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When is a Warranty Not a Warranty?: Deconstructing the Magnuson-Moss Warranty Act's Narrow Definition of "Warranty"

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When is a Warranty Not a Warranty?: Deconstructing the Magnuson-Moss Warranty Act's Narrow Definition of "Warranty"

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Abstract

Prior to the adoption of the Uniform Commercial Code ("UCC"), warranties of goods required reliance on the affirmation or promise relating to the goods for liability to attach. The UCC changed this standard from a reliance standard to a "basis of the bargain" standard. This shift has caused much confusion as to whether the new standard was meant to completely eliminate reliance as a relevant factor, or if reliance still plays a primary role in warranty analysis. Adding to this area of law is the Magnuson-Moss Warranty Act ("MMWA" or "the Act"), which was enacted to address concerns that sellers' warranties were becoming too confusing for the average consumer. To address these concerns, the Act requires a number of explicit disclosure requirements associated with "warranties" as defined under the Act as well as substantive limitations on disclaimers and remedies. Given the consequences under the Act of making a warranty, how that term is defined under the Act is of the utmost importance. Though the Act defines a warranty more narrowly than the UCC does, it utilizes the same "basis of the bargain" language as U.C.C. § 2-313. This issue raises interesting questions concerning MMWA warranties and extended service plans of-

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fered by retailers. While warranty liability might seem to attach under UCC standards, the Federal Trade Commission ("FTC"), which is authorized under the Act to provide guidance and standards has thrown a wrench in this analysis in the form of 16 C.F.R § 700.11 which provides that if any additional consideration is paid "beyond the purchase price of the consumer product," then the basis of the bargain test is not satisfied and the plan would instead be a "service contract" for purposes of the Act.

This provision was at the center of the recent case of Ware v. Samsung Electronics America, Inc. *The Wares purchased a plasma-screen Samsung television from Best Buy and the five-year Geek Squad Protection Plan ("GSPP"), with a bundled discount for both. When the television was incapable of being repaired, the Wares sued for violations of the MMWA, alleging that the GSPP qualified as a warranty under the Act. Citing to the Regulation, the district court dismissed holding that, because additional consideration was paid, the GSPP was a "service contract." The case is of interest as it is one of the few reported decisions to explore, albeit briefly, the issue of what role the "basis of the bargain" language plays when additional consideration is paid. If the Regulation is taken at face value, then any additional consideration, even nominal, would disqualify an otherwise valid warranty under the Act from warranty status. This presents a loophole for manufacturers and retailers alike, which calls into question the rationale of the regulation. This article explores the definition of "warranty" under the Act with reference to the UCC in an attempt to discover where the "additional consideration" language in the Regulation comes from, and whether it is well-founded.*

I. Introduction

Prior to the adoption of the Uniform Commercial Code ("UCC"), warranty law for goods was governed by § 12 of the Uniform Sales Act. This Act provided that for liability to attach, the affirmation or promise relating to the goods had to be relied upon by the buyer. U.C.C. § 2-313 shifted the focus of this standard from "reliance" to the "basis of the bargain." This shift caused much confusion as to whether the new standard eliminated reliance as a relevant factor, or if reliance still plays a primary role in warranty analysis. From

this confusion, it appears that three primary approaches have emerged.

The first approach maintains that little changed from the old reliance standard to the new "basis of the bargain" standard. A second approach holds that the reliance standard has been completely eliminated, to the point that even post-sale promises can become the "basis of the bargain." The third approach does not treat reliance as eliminated completely, but instead views the "basis of the bargain" standard as creating a burden shifting construct. Under this theory, the buyer initially must show at least awareness of the warranty, at which point it is presumed to become a part of the "basis of the bargain." The seller then has the opportunity to rebut this presumption, such as by showing the buyer did not in fact rely. As explained below, this third approach is the one most in line with how leading scholars believe section 2-313 should work.

Adding to this area of law is the Magnuson-Moss Warranty Act ("MMWA" or "the Act"), which was enacted to address concerns that sellers' warranties were becoming too confusing for the average consumer. There was an articulated fear that "[t]he bold print giveth and the fine print taketh away."[1] To address these concerns, the Act requires a number of explicit disclosure requirements associated with "warranties" as defined under the Act. For instance, warranties must be labeled either "FULL" or "LIMITED"[2] and such warranties "may not exclude or limit consequential damages . . . unless such exclusion or limitation conspicuously appears on the face of the warranty."[3] One important consequence of making a warranty under the MMWA is that "if the product (or a component part thereof) contains a defect or malfunction after a reasonable number of attempts by the warrantor to remedy defects or malfunctions in such product, such warrantor *must permit the consumer to elect* either a refund for,

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[1] H.R. Rep. No. 93-1107, at 22–29 (1974), *reprinted in* 1974 U.S.C.C. A.N. 7702, 7706.

[2] 15 U.S.C.A. § 2303(a)(1), (2). Though the section does not use all caps, it does state that the warranty must be "conspicuously designated." 15 U.S.C.A. § 2303(a)(1).

[3] 15 U.S.C.A. § 2304(a)(3).

or replacement without charge of, such product or part (as the case may be)."[4]

Given the consequences of making a warranty under the Act, how that term is defined is of the utmost importance. Though the Act defines a warranty more narrowly than the UCC, it utilizes the same "basis of the bargain" language as § 2-313.[5] Given the pro-consumer animus that prompted the MMWA to be enacted, one would think that a strict showing by the buyer of reliance would not be the favored approach. However, the issue has been scarcely litigated, with many cases turning instead on the narrower definition of "warranty" found prior to the "basis of the bargain" language.[6]

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[4]15 U.S.C.A. § 2304(a)(4) (emphasis added).

[5]Compare 15 U.S.C.A. § 2301(6) (stating that warranty status requires that the "written affirmation, promise, or undertaking becomes part of the basis of the bargain between a supplier and a buyer for purposes other than resale of such product."), with U.C.C. § 2-313(a) to (c) (all requiring that the warranty become a "part of the basis of the bargain").

