# *When should contract obligations be relieved under changed circumstances?*

Henrik Lando

Professor of law and economics

Copenhagen Business School, hl.law@cbs.dk

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## Abstract

*Courts must decide the point at which the community's interest in predictable contract enforcement shall yield to the fact that enforcement of a particular contract would be commercially senseless and unjust.*

*Judge Teitelbaum in the case Alcoa versus Essex Group Inc.*

Wars, pandemics, and many other kinds of events disrupt contracts. Sellers cannot perform, or can only perform at great cost, or buyers find that performance has become pointless or much less advantageous. Should the disadvantaged party still be liable for breach of obligations, or should there be relief either through discharge or amendment of obligations? This question is relevant to the parties when they write force majeure clauses and to judges when they interpret various doctrines such as impossibility, impracticability, *force majeure*, frustration of purpose, mistake, and good faith and fair dealing. It is a question that has been answered differently throughout legal history, to some extent divides common and civil law, and is far from settled in either legal or economic theory. Doubt arises mainly when there is no or little moral hazard involved, i.e. when disadvantaged party cannot be expected to include the event as a contingency in the contract, or to prevent the change of circumstance or mitigate its consequences. This article analyses which standard of relief then maximizes the expected value of the contract ex-ante, in a trade-off between risk allocation and dispute costs that arise when the parties interpret one of the vague standards differently. The optimal standard is then shown to depend on the degree of vagueness of the standard, the parties' risk preferences, the costs of disputes as affected by the conflict resolution mechanism, the density function of the inefficiencies that may arise due to changed circumstance, and on whether the parties govern their contract by relational norms.

## 1. Introduction

Contract obligations sometimes become unexpectedly burdensome to one of the parties due to a change of circumstances. Recently, the war in Ukraine led to temporary unavailability of materials and/or to large price increases of materials. Suppliers were subject to liability for delay due to the unavailability of materials or suffered losses under fixed price contracts due to higher input costs. Similarly, under the Covid pandemic businesses were sometimes unable to produce due to lockdowns, or experienced large increases in the cost of performance as sellers or large declines in the value of performance as buyers.

Under such circumstances, businesses have consulted their force majeure clauses (which regulate circumstances where performance has become physically or economically impossible or impracticable) or their hardship clauses (which require the parties to renegotiate when the performances of the parties have become unbalanced for reasons beyond their control but where performance may still be worthwhile)[1]. Or, in the absence of such clauses, they have inquired into the default rules concerning impossibility, force majeure, impracticability, mistake, frustration of purpose, hardship, good faith and fair dealing, implied terms, or other standards. However, typically neither contract clauses nor default standards have provided clear answers. It is e.g. often unclear when an exogenous

[1] For instance, restaurants have sought relief for having to pay rent when they could not receive customers.

event is of the kind that constitutes force majeure, hardship or frustration of purpose, or how much costs must have gone up for the seller to be relieved, as court outcomes have differed considerably in this regard.[2] The uncertainty was e.g. apparent during the Covid pandemic when law firms struggled to provide advice to their clients.[3]

One source of uncertainty is that theory has not settled the question of when there should be discharge or amendment (in short: relief.) Most contract theorists agree there is a need for adaptation of contracts to changed circumstances since contracts are incomplete due to transaction costs and limited foresight. This need is particularly underlined by relational contract scholars. However, some theorists including Sykes (1991) in an influential article, and textualist authors (e.g. (Schwartz and Scott (2003), (2009), Scott (1999), and Schwartz (1992)) are highly skeptical of relief; they stress the difficulty for courts of knowing when a contract has turned out to be inefficient and the dispute costs generated by vague standards of relief.

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[2] For instance, relief was not granted in Hein v. Fox, 126 Mont. 514, 254 P.2d 1076 (1953), where the Korean War caused a shortage of steel, whereas it was granted in Florida Power & Light Westinghouse Electric Corp, (94 826 F.2d 239, 4th Circuit, (1987)) where the government reneged on its promise to deliver reprocessing services for uranium. It is not clear what caused the difference in outcome.

[3] For instance, on the issue of whether tenants could be relieved of their obligations to pay rent, if e.g. government regulations prohibited restaurants from operating, one law firm stated that `*Emerging litigation trends increasingly favor commercial tenants, and common law legal doctrines that were once only solutions to first-year law school hypotheticals are now viable theories upon which courts have granted commercial tenants judicial relief.´* (Perrie Weiner, Aaron Goodman, Erin Shields & Desirée Hunter-Reay, Common Law Defenses May Favor Commercial Tenants in Covid-19 Disputes, Bloomberg Law (March 2021) (https://www.bakermckenzie.com/-/media/files/people/weiner-perrie/bloomberg--common-law-defenses-may-favor-commercial-tenants-april-2021.pdf?la=en). Whereas another law firm stated that (Mark Stadler, Lessons Learned; Hopefully, No Bridges Burned: The Covid-19 Pandemic and Its Impact On Commercial Leasing, MONDAQ (Sept. 24, 2021), https://www.mondaq.com/unitedstates/landlord-tenant--leases/1114392/lessons-learnedhopefully-no-bridges-burned-the-covid-19-pandemic-and-its-impact-on-commercialleasing*) ..`most (courts) have concluded that the COVID-19 burden most appropriately falls on the tenant and it should not be absolved of its obligation to pay rent.´* Givati et. al. (2023) further describe the state of confusion and conclude: *`it is not clear we have made any real progress in understanding or managing excuse doctrine—even after it has played a pivotal role in an almost unprecedented wave of contractual renegotiation. Excuse remains as vague and ambiguous as ever.´*

Either side to this debate has difficulty explaining aspects of reality. For relational scholars it is difficult to explain why force majeure clauses are as restrictive in scope as they are: If adjustment is good, why then restrict its scope as narrowly as conventionally done? For textualists it is hard to explain why even large firms write vague force majeure clauses that are meant to be enforceable in court.

This article trades off the opposing concerns. On the one hand, more expansionary use of vague standards of relief can repair incomplete contracts more often, which can be beneficial from the point of view of both risk allocation and relational adjustment. On the other hand, vague standards of relief can generate more instances of opportunistic claims for relief and more instances of costly contract renegotiation and litigation. The model of this paper derives when there should be relief depending on the vagueness of the standard, the costs of conflict, the risk preferences of the parties, and the size of the exogenous shock.

One contribution of this article is to address dispute costs through marginal analysis. Thus, if the court decides to grant relief under a change of circumstance that hitherto would not have been sufficient, this policy is likely to create uncertainty about how much the threshold has been lowered. In some circumstances involving an even lower degree of inefficiency, future parties may then come to disagree about whether relief will be granted under the new, more lenient policy.[4] However, the more lenient policy may also dispel doubts that there will be relief at higher levels of inefficiency. At those higher levels of inefficiency, dispute costs will therefore be lowered. As the net effect, if lower levels of inefficiency are more likely to occur than higher ones (as the contract is drafted to be efficient under the more

[4] Most of the ensuing disputes are likely to be resolved through negotiations while some may lead to litigation; in either case, costs will be incurred.

likely circumstances), the broader policy of relief is likely to lead to an increase in dispute costs. It follows that the size of this effect depends on how much more likely small inefficiencies are than large ones, i.e. on the density function of inefficiencies. For instance, a flat density function with a long tail of large inefficiencies favors a policy of excuse at some level of inefficiency (an interior optimum). Large inefficiencies may e.g. arise in long-term contracts when costs change significantly at an early stage.

One implication of the analysis is that the court should consider not only the inefficiency of the contract under the actual circumstances, but also which inefficiencies might have arisen.

The focus on the trade-off between risk allocation (and relational adjustment) and dispute costs is not meant to exclude a role for incentives. For instance, the parties may draft more detailed contracts, prepare for, or mitigate the consequences of the change of circumstances, or rely (perhaps excessively) on performance. The article is mainly concerned with situations where such moral hazard concerns are not significant. Still, incentive issues are usually in the background and will be discussed outside the model.

Excuse doctrines tend to focus on whether events were unforeseeable or unforeseen, which suggests that the relevant economic theory involves the notion of awareness. However, an alternative is to focus on transaction costs and to assume that the parties may know about the possibility of wars, pandemics and many other kinds of events that may disrupt performance but that contingent contracting is costly. This article will suggest that transaction costs is a better approach than unawareness for formulating excuse doctrines.

The following section presents the literature. Then, Sykes' argument for why considerations of risk allocation should generally not justify excuse under circumstances of impossibility or impracticability is discussed within his model of a sales contract. Contrary to

Sykes, it is found that there are circumstances in which excuse is likely to constitute a better risk allocation than expectation damages in the absence of dispute costs. When dispute costs are included in the analysis, the analysis of these circumstances becomes complex, and instead a simpler model will be analyzed and discussed. The theory will then be discussed in relation to a set of paradigmatic cases. Finally, the main assumptions of the model will be discussed, followed by concluding remarks.

## 2. The literature

The question of excuse has a long antecedent in legal history, where two principles have fought for dominance.

One is pacta sunt servanda, which means that promises should be kept. The general usefulness of this principle has been recognized since ancient times. The other is the clausula rebus sic stantibus principle, which has been seen as an exception to pacta sunt servanda at least since Cicero. Cicero wrote (in De officiis 3 25 [95]) :

> *Suppose that a person leaves his sword with you when he is in his right mind, and demands it back in a fit of insanity; it would be criminal to restore it to him; it would be your duty not to do so.*

This comment inspired canonical scholars (such as Thomas Acquinas writing in the 13th. century) to view a promise as premised on circumstances remaining as they were at the time

of the promise. Grotius later essentially rejected (or fundamentally modified) this principle. In 1625, he wrote (De iure belli ac pacis (1993) at 421, l 2, c 16, § 25, n 2)[5]:

*We are used to discuss the question whether promises encompass the tacit condition "If circumstances have remained as they were": One has to answer negatively, unless it is completely obvious that the actual state of circumstances is included in the ratio of which we have spoken*.

Today, the debate between the two principles continues both within and between legal systems, and among contract theorists.[6]

The modern literature can be reviewed around three basic ideas: first, the model of contract remedies that emphasize incentives for breach, incentives for reliance investments, and risk allocation; second, the notion that the promisor may act uncooperatively unless relieved from performance obligations that have become very burdensome, and third (other) ideas of relational contract law.

In the first category, Posner and Rosenfield (1977) emphasize the role of risk allocation, assuming that excuse is mainly relevant when incentive considerations are

[5] For a historical account of the clausula principle, see Pichonnaz (2011).

[6] For instance, English law can be argued to be closer than civil law to Grotius' view: contracts are discharged due to a change of circumstance only when it can be implied that the parties did not intend for the contract to be performed (and this must be clearly implied) or if the purpose of the contract was fundamentally frustrated by the supervening event. It is the topic of debate whether there is here in fact a tension between common and civil law. On the one hand, English courts very rarely excuse performance when the seller's costs have gone up under the doctrine of frustration (Beale and Twigge-Flesner (2020)), and US courts also apply the impracticability doctrine restrictively. Moreover, English law has not acknowledged good faith as an overarching principle, while German courts have historically resorted to the good faith principle when justifying relief. On the other hand, English and US courts can in some cases reach the same result through contract interpretation or more specific rules. And force majeure is restrictively applied in civil law countries. See, for instance, Whittaker and Zimmermann (2000) on a comparison of good faith in France, Germany and England. See also Dawson (1984), (1983), who brings out the greater tendency for German courts as compared with US courts to reform rather than rescind contracts. The reformation of contracts by German courts has been justified by the good faith principle (§242 of the BGB); this is a clear difference to English law.

secondary due to the exogenous nature of the change of circumstance. They consider how doctrines of impossibility and impracticability serve to allocate risk efficiently between contracting parties with a particular view to which party is in a better position to insure or self-insure the risk. The party who can most cheaply insure against an adverse, exogenous, circumstance is the party who has better knowledge of the probability of the change in circumstance and of the size of the consequent loss, as this information will render the insurance contract more efficient. Moreover, a party can better self-insure if it can take advantage of the law of large numbers by entering many contracts for which the risks of changed circumstances are uncorrelated. Posner and Rosenfield find these factors can broadly explain case law.

