factor". But this expression must be explained before going further. In a setting in which the well-being of the members of society depends in a

complex way of the various states of nature, it is not easy to determine who is lucky and who is unlucky. For instance, the winner at a gamble may also be the one whose investment yields the least. One must therefore be able to compute a compound luck measure. This is the luck factor, and in order to fix ideas it may be useful to suggest how it can be measured in practice. Partition the population into “ex-ante classes”, i.e. subgroups who are ex-ante identical in all their characteristics and whose members differ only in their situation ex-post, i.e. when all uncertainty is resolved. In every class consider the distribution of well-being ex-post that would be obtained if redistribution were made ex-ante only, every individual receiving the per capita quantity of transfer currently given to his own class. This hypothetical distribution is examined in order to determine the luck factor before ex-post transfers are made in order to compensate for bad luck, precisely. The luck factor for a given member of this class can then be measured as the percentile of this hypothetical distribution corresponding to this individual’s level of well-being in this distribution.

This bears some formal similarity with Roemer’s (1998) measure of responsibility, but it is almost a dual approach. Roemer partitions the population into circumstance classes, and measures an individual’s responsibility as the percentile of the distribution of well-being in his class corresponding to this individual’s level of well-being. Here, the goal is to measure a circumstance characteristic instead of a responsibility characteristic, and one works with distributions of well-being within ex-ante classes, which include responsibility characteristics in their definition, instead of circumstance classes. Take two individuals who are at the top of their respective ex-ante class, in the hypothetical distribution (with ex-ante transfers only). They then have the same luck factor, and are considered to be both maximally lucky. Two individuals at the bottom will be said to be both maximally unlucky, and so on.

It is easy to understand this measure of the luck factor when there is only one time period with a simple distinction between ex-ante and ex-post. When uncertainty unfolds progressively over time, this appears less simple because at intermediate periods some but not all information about the true state of nature has been revealed. It is, however, still possible to measure the luck factor similarly. An ex-ante class is then made of individuals who are identical before any information is obtained, and would therefore react identically to the same circumstances over time.

It remains to explain why individuals should not be held responsible for the luck factor. This point must be related to the possible conceptions of responsibility that may be adopted. We can focus here on the main options defended in the field of responsibility-sensitive egalitarianism. One is the

view that individuals should be held responsible only for what lies within their control. According to this view, since it is obvious that individuals do not control their luck factor, it really makes no sense to hold them responsible for it, as it has already been explained in the introduction. One can hold gamblers responsible for gambling, but not for winning or losing, unless they cheat and manipulate the outcome.

An alternative view is that individuals should be held responsible for their goals and ambitions (at the exception of those which they do not identify with and which they consider as cravings). Dworkin, in particular, defends the notion of option luck in terms of preference for a more or less risky lifestyle. The gamblers must be allowed to live the life they want just as those who like chocolate should be allowed to have it. The problem is that typically nobody has a preference for being unlucky. One can like gambling but few like losing, and it is therefore hard to defend the idea that we must condone the preferences of the losers for their unlucky lifestyle. They actually have no such preference. Again, it makes no sense to hold people responsible for their luck factor in this second conception of responsibility. They may be held responsible for their taste for risk, but not for their (nonexistent) taste for bad luck. Moreover, consider people who are unlucky at different levels. Some are at the tenth percentile of the distribution of well-being, others are, say, at the fifteenth percentile. It makes no sense to say that one should not redistribute between them because they have a preference for being either at the tenth or at the fifteenth percentile. Nobody has such a taste.

It is true that the possibility of bad luck is part and parcel of a risky life, and that may force public authorities, at the end of the day, to allow some risky activities, but that does not mean that they should incorporate the luck factor into the responsibility characteristics of individuals, in the evaluation of social situations. The idea that people should be held responsible for their luck is, in this context, confusing policy conclusions with conceptual distinctions.

There may be other conceptions of responsibility that would advocate holding people responsible for their luck. A religious view that luck is a gift of God that should not be interfered with, for instance, would indeed forbid us from putting luck into the set of circumstance characteristics that redistribution should seek to neutralize. But it seems sufficient here to show that, given that individuals do not control their luck factor and have no taste for being at a particular (especially a low) percentile of the distribution of well-being, it makes no sense to put the luck factor among responsibility characteristics.

3 Comprehensive well-being

The second principle that will help us here is that the notion of well-being which serves to measure individual advantage should be comprehensive. Dworkin's defense of the risky lifestyle of those who like it must be taken seriously, and here is a way to do this.

Consider that individuals live a certain number of periods, with information about the true state of nature being progressively disclosed. A riskier life means that in early periods of life the span of possible outcomes is greater, and this prospect may have a significant impact on individual preference satisfaction and level of well-being. By taking account of the direct impact of risk on satisfaction, independently of how the outcome turns out to be, it is possible to make sense of the importance of letting people take risks if they wish.

This does not mean that we should consider lifetime well-being as the simple addition of well-being levels at all periods of life. The way in which lifetime well-being depends on the sequence of life events may be more complicated. Moreover, the time sequence is not really the important feature here. What matters here is rather that preferences over more or less risky lifestyles can find an expression through explicit arguments of the well-being function. There must be a place to record the fact that the individual has taken a risk and that this influences the relevant measure of her well-being. Considering the sequence of time periods is the most natural anchor to do this.