[6]See, e.g. Carpenter v. Alberto Culver Co., 28 Mich. App. 399, 184 N.W.2d 547, 548–49, 8 U.C.C. Rep. Serv. 1234 (1970) (holding that language regarding a hair dye would result in "very nice" and "very natural" hair was not an express warranty); Olin Mathieson Chemical Corp. v. Moushon, 93 Ill. App. 2d 280, 235 N.E.2d 263, 264, 5 U.C.C. Rep. Serv. 363 (4th Dist. 1968) (agreeing with trial court's finding that explosives were of "good quality, [and] that good results would be obtained" was "sales talk" rather than an express warranty); Performance Motors, Inc. v. Allen, 280 N.C. 385, 186 S.E.2d 161, 166, 10 U.C.C. Rep. Serv. 568 (1972) (holding statements "that 'the trailer was supposed to last a lifetime and be in perfect condition' " were just puffing and did not create an express warranty); Ruffin v. Shaw Industries, Inc., 149 F.3d 294, 302, Prod. Liab. Rep. (CCH) P 15289, 49 Fed. R. Evid. Serv. 1193, 36 U.C.C. Rep. Serv. 2d 341, 28 Envtl. L. Rep. 21473 (4th Cir. 1998) (holding that statements that carpet "was a higher quality carpet than what [plaintiff] brought in [to the store]" and that plaintiff "was getting 'a very good grade of material' " were just puffery); Boud v. SDNCO, Inc., 2002 UT 83, 54 P.3d 1131, 1135–36, Prod. Liab. Rep. (CCH) P 16406, 48 U.C.C. Rep. Serv. 2d 532 (Utah 2002) (finding statement that a luxury yacht was "best in class" was a mere statement of opinion rather than an assertion of fact); In re Scotts EZ Seed Litigation, 80 U.C.C. Rep. Serv. 2d 935 (S.D. N.Y. 2013) ("defendants' alleged representations concerning EZ Seed are merely the seller's opinion or commendation of the goods and thus cannot create a warranty"); Hume v. Lines, 2016 WL 1031320 (W.D. N.Y. 2016) (stating that "purported statements that the bus would provide 'safe and luxurious

This issue raises interesting questions concerning extended service plans offered by retailers.

For example, assume that at the height of the plasma television craze, you purchased a 50" plasma screen television from Best Buy. You were aware that there were reported problems with plasma-screen technology and so you decided to purchase from Best Buy so that you could take advantage of their much-advertised Geek Squad Protection Plan ("GSPP"). Though the plan cost extra money, it was described to you as a warranty by the salesperson, and incorporated by reference the manufacturer's warranty, and promised to fix defects in materials or workmanship.

Under the above circumstances, a warranty could be found under the UCC,[7] because there was a promise which relates to the goods. The only remaining question under U.C.C. § 2-313 would be whether the promise became a "part of the basis of the bargain."[8] It would seem that regardless of the approach adopted by the court, the buyer could meet this test because of their reliance on the GSPP when deciding to purchase the plasma-screen television. If the MMWA followed this same approach, then the GSPP should similarly qualify as a warranty under the "basis of the bargain" language of the Act. However, the Federal Trade Commission ("FTC"), which is authorized under the Act to provide guidance and standards, has thrown a wrench in this analysis: 16 C.F.R § 700.11 provides that if any additional consideration is paid "beyond the purchase price of the consumer product," then the basis of the bargain test is not satisfied and the plan would instead be a "service contract" for purposes of the Act.[9]

This situation played out in the factually similar case of

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comfort' for many miles strikes the Court as simply a commendation of the bus amounting to puffery.").

[7] See, e.g. Liberty Lincoln-Mercury, Inc. v. Ford Motor Co., 171 F.3d 818, 824–25, 38 U.C.C. Rep. Serv. 2d 11 (3d Cir. 1999) (holding that under U.C.C. § 2-313, an extended service plan could qualify as a warranty so long as it became part of the basis of the bargain).

[8] U.C.C. § 2-313(a) (2011).

[9] 16 C.F.R. § 700.11(b), (c) (2018).

Ware v. Samsung Electronics America, Inc.[10] The Wares purchased a plasma-screen Samsung television from Best Buy and the five-year GSPP, with a bundled discount for both.[11] When the television was incapable of being repaired, the Wares sued for violations of the MMWA, alleging that the GSPP qualified as a warranty under the Act.[12] Citing 16 C.F.R § 700.11, the district court dismissed holding that, because additional consideration was paid, the GSPP was a "service contract."[13]

The case is of interest as it is one of the few reported decisions to explore, albeit briefly, the issue of what role the "basis of the bargain" language plays when additional consideration is paid. If 16 C.F.R § 700.11 is taken at face value, then any additional consideration, even nominal, would disqualify an otherwise valid warranty under the Act from warranty status. This presents a loophole for manufacturers and retailers alike, which calls into question the rationale of the regulation.

This article explores the definition of "warranty" under the Act with reference to the UCC in an attempt to discover where the "additional consideration" language in 16 C.F.R § 700.11 comes from, and whether it is well-founded. Part II explains the history and development of the UCC definition of an express warranty under U.C.C. § 2-313, as well as various jurisdictional approaches to the "basis of the bargain" language. Part III provides an overview of the scope and purpose of the Magnuson-Moss Warranty Act, paying special attention to the definitions of a "warranty" and a "service contract" under the Act. It concludes with an analysis of the FTC's "additional consideration" provision found in 16 C.F.R § 700.11, using the Ware decision as an example of how the Regulation can easily transform a valid warranty into a service contract. Part IV examines the Regulation in light of the jurisdictional approaches to the "basis of the bargain" standard, as well as the potential for abuse by manufactur-

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[10]Ware v. Samsung Electronics America, Inc., 2019 WL 398845 (N.D. Ill. 2019).

[11]Ware, 2019 WL 398845, at *1–2.

[12]Ware, 2019 WL 398845, at *1–2.

[13]Ware, 2019 WL 398845, at *2–3.

ers and retailers. The article concludes by arguing the "additional consideration" standard has no basis in law as a bright line rule, and should be changed or interpreted as a mere consideration in a "basis of the bargain" analysis.

