

## A CONTRACTARIAN APPROACH TO ACTUARIAL FAIRNESS

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### ABSTRACT

We defend, from a contractarian perspective, that the fair price of an insurance policy is the amount that the contracting parties agree when they are both equally uncertain about the insured event. Drawing on the approach developed by R. Sugden in *The Community of Advantage*, we answer two standard objections raised against contractarianism in the actuarial sciences: 1) people are not wise enough to assess their actuarial risks; 2) they are not rational enough to decide which insurance policy suits them better. We show under which circumstances people can make fair actuarial agreements, without presupposing any objective risk or rationality benchmarks.

Keywords: actuarial fairness, contractarianism, risk.

### 1. ACTUARIAL FAIRNESS: A CONTRACTARIAN TAKE

What is the fair price of an insurance policy? The standard answer in the actuarial world is, simply, the mathematical expectation of the insured claims (plus expenses and profit). Imagine an insurance policy  $X$  covering three different events with three different payments to the customer: if nothing happens, the claim will be 0 EUR (with probability 0.81); in a second event (with probability 0.18), the claim will be 50EUR; and in a third event (with probability 0.01), the claim will be 100EUR. The fair price for this contract, in the standard view, is its expected value of 10 EUR:  $E(X) = 0 \times 0.81 + 50 \times 0.18 + 100 \times 0.01 = 10$ . However, this standard view of actuarial fairness is nowadays increasingly contested (Landes 2015): e.g., why should the expected value set the fair price, instead of, say, any other weighted average? And then how should the risks (probabilities) be quantified?

There seem to be two main moral intuitions about the fair price of an insurance premium. Underlying the mainstream view, we find the idea that people confronting the same risks should pay the same price (the mathematical expectation of the insured claims).<sup>1</sup> There is a main contender to this approach, the so-called *solidaristic* view of insurance in which fairness would involve people with lower risks subsidizing those with higher risks, so that their needs are covered at an affordable price (Baker 2011). Both views somehow presuppose an objectivist take on risks: each individual has an objective

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<sup>1</sup> See (Heras et al. 2020) for a discussion of the origins and justification of the standard account of actuarial fairness. Throughout this paper we will speak of actuarial fairness in a broad sense that we introduce there, not to be confused with the textbook definition presented above.

risk profile that a fair price should (or should not) reflect. We are going to present an alternative view articulated on a contractarian approach without any predefined risk benchmarks.

Following Robert Sugden's contractarianism, we defend that, in an insurance contract, it is up to the contracting parties to decide whether the price of an insurance policy adequately reflects the risks it covers, within the relevant legal boundaries. There are no self-standing risk benchmarks – neither probabilities nor expected values – to assess its fairness. Inasmuch as the contracting parties share all the relevant information about the uncertainty of the insured event, any price they agree upon will be fair.

We will present our case starting with a quick overview of Sugden's contractarianism (section 2), after which we will review two well-known objections against a contractarian definition of the fair price of a premium in section 3. We will answer these objections in sections 4 and 5. We will contend, on the one hand, that actuarial risks benchmarks are ultimately a social convention, in which policy-makers level the playing field between customers and experts. On the other hand, this should not be a problem to justify insurance market agreements, since, following Sugden, we assume that agents may be rational even when they violate the axioms of standard decision theory. They just need to assess their risks in a self-interested manner.

In section 6, we will introduce our contractarian take on actuarial justice, making the shared uncertainty about the insured event the key to a fair agreement. We will show then how our view accounts for deception and fraud in real insurance markets. Finally, to test the strength of our approach, in section 7 we discuss a controversial case of insurance exclusion.

## 2. A PRIMER ON SUGDEN'S CONTRACTARIANISM

Intuitively, insurance appears as a series of independent, bilateral contracts in which customers pool their risks for a price. Think of standard life insurance, based on underwriting guidelines and risk classifications targeting the individual customer. Ideally, each individual customer is charged a price according to how she scores on several known risk factors, predicting the potential losses. In practice, companies calculate those prices taking other considerations than risk into account (expenses and profit); however, as we have just mentioned, it is a widespread view in the industry that an insurance contract would be unfair if policyholders agreed to premiums that do not reflect their expected losses (Landes 2015). This view presupposes a self-standing benchmark (expected losses) to assess the fairness of this price. Instead, we are going to adopt a different approach and concentrate on the agreement that leads to this price. From a contractarian perspective, when would this contract be fair?