A difficulty here comes from the fact that individual subjective appreciations of risk may be flawed in many ways. Some individuals may have less information than is available to other people, they may be incompetent at thinking in terms of probabilities, they may have inconsistent attitudes about risky prospects, they may be myopic about the bad consequences that may unfold, and so on. These rationality failures call for the consideration of ideal preferences that individuals would form if they were better informed and properly trained at assessing risky prospects. In practice it may be very hard to obtain the information needed for such a computation, and one may be forced to work with approximations and best guesses, but at least the informational content of the ideal social criterion should be clear.

4 An *ex-post* evaluation

The third principle that plays a key role here is that social evaluation will be made from an *ex-post* perspective. Moreover, in order to make the analysis

simpler it will be assumed that there is no risk at the macro level (i.e. risk affecting all individuals in the same way) so that there is no ex-ante uncertainty about the ex-post distribution of well-being, even within each “ex-ante class”. This implies that, from the standpoint of the evaluation, there is no uncertainty at all and one can directly apply criteria devised for a context of certainty.

The ex-post perspective is opposed to the ex-ante perspective. The latter looks at individual well-being as it can be computed ex-ante and then performs a social aggregation of the distribution of ex-ante levels of well-being, in order to evaluate the social situation. In contrast, the ex-post approach looks at the ex-post distribution of well-being, once all uncertainty is resolved. In case there are different possible ex-post distributions depending on the true state of nature, then one performs an evaluation of this as a social lottery, for instance by computing the expected value of a social welfare function. No such computation is needed when, as assumed here, all states of nature deliver the same ex-post distribution of well-being. For instance, we may know that there will be one winner and $n - 1$ losers (in a population of n individuals), and the state of nature will only determine who is the winner without affecting the statistical distribution of well-being, which is the only information relevant for the evaluation.

The importance of adopting an ex-post rather than an ex-ante viewpoint should be stressed here, because it has a great impact on the evaluation of insurance markets, as will be seen below. In absence of market failures, insurance markets typically yield ex-ante efficient allocations, i.e. allocations such that individual ex-ante utilities could not be improved for some of them without being reduced for others. Therefore, if adequate redistribution is made initially, insurance markets can easily deliver an allocation which is socially optimal for an ex-ante criterion. Things are much less favorable with ex-post criteria of evaluation. For an ex-post criterion, redistributing initial endowments is typically insufficient because individual decisions in the insurance market allocate resources in a way that is sensitive to their attitude to risk rather than to social priorities. As a simple example, categories of individuals who have different attitudes to risk may take different insurance coverage, resulting in various degrees of inequalities among these categories. An ex-post criterion may judge that the resulting distribution of well-being is too unequal in some categories, and there may be no way to achieve a better distribution by free insurance markets. Ex post criteria rather easily justify compulsory insurance policies.¹

¹See Hammond (1981) for a thorough comparison of the ex-ante and ex-post criteria applied to insurance markets.

With this kind of strong implications in sight, the ex-post viewpoint must be supported by some serious arguments. Here is one argument. Imagine an omniscient evaluator who knows the true state of nature. Such an evaluator would certainly make the correct evaluation, assuming that the ethical principles she applies for the certainty case are correct. Let us examine how she would consider the behavior of individuals who ignore the true state of nature and, with their limited knowledge, take risks and buy insurance. She would simply view their decisions as sometimes mistaken and sometimes correct, in light of her superior information. The future losers who take risks are acting against their true interests, unless they like risk so much that they do not regret anything afterward. The potentially lucky who are afraid of taking risks are also doing a mistake, unless they are so afraid of risk that even learning that they would have won does not make them regret their precautions. In contrast, the future winners are right to gamble while the potential losers are right to play it safe. At any rate, the important point is that this omniscient evaluator would make the correct evaluation, and the ignorant population would actually like to be able to trust such an evaluator if one were available (supposing that they endorse the same ethical principles for the certainty case).

Compare this ideal evaluator to another who endorses the same ethical principles in the certainty case but does not know the true state of nature. The latter is the one we are concerned with here. It is for this kind of evaluator that we want to provide a criterion. Unfortunately, there is no way for him to guess the true state of nature. But fortunately, there are cases in which, even without knowing the true state of nature, he can guess how an omniscient evaluator would rank social situations. It turns out that the framework adopted here, in which the ex-post distribution of well-being is known for sure, is precisely a case in which the omniscient evaluator's ranking is absolutely transparent. An ordinary evaluator can then mimic an omniscient evaluator without having as much information. That is possible because even the omniscient evaluator is only interested in the statistical distribution of well-being and of other relevant individual characteristics. For instance, typically she does not care who wins and who loses, she only looks at the resulting inequalities. This information, which is sufficient for the omniscient evaluator, is also available to the ordinary evaluator in our framework. The omniscient evaluator does have additional data (who wins, for instance) but this is not relevant.²