II. Warranty Law Under the UCC

Though the Magnuson-Moss Warranty Act exists independent of state law, as will be explored below, its definition of warranty uses the same "basis of the bargain" standard found in U.C.C. § 2-313. Indeed, the Act's drafters undoubtedly drew upon the UCC.[14] Therefore, a review of how warranties arise under the UCC, and jurisdictional approaches to the "basis of the bargain" language is (pardon the pun) warranted.

A. Types of Warranties Under the Uniform Sales Act and U.C.C. 2-313

Prior to the adoption of Article 2 of the UCC, there was the Uniform Sales Act. The Uniform Sales Act, which was based on the British Sales of Goods Act of 1894, was drafted in 1906 and adopted by 34 states. Notably with regard to warranties, this Act required that a plaintiff prove reliance on a warranty in a suit for breach of an express warranty. Section 12 of the Uniform Sales Act provided:

> Any affirmation of fact or any promise by the seller relating to the goods is an express warranty if the natural tendency of such affirmation or promise is to induce the buyer to purchase the goods, and if the buyer purchases the goods relying thereon . . .[15]

This focus on reliance was softened with the adoption of U.C.C. § 2-313 and the scope of what could form the basis of a warranty explicitly expanded.

Article 2 provides for the enforcement of express warranties made by sellers of goods under § 2-313 in one of three ways.

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[14]White and Summers, Uniform Commercial Code § 10:47 (5th ed.) (noting that it is obvious that the drafter of the MMWA warranty definition was aware of § 2-313 of the Uniform Commercial Code, but it is also obvious that the definition is not co-extensive with the § 2-313 definition of express warranties).

[15]White & Summers, supra, at 618 (quoting the Uniform Sales Act § 12).

(1) Express warranties by the seller are created as follows:

(a) Any affirmation of fact or promise made by the seller to the buyer which relates to the goods and becomes part of the basis of the bargain creates an express warranty that the goods shall conform to the affirmation or promise.

(b) Any description of the goods which is made part of the basis of the bargain creates an express warranty that the goods shall conform to the description.

(c) Any sample or model which is made part of the basis of the bargain creates an express warranty that the whole of the goods shall conform to the sample or model.

(2) It is not necessary to the creation of an express warranty that the seller use formal words such as "warrant" or "guarantee" or that he have a specific intention to make a warranty, but an affirmation merely of the value of the goods or a statement purporting to be merely the seller's opinion or commendation of the goods does not create a warranty.[16]

Subsection (a) is merely a restatement of the standard from the Uniform Sales Act, addressing "[a]ny affirmation of fact or promise made by the seller . . ."[17] Subsections (b) and (c) recognize two other ways in which an express warranty may arise. Subsection (b), like subsection (a), relates to words used by the seller, either oral or written, and will be addressed together below. Subsection (c) permits a warranty to arise by sample or model, is addressed next. Note one major change from the Uniform Sales Code: rather than focusing on reliance, in all three methods, the standard is that the warranty must become "part of the basis of the bargain" before liability attaches. This has been the subject of various jurisdictional approaches and is addressed in section II.B.

1. Affirmations of Fact, Promises, and Descriptions

The most straight-forward example of a warranty under subsection (a) would be statements, written or oral, that use the word "warranty" or "guarantee." However, subsection (2) makes clear that use of such words is not required to create

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[16]U.C.C. § 2-313.

[17]U.C.C. § 2-313.

a warranty under this section.[18] Further, this subsection does not require that the seller intended to make a warranty, only that an affirmation of fact or promise become a basis of the bargain.[19] The "affirmation of fact" provision permits warranties to be created by a seller's affirmative response to a buyer's inquiry. Thus if a buyer were to ask a grocer if a particular food was gluten-free, and the grocer replied in the affirmative, a warranty has been created.[20]

Subsection (b) of § 2-313 covers warranties created by description—a method of warranty creation that was not explicitly recognized under the Uniform Sales Act.[21] Descriptions of goods can be quite detailed, including color, dimensions, materials, etc., but they are also made simply by describing the goods being sold. The comments describe the purpose of this type of warranty as follows:

> In view of the principle that the whole purpose of the law of warranty is to determine what it is that the seller has in essence agreed to sell, the policy is adopted of those cases which refuse except in unusual circumstances to recognize a material deletion of the seller's obligation. Thus, a contract is normally a contract for a sale of something describable and described. A clause generally disclaiming "all warranties, express or implied" cannot reduce the seller's obligation with respect to such description and therefore cannot be given literal effect under Section 2-316.

This is not intended to mean that the parties, if they con-

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[18]U.C.C. § 2-313(2) ("[i]t is not necessary to the creation of an express warranty that the seller use formal words such as 'warrant' or 'guarantee' or that he have a specific intention to make a warranty.").

[19]U.C.C. § 2-313(2).

[20]U.C.C. § 2-313, cmt. 3.

In actual practice affirmations of fact made by the seller about the goods during a bargain are regarded as part of the description of those goods; hence no particular reliance on such statements need be shown in order to weave them into the fabric of the agreement. Rather, any fact which is to take such affirmations, once made, out of the agreement requires clear affirmative proof. The issue normally is one of fact. U.C.C. § 2-313, cmt. 3.

See also Colin P. Marks and Jeremy Kidd, Mastering Sales 76 (Carolina Academic Press 2018) (posting that "if a buyer asks a car dealer, 'This model jeep has four-wheel drive, right?' and the dealer responds 'Yes,' the dealer is just as liable in warranty as had the dealer proactively told the buyer it had four-wheel drive.").