Contractarianism comes in many different shapes. Sugden takes his main normative insight from the Nobel prize in economics James Buchanan: individual choices do not require any further justification, be it in terms of the individual's own values or the

society's good as a whole. For neither Buchanan nor Sugden is it necessary to assess individual choices according to a stable preference structure, as mainstream welfare economists do (Dold and Rizzo 2021). Sugden, a prominent experimental economist himself, claims that there is enough empirical evidence to doubt that there is something like an *inner rational agent* with stable, consistent, and context-independent preferences defining the good life. Individual choices are often context-dependent, often in contradiction with the independent preferences that would supposedly characterise such an inner rational agent. But this contextuality should not undermine the moral worth of the choices, because nobody is in a better position than the individual to judge her own interests at each particular decision.

While welfare economists assess social policies and institutions by invoking the rational structure of individual preferences, for Sugden, this assessment should speak to each individual according to her own understanding of her interests. E.g., for the justification of markets, Sugden proceeds in two steps. First, following Hume's cue, Sugden claims that markets would be acceptable if it is in the interest of the individual to accept the rules governing them "on the condition that everyone else does the same" (Sugden, 2018, p. 14). Then, Sugden shows how market economies expand each individual's opportunity set, i.e., "the set of alternative commodity bundles that the individual can reach by trading at market prices" (Sugden 2021). Let us briefly examine these two claims, starting with the latter.

If choices are the normative touchstone for the contractarian, having more opportunities would be, for Sugden, the relevant policy guideline: for each individual, a larger commodity bundle seems preferable to a smaller one if the former contains everything you have in the latter. Sugden introduces here the concept of *interactive opportunities*. Individual opportunity sets presuppose that people are willing to trade with each other so that those opportunities are realized via market exchanges. Instead, "interactive opportunity is defined for each set of individuals in terms of what those individuals are able to achieve merely by trading with one another" (Sugden 2021). Unlike for opportunity sets, here there is no presupposition about anyone's willingness to trade. Sugden uses the distinction to capture the essential unfairness of markets: a person will have a wide range of interactive opportunities, but market exchanges may not realize all of them. The actual opportunity set will depend on how other people go about their own opportunities.

Sugden ingeniously shows that it is possible to define competitive equilibrium on the basis of interactive opportunities alone, so that a normative benchmark (his Strong Interactive Opportunity Criterion) is satisfied in every competitive equilibrium of an exchange economy. In this regard, Sugden's understanding of markets extensionally overlaps with the mainstream neoclassical view. According to this view, opportunity-defined markets do not deliver equality: depending on how other people use their opportunities, each individual will see her own opportunity set expand or contract, regardless of her own interests. This brings us to the first Humean point above: why would it be in the interest of an individual to accept the rules governing a market if,

despite the promise of an expanded opportunity set, she may end up losing opportunities? Wouldn't it be better to accept those rules nominally and then free-ride? Sugden's contractarianism answers this challenge in two steps: showing how agreements generate team reasoning among the trading partners; and defending social insurance to support the social contract against the discontent of those who lose.

For Sugden, cooperation in our societies occurs when people voluntarily engage in *social practices*, i.e. behavioural regularities that people observe in their recurrent interactions. Market trading would be one such practice and the incentive to engage in it would be mutual benefit. This does not mean a joint utility that the partners try to maximize, since utilities presuppose, once more, preferences and, for Sugden, the participants in a social practice do not need to know each other preferences – they just need to empirically observe that, if they follow the social norm governing a standard practice, it is likely that their partners will do as well, thus increasing the range of opportunities they may all enjoy. Following a norm may occasionally go against an individual's self-interest, but, for Sugden, there is enough psychological evidence to show that when the participants in a social practice reason as members of a group that seeks mutual advantage, they will accept those individual losses if the group gains. But if any of the members of the group free-rides, the other members may stop observing the norm: their implicit agreement crumbles.

Still, markets will bring about inequality, and there is a limit to the losses an individual may endure. Following a Rawlsian cue, and drawing on extensive psychological evidence, Sugden considers it unlikely that if people find themselves losing recurrently, they will stop seeing any advantage in conforming to standard market practices, challenging the stability of markets as social institutions. Hence, to preserve the *community of advantage*, Sugden advocates for social insurance schemes funded by taxes. The justification is here the plain self-interest of the winners: the wealthy have an incentive to accept redistribution in order to sustain the markets in which their assets are valuable.

Summing up, the constraints on self-interest and market intervention makes Sugden "the sort of libertarian that is liked by people on the left" (Guala 2021). Whether Sugden's intellectual project is feasible is still under discussion<sup>2</sup>. But, for the sake of the argument, let us assume that it is and see now how it can help us define the concept of an actuarially fair price.