In comparison with the present article, they do not analyze the trade-off between risk allocation and dispute costs.

Three criticisms have been raised against Posner and Rosenfield's seminal contribution. First, Trimarchi ((1991)) criticizes the weight attached to insurance. Insurance (or other forms of hedging, e.g. in a futures market) may be available to cover losses arising from an accident, such as a fire, but is often not available at a reasonable cost to cover losses from a sudden increase in production costs, or losses arising from a pandemic. Trimarchi instead views the main reason for providing relief to be the prevention of disruption due to financial distress.

Second, Trebilcock (1988) argues that Posner and Rosenfield's arguments for placing risk on one or the other party can seem hard to defend rigorously. Trebilcock believes that one can usually think of equally persuasive counterarguments concerning who is the superior risk-bearer, suggesting that courts' reasoning will be similarly contestable.

Third, it is argued (e.g. by Eric Posner ((2002)) and Givati and Kaplan (2022)) that there are aspects of legal precedent that the theory cannot explain. For instance, why is there a distinction between impossibility, which often leads to relief, and impracticability, which rarely does? If risk bearing capacity is the dominant factor, there is no apparent reason for this difference. We note that a rationale for this distinction arises within the present framework since real impossibility is a less vague term than economic impossibility or impracticability.

Like R. Posner and Rosenfield, Givati et. al ((2023) analyze excuse doctrines considering risk allocation in the context of macroeconomic shocks such as the covid pandemic. When the shock is macroeconomic, and there is a danger of widespread bankruptcies and contagion, a vague standard of excuse may be helpful by inducing the parties to settle in a manner that shares risks.[7]

Also in the first category, White (1988) and Sykes (1991) consider the question of discharge within the conventional model of breach remedies (Shavell (1980)). Discharge is

[7] The reason is that the vagueness of the standard means that both parties risk losing in court, and since by assumption each party risks bankruptcy if it loses in court, each has an incentive to settle. In this way, the authors can explain why the covid pandemic apparently (the evidence is not yet conclusive) did not lead to widespread litigation but rather to renegotiation. They do not claim that the vagueness of excuse led to less litigation than there would have been under a predictable standard; rather their claim is that it led to more sharing of risk. Hence, their theory is that the excuse doctrine can help reach an efficient macroeconomic allocation of risk that prevents widespread bankruptcies and contagion. In more normal circumstances, they emphasize that a vague standard can be undesirable in part because it creates legal uncertainty and therefore costly disputes, including litigation. They write (p. 15): `Conversely, if the law is uncertain, this may push the parties to go to court and spend resources on costly litigation. Uncertainty means that parties cannot know the outcome of their case. Under legal uncertainty, each party might estimate they have a good chance of winning in court. If this is the case, and both parties are over-optimistic, the parties will go to trial and not settle, each of them believing they stand to win by doing so. In this sense, uncertainty is detrimental, generating potential for costly litigation.´

seen as zero damages in case of breach. From this perspective, White finds that zero damages are rarely optimal, and she therefore wishes to abolish discharge, and to instead allow a court to set damages flexibly, considering how they affect incentives for breach, incentives for reliance investments, and risk allocation.[8] White thereby in effect endorses a scheme of risk sharing rather than the dichotomous choice of either upholding the contract and enforcing expectation damages or discharging the seller's obligation to perform.

Trakman (1984) also argues, among others, that loss sharing may be appropriate, when both the seller and the buyer can undertake actions to lower the impact of unforeseen circumstances. Either party may hold more inventories when there is a risk of large cost increases or the buyer may for instance buy from several sources. And either party may be able to mitigate losses after the circumstance has arisen.

By contrast, R. Posner and Rosenfield dismiss loss sharing, because they focus on which of the two parties should take out insurance; the cheapest insurer should take on the full risk.

Within a traditional model of breach remedies, Sykes (1991) finds that the impracticability doctrine creates uncertainty due to its vagueness, without any clear benefit in terms of risk allocation, reliance investments or mitigation of damages. He argues that courts are unlikely to be able to identify when discharge better than expectation damages corresponds to the parties' preferences for risk, or when the alleviation of the promisee's incentive for overinvestment under expectations damages, or the strengthening of the promisee's incentive to mitigate damages ex post, are likely to outweigh the potential

[8] Her analysis also suggests that reliance damages may be a relevant measure, since it tends to share risk more equally than expectation damages, a point also addressed by Hillman (1987).

drawbacks of discharge, such as the promisor's diminished incentives to prepare against the adverse event.

Like Sykes, the textualists (e.g. Schwartz and Scott (2003), (2009), Scott (1999), and Schwartz (1992)) argue that courts cannot know when to provide relief, and that a lenient policy of relief will lead to too many disputes as it will be tempting for a party who suffers losses under a contract to raise a claim for relief.[9]

These authors believe that while contracts are often relational, large (nearly risk neutral) firms will prefer courts to enforce the contract as written, since courts are seen as `institutionally incapable´ of fully understanding their commercial interests.

The effect of discharge on the parties' investment incentives is analyzed by several authors. Anderlini et al. (2007) consider relief from the perspective of risk allocation and reliance investments.[10] While the buyer has no incentive to overinvest under expectations damages in their model, as trade remains efficient after the change of circumstance, they emphasize that relief may undermine the buyer's reliance investments. When relieved, the seller may hold-up the buyer, thereby lowering the buyer's incentive to invest in reliance. On the other hand, relief may improve the allocation of risk. They hence trade-off risk allocation

[9] For instance, Schwartz (1977) notes that it is tempting for a party to attempt to escape contractual obligations that inflict losses. He notes that this leads to dispute costs. Trakman (2007) provides examples of opportunistic claims: he states that large firms sometimes make invalid claims for relief that cannot be resisted by their smaller counterparts.

[10] While they frame the discussion in terms of unforeseeability, they do not consider a model of unawareness.

and the buyer's reliance investments, whereas the present article trades off risk allocation and dispute costs. Naturally, the two approaches are complementary.

Schweizer ((2012)) considers whether alternative rules of discharge (whether discharge is allowed when performance is inefficient or not profitable for the seller) provide optimal incentives for the seller's and the buyer's reliance investments.

In a similar vein, Wagner (1995) defends the impracticability doctrine because discharge may alleviate the buyer's excessive incentive to rely on the contract. In the standard textbook model of reliance investments (Shavell (1980)), the buyer will invest excessively under a rule of expectation damages, since reliance is not, but ought to be, chilled by the possibility that a change of circumstances may render performance inefficient.

Hence, it is conceivable that excusing non-performance when there is a radical change of circumstance may bring reliance closer to the efficient level. Whether the buyer in practice has too great an incentive to invest in reliance under expectations damages is, however, not certain (Eisenberg et al. (2002)).

In the second category, Masten (1988), Goldberg (1987), Givati and Kaplan (2022) and Hart and Moore (2007) consider relief as potentially helpful, because a party who suffers losses may seek to wiggle out of the contract, avoid having to perform the contract, e.g. by finding loopholes in the contract, or shade on performance when aggrieved by the lack of relief.[11]

[11] In Givati and Kaplan' model, when performance is only barely efficient, i.e. when the seller's cost of performance is nearly equal to the buyer's benefit, the cost of avoidance activities, such as hiring lawyers to find loopholes in the contract, is likely to be greater than the value created by performance, which means that requiring performance is then not worthwhile. In their set-up, excuse should always be granted when

In the third category, relational scholars (e.g. MacNeil (1977), Speidel (1981), Hillman (1987), Smythe (2002) and Frydlinger and Hart (2023)) argue that contract parties to especially long-term contracts, who have made transaction-specific investments, rely on mutual adjustments as uncertainty unfolds, and that it is in their interest that courts help achieve such adjustments in accordance with relational norms. One relational view suggested by Speidel (p. 404-405) is that there should at a minimum be a duty for the advantaged party to renegotiate in good faith when an exogenous shock has tilted the balance of obligations, and at a maximum a duty to accept an equitable adjustment proposed in good faith by the disadvantaged party.

The present article is also related to literatures on more general themes of contract law, such as contract interpretation and the trade-off between ex-ante drafting and ex-post enforcement costs, rules versus standards, the role of vagueness, and fault versus strict liability in contract law.

Thus, Shavell (2006) addresses the benefits to contracting parties of *courts interpreting contracts* (in a wide sense of interpretation that includes gap-filling) under changed circumstances when it is costly for the parties to write elaborate, contingent contracts. The benefits of courts modifying, adding, or voiding terms are not only that the effective contract, which is the interpreted contract, comes closer to what the parties would have stipulated if there had been no transaction costs, but also that the parties can spend less effort in drafting the contract when they know courts will step in and repair its shortcomings. The present article applies the same basic framework and develops the analysis by considering not only a

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performance is not efficient, since there is then no benefit from requiring performance and excuse prevents avoidance activities.

benefit of contract interpretation but also a cost, namely the dispute cost that arises because interpretation occurs through vague standards.

R. Posner (2005) considers doctrines of *contract interpretation* such as the parole evidence rule in a trade-off between ex-ante drafting costs and ex-post dispute costs. The parole evidence rule can lower dispute costs by constraining the evidence that can be brought to bear on issues of interpretation, but this can limit the accuracy of adjudication and can put a burden on the parties by making it necessary for them to write more elaborate contracts. The present paper takes the size of dispute costs and the accuracy of adjudication as exogenous parameters, but they are to some extent choice variables.

A common theme of the *rules versus standards* literature, e.g. Kaplow (1992), is that like contract clauses, legal rules cannot be fully contingent on all possible circumstances that may arise. Legal standards are then phrased vaguely and given precise meaning by the enforcer of the standard in the contingency that arises. This idea leads naturally to the view that there is a trade-off between the elaborateness of rules or contract terms and the application of vague standards that shift transaction costs to the point where contingencies arise. The present article can be seen as contributing to this literature by focusing on costs and benefits of vague standards.

E. Posner (2009) views the issue of discharge from the perspective of *fault versus strict liability*. Why is the promisor not excused under a negligence rule, like the tortfeasor, if he or she can prove that non-performance is inefficiently costly for reasons outside his or her control? The negligence rule (with a reversed burden of proof) has actually been applied in some civil law countries for non-generic goods, but the tendency has been towards strict

liability as in common law.[12] Below, an attempt will be made explain this tendency towards strict liability within the model of this article.

## 3. Discharge of a sales contract and risk allocation

In this section, it will be argued that the rule of discharge can be given a rationale in terms of risk allocation despite the skeptical results reached by Sykes (1991). Sykes' main point was that even if the court may know that the seller is risk averse and the buyer risk neutral, the court cannot be certain that voiding the contract under circumstances where the seller is making large losses due to an exogenous shock is beneficial in terms of risk allocation. The court would have to know the precise shape of the seller's utility function as well as the probability distribution of outcomes. This conclusion can be hard to reconcile with cases such as one discussed by the Swedish jurist Lundstedt[13], in which a seller lost goods during transportation due to factors outside both parties' control. Lundstedt wrote:

*If liable, the seller will lose not only the cargo.. without being paid.. but must also compensate the buyer's loss... while the buyer will be entirely unaffected..´*

[12] In Danish law, the negligence rule applies to specific goods as a remnant from the sales goods act of 1906 which was based on the work of a common Scandinavian commission. Since then, Norway and Sweden have adopted strict liability with a force majeure defense for both specific and generic goods, aligning with international sales law (CISG), and this change has also been proposed for Denmark. (Reference to Lookofsky and Møgelvang-Hansen).