[21]U.C.C. § 2-313(1)(b).

sciously desire, cannot make their own bargain as they wish. But in determining what they have agreed upon good faith is a factor and consideration should be given to the fact that the probability is small that a real price is intended to be exchanged for a pseudo-obligation.[22]

The basic principle at the heart of descriptions is that the seller must sell the good promised and cannot substitute a different kind of type of good. For instance, the "substitution of a bicycle for an automobile would quite clearly run afoul of this principle, but other cases are less clear."[23] For example, does a seller's description of the good as a car mean that the car is capable of independent locomotion, and what if the seller sells the goods "as is" so as to disclaim implied warranties? This was the case in Murray v. D & J Motor Co.,[24] though the facts involved more than a simple description of what the goods were. In that case, the plaintiff, Murray, purchased a van from D & J, in part to transport his "ailing and disabled daughter," who was present during the contract negotiations.[25] Murray conveyed that she needed a reliable vehicle, and though she noticed rattling during a test drive, she was assured by the salesmen that there was nothing wrong with the van and that it would provide reliable transportation.[26] The closing documents provided that "the vehicle was being sold 'as is' and 'with all faults' and that express and implied warranties were disclaimed."[27] Soon after the purchase, the van developed problems and broke down requiring between $1,700 to $2,000 to repair (the car was purchased for $3,995).[28]

Murray sued, claiming revocation of the goods under U.C.C. § 2-608 and fraud, but her case was dismissed by the trial court, apparently based upon the "as is" and "with all

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[22]U.C.C. § 2-313, cmt. 4.

[23]Marks & Kidd, supra, at 78.

[24]Murray v. D & J Motor Co., Inc., 1998 OK CIV APP 69, 958 P.2d 823, 35 U.C.C. Rep. Serv. 2d 1177 (Div. 4 1998).

[25]Murray, 958 P.2d at 827.

[26]Murray, 958 P.2d at 827.

[27]Murray, 958 P.2d at 827.

[28]Murray, 958 P.2d at 826–27.

faults" clauses.[29] On appeal, the court disagreed that the presence of such clauses precluded Murray from claiming revocation, but also addressed the express description warranty.[30] Relying on the comments to § 2-313, the court held that the disclaimers did not preclude a claim for breach of a description warranty.[31] Comment 4 states:

> [A] contract is normally . . . for something describable and described. A clause generally disclaiming 'all warranties, express or implied' cannot reduce the seller's obligation with respect to such description and therefore cannot be given literal effect under Section 2-316.

> This is not intended to mean that the parties, if they consciously desire, cannot make their own bargain as they wish. But in determining what they have agreed upon in good faith is a factor and consideration should be given to the fact that the probability is small that a real price is intended to be exchanged for a pseudo-obligation.[32]

Focusing on the last sentence of the above quoted comment, the court held that the disclaimers were no bar to Murray's claims and that, for purpose of dismissal "the facts . . . support Murray's assertion that the vehicle did not meet the warranty of description."[33]

Based on the commentary, the Code appears to prohibit a seller from avoiding liability based on disclaimers of all warranties when a description warranty is the basis of the suit. However, too broad an application of this principle would seem to overlap with the concept of the implied warranty of merchantability, which normally could be excluded. Courts and commentators have reached varying results on the question of how far the description warranty can extend beyond the class of goods described.[34]

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[29]Murray, 958 P.2d at 826, 828.

[30]Murray, 958 P.2d at 829.

[31]Murray, 958 P.2d at 829.

[32]U.C.C. § 2-313 cmt. 4.

[33]Murray, 958 P.2d at 829.

[34]See Frisch, Buyer's Remedies and Warranty Disclaimers: The Case for Mistake and the Indeterminacy of U.C.C. Section 1-103, 43 Ark. L. Rev. 291, 309–10 (1990) ("Put another way, what quality of performance is promised by a description warranty? At least one court and several com-

2. Samples and Models

Subsection (1)(c) adds samples and models to the list of ways a warranty can be created.[35] These concepts are a departure from the previous two mentioned in that they do not involve verbal or written representations. However, a sample or model can just as easily convey representations about the product being sold. Though the concepts may appear similar, samples and models are significantly distinct. A sample is a drawn from the bulk or inventory of goods that are to be sold; whereas a model is meant to act as a representation of the good to be sold but is not drawn from the actually inventory to be sold.[36]

Whether a sample or model qualifies as a warranty depends on the surrounding circumstances. Comment 5 to U.C.C. § 2-313 provides a caveat that though a warranty does not need to be made orally, "all descriptions by merchants must be read against the applicable trade usages with the general rules as to merchantability resolving any

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mentators have suggested something akin to merchantability. If this is the correct quality of performance promised, then despite an otherwise effective disclaimer of implied warranties, the warranty of merchantability lives on in the guise of an express warranty of description."); White, Retail Sellers and the Enforcement of Manufacturer Warranties: An Application of the Uniform Commercial Code To Consumer Product Distribution Systems, 32 Wayne L. Rev. 1049, 1087–88 (1984) ("Finding an express warranty based on a generic description of a product has been criticized as contradicting the UCC's warranty scheme by nullifying sections 2-316(2) and 2-316(3). . . . According to the critics, the express representation made during the sale of an 'automobile' is that what is being sold is a machine designed to function as an automobile, but which might have a defect characteristic of automobiles. Buyers want a product that fulfills its purpose and a representation to this effect is implicit in most sales situations. This representation, however, is the province of the implied warranty of merchantability, not the section 2-313 express warranty."); Bicknell v. B & S Enterprises, 160 Ga. App. 307, 287 S.E.2d 310, 33 U.C.C. Rep. Serv. 263 (1981) (upholding sale of car "as is" despite numerous serious defects when there was "no question that the automobile was in fact a 1974 Pontiac Firebird with two doors" and the buyer had ample opportunity to inspect the car).

[35] U.C.C. § 2-313(1)(c).

[36] Marks & Kidd, supra, at 79.

doubts."[37] The following illustration is useful in distinguishing when a warranty might not arise:

> For instance, if a seller of coal offers up a lump of coal for inspection, but expressly caveats that the actual coal to be sold will be of inferior quality, the coal offered would not be a sample, and its use as a model would be subject to the caveat. Similarly, if the same seller had piles of coal on its lot, and the buyer, while on site, inspected the coal, it would not necessarily follow that the coal so inspected was intended to be a sample or model by the seller, unless words or circumstances indicated otherwise.[38]

B. The "basis of the bargain" and Jurisdictional Approaches

Section 2-313 of the UCC has arguably expanded the scope of warranty creation beyond those methods listed in the statute. By shifting from a reliance standard to a "basis of the bargain" standard, the drafters thoroughly muddied the waters regarding what reliance, if any, need be shown before liability under a warranty arises. Courts have adopted a variety of jurisdictional approaches in response to this ambiguous term.