### 3. TWO OPEN QUESTIONS AGAINST A CONTRACTARIAN DEFINITION OF ACTUARIAL JUSTICE

We have presented what will be our take on contractarianism. To see how it would work in the assessment of actuarially fair prices, let us first present some challenges raised against mainstream contractarianism (Landes 2015), that we will answer in the next two

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<sup>2</sup> For recent debates see the objections and responses compiled in the *Journal of Economic Methodology* (28.4, 2021) and the *International Review of Economics* (68.1, 2021).

sections. If the fairness of the agreement depends on the assessment of each customer's risk, Landes wonders: how should these risks be estimated? How should they be assigned to each single individual? Should actuarial prices reflect only these estimated risks or the particular risk aversion of the customer?

The first of these questions presupposes an asymmetry between the expert quantification of risk by insurers and its lay understanding by customers. The expert should be able to grasp the statistical distribution of the risk in the customers' population, having both the mathematical skills and the necessary data to calculate it. Few lay customers would have them, and if they did, they would face a challenging reference class problem: i.e., there are many potential risks classifications of each single individual and, therefore, many different ways to assess her individual risks from population data. But even assuming a single risk classification was agreed -this is Landes' second question-, customers would still be averse to risk in different degrees and, therefore, more or less willing to pay the standard insurance premium for that risk. If insurance companies adjusted their prices to their customers' risk aversion, would the price still be fair?

In other words, Landes' questions challenge the possibility of grounding an actuarial fair price on an informed agreement between the contracting parties for epistemic reasons. Customers lack the ability to estimate actuarial risks (Landes 2015) and to calculate correctly the contract's expected losses. Since this calculation is out of reach, Landes suggests instead to explore what sort of agreement customers would "reasonably" adhere to (Landes 2015). In section 6, we are going to present a contractarian proposal for a reasonable agreement. To get there, we need first to answer Landes' questions. In section 4 we will argue that actuarial risks are ultimately a convention that both laymen and experts may grasp. In section 5, we will contend that insurance customers are rational enough to agree on a fair price. On these grounds, we will lay next our own contractarian approach.

#### 4. THE RELEVANT ACTUARIAL RISKS ARE SOCIAL CONVENTIONS

According to (Hacking 2001), there are two main types of insurance depending on the risks considered. On the one hand, there is *ordinary insurance*, covering events for which there is a frequency-type probability -e.g., mortality rates for life insurance. On the other hand, *extraordinary insurance* covers events for which no such frequencies exist -e.g., moon landings. Here, insurance is a gamble based on belief-type probabilities. As we are going to see, the distinction between ordinary and extra-ordinary insurance is rather a matter of degree. All actuarial risks ultimately rely on *evidential probabilities*: actuarial risk estimates are always conditional on *legally regulated* evidence, where non-scientific considerations play a key role.<sup>3</sup> Today, insurance regulations (such as the EU Solvency II

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<sup>3</sup> We are not debating here how actuarial estimates track real risks: we think they do, but not in the same way that physics track the probability of a nucleus decay. Landes' objection hinges about the asymmetry

Directive [2009/138/EC]) allow companies to manage their customers' risks as they see fit, provided they meet strict controls of solvency. The main consideration here is how to calculate, on purely financial grounds, the reserves that companies should have to pay client claims.

Landes' objection against contractarianism is that the proper estimation of actuarial risks is too complex for most customers to grasp. Therefore, they are incapable of reaching an informed agreement about actuarial prices on their own, as the contractarian would expect. Our answer is that regulators level the playing field between actuarial experts and insurance customers, allowing the latter to reliably assess premiums on their own. Our argument has two parts. First, we show that insurance risk estimates are not self-standing scientific predictions that customers should grasp on their own. Instead, risk estimates are the outcome of heavily regulated models: they track features of the real world, but their final form depends on a social convention. The second part of our argument is to show why this regulation would be defensible from a contractarian perspective. A quick discussion of two examples in life and non-life insurance will illustrate how policy-makers make risk assessment possible in insurance markets.

Life insurance is the canonical instantiation of Hacking's ordinary insurance. It requires the estimation of how the mortality of a population will evolve throughout several decades. This frequency is, in fact, a moving target: during the period under analysis, the longevity of the population will predictably change, as it has been observed in most countries for the last 150 years. The most sophisticated tool available in the industry for this mortality estimate are the so-called *dynamic tables* (for its methodological foundations, see (Lee and Carter 1992)). These estimates are ultimately evidential probabilities rather than objective frequencies, since they depend not just on particular mortality datasets, but also on some controversial assumptions. For instance, there still is no agreement on whether longevity will rise indefinitely or at which point it will stop (Dong et al. 2016). Beyond several decades, the confidence intervals for a mortality estimate become broader and broader, particularly if we take into account the uncertainty in the estimation of the parameters of the model (Dowd et al. 2010). If we compare mortality estimates from different dynamic tables for a distant point in the future, the differences are significant: e.g., an 11 year discrepancy in the estimated life expectancy for Japanese women in 2070 (Vaupel et al. 2021). In this sense, the difference between ordinary and extra-ordinary insurance is a matter of degree.