[13] SvJT 1921 s.325 ff. Cited and discussed in Runesson (1996) p. 200. Runesson's book can be accessed through https://www.juridikbok.se/start/index.

This allocation of risk would seem hard to justify unless it is known that the seller is risk neutral. Even in the absence of an attendant loss, E. Posner (2009) notes that it is generally not optimal for S to act as insurer for B (of the expected gain from the transaction) unless S is risk neutral and B risk averse.

We shall now argue that Sykes' conclusion is subject to several reservations. His model can be simplified as follows. The seller, S, can produce at cost *c*, which is a continuous variable in the interval (0,100). For the buyer, B, the value of the good, *v*, is 50. The density function of $c$ is $f(c)$ defined on the interval (0,100); $\int_0^{100} f(c)dc = 1$. The concave or linear utility functions for S and B are $U(.)$ and $V(.)$, respectively. The parties agree on a price *p*, i.e. they write a fixed-price contract rather than a price-schedule *p(c),* as would be optimal when both parties are risk averse. The assumption of a fixed-price contract derives from transaction costs; it is assumed to be too costly to formulate and agree on an elaborate schedule. In case of breach, the rule is expectation damages, which means that S pays (*v – p)* to B. When *c* is larger than some threshold T, there is discharge, which means that S can step back from the contract without paying damages such that both parties obtain a pay-off of zero.[14]

Sykes' point is that when the court knows that S is risk averse and B is risk neutral but does not know the exact form of the U(.) function or f(c), discharge may not improve on risk allocation for the following reason: Assume that T = 100, meaning that there is never discharge. If T is lowered by a small amount, the price p must also be lowered, to keep B's

[14] Sykes' model does not explain why the rule of discharge is the only alternative to expectation damages. Since *c* and *v* are both assumed to be verifiable, other rules by which the parties could share the risk are possible within the model.

utility intact. This increases damages 50 – p, which must be paid in all states of breach. S may not prefer this, if S is strongly risk averse about losses larger than $v - p$.

Sykes himself notes that there are contingencies where his result does not hold. If S's attitude to risk can be expressed by the variance of profits as in the capital-pricing model, it would be optimal to discharge S's obligations when performance has become inefficient. Arguably, this is an indication that relief is likely to benefit S. He also shows (p. 58) that when there are only two states, a bad and a good state, it is optimal to discharge in the bad state if performance is inefficient in that state (assuming that S is risk averse and B is risk neutral). To these reservations, it can be added that discharge is more likely to be efficient the more likely are the states in which S makes a profit. The lowering of $p$ that results from discharge then more often affects S's pay-off in good states, which means that S's risk is reduced. Hence, if the court believes that outcomes where S suffers (significant) losses are relatively rare, it can feel more confident that discharge is optimal.

Moreover, Sykes concedes (p. 85) the point noted above that when an event occurs that destroys an uninsured means of production and thereby renders performance impracticable for S, discharge will tend to be beneficial from the viewpoint of risk allocation, as S should not face both the loss of the means of production, the loss of expected profits, and the payment of expectation damages. It can be added that a similar point arises when S has made reliance investments that prove futile due to events that render performance impracticable. If, for instance, S has invested 1 to be able to produce at a cost of 3, the price is 5 and B's benefit is 7, and if an event such as a pandemic arises that renders performance impossible or impracticable, S's loss will be 3 under expectation damages while B will make a positive pay-off of 2. If S is risk averse and B is risk neutral, a likely better outcome in terms of risk

allocation is for both to receive zero under discharge.[15] This would also likely be better if both are risk averse.[16]

Finally, Sykes' argument rests on *v* being constant. If relief is granted when *v* and *c* have risen together, this will eliminate the highest levels of expectation damages, $v - p$, and hence the highest losses for S. If the loss is sufficiently large, this will likely improve on the allocation of risk, when S is not significantly less risk averse than B.

We conclude that there are circumstances where the court can presume that relief is likely to be better in terms of risk allocation than expectation damages. It therefore makes sense to add dispute costs to Sykes' model and to trade off these with the concern for risk allocation.

## 4. Adding dispute costs to the model of a sales contract

Sykes' model can be expanded to include dispute costs under a vague standard of relief as follows. In the model above, we can assume that the court relieves S when $c > \bar{c}$,

[15] Sykes' argument that expectation damages in all breach states will go up still applies, but so do the objections to the argument. For instance, in a two-state world risk allocation will be very inefficient if S loses also reliance investments.

[16] If B makes reliance investments, these will (if they are not cooperative by lowering S's cost of delivery) be covered under expectation damages but will not be covered if the contract is discharged. Discharge may then put too much risk on B; sharing of B's loss of the investment may then be part of optimal risk allocation.

and that this standard is vague such that the parties in the interval $(\bar{c}-z, \bar{c}+z)$, where $z$ is a measure of the vagueness of the standard.

In the interval $(\bar{c}-z, \bar{c})$, the rule is expectation damages, while in $(\bar{c}, \bar{c}+z)$ it is discharge. When there is disagreement, we assume that the parties each bear the dispute cost $\tau/2$. If the court seeks that threshold of intervention $\bar{c}$, which maximizes the parties' ex-ante expected utilities, it faces the following maximization problem assuming $\bar{c}-z>50$:

$$\text{Max } EU = \int_0^{50} U(p-c)f(c)dc + \int_{50}^{\bar{c}-z} U(-(50-p))f(c)\,dc + \int_{\bar{c}-z}^{\bar{c}} U(-(50-p)-\tau/2)f(c)dc + \int_{\bar{c}}^{\bar{c}+z} U(-\tau/2)f(c)dc + \int_{\bar{c}+z}^{100} U(0)f(c)dc$$

s.t.

$$EV = \int_0^{\bar{c}-z} V(50-p)f(c)dc + \int_{\bar{c}-z}^{\bar{c}} V(50-p-\tau/2)f(c)dc + \int_{\bar{c}}^{\bar{c}+z} V(-\tau/2)f(c)dc + \int_{\bar{c}+z}^{100} V(0)f(c)dc = k$$

The Lagrange-function reads:

$$\int_0^{50} U(p-c)f(c)dc + \int_{50}^{\bar{c}-z} U(-(50-p))f(c)\,dc + \int_{\bar{c}-z}^{\bar{c}} U(-(50-p)-\tau/2)f(c)dc + \int_{\bar{c}}^{\bar{c}+z} U(-\tau/2)f(c)dc + \int_{\bar{c}+z}^{100} U(0)f(c)dc + \lambda\left(\int_0^{\bar{c}-z} V(50-p)f(c)dc + \int_{\bar{c}-z}^{\bar{c}} V(50-p-\tau/2)f(c)dc + \int_{\bar{c}}^{\bar{c}+z} V(-\tau/2)f(c)dc + \int_{\bar{c}+z}^{100} V(0)f(c)dc - k\right)$$

The condition for an interior optimum becomes:

$$\frac{\partial L}{\partial \bar{c}} = f(\bar{c}-z)\left(U\left(-(50-p)\right) - U\left(-(50-p)-\frac{\tau}{2}\right) + \lambda V(50-p) - \lambda V\left(-\frac{\tau}{2}\right) - f(\bar{c}+z)\left(U(0) - U\left(-\frac{\tau}{2}\right) + \lambda\left(V(0) - V\left(-\frac{\tau}{2}\right)\right)\right)$$

$$= f(\bar{c})\left(U\left(\frac{-\tau}{2}\right) - U\left(-(50-p)-\frac{\tau}{2}\right) - \lambda\left(V\left(50-p-\frac{\tau}{2}\right) - V\left(\frac{-\tau}{2}\right)\right)\right)$$

This first-order condition can be separated into the costs and benefits of lowering $\bar{c}$ by $d\bar{c}$:

Lowering $\bar{c}$ implies more likely conflict, because there will be uncertainty in the new interval $(\bar{c} - z - d\bar{c}, \bar{c} - z)$, which implies conflict with probability $f(\bar{c} - z)$. The extra cost of conflict is the first part of the left-hand side of the first-order condition: $f(\bar{c} - z)(U\big(-(50-p)\big) - U\left(-(50-p) - \frac{\tau}{2}\right) + \lambda V(50-p) - \lambda V\left(-\frac{\tau}{2}\right)$.

Note that the cost of conflict may be greater for S when it occurs in a state where discharge is not granted.

On the other hand, lowering $\bar{c}$ avoids conflict in the interval $(\bar{c} + z - d\bar{c}, \bar{c} + z)$, which lowers costs by the second part of the left-hand side of the first-order condition: $f(\bar{c} + z)(U(0) - U(-\frac{\tau}{2}) + \lambda(V(0) - V\left(-\frac{\tau}{2}\right))$. Note that this beneficial effect occurs when there is avoidance, and the parties share the loss: it is therefore likely to be smaller than the effect of more conflict in the interval $(\bar{c} - z - d\bar{c}, \bar{c} - z)$ if S is risk averse. Note that if large shocks are less likely than small, $f(\bar{c} + z)$ is lower than $f(\bar{c} - z)$ which is an additional reason why there is likely to be a net increase in expected dispute costs when $\bar{c}$ is lowered.

This analysis of a model of a fixed-price sales model will not be pursued any further. As indicated, the model does not provide a strong rationale for relief since the cost to S is never greater than 50 – p, the measure of expectation damages. For the model to better capture the rationale for relief, we would assume that *v* also varies (it is equal to 50 in the model), which would involve double integrals, or that S may suffer the loss of an asset. Or we might assume that specific performance is enforced, possibly in the form of a cover purchase where performance is rendered by an alternative supplier. Under these assumptions we could show that the optimal court policy is contingent on the shape of the density function, the

degree of vagueness, and the size of conflict costs, but the models turn out to be difficult to handle analytically. Instead, we introduce a model which is simpler and more tractable. In it, the inefficiency of risk allocation, *y*, is the main variable measured by the difference between the value created ex-ante under relief and the value generated by expectation damages. This model has the advantage not only of greater tractability but also of greater generality. It can apply also to other situations where an incomplete contract leads to inefficiency that can be repaired through a vague standard.

## 5. Optimal relief in a simplified model

As in Sykes' model, two parties write a contract which is insufficiently contingent on future contingencies. This means that the risk of future contingencies is not optimally allocated. For some contingencies, the court may then be ready to provide relief to the disadvantaged party.

To simplify, we assume that the parties' drafting efforts are not affected by the court's policy. For given drafting efforts, the level of inefficiency of the contract that may arise is a continuous variable *y*. In the sales model above, this was the inefficiency of the fixed-price contract as dependent on cost increases. This inefficiency would in that model by measured by how much greater the value of the contract (the sum of the parties' certainty equivalents) would have been if the parties had written an optimal price schedule.[17]

[17] In another context, the inefficiency would e.g. be measured by how much greater the sum of the parties' certainty equivalents would have been if the contract had granted the seller optimal time extension in case of a delay caused by an external event.

At the time of contract formation, the parties can anticipate various levels of inefficiencies that may occur under their contract. These occur with different probabilities, which we represent by the density function, *f(y),* since *y* is a continuous variable. The function is defined on the closed interval *(0, h)*, where *h* is the maximal level of inefficiency that may arise, $\int_0^h f(y)dy = 1$.[18]

Before contract formation, the court announces its policy $y'$, meaning that relief will be granted if the inefficiency of the contract exceeds $y'$. Significantly, this policy can only be communicated vaguely through court decisions. This means that the policy is open to interpretation in an interval around $y'$. As in the sales model, we assume that there will be conflicts of interpretation in an interval of size *2z* around $y'$, and that the cost of conflict in this interval equals $\tau$. The variable *z* hence expresses the extent of vagueness.

We rule out the possibility that the court can, by announcing that it will always provide relief, secure efficiency without any conflicts of interpretation. This policy would create conflict when the parties disagree about whether the contract's allocation of risk is efficient, and we assume that such conflicts would arise too often for this to be an optimal policy.