1. Section 2-313's "basis of the bargain" Standard

In addition to adding to the types of warranties that were described in the Uniform Sales Act, the UCC also departed in its approach to reliance. While the Uniform Sales Act required reliance, Article 2 does not. Instead, the promise, affirmation of fact, description, sample or model must form "part of the basis of the bargain."[39] Unfortunately, the Code gives little guidance as to what "basis of the bargain" means.[40] The Comments provide some guidance stating:

> No specific intention to make a warranty is necessary if any of these factors is made part of the basis of the bargain. In actual practice affirmations of fact made by the seller about the goods during a bargain are regarded as part of the description of

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[37]U.C.C. § 2-313, cmt. 5.

[38]Marks & Kidd, supra, at 79.

[39]U.C.C. § 2-313(1)(a) to (c).

[40]White & Summers, supra, at 619 (noting "[t]he extent to which the law has so been changed is thoroughly unclear."); Marks & Kidd, supra, at 79.

those goods; hence no particular reliance on such statements need be shown in order to weave them into the fabric of the agreement. Rather, any fact which is to take such affirmations, once made, out of the agreement requires clear affirmative proof. The issue normally is one of fact.[41]

Comment 7 to U.C.C. § 2-313 further notes, "[t]he precise time when words of description or affirmation are made or samples are shown is not material. The sole question is whether the language or samples or models are fairly to be regarded as part of the contract."[42]

From the comments it appears that in adopting a "basis of the bargain" standard, the drafters were rejecting the old reliance standard.[43] But this is not to say reliance is irrelevant, only that the burden may have shifted away from the buyer and onto the seller. White and Summers summarize the "basis of the bargain" standard as follows:

> [The Comments] to 2-313 arguably mean[] that any affirmation is presumed to be a part of the basis of the bargain and that the plaintiff need put in no evidence unless the defendant offers evidence of the buyer's nonreliance . . . If a plaintiff is suing on a seller's statement made orally during the negotiations or in writing as part of the contract, a lazy lawyer can likely pass the basis-of-bargain test at least initially without any proof of buyer's reliance. We would so define the "presumption" here; even though plaintiff has not put on proof of reliance, defendant's motion for a directed verdict will be denied. A careful lawyer, however, will allege some reliance and offer some proof.[44]

White and Summers go on to note that a seller can rebut this presumption by showing nonreliance.[45] Of course, this still leaves us with little guidance as to what it means for something to become the "basis" of the bargain, if reliance is

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[41]U.C.C. § 2-313, cmt. 3.

[42]U.C.C. § 2-313, cmt. 7.

[43]Keith v. Buchanan, 173 Cal. App. 3d 13, 220 Cal. Rptr. 392, 397–98, 42 U.C.C. Rep. Serv. 386 (2d Dist. 1985); Winston Industries, Inc. v. Stuyvesant Ins. Co., Inc., 55 Ala. App. 525, 317 So. 2d 493, 497, 17 U.C.C. Rep. Serv. 924 (Civ. App. 1975); Robert A. Hillman, Principles of Contract Law 120–21 (West Academic Publ., 3d ed. 2014).

[44]White & Summers, supra, at 62-22 (internal notes omitted).

[45]White & Summers, supra, at 622, n. 4.

truly no longer the standard.[46] Professor Robert Hill suggests that perhaps the best approach is to accept a "mixed motives" idea, under which "a statement is a basis of the bargain so long as the seller's utterance is at least 'one of the inducements for the purchase of the product.' "[47] However, as explored below, perhaps due to the lack of clarity in the term "basis of the bargain," some courts continue to utilize a reliance standard.[48]

2. Jurisdictional Approaches to the "basis of the bargain" Standard

Three broad approaches to the "basis of the bargain" language appear to have emerged. The first approach continues to require that a plaintiff show reliance as part of its prima facie case.[49] Such courts appear to equate the "basis of the bargain" language to the old reliance standard, despite the UCC's commentary to the contrary.[50] Accordingly, such courts have required that a buyer show reliance on a seller's statement, even in instances where the statement is itself labelled a warranty.[51]

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[46]White & Summers, supra, at 619 (quoting 1 N.Y. State Law Revision Comm'n 392–93 (1955) which notes "that the word 'basis' has no generally understood legal or psychological meaning.").

[47]Hillman, supra, at 121 (quoting Keith, 220 Cal. Rptr. at 397–98).

[48]Hillman, supra, at 121 ("In fact, because of the lack of clear direction from comment 3 and the inherent ambiguity of the term 'basis of the bargain,' courts have not been consistent in deciding whether the seller must show that the buyer has not relied on the statement.").

[49]See Compaq Computer Corp. v. Lapray, 135 S.W.3d 657, 675, 53 U.C.C. Rep. Serv. 2d 483 (Tex. 2004) (cataloging the courts that continue to require reliance).

[50]Compaq, 135 S.W.3d at 675 (stating that 2-313 "incorporates a reliance element, providing that a seller's statement that is 'part of the basis of the bargain' creates an express warrant," and that, despite the comments contrary suggestion that reliance is not necessary, that this "suggestion is not uniformly followed.").