These are, of course, scholarly debates on the topic that are out of reach for the average insurance customer. Our point is that these debates are not closed when experts reach a scientific consensus. Companies investing in dynamic tables are market players and their mortality estimates are gambles that may backfire if they are too daring. To protect

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of knowledge between actuaries and customers, independently of whether this knowledge is based on objective risks or socially regulated models.

insurance customers, regulatory authorities, through solvency requirements, make sure that companies do not deviate much from each other in their estimates. This solves Landes' objection: if a market is well regulated, insurance customers should be able to choose which price suits them best without sophisticated expert advice.

Consider now another *ordinary* type of insurance: car insurance. Again, although accident rates seem to yield frequencies, we are talking about evidential probabilities. So far, the estimation of risks has relied on easy-to-collect variables related either to the drivers (age, gender, marital status...), the characteristics of the vehicles (power, age, model...) or how they are used (business or pleasure). Some of these variables, such as age, are powerful risk factors: e.g., very young or very old drivers, for instance, show higher claim rates than the rest of the age cohorts (Kelly and Nielson 2006). But it now seems possible to obtain better predictions drawing on new classes of risk factors. E.g., recent studies have shown that taking into account data about the behaviour of drivers, extracted from tracking devices installed in their vehicles, improves the conventional model for estimating the frequency of claims (Ferreira Jr and Minikel 2012; Lemaire et al. 2016). According to (Ayuso et al. 2019), usage-based information may help in shaping premium ratemaking, giving drivers price incentives to drive more carefully.

Predictions about individual risk profiles may be accurate enough to confirm Landes' point. Experts are able to grasp a customer's risk better than the customer herself, so how could the latter be able to assess the fairness of an insurance price unassisted? Again, we think that legislators are doing the heavy lifting on behalf of insurance customers, this time regulating which risk factors are acceptable. Experts are indeed capable of predicting a driver's claims much better than herself, but they may not understand why, for instance, a credit score is a good driving risk factor. Moreover, experts should persuade regulators that it is fair to calculate a price drawing on such black box predictions. In our view, once a regulator has decided which risk factors should be legitimately used, customers are perfectly capable of deciding by themselves which price suits them best.

Let us consider one such black box. (Kiviat 2019) has studied how US legislators have debated the use of *credit scores* (tracking how reliable an individual is in paying her debts) as a predictor for car insurance claims. Credit scores provide an excellent risk factor, but there is no clear causal story justifying why car insurance prices should penalize debtors. Without this story, US policymakers resist the use of credit-based insurance scores, since it would hold drivers accountable for actions that are not really their fault. Even for risk factors for which there seems to be a causal story, North Americans disagree. The kilometres driven at night per year is a good predictor of the number of claims a driver may file, but only 30% of US citizens find it a legitimate risk factor, since it would penalize those drivers who work night shifts (Kiviat 2021).

Summing up, although the estimation of actuarial risks is a sophisticated task, we are not talking about self-standing scientific predictions. Actuarial estimates are heavily regulated either indirectly, through solvency requirements, or directly, with mandates

on which risk factors companies are allowed to use. Now, for the second part of our argument: why would a contractarian justify this regulatory approach, instead of letting markets set the risk benchmarks? For Sugden, if there is a risk of market failure, the justification of any State intervention should be grounded on the interests of the actual insurance customers, as they themselves perceive them, with the goal of increasing their opportunities.

Regulation is generally considered necessary to prevent insurance companies to take excessive risks, given that it is their customers, not their owners, who will bear the main costs of a bad outcome. The early history of insurance markets is fraught with companies collapsing for miscalculating their risks, often to increase their profits. As we have discussed elsewhere (Anonimized), the rise of probability in the 18<sup>th</sup> century was followed by a wave of “scientific” insurance, in which actuaries tried to quantify the risks of death objectively by drawing on mortality tables, setting insurance apart from mere gambling. However, within a century, the project had collapsed: actuaries rarely agreed on their mortality estimates and the State had to intervene to set mortality benchmarks by law, so that companies did not go bankrupt for gambling too much on prices. Ever after the 19<sup>th</sup> century, Western States have regulated, directly or indirectly (through solvency requirements), the risk benchmarks insurance companies are allowed to use, openly acknowledging the possibility of a market failure if those benchmarks were withdrawn.