Relief may either take the form of discharge or amendment of the contract. For simplicity the court is assumed to repair the contract in an optimal manner from the ex-ante perspective. In the example of the sales model, the price would be adjusted to optimally take the cost increase into account. Or, in case of delay, the optimal time extension would be granted. It is further assumed that when the parties agree on what the court will do, they will adjust the contract themselves at zero bargaining costs. It is of course a strong assumption that the

[18] The probabilities are conditional on an inefficiency arising.

contract will be optimally reformed by either the court or the parties themselves, and we shall discuss how results will be affected if only a fraction of the inefficiency can be repaired.[19]

If, however, the parties disagree about what the court will do, they will go to court or negotiate themselves, at significant cost. Again, to simplify we assume that the outcome will in either case eventually become optimal (but for the dispute costs). Hence, when $y < y' - z$, the parties agree that there will be no court relief, which means that the inefficiency will be allowed to stand. If $y \epsilon (y' - z, y' + z)$, the parties will negotiate or litigate at a total dispute cost of $\tau$. We assume that it will be in the disadvantaged party's interest to negotiate or litigate, i.e. the party's dispute cost is lower than the gain from repair of the contract.[20] The parties cannot settle immediately due to their divergent beliefs about the outcome of litigation. If $> y' + z$, the parties will both realize that the court will repair the contract, and so will agree to adjust the contract optimally themselves at zero dispute cost.

Despite the (strong) assumption that the court will be able to repair the contract from the ex-ante viewpoint, we will also consider the case where the parties may disagree about how the court will provide relief. If there is no uncertainty about whether the court will provide relief, there will be a dispute cost due to uncertainty about how relief will be effectuated. This dispute cost occurs in the interval $(y', h)$.

The game is hence the following when there is uncertainty only about when the court will provide relief:

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[19] We ignore the complication that the optimal relief is endogenous, since it depends on the parties' attitude to risk, which may depend on the court's policy of relief that can affect the parties' wealth. This wealth effect would be absent under constant absolute risk aversion.

[20] Dispute costs are likely to increase with *y*.

1) The court announces $y'$

2) The parties write a contract which creates a density function, $f(y)$, of potential inefficiencies.

3) As the contract is carried out, it is not adjusted when $y < y'$, is adjusted optimally when $y \in (y' - z, y' + z)$ at a dispute cost $\tau$, and is adjusted optimally at no cost when $y > y' + z$.

In equilibrium, the court maximizes social welfare, as expressed below.

We consider uncertainty about whether and how the court will provide relief in turn.

## 5.1. Uncertainty about whether the court will provide relief

In setting the policy $y'$, which means that the court provides relief when $y \geq y'$, the court seeks to maximize the value of the contract minus the conflict costs. The efficiency benefit from the court policy is given by:

$$\int_{y'}^{h} yf(y)dy$$

since the court applies a different measure that creates a greater value of $y$ whenever the efficiency gain exceeds $y'$.

Further, costs of dispute will be $\tau$, whenever the parties disagree about the court's policy, so the expected dispute costs will be:

$$\int_{y'-z}^{y'+z} \tau f(y)dy$$

The court then maximizes:

$$G(y') = \int_{y'}^{h} f(y)ydy - \int_{y'-z}^{y'+z} \tau f(y)dy$$

with respect to $y'$.

This maximization problem allows us to analyze anew the schism between the principles of pacta sunt servanda and clausula sic stantibus, and the difference between the more restrictive common law and the less restrictive civil law approach. Our first result is that when the density function is steeply declining, and vagueness and conflict costs are significant, pacta sunt servanda is optimal and the common law approach preferable to that of civil law.

**Proposition 1**

*A sufficient condition for it to be optimal for the court never to provide relief is:*

*For any* $y < h$, $y < -\varepsilon(y)2z\tau$, where $\varepsilon(y) = f'(y)/f(y)$

Proof: If there is an interior solution, it must fulfill the first-order condition. As in the sales model, differentiation yields an effect on dispute costs of a small decrease $dy$ in $y'$ equal to:

$$-\tau(f(y'+z) - f(y'-z))$$

The benefit of decreasing the threshold in terms of more efficient relief, on the other hand, equals:

$$f(y')y'$$

Thus, if there is an interior optimum, it must fulfill the first-order condition:

$$f(y')y' = \tau(f(y'-z) - f(y'+z))$$

When relief is granted more often, there will be an expected efficiency gain equal to $f(y')y'$, an increase in expected conflict costs equal to $\tau(f(y'-z)$ for lower levels of inefficiency, and a decrease in expected conflict costs , $\tau f(y'+z)$ for higher levels of inefficiency.

If we denote $f'(y)/f(y)$ by $\epsilon(y)$, the first-order condition can be (Taylor-) approximated by: $y^* = -\varepsilon(y)2z\tau$. When $y' < -\varepsilon(y')2z\tau$, the marginal benefit from increasing the standard is greater than the marginal cost, such that the standard should be increased up to the maximal level, $y = h$. QED.

On the other hand, if conflict costs and vagueness are smaller, and the density function is not as steep, there may be an interior maximum, i.e. the clausula principle may be optimal. How the interior maximum depends on the parameters will be shown below in the case of a linear density function, after considering the interior maximum that may arise when the parties disagree only about how the court will provide relief.

### 4.2. Uncertainty about *how* the court will provide relief

We assume that the uncertainty about how the court will act will lead to conflict costs equal to $\tau_1$.

If the court revises the contract when inefficiency equals $y'$, and there is always doubt about how the court will provide relief, conflict costs will be equal to

$$\int_{y'}^{h} \tau_1 f(y)dy$$

while the efficiency gains are, as before,

$$\int_{y'}^{h} yf(y)dy$$

Social welfare, $G(y')$ now equals

$\int_{y'}^{h} yf(y)dy$ - $\int_{y'}^{h} \tau_1 f(y)dy$, and the first-order condition reads

$$-y'f(y') + \tau_1 f(y') = 0$$

i.e. $$y' = \tau_1$$

This is a global maximum of social welfare, as $G'(y') < 0$ when $y' > \tau_1$ and $G'(y') > 0$ when $y' < \tau_1$.

This result implies that it is optimal to provide relief when the inefficiency is larger than the dispute cost. The $\varepsilon(y)$ of the density function no longer matters, only the size of the inefficiency. Hence, when uncertainty about the nature of the revision can be a cause of conflict it can no longer be optimal to always revise the contract; the size of the inefficiency must be large enough to justify it.

### 4.3. The case of a linear density function

It is hard to generate general results without restricting the shape of the density function. Assuming a linear density function, on the other hand, enables both analytical and graphical analysis.

Let $f(y) = \alpha(h - y)$ where $\alpha > 0$ and $h > 0$, and $h$ is the highest possible level of inefficiency. Since $f$ is a density function conditional on the occurrence of inefficiency,

$$\int_0^h \alpha(h - y)dy = 1$$

This implies that $h = \sqrt{\frac{2}{\alpha}}$ and $\alpha = \frac{2}{h^2}$. We may also consider the possibility of conflict arising in states where $y$ is negative. If, for instance, we consider all states in the interval $[-2,10]$, then

$$\int_{-2}^{10} \frac{2}{10^2}(10 - y)dy = \frac{36}{25}$$

which means that we should use the density function g(y) = $\alpha(h - y)/(36/25)$.

However, dividing everywhere by a constant will not change any of our results.

Note, however, the drawback of assuming linearity that the slope of the density function and the highest level of inefficiency are directly related, such that we cannot vary them independently.

For this linear case, we now analyze how the size of the maximal inefficiency, the degree of vagueness and the conflict costs affect the optimal court policy.

Since

$$G(y') = \int_{y'}^{h} f(y)ydy - \int_{y'-z}^{y'+z} \tau f(y)dy$$

When $f(y) = \alpha(h-y) = \frac{2}{h^2}(h-y)$, social welfare becomes

$$G(y') = \int_{y'}^{h} \frac{2}{h^2}(h-y)ydy - \int_{y'-z}^{y'+z} \tau \frac{2}{h^2}(h-y)dy$$

Then, $\frac{dG(y')}{dy'} = -\frac{2y'}{h} + \frac{2y'^2}{h^2} + \frac{4z\tau}{h^2}$ and $\frac{d^2G(y')}{dy'dy'} = -\frac{2}{h} + \frac{4y'}{h^2}$

The second-order condition for a local maximum becomes $\frac{d^2G(y')}{dy'dy'} = -\frac{2}{h} + \frac{4y'}{h^2} < 0$, which is the condition $y' < \frac{h}{2}$.

The first-order condition is $-\frac{2y'}{h} + \frac{2y'^2}{h^2} + \frac{4z\tau}{h^2} = 0$,

which yields two solutions:

$$y' = \frac{1}{2}\left(h - \sqrt{h^2 - 8z\tau}\right) \text{ and } y' = \frac{1}{2}(h + \sqrt{h^2 - 8z\tau})$$

Only for the former is $y' < \frac{h}{2}$, hence only for that solution is the second-order condition also fulfilled; it is hence the only candidate for a global maximum.

We now confirm Proposition 1 above in the case of a linear density function.

**Proposition 1'**

*In the example of a linear, declining density function, if* $h^2 < 8\tau z$*, the standard should never be applied.*

*Proof*: The first order condition:

$$G'(y') = -f(y')y' - \tau\big(f(y'+z) - f(y'-z)\big) = 0$$

becomes: $-\alpha(h-y')y' - \tau(\alpha\big(h-(y'+z)\big) + \tau\alpha\big(h-(y'-z)\big) = 0$

which is equivalent to: $(h-y')y' = 2\tau z$. If $2\tau z$ is consistently higher than $(h-y')y'$, the first-order condition cannot be fulfilled; the gain from not providing relief in terms of a lowering of conflict costs then always outweigh the efficiency loss.

When $y'$ approaches *h*, the benefit from increasing $y'$ by *dy* increases, as there will no longer be an increased conflict cost in the interval $y'+z+dy$ when $y'+z>h$. This reinforces the result that the standard should never be applied.

The condition $h^2 < 8\tau z$ is also the comparison from Proposition 1 which reads:

*For any* $y < h$, $y < -\varepsilon(y)2z\tau$, where $\varepsilon(y) = \frac{f'(y)}{f(y)}$.

For in the linear case,

$$\frac{-f'(y)}{f(y)} = \frac{\alpha}{\alpha(h-y)} = \frac{1}{(h-y)}$$

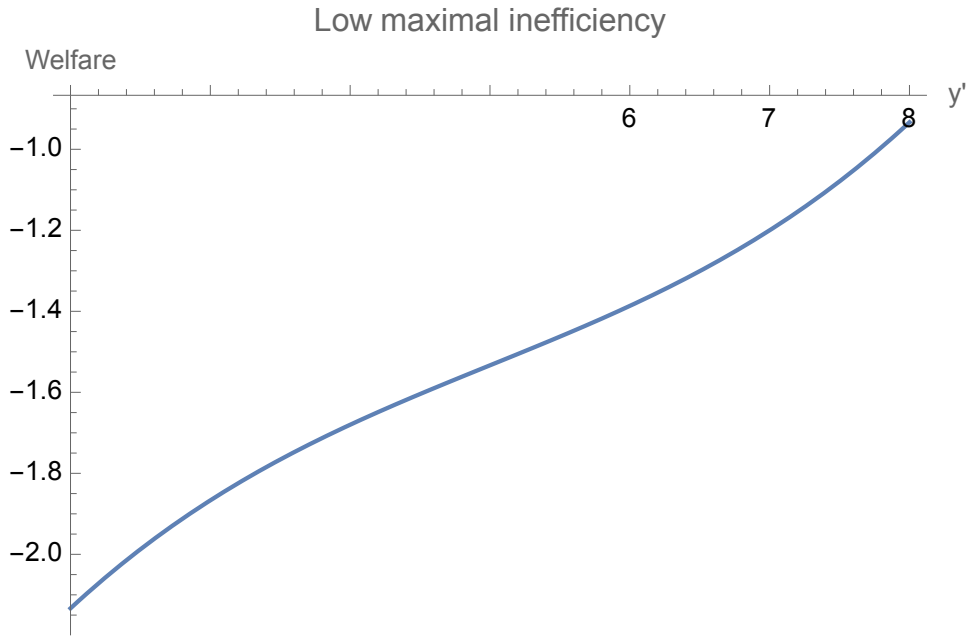
which means that the condition from Proposition 1 becomes

$$y < \frac{2z\tau}{(h-y)}$$

This condition is fulfilled when $h^2 < 8\tau z$, since $(h-y')y'$ attains its maximum for $y' = \frac{h}{2}$ where it equals $\frac{h^2}{4}$. $\frac{h^2}{4}$ being lower than $2\tau z$ is therefore a sufficient condition for it never to be optimal to provide relief.