[51]Compaq, 135 S.W.3d at 675–76. See also Speed Fastners, Inc. v. Newsom, 382 F.2d 395, 397, 399–400, 4 U.C.C. Rep. Serv. 681 (10th Cir. 1967) (requiring evidence that plaintiff's employer relied on statements in seller's pamphlet before purchase); DiIenno v. Libbey Glass Div., Owens-Illinois, Inc., 668 F. Supp. 373, 376, 4 U.C.C. Rep. Serv. 2d 706 (D. Del. 1987); Global Truck & Equipment Co., Inc. v. Palmer Mach. Works, Inc.,

In contrast to the reliance jurisdictions are those that hold that the UCC has done away with the reliance requirement altogether, even to the point that a buyer need not be aware of a warranty when being made.[52] A good example of this approach is the case of Autzen v. John C. Taylor Lumber Sales, Inc.[53] Autzen involved the sale of a 50' wooden boat to Autzen for $100,000.[54] One day after the purchase price was agreed upon and the contract was formed, seller's agent offered to

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628 F. Supp. 641, 651–52, 42 U.C.C. Rep. Serv. 1250 (N.D. Miss. 1986) (holding that buyer could not recover for breach of express warranty unless buyer could show it relied on statements prior to or contemporaneously with sale); Hagenbuch v. Snap-On Tools Corp., 339 F. Supp. 676, 680, 10 U.C.C. Rep. Serv. 1005 (D.N.H. 1972) (disapproved of on other grounds by, Thibault v. Sears, Roebuck & Co., 118 N.H. 802, 395 A.2d 843 (1978)); Stamm v. Wilder Travel Trailers, 44 Ill. App. 3d 530, 3 Ill. Dec. 215, 358 N.E.2d 382, 385, 20 U.C.C. Rep. Serv. 1142 (5th Dist. 1976) (noting that "cases under the [Illinois] Commercial Code require a reliance by the buyer upon the promise, affirmation or description."); Scaringe v. Holstein, 103 A.D.2d 880, 477 N.Y.S.2d 903, 904, 38 U.C.C. Rep. Serv. 1595 (3d Dep't 1984); Thomas v. Amway Corp., 488 A.2d 716, 720, 40 U.C.C. Rep. Serv. 836, 54 A.L.R.4th 561 (R.I. 1985) (stating that a plaintiff must prove reliance in an express warranty action).

[52]Compaq, 135 S.W.3d at 676. See also Lutz Farms v. Asgrow Seed Co., 948 F.2d 638, 645, Prod. Liab. Rep. (CCH) P 12965, 34 Fed. R. Evid. Serv. 813, 15 U.C.C. Rep. Serv. 2d 1167 (10th Cir. 1991) (holding that reliance is not required under Colorado law); Winston Industries, Inc. v. Stuyvesant Ins. Co., Inc., 55 Ala. App. 525, 317 So. 2d 493, 497, 17 U.C.C. Rep. Serv. 924 (Civ. App. 1975) (holding in the sale of a sale of mobile home that is was unnecessary to show "any particular reliance" by the buyer even though the buyer never received a written copy of the warranty and was unaware of its existence); Torres v. Northwest Engineering Co., 86 Haw. 383, 949 P.2d 1004, 1013, 36 U.C.C. Rep. Serv. 2d 378 (Ct. App. 1997) ("reliance is not an essential element of a breach of express warranty claim under the UCC"); Hawkins Const. Co. v. Matthews Co., Inc., 190 Neb. 546, 209 N.W.2d 643, 654–55, 12 U.C.C. Rep. Serv. 1013 (1973) (disapproved of on other grounds by, National Crane Corp. v. Ohio Steel Tube Co., 213 Neb. 782, 332 N.W.2d 39, 36 U.C.C. Rep. Serv. 779 (1983)) and (disapproved of on other grounds by, Nerud v. Haybuster Mfg., Inc., 215 Neb. 604, 340 N.W.2d 369, 37 U.C.C. Rep. Serv. 703 (1983)) (same); Daughtrey v. Ashe, 243 Va. 73, 413 S.E.2d 336, 338–39, 16 U.C.C. Rep. Serv. 2d 294 (1992) (holding that the "basis of the bargain" language does not establish "a buyer's reliance requirement").

[53]Autzen v. John C. Taylor Lumber Sales, Inc., 280 Or. 783, 572 P.2d 1322, 1978 A.M.C. 2263, 23 U.C.C. Rep. Serv. 304 (1977).

[54]Autzen, 572 P.2d at 1323–4.

do a survey of the boat's condition, which the buyer initially declined.[55] However, the seller insisted, the survey did go forward and the results were that the boat was in good shape.[56] After the sale, dry rot and serious defects to the boat were found and confirmed on reexamination by the first surveyor.[57] Autzen filed suit for breach of express warranty regarding the condition of the boat and the jury found for him, which the Supreme Court of Oregon affirmed.[58]

On appeal, the seller claimed that the survey that was conducted could not be a warranty under the basis of the bargain language as the sale had already taken place before the offer to conduct a survey.[59] The Oregon Supreme Court disagreed, distinguishing between contract formation and a "bargain." The court explained:

"A 'bargain' is not something that occurs at a particular moment in time, and is forever fixed as to its content; instead, it describes the commercial relationship between the parties in regard to this product. The word 'bargain' is not encrusted with pre-Code concepts which had attached themselves to contract formation notions that a contract came into existence at some specific point in time * * *. The Code's word is 'bargain' a process which can extend beyond the moment in time that the offeree utters the magic words, 'I accept'." Nordstrom, Law of Sales, s 67, 206 (1971).

At the time Buyer was first informed of the [boat] survey results, he had not yet taken possession of the boat. While this description did not induce the actual formation of the contract, the jury might have found that it did induce and was intended by the Seller to induce Buyer's satisfaction with the agreement just made, as well as to lessen Buyer's degree of vigilance in inspecting the boat prior to acceptance.[60]

The seller additionally attempted to argue that the survey could not qualify as a basis of the bargain as it was not bargained for but was volunteered (and initially declined) by

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[55] Autzen, 572 P.2d at 1324.

[56] Autzen, 572 P.2d at 1324.

[57] Autzen, 572 P.2d at 1324.

[58] Autzen, 572 P.2d at 1323.

[59] Autzen, 572 P.2d at 1325–26.