As the two cases discussed above illustrate, risk benchmarks are set combining political and prudential considerations, such as which risk factors are legitimate or how much companies are allowed to differ in their mortality estimates. There is no systematic justification to answer any of these questions, contractarian or otherwise. For Sugden’s contractarianism, as for any mainstream economist, the general rationale for this intervention is clear: to prevent insurance companies from taking excessive risks at the expense of their clients’ interests.

The goal of this section was to show that actuarial risks are the outcome of heavily regulated models, and there are good principled reasons for this regulation to exist. For the sake of our argument, this is enough to answer Landes’ first objection. Experts with the proper statistical skills may indeed have an advantage in the assessment of an insurance contract, but if regulators have levelled the playing field, the advantage is not substantial. Furthermore, risk assessment is not just about probabilities, but about values. In the next section, we will vindicate the contractarian intuition that customers generally know their interests best.

#### 4. HOW MUCH RATIONALITY DOES THE CONTRACTARIAN NEED?

Landes second objection against contractarianism is about people’s ability to estimate their risks. If insurance customers cannot do it properly, how can an agreement on a premium be fair? Customers may be deceived very easily by predatory companies. Since we are going to defend that, in a fair insurance agreement, people are free to estimate their risks as they want, we should fend off this objection.

There are two versions of this objection. In its mild form, a simple lack of mathematical skills would explain the inability of customers to properly estimate their risks. But this could be solved with a standard regulatory fix: including a readable index of the risks involved in every contract -e.g., a coloured risk label. A stronger version would hold that there are cognitive biases preventing most insurance customers from making rational decisions about contracts. Paternalism would be the only remedy, as Landes seems to suggest: a benevolent expert should choose the best insurance option for each of us, using something like the objective expected losses as a benchmark. In our approach, the fairness of a price depends on how the actual agreement is achieved. If a paternalist nudge is inevitable, contractarianism would be untenable, since it presupposes that self-interest alone should provide all the relevant motivation.

Our answer is that we should reassess what counts as rational in decision-making about insurance. Landes' objection presupposes a model of rational decision in which biases make customers deviate from a particular decision benchmark -the objective expected losses of a contract. There are three types of arguments to justify the use of this benchmark. First, involuntary transfers: if a customer were to pay more than her expected objective losses for an insurance policy, she would be subsidizing those other customers who are paying less. But this argument would equally work with any other risk estimate, not just with expected losses. The second argument is that insurance companies are dealing with large pools of customers, for which the expected losses provide a sound financial estimate to secure the company's solvency. But this argument does not hold for individual customers. Most individual customers will only make a few actuarial decisions in their lifetime<sup>4</sup>. Why should we assume they are biased if they adopt a different decision rule?

The third and, perhaps, strongest argument to justify the superiority of the expected losses as a risk benchmark invokes rational decision theory. This assumes that preferences that are roughly stable through time, consistent and context-independent. Maximizing the satisfaction of such preferences would be the most rational expression of self-interest, and any deviation from the prescribed outcome would constitute a bias. As we have already seen, Landes' contractarianism presupposes this approach to rationality. However, experimental and behavioural economics have challenged that actual decision-makers may ever have such articulated preferences. To renew the contractarian approach, we need a defence of the superiority of market agreements to satisfy individual interests that does not presuppose the traditional standard of rationality. And, as have already seen in section 2, this is what Robert Sugden's contractarianism does.

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<sup>4</sup> From a probabilistic standpoint, insurance customers would be naturally modelled as Bayesian agents forming subjective probabilities about actuarial risks. However, as we will argue below in more detail, there are few occasions for updating since customers just sign a few contracts throughout their life and rarely have access to other people's claims. For the same reason, it is difficult to construct money pumps against their interests, so deviating from Savage axioms may not put them at excessive risk.

For Sugden, in a Humean vein, an institution would be fair if it is “in the interest of the individual to accept the rules of that institution, on the condition that everyone else does the same” (Sugden, 2018, p. 14). The assumption here is that each individual knows best what it is in her interest. From a paternalist stance, this knowledge would seem ungrounded: individuals are often irrational and act against their own best interest. Sugden’s rejoinder denies the existence of any perfectly rational individual (with stable, consistent and context-independent preferences defining the good life), whose best-interest decisions may provide a benchmark for anybody else’s choice. Instead, for Sugden, a recommendation is normatively compelling if it is addressed to the concerned individual showing she would benefit from the proposal in terms she would accept.

From Sugden’s contractarian perspective, any decision flaws that individuals are willing to admit may justify a regulatory intervention: e.g., most insurance customers will probably admit that they skip the small print in their policies, a flaw that a regulator may easily correct, in their interest, mandating that the key points are presented in a salient, readable manner. The justification is simple and, again, should not only appeal to contractarians: “if there is to be price competition, buyers need to compare like with like” (Sugden, 2018, p. 159). Obfuscated information in an insurance policy is just an obstacle to competition. But while one thing is to make the information more transparent, it is something very different to presuppose that a third party knows better than the customer which options suit her interests best.