QED.

The result can also be illustrated graphically. For *h = 10, z = 2,* and $\tau = 8$, the condition $h^2 < 8\tau z$ holds. Graph 1 shows how social welfare depends on the level of relief $y'$.




Graph 1. Social welfare when *h = 10*, $\tau = 8$ and z = 2.

The graph plots social welfare as $\int_v^{10} 2/(10^2)(15-y)y\,dy - \int_{v-2}^{v+2}(2/10^2)(10-y)8\,dy$.

For any court policy of relief, social welfare remains negative. This illustrates that if the density function is steep, and vagueness and conflict costs are high, the more restrictive common law approach is preferable.

By contrast, if *h* is large compared with $\tau$ and *z,* relief is optimal at an interior maximum:

**Proposition 2**

*In the example of linear, declining density function, if* $h^2 > 12\tau z$*, there is an interior optimum. It is given by* $y^* = \frac{h}{2} - \frac{\sqrt{h^2-8\tau z}}{2}$.

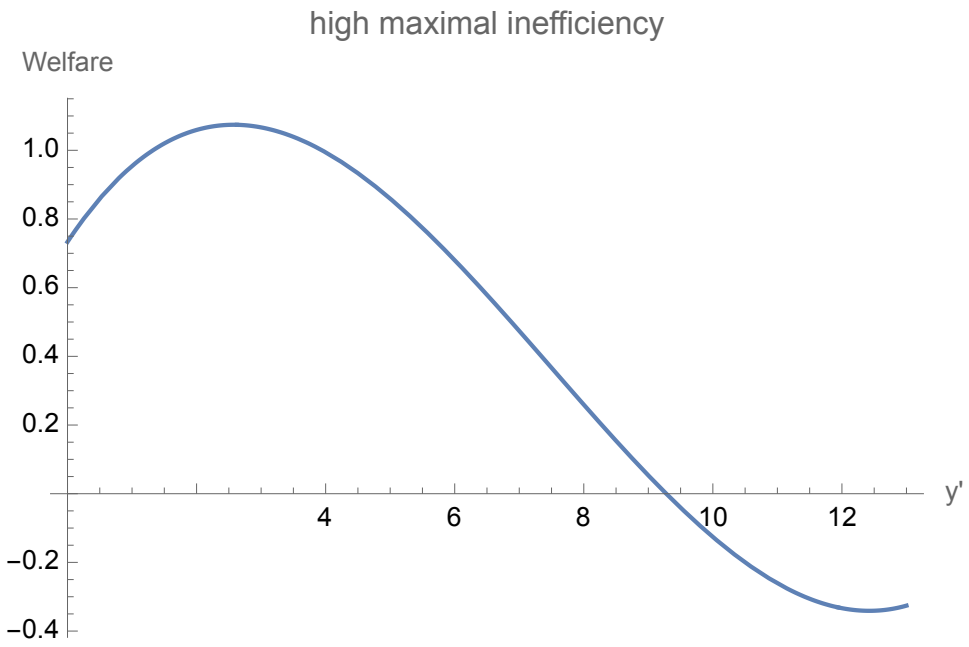
*Proof*: As mentioned above, $G'(y) = 0$ and $G''(y') < 0$ only when $y' = \frac{1}{2}\left(h - \sqrt{h^2 - 8z\tau}\right)$. If there exists an interior, global, maximum, this must be it. Denote this candidate for a global maximum by $y''$. Note that if $G(y'') > 0$, it must also be a global maximum, since $G''(y') < 0$ when $y' < y''$ (since the condition for $G''(y') < 0$ is that $y' < \frac{h}{2}$ and this is fulfilled when $y' < y''$), which implies that $G'(y') > 0$ when $y' < y''$. This again implies that $G(y') < G(y'')$ when $y' < y''$. Hence, it cannot be optimal to provide relief at a lower level than $y''$. Since there are no other local maxima, the only other policy that may be better than providing relief at $y''$ is to never provide relief, i.e. $y' = h$. This provides social welfare $G(h) = 0$. However, we can derive a condition for when $G(y'') > 0$, by considering when social welfare is positive at $y' = \frac{h}{2}$, since we know that $G(y'') \geq G\left(\frac{h}{2}\right)$.

$$\mathrm{G}(y' = \tfrac{h}{2}) = \int_{\frac{h}{2}}^{h} \frac{2}{h^2}(h - y)y\,dy - \int_{\frac{h}{2}-z}^{\frac{h}{2}+z} \frac{2}{h^2}(h - y)\tau\,dy = \frac{h}{6} - \frac{2z\tau}{h}$$

This is positive when $h^2 > 12\tau z$. Therefore, it is a sufficient condition for a global, interior maximum that $h^2 > 12\tau z$, and as noted, the global maximum must be where $y' = \frac{h}{2} - \frac{\sqrt{h^2-8\tau z}}{2}$. QED.

To confirm this result graphically, consider *h = 15*, $\tau = 8$ and z = 2.

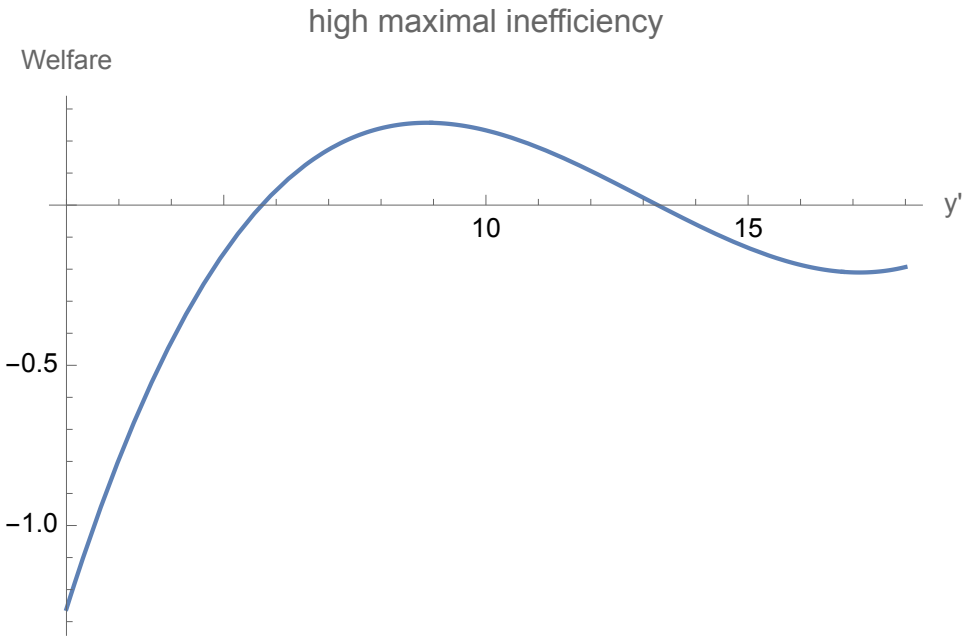
The condition $h^2 > 12\tau z$ is fulfilled and the first-order condition gives the solution $\frac{h}{2} - \frac{\sqrt{h^2-8\tau z}}{2} \cong 2.6$:




Graph 2. Social welfare when $h = 15$, $\tau = 8$ and $z = 2$.

The graph plots social welfare as $\int_v^{15} 2/(15^2)(15-y)y\,dy - \int_{v-2}^{v+2}(2/15^2)(15-y)8\,dy$.

When it is uncertain both whether and how a court will provide relief, it is again the case that when the *f*-function is steep and vagueness and dispute costs are high, the common law approach is optimal, while the civil law approach is optimal under the opposite assumptions. To illustrate, let again vagueness be given by the parameter $z = 2$, and conflict costs by the parameters $\tau = 8$ and $\tau_1 = 6$. If $h$ is equal to 20, social welfare depends on the level of threshold for court relief as shown in graph 3.

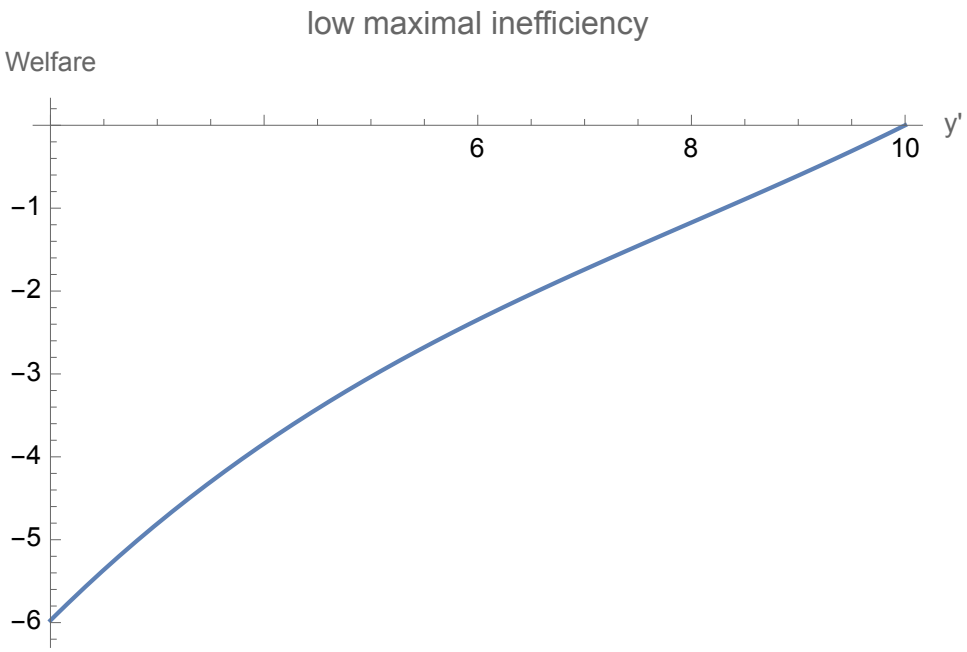



Graph 3. Social welfare when $h = 20$, $\tau = 8, \tau_1 = 6$, and z = 2. Social welfare is plotted as

$$\int_{y'}^{20}(2/400)(20-y)y\,dy - \int_{y'-2}^{y'+2}(2/400)(20-y)8\,dy - \int_{y'}^{20}6(2/400)(20-y)\,dy.$$

There is an interior maximum at $y' \approx 9$.

Let us then consider a steeper density-function given by $h = 10$.




Graph 4. Social welfare when $h = 10$, $\tau = 8, \tau_1 = 6$, and z = 2.