This justifies adopting the ex-post viewpoint. The ex-ante viewpoint is

²When, contrary to our assumptions, there is uncertainty about the ex post distribution, the analysis is a little more complex but the bulk of the argument still holds true, because it is still possible for the ordinary evaluator to rank *some* social situations like an

sometimes defended on the grounds that it enables the evaluator to take account of fairness in lotteries. The ex-post viewpoint fails to see the difference, it is alleged, between giving the prize for sure to one individual and operating a fair lottery between all of them, because ex-post the distribution, in both cases, has one winner and $n - 1$ losers.³ But this is a caricature of the ex-post approach. In the previous section a comprehensive approach to the measure of well-being has been defended, and such a measure can record the prospects of winning for all with the fair lottery. The ex-ante prospects have their importance through their impact on individual well-being ex-post, and do not require adopting an ex-ante perspective. Moreover, most of our intuitive concerns for fair lotteries have to do with impartiality of the selection process.⁴ If it were known that the selection of the winner in the above example is totally impartial, it would not matter whether it is made by a lottery or not. Checking impartiality of a selection process is an issue that is totally orthogonal to the ex-ante-ex-post distinction.

5 Two criteria

Equipped with these guiding principles, let us see how one can apply the concepts of Conditional Equality and Egalitarian Equivalence in the current context. The ex-post approach and the above observation that we can mimic the omniscient evaluator allows us to analyze the issue as if we knew the true state of nature. In other words, we adopt the point of view of the omniscient evaluator, knowing that the ordinary evaluator will have the same ranking. This simplifies some formulations by saving us the trouble to reason in terms of statistical distribution rather than individual well-being.

Once the luck factor has been computed for each individual, one can compute individual well-being in the true state of nature as a function of responsibility characteristics (including possibly risky actions or risky dispositions), circumstance characteristics, including the luck factor, and resources in all states of nature. We do not retain resources in this state of nature only, because, as argued above, ex-ante prospects may affect ex-post well-being, and such prospects depend on resources that would have been made available in other states of nature. Note that the circumstance characteristics can incorporate dispositions to react in different ways to different states of nature. For instance, a pale skin may be a handicap in sunny weather but not

omniscient evaluator, and this seriously constrains his evaluations. See Fleurbaey (2006) for the analysis of this more general case.

³This is Diamond's (1967) famous critique of utilitarianism.

⁴As argued in Broome (1984).

in cloudy weather. Similarly, responsibility characteristics may determine changes of attitudes depending on states of nature. Even though the individual is not responsible for being in one state of nature rather than another, he may be responsible for how he reacts to various states of nature.

We can now define the two criteria that are the focus of this section.

Conditional Equality: Define a reference value of responsibility characteristics and give priority (according to the leximin criterion) to individuals who, with their current resources, circumstances including luck, and this reference value of responsibility characteristics, would be the worst-off.

This definition is essentially identical to the standard definition that one finds in the literature.⁵ In order to see what implications this criterion has in the current context, let us examine what happens when equality among all individuals, as measured by this criterion, is achieved. In order to make the analysis clearer, it is convenient to decompose redistributive policy into ex-ante transfers designed to compensate for circumstance characteristics that are known ex-ante, and specific ex-post transfers for the compensation of luck.

First, let us assume that the reference responsibility characteristics are those of the most cautious individuals. This particular choice will be justified below. Let us further assume that in absence of ex-post transfers these cautious individuals are already fully insured by their own private initiative. In this context, full equality among them is achieved and Conditional Equality does not advocate any ex-post transfer in this category. Now, since other individuals are evaluated by how well-off they would be if they had the cautious characteristics, it appears that they do not need any ex-post transfer as well, and the best policy is then, as far as ex-post transfers are concerned, a *laissez-faire* policy. No compensation ex-post is made for the bad luck of those who undertake risky activities that the cautious individuals avoid.

This sounds like option luck, but before discussing option luck, let us examine what happens when the cautious do need ex-post transfers because their private actions do not fully insure them. In this case, the cautious individuals will receive ex-post transfers which will fully insure them if equality is achieved. Those who have more risky dispositions or behavior will obtain

⁵When ex-ante prospects matter to the computation of ex-post well-being, well-being depends on resources available in the various states of nature. Resources are then multi-dimensional and this affects the definition of Conditional Equality if one wants this criterion to respect people's evaluation of ex-ante prospects. This complication is ignored here.

the same transfers, even if typically such transfers will fail to fully insure them. In other words, they will have to bear the extra risk that they take. Again, this seems quite in line with the idea of letting individuals bear the consequences of option luck. We therefore obtain here a consistent notion of option luck, without making the sloppy assumption that individuals must be held responsible for being lucky or unlucky. Even if individuals are not held responsible for their luck, they may be put to bear the consequences of the extra risk they take because their situation is evaluated by reference to what they would obtain with a more cautious behavior. The idea of option luck should not be interpreted in terms of moving the responsibility cut in order to incorporate luck into the responsibility sphere, which appears questionable, but in terms of liberal reward as embodied in Conditional Equality.