[60] Autzen, 572 P.2d at 1325–26.

the buyer.[61] The Court again, disagreed holding that "[t]he basis of the bargain requirement . . . does not mean that a description by the Seller must have been bargained for. Instead the description must go to the essence of the contract."[62]

The third intermediate approach views U.C.C. § 2-313 as not necessarily eliminating reliance altogether, but rather as creating a shift in the burdens of proof.[63] Kelleher v. Marvin Lumber & Cedar Co.[64] is useful in not just illustrating this approach, but also for its explanation of why this approach is more in-line with the comments to and purpose of section 2-313. In Kelleher, the plaintiff purchased and installed windows manufactured by the defendant, Marvin Lumber

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[61]Autzen, 572 P.2d at 1326.

[62]Autzen, 572 P.2d at 1326. This distinction between a bargain and what is essentially consideration is notable as the C.F.R. has stated that under Magnuson-Moss Warranty Act, if additional any additional consideration is paid, then the resulting warranty is in fact a service plan. 16 C.F.R. § 701.11(b), (c) ("A written warranty must be 'part of the basis of the bargain.' This means that it must be conveyed at the time of sale of the consumer product and the consumer must not give any consideration beyond the purchase price of the consumer product in order to benefit from the agreement."). This will be discussed in section III.C. and IV. infra.

[63]See Keith, 220 Cal.Rptr. at 398 ("The representation need only be part of the basis of the bargain, or merely a factor or consideration inducing the buyer to enter into the bargain. A warranty statement made by a seller is presumptively part of the basis of the bargain, and the burden is on the seller to prove that the resulting bargain does not rest at all on the representation."); Bysom Enterprises, Ltd. v. Peter Carlton Enterprises, Ltd., 267 Ill. App. 3d 1, 204 Ill. Dec. 408, 641 N.E.2d 838, 843 (1st Dist. 1994) ("the fact that the warranties are in the Purchase Agreement is prima facie evidence that they are part of the bargain. The burden of disproving this is upon [the seller]."); Torres v. Northwest Engineering Co., 86 Haw. 383, 949 P.2d 1004, 1015, 36 U.C.C. Rep. Serv. 2d 378 (Ct. App. 1997) ("[W]e conclude, as other jurisdictions have, that under the UCC, a seller's statements to a buyer regarding goods sold, made during the bargaining process, are presumptively part of the basis of the bargain between the seller and buyer. Therefore, the burden is on the seller to prove that the resulting bargain did not rest at all on the seller's statements.").

[64]Kelleher v. Marvin Lumber & Cedar Co., 152 N.H. 813, 891 A.2d 477, 2006-1 Trade Cas. (CCH) ¶ 75085, 58 U.C.C. Rep. Serv. 2d 401 (2005).

and Cedar Company in 1986.[65] Though the windows were initially treated with a wood preservative, the windows leaked and the surrounding wood rotted.[66] Over the next several years the plaintiff noticed other windows were also experiencing wood rot and reported this to the defendant.[67] In 1998, plaintiff filed a formal complaint regarding the wood rot, and it was discovered that 17 windows suffered rot damage.[68] The plaintiff ultimately filed suit for breach of warranty under state law and the MMWA, seeking damages for the replacement of the defective windows, loss of value of the house and costs related to repairing other water damage caused by the defective windows.[69] The plaintiff won at trial and defendant appealed.[70]

On appeal, at issue was whether a statement made in the defendant's catalog "that the windows were deep treated to permanently protect against rot and decay" qualified as an express warranty under both state law and the MMWA.[71] The court first held that the statement was indeed an affirmation of fact relating to the windows before determining whether the affirmation was a part of the basis of the bargain.[72] In reviewing the statements made in the catalog, the court reviewed the various approaches outlined above to the "basis of the bargain" language and rejected both stating:

> Both of these positions are inconsistent with the official comments to section 2-313 of the UCC. Official Comment 3 states in pertinent part:
>
> > In actual practice affirmations of fact made by the seller about the goods during a bargain are regarded as part of the description of those goods; hence no particular reliance on such statements need be shown in order to weave them into the fabric of the agreement. Rather, *any fact which is to take such affirmations, once made, out of the agreement requires clear affirmative proof*. The issue normally is one of fact.

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[65]Kelleher, 891 A.2d at 484.

[66]Kelleher, 891 A.2d at 484.

[67]Kelleher, 891 A.2d at 484.

[68]Kelleher, 891 A.2d at 484.

[69]Kelleher, 891 A.2d at 484.

[70]Kelleher, 891 A.2d at 486.

[71]Kelleher, 891 A.2d at 499–500.

[72]Kelleher, 891 A.2d at 500.

(Emphasis added.) Furthermore, comment 8 states that "all of the statements of the seller [become part of the basis of the bargain] unless good reason is shown to the contrary." (Emphasis added.) Comment 7 states that "the precise time when words of description or affirmation are made . . . is not material. The sole question is whether the language . . . [is] fairly to be regarded as part of the contract." Thus, the majority position that reliance is an essential element under section 2-313 is clearly contrary to the plain language of section 2-313 and comment 3. Likewise, the minority position eliminating any reliance requirement is also contrary in that it nullifies the phrase "part of the basis of the bargain," thereby allowing a buyer to recover on a breach of warranty claim without being aware of the existence of the statements when the bargain was being negotiated.[73]

The court proceeded to adopt an intermediate approach.[74] Under this approach, once buyers show they were aware of the "affirmation of fact or promise, the statements are presumptively part of the basis of the bargain [and] the burden then shifts to the seller to prove, by clear affirmative proof, that the resulting bargain did not rest *at all* on the seller's statements."[75] Based on this approach the court concluded that there were really two dispositive issues with regard to the "basis of the bargain": "whether the statements were of the type that would naturally induce the purchase of the product; and whether the buyer was aware of the statements during the negotiating process."[76] Despite this conclusion, the court found that there were credibility issues regarding whether the plaintiff was aware of the catalog affirmations when purchasing the window that needed to be resolved by the trier of fact, and so vacated the verdict and remanded.[77]

This intermediate approach is consistent with the approach articulated by Professors White and Summers as

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[73]Kelleher, 891 A.2d at 501 (emphasis in original).

[74]Kelleher, 891 A.2d at 501.