The graph plots social welfare as a function of $y'$:

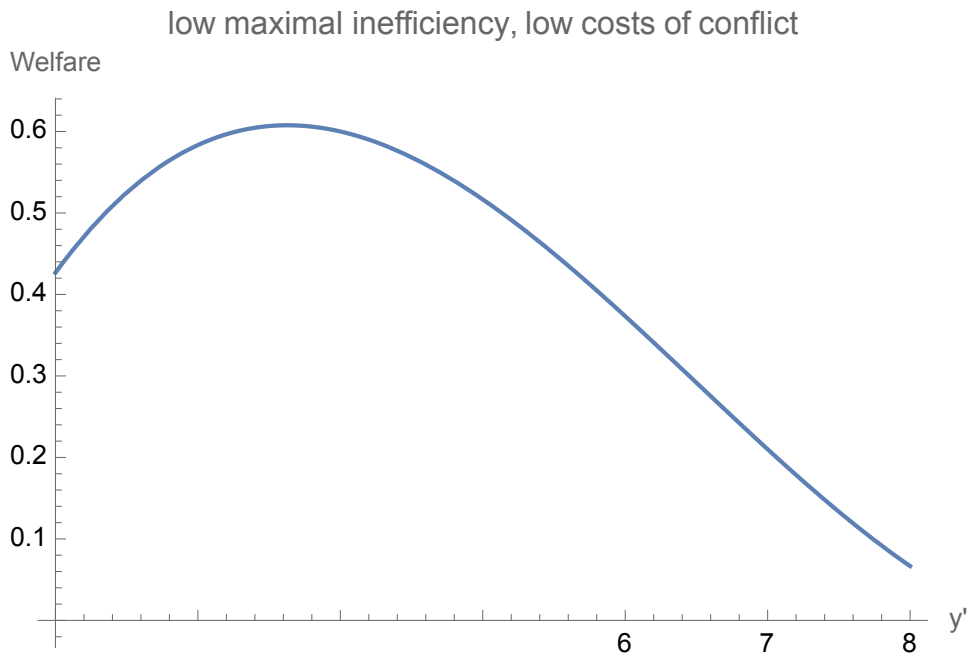
$$\int_{y'}^{10}(2/100)(10-y)y\,dy - \int_{y'-2}^{y'+2}(2/100)(10-y)8\,dy - \int_{y'}^{10}6(2/100)(10-y)\,dy.$$

There is now no interior maximum.

As one might expect, if we vary the conflict cost, we find that the civil law approach becomes optimal for low costs while common law becomes optimal for high costs.

To illustrate, consider low costs of conflict: $\tau = 1$ and $\tau_1 = 3$.

In the case of $h = 10$, where common law was more efficient for higher costs of conflict, the optimal policy of relief is $y^* \approx 3.5$ for lower costs of conflict, as indicated in Graph 5.




Graph 5. Social welfare when $h = 10$, $\tau = 1, \tau_1 = 3$, and z = 2. Social welfare is plotted as

$$\int_{y'}^{10}(2/100)(10-y)y\,dy - \int_{y'-2}^{y'+2}(2/100)(10-y)1\,dy - \int_{y'}^{10}3(2/100)(10-y)\,dy.$$

Now the civil law approach is optimal despite the steep density function.

An increase in $z$, the vagueness of the standard, has the same impact of rendering relief less attractive. Note that $z$ and $\tau$ always appear as $\tau z$, such that they affect the optimal policy in the same manner.

## 6. Relational contracts

In some contracts termed relational, the parties expect more accommodation and cooperation from each other than in arms-length contracts. For such contracts there may be a mutual understanding that the contract should be reformed after an exogenous shock. However, conflicts arise also in relational contracts especially when circumstances change significantly. For large inefficiencies, the temptation to renege on the implicit contract of reforming the contract can be great and the contract may then fall outside its self-enforcing range (Klein (1996)). For instance, in the Alcoa case the amount at stake in the contractual dispute was in the order of 60 mio. USD, and concerns for a good relationship may then not be enough to settle differences of interpretation. The question arises whether the optimal standard of relief is different when the contract is relational, and the parties can be expected often to renegotiate the contract at low cost but to sometimes not be able to do so. This is a complex question that calls for a separate analysis. However, two comments can be made in our context. Let us denote the limit of the self-enforcing range by $y^r$ meaning that parties will by themselves adjust obligations when $y < y^r$. For inefficiencies greater than $y^r$, the relational norms are no longer sufficient to ensure accommodation, and the parties may end up in conflict if they disagree about when or how the court will provide relief. As the first comment, this means that if $y' > y^r$, we can expect dispute costs in an interval around $y' > y^r$. There is then a trade-off between dispute costs and optimal risk allocation as in our model. However, as the second comment, if $y' < y^r$, and $y' + z < y^r$, dispute costs may not arise, as the parties then both know that there will be relief outside the self-enforcing range. If the parties accommodate, the relationship may then survive the shock. The first comment suggests that our model above can apply also to relational contracts, while the second comment suggests that there may be a wider scope of relief in relational contracts. This wider

scope has been proposed by proponents of relational contract law, e.g. Speidel (1981) mentioned above. By contrast, textualists and others counter that parties may wish to base their implicit contract on information that is observable to them and may wish to avoid costly trials where courts will lack some of that information. For instance, Baird ((1990)) notes that parties tend to write gross inequity clauses such that they are not enforceable in court but only govern the parties' expectations.[21] In the analysis of doctrine and cases below, we shall keep these diverse perspectives in mind.

## 7. Relation to doctrine and relief clauses

According to the present analysis, the optimal court policy and the optimal contract depend on the circumstances of the contract, e.g. the parties' degree of risk aversion, the density function of potential inefficiencies, and the expected dispute costs. It should therefore be possible for parties to signal their types to the court. For instance, if the parties expect to cooperate closely while adhering to relational norms, and if they expect to be able to do so within a large self-enforcing range, then it might be optimal for them to enter a hardship clause that calls for renegotiation in good faith under a comparatively wide range of outcomes, namely when the equilibrium of obligations under the contract has been disturbed. Parties hereby avoid the aggrievement and shading that may result if the advantaged party in the absence of court enforcement chooses not to relieve the disadvantaged party when the shock is outside the self-enforcing range. If, at the other extreme, the parties do not expect a

[21] However, unenforceability cannot be said to be universal. Hardship clauses can e.g. be written so as to be enforceable in court.

significant self-enforcing range, and if they expect the maximum inefficiency to be of limited size, e.g. because expectation damages are bounded above (and it is certain that specific performance will not be enforced), or because the disadvantaged party can terminate the contract at relatively short notice, or because the promisor is nearly risk neutral, then it may be optimal for the parties to stipulate that no circumstances should excuse the promisor. The advisability of such a stipulation may of course be tempered by incentive considerations; if, for instance, both parties can act to lower the likelihood of the adverse effect or its consequences, this may speak in favor of sharing the risk through a relief clause. In between the two extremes, the parties may attempt to indicate approximately at what level of losses[22] to the promisor, due to circumstances that the parties could not prevent or mitigate and could not be expected to contract about, they would want the court to relieve the promisor.

Contrary to most excuse doctrines, these suggestions mention neither the failure of basic assumptions nor the unforeseeability of the event. The failure of basic assumptions is central to the US impracticability doctrine (as laid down in the UCC, Section 2-615, and in the Second Restatement of Contract Law, §261), and to the German doctrine of Wegfall der Geshäftsgrundlage (§313 in the BGB), while the unforeseeability requirement is central not only to these doctrines but also to force majeure doctrines in civil law. The failure of basic assumptions, in some versions at least, refers to the situation where the parties were *unaware*[23] of the possibility of the event that transpired, and where this unawareness was

[22] Schwartz (1992) suggests that losses are unverifiable but it would seem that the approximate loss can often be estimated, although with uncertainty.

[23] There exists a literature, relevant to law, of unawareness. One reference is Schipper (2013).

critical for one party's acceptance of the contract (i.e. material).[24] The requirement of unforeseeability is about whether the parties ought to have been aware of the possibility of the event.

A logic behind requiring unawareness of the possibility of the change of circumstance is of course that there is no meeting of the minds about how to regulate the change when the parties did not consider it. However, the failure of a basic assumption or unforeseeability of the event is neither necessary nor sufficient for relief. It may be thought that the two requirements are necessary because if the parties foresaw the possibility of the change, they must have priced it into the contract and relief may then seem unfair (efficient). Yet, this argument can to some extent be considered circular, for if the court is known to provide relief even for events that were probabilistically foreseeable, parties will price that court policy into the contract.

Nor is unforeseeability or the failure of basic assumptions sufficient for relief: the contract may have allocated the risk optimally even if the parties did not contemplate the risk or assumed it would not occur.

One reason for not applying these notions in the present analysis is that, as the theory of incomplete contracts has made clear, contracts may be incomplete not only because the parties cannot think of all possible events but also, and perhaps more often, because when events occur with a small probability it can be rational for the parties not to incur the drafting and negotiation costs of including them in the contract. The approach of the present article

[24] In Oertmann's version (1921), the requirement was that one party's assumption about future events was critical for that party's signing the contract, and that this was apparent to the other party from the context of the negotiations.

has been to say that the relevant concern is whether the risk would have been allocated differently in a complete contract, and that it is not of decisive importance whether the parties overlooked future states or rather chose not to contract about them. Also, for the same reason, it is not decisive whether the event which transpired was foreseeable or not.

This is not to say that it is irrelevant to consider whether the change was unforeseeable. If a change was understandably not within the parties contemplation, it is not relevant to consider whether the parties ought to have provided for the change in the contract, and the parties cannot have traded the risk. Hence, unforeseeability can be part of the assessment of whether there should be relief. It is, however, rarely an important part, as usually it is unclear whether the parties were unaware of the possibility of a change of circumstance or whether they considered it to be (perhaps very) improbable, and this issue is rarely the topic of court proceedings. Often, foreseeability test concerns the probability of the event, as will be exemplified below in the discussion of the Alcoa case.

This criticism of doctrine has also been brought forward by legal commentators and judges. It is e.g. mentioned in comment c. to the Restatement that

*`If the supervening event was not reasonably foreseeable when the contract was made, the party claiming discharge can hardly be expected to have provided against its occurrence. However, if it was reasonably foreseeable, or even foreseen, the opposite conclusion does not necessarily follow. Factors such as the practical difficulty of reaching agreement on the myriad of conceivable terms of a complex agreement may excuse a failure to deal with improbable contingencies.´*

Or, as Lord Denning stated[25]:

*`It has frequently been said that the doctrine of frustration only applies when the new situation is "unforeseen" or "unexpected" or "uncontemplated", as if that were the essential feature. But it is not. It is not so much that it is 'unexpected,' but rather that the parties should have made no provision for it in their contract.´*

In *L.N. Jackson & Co. v. Royal Norwegian Government,*[26] Judge Clark wrote that to require an absolute absence of foreseeability would, if accepted, *`practically destroy the doctrine of supervening impossibility.. Certainly the death of a promisor, the burning of a ship, the requisitioning of a merchant marine on the outbreak of a war could, and perhaps should, be foreseen´*. And further:

*`Foreseeability, as we have said, is at best but one fact to be considered in resolving first how likely the occurrence of the event in question was and, second whether its occurrence, based on past experience, was of such reasonable likelihood that the obligor should not merely foresee the risk but, because of the degree of its likelihood, the obligor should have guarded against it or provided for non-liability against the risk´.*

Zweigert and Kötz (1998) are also critical of the requirements of the failure of basic assumptions. They believe that the real considerations concern the allocation of risk and that the notion of the failure of basic assumptions is only used in practice to `dress up the really material considerations´ (p. 522). In this stance, they may have been inspired by Posner and Rosenfield (1977), whom they cite. Posner and Rosenfield attempted to cut through what

[25] (UK) Ocean Tramp Tankers Corp. v. V/O Sovfracht, (1964) 1 All ER 161.

[26] 177 F.2d 694, 699 (2d Cir.1949)

they saw as confused doctrine and claimed that excuses should instead be analyzed under the perspective of efficient risk allocation. This article expands on their work by including the concern for dispute costs (arising in part from opportunistic or optimistic claims for relief).