So far we have considered taking the most cautious responsibility characteristics as the reference. One could imagine taking risk-loving characteristics as the reference, but this would have strange consequences. One would then insure the risk-lovers and force the cautious to bear risk by giving them the same transfers as those received by the risk-lovers. The lucky cautious, who have a small gain before transfer, would pay a high tax while the unlucky cautious, who suffer a small loss before transfer, would receive a large unneeded indemnity. This is not totally silly. For instance, imagine that the reference is defined after the courageous entrepreneurs who take high risks for the benefit of society. One could then imagine that they would deserve full insurance while those who adopt timorous attitudes would be “punished” by paying the same taxes. This is, however, a little far-fetched and it appears more natural, by reference to the intuitive notion of option luck, to take the most cautious characteristics as the reference.⁶

Let us now turn to Egalitarian-Equivalence.

Egalitarian-Equivalence: Define a reference kind of circumstances including luck, and give priority (leximin) to individuals whose current level of well-being would be obtained with the least resources if their circumstances were of the reference kind (and their responsibility characteristics unchanged).

Take an individual with his current level of ex-post well-being. He could have the same well-being with a reference kind of circumstances and a reference level of luck, but with a different quantity of resources. We want to evaluate his situation by this “equivalent” quantity of resources. A difficulty

⁶There is even a problem of consistency with other options. Imagine that the most cautious are fully insured spontaneously. Then it does not make sense to tax the lucky among them and indemnify the unlucky, since they all have the same zero luck.

here is that resources are multidimensional, because even when there is only one good like money, there is one quantity for each state of nature. As a consequence, one must not only choose reference circumstances and luck but also a certain kind of equivalent resources. The most natural, and simplest, option consists in taking a certain quantity as the kind of resources considered for the computation.

One can get an idea of the implications of the Egalitarian Equivalence criterion by looking at a situation in which full equality, according to it, is achieved. The compensation principle, fully satisfied by this criterion, implies that individuals with the same responsibility characteristics will obtain the same level of well-being. This means that all categories of individuals will be fully insured, with a level of well-being that depends on their responsibility characteristics. This produces a situation similar to that advocated by Le Grand (1991), as recalled in the introduction. Every category of individuals will bear the average consequences (approximately) of their risky behavior but not the consequences of their personal luck.

A Dworkinian purist could object that the risk-lovers are prevented from living the kind of life they like. But there are two categories of risk-lovers to distinguish. The ordinary risk-lovers like risk *ex-ante* and regret their folly once they discover that they are unlucky. For these, the omniscient evaluator does not feel compelled to respect their *ex-ante* preferences since they are based on ignorance of their bad luck. But there can be super risk-lovers who, even when they lose, are still happy *ex-post* to have played the game. This happens when the thrill provided by risk is so great that it compensates the disappointment of losing. Such individuals have preferences over resources which are then decreasing: They would not want to receive more resources in bad states of nature because this would reduce the thrill. This corresponds to preferences with satiation, and it is indeed possible (we will not prove it here), in this case, for the Egalitarian Equivalence criterion to leave the satiated individuals with less resources than others, which means here that the super risk-lovers are allowed to live their dangerous life.

Let us illustrate the concepts introduced here with a simple example. In order to avoid the use of (utility) functions let us measure well-being in monetary terms. Imagine that people's circumstances, apart from luck, are described by a quantity of bequest. Assume that 60% of the population (the "poor") receive no bequest while 40% (the "rich") receive a bequest of $\$B$. In each category, half are very risk-averse (the "cautious") and half are less risk-averse (the "entrepreneurs"). The risk-averse simply keep their bequest as it is, while the entrepreneurs invest it and either double it if they are lucky, or lose it if they are unlucky. It is assumed that 1/4 are unlucky. Observe that the poor have no bequest to invest, but an *ex-ante* transfer is made to

them that they can invest if they wish. It is also possible to make transfers ex-post depending on luck.

The obvious policy, as far as ex-ante transfers are concerned, is to equalize initial endowments by redistributing bequests. Everyone then obtains $\$.4B$. The cautious keep it safe while the entrepreneurs invest it and either obtain $\$.8B$ or lose everything. The average wealth ex-post, among entrepreneurs, is $\$.6B$. Let us now look at ex-post transfers.

Conditional Equality would not make any redistribution ex-post when the reference type is cautious. The entrepreneurs could all obtain $\$.4B$ like the cautious, independently of their luck, and therefore there is no need to redistribute among them. The final distribution then has half of the population (the cautious) with $\$.4B$, $3/8$ with $\$.8B$ and $1/8$ with zero.

Egalitarian Equivalence, with average luck as the reference, would not redistribute ex-post between the investors and the cautious, but would equalize gains among the former, leaving each of them with $\$.6B$. Let us check this result by making the computation for Egalitarian Equivalences, with “poor” as the reference circumstance and average luck as the reference “luck”. With average luck, investing would yield the average yield of fifty percent. For a cautious poor, his equivalent transfer in the certainty scenario is equal to his current transfer, $\$.4B$. For a cautious rich, his equivalent transfer is also equal to $\$.4B$, because if he were poor he would need this transfer in order to have his current level of final wealth, $\$.4B$. A lucky or unlucky entrepreneur now has $\$.6B$, which, if he were poor, would be obtained by receiving a transfer of $\$.4B$ and investing it at a fifty percent rate of return. Therefore all individuals have the situation that a poor receiving a transfer $\$.4B$ and having the same disposition to invest as themselves would obtain. This is perfect equality according to Egalitarian Equivalence. A similar analysis would be done, justifying the same allocation, if “rich” were to be taken as the reference circumstance.⁷