The upshot for our argument is that, against Landes’ second objection, we do not need to presuppose much mathematical rationality in prospective policyholders in order to deem an actuarial agreement fair. They should be able to achieve it with whatever risk estimates they want to use, provided it satisfies their self-interest as they assess it. For an agreement to be fair, as we are going to defend next, we only need the parties to agree on the existence of a risk, i. e. a possible loss, and how to assess it.

## 5. ON DOMATIAN AGREEMENTS

Now, if actuarial risks are just heavily regulated conventions, under which conditions will an agreement on a price be fair? We are going to defend the following general principle about aleatory contracts (agreements hinging on a random event): assuming the agreement satisfies the interests of the contracting parties, they are fair if both parties are equally uncertain that the event will happen. They share the information they have on the event and if none of them considers that the other party has an advantage, their agreement will be fair. We call these ‘Domatian agreements’, after the discussion of aleatory contracts that the French jurist Jean Domat (1625-1696) presented in his masterpiece *The Civil Law in Its Natural Order* (1850 [1689]).<sup>5</sup> To illustrate these

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<sup>5</sup> For an introductory overview of Domat’s work see (Iglesias, 2009). Domat’s principle is an instantiation of the doctrine of *uberrima fides* in Anglo-Saxon insurance law, “the customer’s duty to disclose facts which are material to the risk and which enable the insurer to form a rational decision whether to accept the risk and, if so, at what premium” (Achampong, 1987, p. 329).

agreements, we can use a 17<sup>th</sup> century example presented by Domat himself: imagine a group of childless friends forming a partnership paying an annual fee to fund the future dowries of their daughters, if they ever have one. Although some of the partners may end up having only boys, the agreement is fair to the extent that nobody among them knew the gender of their future children when they signed their agreement.

Although Domat's legal philosophy is far from contractarianism, this approach to the justice of aleatory contracts can be vindicated on contractarian grounds, following Sugden's guidance. For a contractarian, as we already mentioned, the fairness of an institution depends on whether it is in the interest of an individual to accept it, on the condition that everyone else does the same (Sugden, 2018, p. 14). Domatian agreements are based on one such institution, a norm of fairness for aleatory contracts: the contracting parties agree to disclose the information they have about the insured event, assuming that they will all be equally honest. They accept this norm on a purely self-interested basis: individuals can expect to benefit from this rule as often as they don't, provided there is real randomness in the insured event. As in any fair lottery, sometimes they will win, sometimes they will lose. On these grounds, the mutual advantage is the only justification of the insurance price: each party cares about its own interest, without any objective/external risk benchmark to assess whether the deal is fair. Fair insurance contracts, in this sense, are – in the words of Hume – highly conducive “to the support of society, and the well-being of every individual” (Sugden, 2018, p. 36).

In our view, it is up to the contracting parties to decide whether the price of an insurance policy reflects adequately the risks it covers, within the relevant legal boundaries. There are no self-standing risk benchmarks, either probabilities or expected values, to assess its fairness. Inasmuch as both the contracting parties have the same relevant information about the insured event, any price they agree on will be fair.

Now, the straightforward objection against the fairness of Domatian agreements is that we may not expect any self-interested partner to behave accordingly. From a game-theoretic standpoint, if anyone is certain that her partners are going to be honest about their risks, the optimal strategy is usually to lie about your own. Our answer is that, true as that may be in the model, there is anthropological evidence showing that Domatian agreements hold well against free-riding. Let us consider a kind of Domatian agreement, the so-called Risk-pooling systems (RPS) – informal insurance schemes observed across a wide range of cultures – see the work of the Human Generosity Project for an overview and analysis (Cronk and Aktipis 2021). Key to RPS is they are self-enforced, without State intervention.

The Maasai have, for instance, the *osotua*, is a partnership in which two individuals commit themselves to helping each other out in case an unpredictable need arises (e.g., drought that may affect their livestock) (Cronk et al. 2019). The *osotua* is not a loan; it does not create repayable debt. In a Domatian spirit, this is a voluntary agreement in which the partners assess each other's wealth (the cattle they own) and risks (how

exposed to drought they are). It is difficult for them to cheat since their wealth and risks are observable, but they are also educated in the *osotua* values. This shows up in experiments where the Maasai play trust games: when framed as an *osotua* partnership, the usual reciprocity expectations are significantly reduced. In a Sugdenian light, we'd say that the *osotua* creates a form of team reasoning among the partners: if any of them follows the norm, it is likely that the other partner will do so as well, and this will increase the range of opportunities (wealth measured in livestock) they may enjoy in case of need. The partnership holds because both parties consider the agreement fair, and both benefit from it.<sup>6</sup>

There are many RPS in our contemporary societies, but all of these risk-sharing schemes differ significantly from market insurance, in which risks and wealth are often invisible, creating ample room for cheating. In this context, free-riding may destroy any fair Domatian agreement. But, as we are going to see next, the State enforces Domatian fairness, punishing fraud and fostering transparency in insurance contracts.