The claim is that what should be foremost in the minds of judges and practitioners are not notions of basic assumptions or foreseeability but (when moral hazard considerations are not important) risk allocation and dispute costs under vague standards.

## 8. The theory applied to case law

The theory of relief suggested in this article can throw light on existing statutes and case law, and case law can throw light on the theory. We shall pay particular attention to the question of the nature of the requirements for relief. The dividing line is often said to be between a common law approach which allows for relief mainly in case of impossibility of performance (rather strictly interpreted) and a civil law approach where relief is granted also for changed circumstances that do not amount to impossibility but only create a (very) onerous obligation.

US courts generally interpret the requirements for relief quite strictly despite the wording of the Uniform Commercial Code and the Restatement, and English courts interpret frustration of purpose narrowly (Hugh Beale and ..). Germany has codified relief not only due to impossibility but also to situations where (among other conditions) a failure of basic assumptions leads to an allocation of risk that the parties would not have agreed to if their assumptions had been correct (§313 of the BGB). French contract law for many years required impossibility but recently, in a law reform of 2005, introduced relief also for changed circumstances not amounting to impossibility (*imprevision* or impracticability). The theory casts light on this basic distinction as impossibility can be a less vague term than

impracticability. Parties are more likely to agree on impossibility than on impracticability. According to the theory, it may then be better to restrict relief to impossibility when the inefficiency of the incomplete contract is not too great, and vagueness and conflict costs are significant. We now consider a case of impossibility, Taylor v. Caldwell[27], and a case of impracticability, Alcoa versus Essex Group Inc[28], to illustrate this distinction, and also to consider how the cases cast light on the theory. Both cases are classics of contract law. Then, we consider the choice between impossibility and impracticability in the context of corona cases. Again, we shall be interested in how the corona cases cast light on the theory and vice-versa.

In *Taylor*, a case decided in England in 1863, a music hall burned down prior to a series of planned concerts. The owner of the music hall had promised to lend the premises to a set of concerts and was sued by the promoters of the concerts for breach of contract. In what was the first holding of impossibility in common law, the court excused performance, discharging the payment of expectation damages.

The defendant's lawyer argued that[29]:

*..there are authorities which, as we think, establish the principle that where, from the nature of the contract, it appears that the parties must from the beginning have known that it could not be fulfilled unless when the time for the fulfilment of the contract arrived some particular specified thing continued to exist, so that, when entering into the contract, they must have contemplated such continuing existence as the foundation of what was to be done; there, in*

[27] 122 3 Best & South 826 (K.B. 1863).

[28] 115 499 F. Supp. 53 (W.D. Pa. 1980).

[29] https://www.bailii.org/ew/cases/EWHC/QB/1863/J1.html.

*the absence of any express or implied warranty that the thing shall exist, the contract is not to be construed as a positive contract, but as subject to an implied condition that the parties shall be excused in case, before breach, performance becomes impossible from the perishing of the thing without default of the contractor. There seems little doubt that this implication tends to further the great object of making the legal construction such as to fulfil the intention of those who entered into the contract. For in the course of affairs men in making such contracts in general would, if it were brought to their minds, say that there should be such a condition.*

This argument prevailed and the parties were both relieved of their obligations.

Above, we discussed the case where a good necessary for performance is lost. Rather than take for granted that the hypothetical will of the parties would have been to excuse performance, as the defendant's lawyer did, we considered the question from the perspective of risk allocation. It seems likely that risk is better allocated if there is relief, although in Taylor, the plaintiffs made reliance investments in part to market the event.[30] Relief being optimal assumes that the music hall was not insured, which is not clear from the legal records and was apparently not considered important by the parties or the court. The issue was hence not seen as one of risk allocation but rather as one of an implied condition or the failure of a basic assumption. This reasoning was later abandoned by American courts and by legal textbook writers such as Williston and Corbin, who considered the idea of an implied

[30] Reliance investments increase expectation damages, but it may be difficult to measure expectations damages. If expectation damages are not fully compensated, whether discharge is optimal from the view of risk allocation can be unclear.

condition to be a fiction. They considered relief to be based on equity, which may be considered analogous to the concern for optimal risk allocation stressed in this article.[31]

If we assume that the fire caused the defendant a considerable loss, such that the concern for risk allocation would suggest discharge, the question according to our theory is whether dispute costs will reverse this conclusion. However, as mentioned, a standard which grants relief when the loss of a good renders performance literally impossible is not vague. If there is a presumption that risk is generally better allocated through relief than through expectation damages when a good necessary for performance perishes, a general rule of relief may be advisable as this is a clear rule that avoids disputes. If such a presumption is only valid when insurance of the good is not available, a distinction may have to be made. If the good is not insurable, there should be automatic relief, if the parties should not have contracted for the event and if the event and its consequences were outside the disadvantaged party's control. If the good is insurable, the question arises whether, if insurance had been taken out, risk allocation would still be sufficiently inefficient for relief to be optimal despite the dispute costs generated by this vague standard. According to the analysis above, it may be optimal to never provide relief if in case of insurability, risk allocation is generally better under expectation damages than under relief, and to always provide relief if the opposite presumption holds.

This is worth showing within the model.

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See the account in Opera Co. of Boston, Inc. v. Wolf Trap Foundation for Performing Arts, United States Court of Appeals, Fourth Circuit.May 4, 1987, 817 F.2d 1094.

Assume that whether the good is insurable or not, relief will be optimal in some set of cases A, and in-optimal in terms of risk allocation in another set of cases B. In our model, B represents cases where *y* is positive. Also assume that for cases where y is either a small negative or a small positive number, the parties may disagree about whether the case falls in the category A or the category B. A rule which is contingent on the category will then create significant dispute costs since such small inefficiencies occur often. Four standards are possible: one that never provides relief, one that always provide relief, one that provides relief if the case falls in category B, and one that provides relief if the case falls in category B and if the inefficiency is sufficiently large. If B cases arise much more often than A cases, it may be optimal to always provide relief, as this avoids dispute costs.[32] If A cases arise often, it may be optimal to never provide relief; this will be optimal if the maximal inefficiency of B cases is limited. Or it may be optimal to provide relief when the inefficiency is sufficiently large, if indeed the maximal inefficiency is large.

The main features of Alcoa versus Essex Group Inc[33] have already been mentioned. The contract was signed in 1967 and was to run until 1983. In 1983, Essex could extend the contract till 1988. For Alcoa, it was hence a commitment of around twenty years. The reason for this long-term contract was, as noted by Klein (1996), partly that the parties had located next to each other and needed to guard against hold-up. The contract involved Essex delivering alumina to Alcoa, which then by a smelting process transformed it into aluminum that was then delivered back to Essex. The price per pound of aluminum was set according to a formula involving three components, two of which were labor costs and non-labor costs.

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[32] Note, however, that dispute costs may arise concerning e.g. whether the disadvantaged party could have done more to prevent or mitigate the loss.

[33] 115 499 F. Supp. 53 (W.D. Pa. 1980).

The non-labor costs were indexed by the Wholesale Price Index for Industrial Commodities, which had historically tracked the non-labor costs but which turned out to do so poorly when the price of electricity increased in 1973 and again in 1979. The price hence did not reflect Alcoa's costs and by 1978, the annual loss for Alcoa was in the order of 8 mio $ per year according to the calculations of the court. At that rate, Alcoa could expect to lose in the order of 75 mio $ from 1978-79 till 1988. At the same time, the price of aluminum that Essex could resell increased very substantially creating a large windfall gain for Essex. In terms of our model, *v* and *c* rose together such that expectation damages increased significantly and performance of the contract remained efficient. For the court, the question was whether it should provide relief and if so, whether relief should be in the form of discharge or reformation. The court found that there was ground for relief under the doctrines not only of impracticability but also of mutual mistake and frustration. The parties had both made the mistake of assuming that the index would track non-labor costs at the Alcoa factory.[34] The main requirement for the doctrines to apply was hence present, as an event had occurred the non-occurrence of which was basic assumption of the parties. The court reformed the contract by establishing a new price schedule around a ceiling price that Exeter had secured in the contract (although it can be argued that this ceiling price also was predicated on the absence of a large increase in energy prices).

The case and judge Teitelbaum's reasoning connect with the theory presented in this article in several ways.

First, there was apparently a relational contract between Alcoa and Exeter. As part of the proceedings, Alcoa claimed that Exeter's President had orally promised an increase in the price in 1975, after the increase in oil prices in 1973. Moreover, Alcoa argued and the court

[34] Frustration occurred according to the verdict, as Alcoa' purpose of making a profit was frustrated.

found credible, that Alcoa did not, despite the increase in its costs decrease its deliveries by 15% as it was allowed to do under the contract, because Alcoa wanted to act cooperatively to induce Exeter to agree to a price increase (p. 33). It would seem that the oil shocks of 1973-74 and 1979 moved the contract out of its self-enforcing range, as described above. For such shocks, the dispute costs created by vague standards are relevant, but account should be made of the losses that may accrue if the parties do not accommodate in a relational manner because they think the court will not provide relief. In the absence of accommodation, Alcoa eventually did e.g. decrease its deliveries by 15%.

Second, the court considered risk allocation of key importance. It noted that the parties had spent considerable resources to limit exposure to cost increases, e.g by hiring the Alan Greenspan as consultant and by checking that the price index tracked historic costs. The court stated that if long term contracts will be too risky, in the absence of relief, parties will resort to other tools of cooperation (such as integration).

The court also compared the extent of the cost increase to other similar cases where relief had not been granted. For instance, in Publicker Industries, Inc. v. Union Carbide Corp,[35] the increase in energy prices in 1973 led to costs for Union Carbide of 37.2 cents per gallon while the contract contained a price ceiling of 26.5 cents. The loss of 10.7 cents per gallon would amount to an aggregated loss of $5.8 million. The Alcoa court considered a vital difference between *Publicker Industries* and *Alcoa* to be that in *Publicker*, the contract was formed after an increase in oil prices in 1971 while in the latter the contract was formed before that increase. The court in Publicker had noted that the parties were likely to have traded the risk of large cost increases, which were deemed foreseeable due to the increase in 1971. Our theory suggests that the concept of foreseeability is unclear and that the relevant

[35] *17, UCC Rep. 989 (E.D.Pa.1975).*

question should be whether Union Carbide should have demanded a clause in the contract covering a large increase in energy costs, and if not, whether the increase was so large as to warrant reformation or discharge.

The Alcoa court also considered this question of the size of the loss. The Publicker court had stated that: *`We are not aware of any cases where something less than a 100% cost increase has been held to make a seller's performance 'impracticable'.* According to our theory, the relevant metric is not the percentage increase in costs, but the degree of the inefficiency of risk allocation which is likely to be a function of the total loss (price times quantity) to the supplier and the gain to the buyer. The court in Alcoa emphasized the absolute size of gains and losses and noted that the size of the loss to Alcoa was more than a thousand times greater than that of the transporter in the case Transatlantic Financing Corp. v. United States[36], where the transporter had had to freight goods around Africa when the Suez Canal was closed in 1956.

Our theory would suggest a further difference between *Alcoa* and e.g. *Publicker* or *Transatlantic*. The Alcoa contract was a long-term contract dating from 1967 till 1988. As the first cost increase occurred rather early (in 1973) the potential inefficiency of risk allocation was large, assuming that the parties were risk averse. If relief is granted at some level of inefficiency, we might expect parties to renegotiate when the inefficiency is larger than that level, depending on the degree of vagueness of the standard. *Publicker* was a much shorter contract, which means that its maximal inefficiency is likely to have been smaller. *Transatlantic* was a singular contract with a limited, maximal inefficiency. Our theory suggests that relief may be warranted at some level of inefficiency when the maximal efficiency is very large, while pacta sunt servanda may be optimal when the latter is limited.