One complication has been ignored in this example and in all this section. It has been assumed that risky actions (such as investing, in the above example) are fixed and put into the responsibility sphere. But this is questionable when such actions are influenced by personal circumstances and when taxes and transfers can depend on such actions and can therefore directly influence them as well. It is then more sensible to hold individuals responsible for their risky dispositions but to incorporate their actions into the cate-

⁷With maximal luck as the reference, the cautious would all have $.33B$ and the entrepreneurs would all have $.66B$, with a transfer from the former to the latter in order to guarantee maximal yield to all of them. With minimal luck as the reference, in this example, all resources would be given to the cautious, because all entrepreneurs would be given the fate of the unlucky.

gory of external “resources” (or, if one prefers, “functionings”). This will not be examined in more detail here, but it can be shown, with the help of some formalism, that the bulk of the above analysis remains valid under this additional complication.

6 The intrinsic failure of insurance markets

Insurance markets are known for being particularly vulnerable to market failures in terms of adverse selection as well as moral hazard. Here we will show that they suffer from a deeper problem in terms of social welfare, even in absence of the usual market failures.

In a nutshell, the problem is that in absence of market failures, an insurance market generates an allocation that is ex-ante Pareto-efficient, and that such an allocation is unlikely to be a social welfare optimum.

Let us consider a simple one-period exchange economy in which $x_{is} \in \mathbb{R}_+^\ell$ is the vector of consumption goods consumed by $i \in N$ in state $s \in S$ (where S is assumed to be finite). Let $x_i = (x_{is})_{s \in S}$ and $x_N = (x_i)_{i \in N}$. Agent i has an initial endowment $\omega_i \in \mathbb{R}_+^\ell$. In state s , he is submitted to a luck factor λ_{is} which affects his endowment (changed into $\omega_i + \lambda_{is}$) and a luck factor λ'_{is} which directly alters his satisfaction, and faces prices $p_s \in \mathbb{R}_{++}^\ell$. When insurance markets are open which allow agents to transfer resources from one state to the other, the vectors p_s can operate as prices for contingent commodities and the budget constraint can be simply written as

$$\sum_{s \in S} p_s x_{is} \leq \sum_{s \in S} p_s (\omega_i + \lambda_{is}).$$

Agent i has a Von Neumann-Morgenstern utility function

$$U_i(x_i) = \sum_{s \in S} \pi_{is} u_i(x_{is}, \lambda'_{is}),$$

where $\pi_i = (\pi_{is})_{s \in S}$ is the vector of subjective probabilities and u_i is the Bernoulli utility function which depends not only on consumption but also on the luck factor λ'_{is} .

An allocation x_N is feasible if for all $s \in N$,

$$\sum_{i \in N} x_{is} = \sum_{i \in N} (\omega_i + \lambda_{is}).$$

It is ex-ante Pareto-efficient if there is no other feasible allocation x'_N such that $U_i(x'_i) \geq U_i(x_i)$ for all $i \in N$, with at least one strict inequality.

An allocation x_N is a Walrasian equilibrium if it is feasible and if there is a price vector $p = (p_s)_{s \in S}$ such that for all $i \in N$, x_i maximizes U_i under the budget constraint. The first welfare theorem applies here when for all $i \in N$, u_i is locally non-satiated⁸ in x_{is} for all λ'_{is} : *every Walrasian equilibrium is ex-ante Pareto-efficient*. (Indeed, necessarily $\pi_i > 0$, so that, when u_i is locally non-satiated in x_{is} for every s , U_i is locally non-satiated in x_i and the standard proof of this theorem works.)

A corollary of this first welfare theorem is that, if for all $i \in N$, u_i is locally non-satiated and concave in x_{is} for all λ'_{is} , then, *for every Walrasian equilibrium x_N^* there is $(\alpha_i)_{i \in N} \in \mathbb{R}_+^n$ such that x_N^* maximizes $\sum_{i \in N} \alpha_i U_i(x_i)$ over the set of feasible allocations*. This is because U_i is then concave for all $i \in N$, implying that the set of feasible utilities

$$\{(U_i(x_i))_{i \in N} \mid x_N \text{ is feasible}\}$$

is convex. The first welfare theorem can be understood as saying that there is no intersection between this set and the other convex set

$$\{(U_i(x_i))_{i \in N} \mid (U_i(x_i))_{i \in N} > (U_i(x_i^*))_{i \in N}\}.$$

The separating hyperplane theorem then implies that there is $(\alpha_i)_{i \in N} \in \mathbb{R}_+^n$ such that $(U_i(x_i^*))_{i \in N}$ maximizes $\sum_{i \in N} \alpha_i U_i$ over the set of feasible utilities.

Now consider two agents i and j who are ex-ante identical in x_N^* under the price vector p . This is defined here as meaning that $u_i = u_j$, $\pi_i = \pi_j$, $\omega_i = \omega_j$, and that there is a permutation σ over the set S such that for all $s \in S$, $\pi_{i\sigma(s)} = \pi_{is}$, $p_{\sigma(s)} = p_s$, $\lambda_{is} = \lambda_{j\sigma(s)}$ and $\lambda'_{is} = \lambda'_{j\sigma(s)}$. In other words, they have identical characteristics and, up to a permutation of states s , they face exactly the same luck factors. This definition of ex-ante identical agents is a little restrictive and one could enlarge it at the cost of cumbersome notations (for instance, state s for i may be equivalent to two states s' , s'' for j), but this will suffice for our purposes. Since these two agents are identical ex-ante and face the same prospects, necessarily $U_i(x_i^*) = U_j(x_j^*)$.