When a customer behaves in a way that increases/decreases the risks of the event resulting in a valid, payable claim, it is legally a *planned fraud* (Lesch & Brinkmann, 2011). In planned frauds (e.g., arson), the fraudster transforms the random insured event into a guaranteed incident through his planned intervention. This is unfair, in our account, because the customer deceives the company about the actual uncertainty insured: whereas the company would expect to see, on average,  $x$  fires, the losses will be actually bigger.<sup>7</sup>

Insurance companies are often accused by customers of misrepresenting the actual risks insured, making customers believe the contracted coverage is broader than it actually is (Kvalnes, 2011). They only find out when the companies refuse to pay the indemnity. In our account, this is legal, but unfair. Insurance policies are *credence goods*, and customers often ignore the real quality of the service they are buying because they do not have access to other customers presenting similar claims with their same policy. For most customers, the two main factors for buying insurance are its price and the advertised benefits. Insurance *sales stories* convey the impression that companies cover risks because they trust their customers, as if they were friends or family, without inquiring about the claim details (Baker 1993). As we already argued in section 4, for an

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<sup>6</sup> (Skogh 1999) provides a decision theoretic analysis of RPS showing that mutually beneficial risk-sharing is, indeed, possible without the assignment of a probability. If the partners assume that the risks they are confronting have the same probability, whatever it may be, they will have the right incentive to pool those risks.

<sup>7</sup> Now, assuming there will be fraud, companies may protect themselves against it, raising *ex ante* the probability of the insured event. "Innocent" customers will pay for these overestimated risks: wouldn't this be unfair? The problem is that it might be impossible for companies to control for the possibility of fraud in a more efficient way. Screenings or more exhaustive fraud investigation will equally raise the price. Hence, to the extent that the possibility of fraud is generally acknowledged, the overestimation of risks may be legitimate.

agreement to be fair, it is not enough that the small print accurately presents the underlying risk model, it should do it in a mutually understandable manner.

Summing up, be it in Stateless communities or in insurance markets, there is a widespread contractarian intuition about fairness that, in our view, is best captured by what we call Domatian agreements. For actuarial prices to be fair, the contractarian requires an agreement in which the parties share the uncertainty about the insured event and find the price mutually advantageous. Sharing the uncertainty would mean that they do not mislead each other about the insured risks, either because there are no such risks or they are not actually covered by the insurance. Let us now test the strength of our approach with a discussion of a complicated case, pitting our contractarian intuitions against a popular view of what actuarially fair prices should be like.

## 6. THE SAD CASE OF ED STEIN

Medicare Advantage is a US federal program that subsidizes private insurance plans for half of the elderly Americans. In 2020, the *New York Times* illustrated a moral dilemma a contractarian could confront, through the story of Ed Stein<sup>8</sup>. At 65, Stein could choose between Medicare Advantage or the traditional, publicly managed, Medicare with supplemental coverage (Medigap) to pay for extraordinary expenses. Having good health, Stein was an attractive customer for private insurance companies, that enticed him to join Medicare Advantage with perks like gym memberships.

Stein was taking a risk that only became obvious seven years later: after a severe cancer diagnosis, he faced a difficult choice. There was no good local specialist available in his Medicare Advantage plan, but returning to the traditional Medicare scheme was practically impossible after the diagnosis. The US federal government allows seniors a six-month period, after they turn 65, to return to standard Medicare with supplemental coverage, in which no company can reject them or charge a higher premium for pre-existing conditions. Companies are free to do so only once the six months expire. Knowing Stein's diagnosis, no company was willing to provide him with an affordable Medigap coverage.

In their recent best-seller *Risky Business. Why Insurance Markets Fail and What to Do about It?*, A. Finkelstein, R. Fisman and L. Einav (Einav et al. 2023) present the story as an example of what they see as an inevitable trade-off between fairness and efficiency in actuarial markets. For them, fairness considerations justify the six-month trial period, in which insurance companies treat every US senior equally, offering them affordable insurance independently of their health status. Afterwards, for the sake of efficiency, market considerations will prevail, charging each customer according to their risk profile.