[36] 363 F.2d 312 (D.C.Cir.1966).

Relief may, however, not be optimal even if the maximal inefficiency is very large, if dispute costs and the level of vagueness are significant. The Alcoa court addressed neither the maximal level of inefficiency, nor vagueness or dispute costs. There was hence no clear standard for when there would be relief.

Several commentators and judges subsequently criticized the verdict, both for being too activist, i.e. for giving the judge too much leeway to reform the contract[37], and for allowing too much vagueness. For instance, in Wabash v. Avnet, Judge Shadur stated that[38]:

> *"under the logical consequences of that case (Alcoa) there would be no predictability or certainty for contracting parties who selected a future variable to measure their contract liability. Whichever way the variable fluctuated, the disappointed party would be free to assert frustrated expectations and seek relief via reformation."*

Relational contract lawyers on the other hand praised the verdict, e.g. Speidel (1981) and Hillman (1987). They saw the verdict as permitting the court to force the parties to stick to their relational contracts of mutual adjustments. In terms of the model, those in favor of the verdict can be seen as considering dispute costs and vagueness to be low in comparison with the potential inefficiencies of risk allocation and the loss of cooperation (in the interval $y > y' + z$). Also, the proponents of the verdict held greater confidence in the courts' ability to know when a contract's risk allocation was unintended.

According to Halpern (Halpern, 1986), the critics persuaded the courts, such that by 1986, the verdict had `already faded into obscurity´ (p. 1122) as it was barely mentioned in cases of impracticability.

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[37] Professor Dawson was especially adamant that American courts should not follow the German courts in their activism in reforming contracts under a good faith standard. See Dawson (1983, 1984).

[38] 516 F. Supp. 995 (N.D. Ill. 1981), at 999.

This analysis is relevant to some of the corona cases where performance was impossible for the seller or where the purpose of the contract was frustrated for the buyer. For instance, suppliers and buyers were sometimes prevented from producing by government regulation. Note that frustration of purpose for the buyer is not exactly symmetric to impossibility for the seller. If, for instance, a restaurant was prohibited from receiving guests, the purpose of its rental agreement with its landlord can be said to have been frustrated, and the question is then whether it should still be required to pay rent. The payment in question is then no greater than the rent, which limits the inefficiency of the risk allocation. If, however, a seller were unable to sell, the damages owed to its buyer under expectations damages would be $v - p$, which might increase with $v$. Yet, impossibility for the seller and frustration of purpose for the buyer are otherwise analogous and may be treated together. When there is actual impossibility and complete frustration of purpose, a standard that provides relief may not be as vague as a standard that is contingent on a sufficient cost increase. It is like a necessary good perishing. We now analyze how the theory can more specifically be applied to corona cases.(To be continued, have gotten hold of corona cases..).

## 9. Discussion of assumptions

Several assumptions limited the generality of the analysis.

Often, the parties may to some extent take precautions against or mitigate the consequences of external shocks. Naturally, the more the disadvantaged party can do to prevent or mitigate, the less reason is there to deviate from expectations damages, while the more the advantaged party can do, the greater is the reason for discharge. If both parties can act, this may call for a remedy that shares risk, as noted by Trakman (1985).

Careful drafting of the contract is another incentive concern. However, if the parties bear the costs of disputes themselves, this provides an optimal incentive within the model to draft carefully. Yet, a deeper analysis of how a court policy of relief may affect drafting incentives is outside the scope of this article.

It was assumed that the main cost of vague standards are the dispute costs that arise when parties disagree about force majeure clauses (or similar terms or doctrines). That such costs are real also when the parties avoid litigation is confirmed by practitioners.[39] There is, however, also another cost that we did not focus on: the disadvantaged party may by claiming

[39] For instance, Tim Cummins, President of World Commerce and Contracting commented in an e-mail correspondence about the handling of force majeure claims in a large firm:

`the extent of required review and negotiation of a force majeure claim would vary dramatically based on the nature of product or service – e.g. extent of impact, ease of replacement etc. Reaching resolution could involve just a handful of people, or potentially require widescale engagement and executive sign-off´.

an excuse get out of a contractual obligation. A vague standard may thereby cause inefficient breach, which may also lower the advantaged party's incentive for reliance investments. We did not include this possibility in the model, but it strengthens the argument for pacta sunt servanda.

We also did not include the costs of enforcing expectation damages. Measuring damages is subject to vague standards that may cause disputes. Yet, more is at stake in a dispute about discharge, and so costs are likely to be higher. The results of the model hence still hold when the dispute cost is interpreted as net of the cost of disputes concerning damages.

Textualists argue that courts (or other adjudicatory bodies) lack information to set the optimal level of intervention $y^*$. A more realistic model would account for the adjudicator's imperfect information. A simple formulation would assume that the court thinks it improves efficiency with probability $\mu$. Its maximization problem is then:

$$G(y') = \int_{y''}^{h} \mu f(y) y dy - \int_{y'-z}^{y'+z} \tau f(y) dy$$

The first-order condition would be: $\mu f(y')y' = \tau(f(y'-z) - f(y'+z))$. This is the first-order condition when conflict costs are $\tau/\mu$. The uncertainty hence affects the first-order condition the same as an increase in conflict costs, which we analyzed.

Authors differ on the role of risk aversion. Sykes assumes that large firms are largely risk neutral, while risk aversion is central to R. Posner and Rosenfield. This article assumed that even large shareholder firms may be risk averse, as evidenced by the extent to which they draw up insurance. Risk aversion and the desire to draw up insurance can be explained

by the concern for capital structure, which affects a party's financing costs (Froot et al. (1993)). Also, managers or lawyers who decide contract choices and organizational structure, are typically risk averse, which means that contract law can affect their choices. If contracts expose them to risk, they may wish to spend too many efforts on drafting contracts, or they may prefer integration to contracting, etc.

Finally, in the simplified model, it was assumed that the efficiency losses could be analyzed separately from the dispute costs although these occur in states where one party already suffers losses. One might analyze the case where dispute costs increase with $y$ as a proxy for this concern. This would point attention to a further reason for applying excuse restrictively: often, the dispute costs arise when one party is least able to bear them.

## 10.Concluding remarks (unfinished..)

When large shocks hit the economy, contracts are thrown into disarray and disadvantaged parties turn to their often vague force majeure clauses, and to doctrines of force majeure, impracticability or frustration, to seek a solution to their difficulties. As most recently shown during the Covid-pandemic, they often discover that both their contracts and the legal doctrines are too vague to provide any real guidance. The concepts of foreseeability and failure of basic assumptions can seem unfit and unclear. What is needed is a clearer set of doctrinal principles. To this task the value maximization principle of contract theory can be useful because it offers a simple and powerful framework. This article applies this principle to the fundamental trade-off between risk allocation and dispute costs. This led to a new set of principles of relief both non-relational and for relational contracts, and to a new set of suggestions for parties on how to draft terms of excuse.

While this economic approach may be clearer and less vague than current doctrine, it still relies on costs that are hard to estimate. We do not have much evidence on the costs of disputes or of opportunistic claims for relief, nor do we know much about the value which contracting parties attach to the ´repairing´ of the contract's risk allocation. The court and the parties may have to rely on their own intuitions about these costs. Hence, it would seem a worthwhile area of future empirical research to attempt to measure these costs.

Appendix A.

We show that when $y^r > \tau_1$, is optimal to provide relief whenever $y > y^r$.

Such policy generates welfare

$$\int_0^{y^r} yf(y)dy + \int_{y^r}^{h} y - (\tau_1 + g)f(y)dy = \int_0^{h} yf(y)dy - \int_{y^r}^{h}(\tau_1 + g)f(y)dy$$

It is assumed that the disagreement which occurs outside the self-enforcing range about how the court will provide relief leads to impaired cooperation.

Compare never and always, i.e. $\int_0^{y^r} yf(y)dy + \int_{y^r}^{h} -gf(y)dy$ with $\int_0^{h} yf(y)dy - \int_{y^r}^{h}(\tau_1 + g)f(y)dy$.

The difference is: $\int_{y^r}^{h}(\tau_1 - y)f(y)dy$

It is then a simple comparison between conflict costs on the one hand and benefits of correcting the inefficient contract on the other. Note that if the self-enforcing range is sufficiently high, always providing relief is better than never providing relief.

It can thus be optimal to always provide relief if the benefit $\int_{y^r}^{h} yf(y)dy$ is greater than $\int_{y^r}^{h} \tau_1 f(y)dy$ and if this policy is also better than the interior optimum.

Compare, then, always providing relief with doing so when the efficiency is sufficiently large, i.e. compare $\int_0^{y^r} yf(y)dy + \int_{y^r}^{y^*-z} -gf(y)dy + \int_{y^*-z}^{y^*+z}(-g - \tau + y)f(y)dy + \int_{y^*+z}^{h} yf(y)dy - \int_{y^*}^{h} \tau_1 f(y)dy - \int_{y^*+z}^{h} gf(y)dy$ with $\int_0^{h} yf(y)dy - \int_{y^r}^{h}(\tau_1 + g)f(y)dy$

The difference is: $\int_{y^r}^{y^*-z}(\tau_1 - y)f(y)dy - \int_{y^*-z}^{y^*+z} \tau f(y)dy$

This is negative when $y^r > \tau_1$, which means that we can conclude that always providing relief is then optimal, while if $y^r < \tau_1$, the size of $z$ and $\tau$, and the shape of the density function ($h$) matter.

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liability (and product liability) tends to be strict within a wide range of external circumstances.[40] Determining that range is the topic of this article.

We do not discuss the contentious issue of which exception to expectations damages is preferable. For instance, Dawson (1983,1984) argues that courts lack the information and the competence to adjust the price, while Speidel (1981) argues that the anticipation of such adjustment can bring the parties to renegotiate on their own.

For the first-order condition to yield a maximum rather than a minimum, the second-order derivative of social welfare, $G''(y') < 0,$ must be negative at the stationary point.

$G''(y') = -f'(y')y' - f(y') - \tau(f'(y' + z) - f'(y' - z))$. Hence,

$G''(y') < 0$ when $f'(y')y' + f(y') > \tau(f'(y' - z) - f'(y' + z))$

[40] The victim of a tort may threaten to bring suit although the injurer has not acted negligently, but this threat may not be credible. If the promisor claims an excuse and does not perform, and asks for renegotiation, the promisee faces a choice of either accepting to renegotiate or to bring suit for damages. When the bringing of suit is very costly, the outcomes are likely to be different.

We now summarize the first and the second-order conditions:

**Lemma 1**: An interior solution, $y^*$, must fulfill the conditions:

$$(1)\ y^* = \frac{f(y^* - z) - f(y^* + z)}{f(y^*)}\tau$$

$$(2)\ f'(y^*)y^* + f(y^*) > \tau(f'(y^* - z) - f'(y^* + z))$$

Next, we consider which court policy is optimal when there is uncertainty about how the court will provide relief but not whether there will be relief.

### 4.3. Uncertainty both about *when* and *how* the court will provide relief

We can denote the cost of dispute in the interval in which there is uncertainty about whether there will be revision as $\tau$, which now also includes the cost attributable to uncertainty about how there will be revision, and we can denote the cost that arises when there is uncertainty only about how there will be revision by $\tau_1$.[41]

[41] Results will be unaffected if we consider costs arising due to disagreement about how the court will intervene to arise in the interval $[y' - z, h]$.

Then, the welfare function reads (for $y' > 0$):[42]

$$G(y') = \int_{y'}^{h} f(y)ydy - \int_{y'-z}^{y'+z} \tau f(y)dy - \int_{y'}^{h} \tau_1 f(y)dy$$

and the first-order condition becomes:

$$y' = \frac{f(y'-z) - f(y'+z)}{f(y')}\tau + \tau_1$$

[42] We assume that there may at the same time be costly conflict about whether and about how a court will provide relief.