Moreover, the set

$$\{(U_i(x_i), U_j(x_j)) \mid x_i + x_j = x_i^* + x_j^*\}$$

is symmetric with respect to the 45° line, so that $(U_i(x_i^*), U_j(x_j^*))$ maximizes $U_i + U_j$ in this set. Equivalently, (x_i^*, x_j^*) maximizes $U_i(x_i) + U_j(x_j)$ under

⁸I.e. for every x_{is} , every neighborhood of x_{is} , there is x'_{is} in this neighborhood such that $u_i(x'_{is}, \lambda'_{is}) > u_i(x_{is}, \lambda'_{is})$.

the constraint $x_i + x_j = x_i^* + x_j^*$. Note that, since $\pi_i = \pi_j$,

$$\begin{aligned} U_i(x_i) + U_j(x_j) &= \sum_{s \in S} \pi_{is} u_i(x_{is}, \lambda'_{is}) + \sum_{s \in S} \pi_{js} u_j(x_{js}, \lambda'_{js}) \\ &= \sum_{s \in S} \pi_{is} [u_i(x_{is}, \lambda'_{is}) + u_j(x_{js}, \lambda'_{js})], \end{aligned}$$

and recall that $x_i + x_j = x_i^* + x_j^*$ means that for all $s \in S$, $x_{is} + x_{js} = x_{is}^* + x_{js}^*$.

Therefore, necessarily for all $s \in S$ such that $\pi_{is} > 0$, (x_{is}^*, x_{js}^*) maximizes $u_i(x_{is}, \lambda'_{is}) + u_j(x_{js}, \lambda'_{js})$ under the constraint $x_{is} + x_{js} = x_{is}^* + x_{js}^*$. By extension to more than two agents, we have then proved the following result:

Proposition 1 *Assume that for all $i \in N$, u_i is locally non-satiated and concave in x_{is} for all λ'_{is} . For every Walrasian equilibrium x_N^* , and every subgroup $G \subseteq N$ of agents who are ex-ante identical, for every $s \in S$, x_{Gs}^* maximizes $\sum_{i \in G} u_i(x_{is}, \lambda'_{is})$ under the constraint $\sum_{i \in G} x_{is} = \sum_{i \in G} x_{is}^*$.*

In a nutshell, ex-ante identical agents are treated in a utilitarian way, and their sum of utilities is maximized whatever the state of nature. Let us now examine how this can be assessed from the standpoint of social welfare. The disturbing feature of this result is that agents who are ex-ante identical may be different ex-post, because in a particular state s they may be hit differently by their own luck factors.

Let us assume for a moment that well-being, in the true state s , is measured by the function $u_i(x_{is}, \lambda'_{is})$. This means that ex-ante prospects, as appreciated by the agent through $U_i(x_i)$, are not considered relevant. In this perspective, the compensation principle advocates equalizing the agents' well-being when they are ex-ante identical, since they differ only with respect to the luck factors for which they are not responsible.

Let us first examine two agents whose endowments only are hit differently: $\lambda_{is} \neq \lambda_{js}$, $\lambda'_{is} = \lambda'_{js}$. One immediately sees that maximizing $\sum_{i \in G} u_i(x_{is}, \lambda'_{is})$ under the constraint $\sum_{i \in G} x_{is} = \sum_{i \in G} x_{is}^*$ will induce $u_i(x_{is}, \lambda'_{is}) = u_j(x_{js}, \lambda'_{js})$ as a possible solution, and as the only solution if utility functions are strictly concave. This is satisfactory at the bar of the compensation principle. Since it is obvious that appropriate lump-sum transfers made ex-ante can adequately compensate for differences in initial endowments, one then sees that, when luck only affects endowments, insurance markets can correctly deal with the compensation of luck factors ex-post and no ex-post transfers are needed.

Things are much less favorable when luck also affects utility directly: $\lambda'_{is} \neq \lambda'_{js}$. Then, typically, maximizing $\sum_{i \in G} u_i(x_{is}, \lambda'_{is})$ under the constraint

$\sum_{i \in G} x_{is} = \sum_{i \in G} x_{is}^*$ will induce $u_i(x_{is}, \lambda'_{is}) > u_j(x_{js}, \lambda'_{js})$ when λ'_{is} entails a greater marginal utility than λ'_{js} with respect to x_{is} . It is well known since Arrow (1971) and Sen (1973) that the utilitarian approach is not well equipped to correct handicaps that lower utility levels without increasing marginal utility. We find again an illustration of this problem here. The compensation principle will not be satisfied, and transfers between i and j will go to the agent with greater *marginal* utility even if he is also the agent with greater *level* of utility. Therefore, we reach here the conclusion that insurance markets should not be trusted in order to deal with luck factors which affect utility directly and not only endowments. Insurance markets against fire and theft (of replaceable objects!) are fine, but they should not be relied upon in order to deal with accidents, for instance.