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<sup>8</sup> See <https://www.nytimes.com/2020/02/21/business/medicare-advantage-retirement.html> (Accessed on May 16, 2023)

The trade-off occurs because those first six months of fairness create an adverse selection problem: healthy seniors will probably avoid the traditional Medicare scheme, as Stein did, leaving in the public system those in greater need of care, i.e. the more expensive customers. To secure the solvency of the insurance scheme, after those six months, companies are free to use any information they can gather to select their customers, making market prices more efficient, but unaffordable for many potential customers. Having more fairness (longer trial periods) would increase selection problems; having more efficiency can only be achieved at the expenses of fairness (shorter trial periods).

In the way (Einav et al. 2023) present Stein's case, the trade-off seems inescapable, but only under the assumption that a maximally fair health insurance scheme would be one providing affordable care to every senior at any stage of her life, whatever her risks. We think this is an exaggerated assumption: in every theory of distributive justice, there are limits to redistribution, not necessarily in a trade-off with efficiency. Our contractarian take, for instance, offers a different perspective on Stein's story. Denying Stein an affordable Medigap coverage would have been fair if, at 65, he had grasped all the relevant uncertainties when opting for Medicare Advantage.

Clearly, when the contract was signed, Stein and his insurance provider were equally uncertain about Stein's future diagnosis. They both gambled on his future health. The contentious point, according to the *New York Times* piece, is whether the information about future coverage scenarios was presented in a way that allowed customers like Stein to make an informed choice.

There seem to have been two types of obstacles for assessing Medicare Advantage plans: misleading advertisements and changes in coverage. The former is just another instance of the sale-stories problem we already discussed in section 5, and the proper answer is regulation: if there is to be price competition, buyers need to compare like with like when assessing alternative insurance schemes<sup>9</sup>. The problem of changes in coverage is, perhaps, more difficult to tackle. Insurance companies benefit from changing healthcare providers, and they often do it. Despite the warning to patients, it is difficult for them to keep track of the changes in the services provided in their Advantage plans. Is it possible to present this information in a way that the average customer grasps? For Stein himself, it is not: "We think of ourselves as sophisticated consumers, but when it comes to health care, it is almost impossible to figure it out."

A paternalist approach would conclude that fairness is only possible in an entirely public health insurance system, where an expert can decide for each senior which option suits her best. A contractarian would just require the State to regulate the terms of each insurance agreement in a way that allows customers to figure out which plans suits them. As of today, there are apparently similar levels of satisfaction and low levels of

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<sup>9</sup> For the current US debate on how to regulate this problem see: <https://www.nytimes.com/2022/11/03/upshot/private-medicare-misleading-marketing.html> (Accessed on May 16, 2023)

switching between Medicare and Medicare Advantage<sup>10</sup>, suggesting that for most consumers the choice is not impossible. This is the key Domatian intuition: once the agreement is signed, customers and insurance companies seem happy to let the chips fall wherever they may land. Unless Stein could show that he was misled when joining Medicare Advantage, his exclusion would have been fair.

## 7. CLOSING REMARKS

We have presented a contractarian view of actuarial justice in which any agreement about prices with shared uncertainty about the risks would be normatively justified. We assume, on the one hand, that actuarial risks are ultimately grounded on social conventions, and therefore customers and companies have an active role to play in the definition of the risk benchmarks and what should count (or not) as a risk factor. On the other hand, we assume that the contracting parties are usually rational enough to assess what is better for their interests and that the only normative constraint on their decision is the exploitation of the other parties' ignorance about their own risks.

As compared to the standard account, in which actuarially fair prices are just the mathematical expectations of the claims, our approach is more transparent. As we have shown elsewhere (Heras et al. 2020), the Aristotelian intuition behind the mainstream view of actuarial fairness is that there should be a certain equality in the exchange. The price of an insurance policy should be proportional to the risks each of the contracting parties undertakes. And the expected value of the insured claims fixes this proportion by weighing the claims of their respective probabilities.

However, as we have argued here, the standard account of actuarial justice has nothing to say on how to estimate these probabilities, and there is more than one possible estimate. By this standard, it seems arbitrary to claim that a particular price is fair without establishing how the actuarial risks are calculated. In this regard, the advantage of our approach is that it is transparent about how the agreement on risks should be reached to set a fair price, defending an idea of fairness that, in our view, is driving actual insurance contracts. Whether this contractarian approach can stand the test of an actuarial world full of new calculation devices remains yet to be seen.

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<sup>10</sup> For an updated survey see: <https://www.kff.org/medicare/report/beneficiary-experience-affordability-utilization-and-quality-in-medicare-advantage-and-traditional-medicare-a-review-of-the-literature/> (Accessed on May 16, 2023)

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