We have been dealing here with a simple exchange economy. But a difference in productive skills can be viewed essentially as a difference in the disutility of earning a certain level of pre-tax income. Therefore, with little change it can be shown that insurance markets cannot be used in order to compensate for luck factors which affect productivity.

The condemnation of insurance markets relies here on the compensation principle, and at this point one may wonder whether relying on Conditional Equality, which leans toward liberal reward more than toward compensation, would yield different conclusions. But Conditional Equality still makes transfers in favor of the unlucky when their bad luck lowers utility undoubtedly (i.e. including for the reference utility function), whereas the utilitarian criterion can make transfers in the reverse direction. In other words, the utilitarian criterion totally abandons the compensation ideal whereas Conditional Equality does retain it to some extent. Moreover, the principle of liberal reward itself is not well served by insurance markets. In fact, even the more basic principle of impartiality, which is contained in the compensation principle as well as the liberal reward principle since both imply that identical agents should obtain equivalent resources, is violated by insurance markets. Take two individuals who are ex-post identical, in the sense that they have the same endowment ω_i , the same utility function u_i and the same shocks $\lambda_{is}, \lambda'_{is}$ in the true state s . For the omniscient evaluator, it appears obvious that they should receive the same resources, or least equivalent bundles of resources. Both Conditional Equality and Egalitarian Equivalence do treat such agents identically, of course, since they are identical in their responsibility and circumstance characteristics (no matter how the responsibility cut is made). But this is not the case with the insurance market, because these agents may have different situations in other states of nature, and this may have led them to make different arrangements for the true state s . For the omniscient evaluator, it appears utterly questionable to refer to counterfac-

tual states (that do not correspond to any reality since the true state is s) in order to give different resources to identical agents. This is, nonetheless, what insurance markets do. In conclusion, the deep flaw of insurance markets does not come from any connection with liberal reward but from their connection with the ex-ante perspective and their unjustifiable dependence on counterfactual states that do not have any reality.

All this analysis would be modified if, recalling the principle that well-being should be a comprehensive notion, well-being in the true state s were computed as a function of ex-post utility $u_i(x_{is}, \lambda'_{is})$ and of ex-ante utility $U_i(x_i)$. Suppose, to take an extreme case, that only ex-ante utility matters. In that particular case, insurance markets (in absence of market failures) are acceptable, after initial transfers have equalized the agents' endowments properly. In less extreme cases where both $u_i(x_{is}, \lambda'_{is})$ and $U_i(x_i)$ matter to ex-post well-being, insurance markets will not be fully acceptable in general, but the operation of ex-post transfers in order to enforce the compensation principle might have to be curbed in order to let the agents enjoy, to some extent, their ex-ante prospects as they see them.⁹ In practice, one can then expect that some amount of minimal compulsory insurance will have to be imposed, for instance against accidents that reduce marginal utility of income, letting the agents free to buy extra insurance if they wish. A detailed study of optimal insurance policies, which would have to incorporate adverse selection and/or moral hazard issues as well in order to be realistic, will not be undertaken here.

7 Dworkin's hypothetical insurance

Dworkin's faith in insurance markets (which is understandable in view of the fact that most economic analyses of such markets adopt the ex ante viewpoint) leads him to rely on such markets in order to calibrate the transfers between lucky and unlucky agents, even when such luck comes with the birth lottery of talents. Since individuals cannot buy insurance before they are born, he imagines a hypothetical insurance market in which, behind a veil of ignorance hiding their personal talents and handicaps, individuals could take an insurance. The net payments of insurance premiums and indemnities that would occur ex-post after the operation of such hypothetical market

⁹This does not only concern the super risk-lovers mentioned in Section 5, who gamble on property and are happy even when they lose. One can also think of agents who want to spend money when they are fit rather than if they are crippled by an accident, and are so unhappy to pay a strong tax for the disabled that, even after their own accident, they still regret not having had enough good time beforehand.

can, according to him, give us an idea of the taxes and transfers that a public authority should implement.

We have seen in the previous section that insurance markets, in ideal circumstances without market failures, produce at best allocations that are efficient ex-ante, but fail to be satisfactory for any reasonable ex-post social welfare criterion that obeys the compensation principle to some extent (like Conditional Equality or Egalitarian Equivalence). Insurance markets do not correctly compensate the unlucky, except in the special case of bad luck involving only the loss of replaceable wealth. Damages to personal talents which affect either productive capacities or consumption capacities do not fall into this category and cannot be properly treated by insurance markets. This is because insurance markets are devoted to satisfying people's ex-ante (ignorant) desires, whereas a good social criterion, as argued in Section 4, must adopt the ex-post viewpoint which takes advantage of superior knowledge of the ex-post distribution. Typically, ex-ante individuals are too willing to sacrifice their situation in a state of nature in which they have low marginal utility, because they hope to enjoy resources better in states of nature with greater marginal utility. For the ex-post viewpoint, those among them who will end up in the bad situation are just ignorantly acting against their own interests, and there is no reason to blindly condone their ex-ante decisions.

Once it is understood that insurance markets are not trustworthy in the case of risk to personal talents, it immediately appears that Dworkin's idea to rely on such markets for the case of the birth lottery is wrongheaded. The fact that this will entail policies which have more to do with utilitarianism than with equality of resources has already been extensively shown by Roemer (1985, 2002), in results which bear some formal similarity with the analysis of the previous section.

There remains, however, a glimpse of hope for the advocate of insurance markets. We have seen in the previous section that, if well-being is measured ex-post but takes account of periods in which individuals live with uncertain prospects, then it may be good for well-being to go some way in the direction of respecting individuals' ex-ante decisions. In other words, people make wrong decisions ex-ante but these are their decisions and forcing them to do otherwise appears bad to them, at least until uncertainty is resolved. Therefore, it may be that in practice insurance markets, possibly with some safeguards, are not always a bad solution, even as far as personal talents are concerned.

These considerations do not appear promising for the hypothetical insurance. They are valid only when people do make decisions and live with these decisions for some time, so that their ex-post well-being is strongly influenced

by their perception of their ex-ante prospects. In the hypothetical insurance market, in contrast, people operate under a veil of ignorance and make hypothetical decisions. It is as if they were souls taking insurance before being incarnated in particular bodies with special talents. Because actual people do not live before being born (as far as we know, and as far as it seems relevant for the purpose of social evaluation), there is no sense in which one could say that their current post-birth well-being is influenced by their enjoyment of having made good insurance decisions before being born. Therefore there is no hope to save the hypothetical insurance market by invoking a conception of well-being that incorporates ex-ante utility. Ex ante utility is not enjoyed by people in this case, in any reasonable sense.

Dworkin's general approach to the theory of equality of resources is very inspiring and deserves much praise, but we are now in a position to describe where and how it goes astray. He starts with the idea of the no-envy criterion, which we have seen to be a good starting point for defining equality in a multi-dimensional context. Dworkin aptly sees that personal talents should be counted among resources to be submitted to the envy test if compensation of personal handicaps by external transfers is to be envisaged. And he correctly notes that the envy test is likely to fail in the sense that envy-free allocations may not exist. He then argues that, applied to the context of uncertainty, the correct viewpoint for the evaluation of personal bundles is the ex-ante viewpoint, because this is how one can take account of people's desires about more or less risky lifestyles. Applying the envy test in the ex-ante context is easily satisfied by operating an insurance market with equal initial endowments. Now, adopting the ex-ante viewpoint is his main mistake here. As we have seen, it is indeed important to take account of people's wishes about lifestyles, but the correct viewpoint for social evaluation is the ex-post viewpoint. To say otherwise would imply that an omniscient evaluator (with a correct ethical theory) can be wrong, and this appears impossible.

The next point in Dworkin's reasoning is that, since the envy test does not work well with personal talents but (allegedly) works well with insurance markets, the situation would be perfect if individuals had the opportunity to insure against personal handicaps before being born. They have no such opportunity in practice, but one can imagine what they would do if they had it. Hence the idea of the hypothetical insurance. He then extends this idea to all situations in which an insurance market does not exist and one seeks the correct policy of taxes and transfers. The wrong premiss in this step is that insurance markets work well as compensatory devices, and this relates to the mistake of adopting the ex-ante viewpoint. Moreover, as we have just seen, insurance markets work especially badly for personal talents and when ex-ante utility does not matter in the computation of ex-post well-being, and

these are precisely two features of the hypothetical insurance.

The alternative route that Dworkin should have explored consists in analyzing the envy test, distinguishing the compensation principle and the liberal reward principle that it encapsulates, and seeking criteria which satisfy these principles in a sufficiently moderate way so that optimal allocations can always be found. Conditional Equality and Egalitarian Equivalence, for instance, are much more faithful to Dworkin's initial vision than the hypothetical insurance market.

8 Conclusion

The three guiding principles here have been that individuals should not be held responsible for their luck, that ex-ante prospects may also matter ex-post, in the evaluation of a life, and that social evaluation should adopt the ex-post viewpoint. They make the idea of option luck quite suspect, but we have seen that Conditional Equality provides a rather natural way to define and apply it in a consistent way. Even with Egalitarian Equivalence, which typically advocates full insurance of bad luck, it is possible to leave a room for uninsured risky activities if this corresponds to lifestyles the enjoyment of which is essential to well-being.

The ex-post viewpoint, however, makes it legitimate for social policies not to condone each and every ex-ante wish that people may have. In particular, insurance markets which leave it to individuals to decide ex-ante how much coverage they want operate well (in absence of market failures) only in the case of damage to replaceable property and cannot be safely relied upon in other cases. This appears to radically undermine Dworkin's idea that hypothetical insurance markets can give us a rough idea of the optimal tax and transfer policies in many contexts, especially the case of unequal personal talents. The criteria of Conditional Equality and Egalitarian Equivalence studied here appear definitely superior, even according to the general principles set out by Dworkin himself, such as the idea that the allocation must "endowment insensitive" (compensation principle) and "ambition sensitive" (liberal reward). The hypothetical insurance market does not compensate bad luck properly, as it has been explained in detail here. It does not satisfy the liberal reward principle either, since individuals with identical endowments and luck may end up with very different transfers if their hypothetical insurance decisions are different.

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