[75]Kelleher, 891 A.2d at 501 (emphasis in original).

[76]Kelleher, 891 A.2d at 502.

[77]Kelleher, 891 A.2d at 502–03.

well as Professor Hillman.[78] It also appears to be the most consistent with the comments to § 2-313 in that reliance ceases to be the *sine qua non* of warranty liability, but still permits a showing of non-reliance as a defense. This third approach appropriately respects the modifier "part of" that precedes "basis of the bargain," recognizing that any number of affirmations or promises could be "part of" the purchasing decision, and leaving it the burden of the seller who makes such affirmations or promises to rebut them by showing *no* reliance. Though the MMWA does not explicitly articulate what approach to adopt with regard to its "basis of the bargain" language, because the Act also uses the modifier "part of" and has a pro-consumer purpose, the intermediate approach is the most appropriate to adopt as well. Unfortunately, the FTC has given little guidance on this issue, and as explored below, what guidance it has given is not consistent with any of the approaches outlined above.

III. The Magnuson-Moss Warranty Act's Definition of Warranty

The MMWA is a pro-consumer act meant to de-mystify the language of warranties and offer certain protections to consumers. The Act attaches disclosure requirements to those making "warranties" as defined under the Act, and imposes specific limitations on what can be disclaimed. The Act also has a residual category labeled "service contracts" for promises that may not quite meet the definition of a "warranty" under the Act. This category, however, does not impose the same sort of requirements that come with a warranty. Though not often litigated, the distinction can make a big difference for consumers, especially with regard to remedies. Unfortunately, the FTC's guidance on this issue, as articulated through the Code of Federal Regulations, are neither especially enlightening nor consistent with the Act itself or the UCC.

A. The History and Purpose of the Magnuson-Moss Warranty Act

The MMWA was created to address the belief that consumer product warranties under state law often were too

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[78]See supra notes 42 & 46, and accompanying text.

complex and varied to be easily understood or to allow meaningful comparisons, and that restrictions buried in the text hindered meaningful warranty protection.[79] As was noted in the House Report on the legislation:

> Another growing source of resentment has been the inability to get many of those products properly repaired and the developing awareness that the paper with the filigree border bearing the bold caption 'Warranty' or 'Guarantee' was often of no greater worth than the paper it was printed on. Indeed, in many cases where a warranty or guarantee was ostensibly given the old saying applied 'The bold print giveth and the fine print taketh away.' For the paper operated to take away from the consumer the implied warranties of merchantability and fitness arising by operation of law leaving little in its stead.[80]

The MMWA addresses these concerns in two ways. First, by setting out minimum informational standards associated with warranties. Second, by providing substantive limitations on certain disclaimers when a warranty is given.

The MMWA is limited to sales of consumer products, defined as "any tangible personal property which is distributed in commerce and which is normally used for personal, family, or household purposes."[81] The MMWA applies to consumer product warrantors.[82] defining a warrantor broadly as "any supplier or other person who gives or offers to give a written warranty or who is or may be obligated under an implied warranty."[83] The Act broadly defines a supplier as "any person engaged in the business of making a consumer

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[79]See S. Rep. No. 93-151, at 6–8 (1973); H.R. Rep. No. 93-1107, at 22–29 (1974), *reprinted in* 1974 U.S.C.C.A.N. 7702, 7705–11. See also Devience, Magnuson-Moss Act: Substitution for UCC Warranty Protection, 95 Com. L.J. 323 (1990).

[80]H.R. Rep. No. 93-1107, at 22–29, *reprinted in* 1974 U.S.C.C.A.N. 7702, 7706.

[81]15 U.S.C.A. § 2301(1).

[82]Section 2310(d) of the MMWA provides that "a consumer who is damaged by the failure of a supplier, warrantor, or service contractor to comply with any obligation under this chapter, or under a written warranty, implied warranty, or service contract, may bring suit for damages and other legal and equitable relief." 15 U.S.C.A. § 2310(d)(1).

[83]15 U.S.C.A. § 2301(5).

product directly or indirectly available to consumers."[84] This definition is broad enough to reach manufacturers and retailers alike, thereby loosening vertical privity requirements that might normally be an obstacle for downstream purchasers of goods under the UCC. Thus, once a retailer or manufacturer makes an express warranty, as defined under the Act, the MMWA applies.[85]

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[84]15 U.S.C.A. § 2301(4).

[85]There exists authority that the Act applies not only to those making express written warranties, but even where no express warranties have been made and a suit is brought simply for a breach of an implied warranty, such as merchantability. See McCurdy v. Texar, Inc., 575 So. 2d 299, 300, 1991-1 Trade Cas. (CCH) ¶ 69359 (Fla. 4th DCA 1991) see also Milicevic v. Fletcher Jones Imports, Ltd., 402 F.3d 912, 918, 2005-1 Trade Cas. (CCH) ¶ 74736, 66 Fed. R. Evid. Serv. 1059 (9th Cir. 2005) ("The Act's consumer-suit provision . . . supplies a federal remedy for breach of written and implied warranties . . ." (quoting Richardson v. Palm Harbor Homes, Inc., 254 F.3d 1321, 1325, 2001-2 Trade Cas. (CCH) ¶ 73334, 45 U.C.C. Rep. Serv. 2d 56 (11th Cir. 2001))); Rentas v. DaimlerChrysler Corp., 936 So. 2d 747, 750 (Fla. 4th DCA 2006) (MMWA "provide[s] an independent federal cause of action for breach of warranty"); Hyler v. Garner, 548 N.W.2d 864, 874 (Iowa 1996), as amended on denial of reh'g, (June 18, 1996) ("The Magnuson-Moss Act created a federal remedy for breach of written and implied warranties falling within the statute"); Carolyn L. Carter et al., Nat'l Consumer Law Ctr., Consumer Warranty Law: Lemon Law, Magnuson-Moss, UCC, Manufactured Home, and Other Warranty Statutes § 2.3.1.3 (5th ed. 2015); Christopher Smith, Private Rights of Action Under the Magnuson-Moss Warranty Act, in Practicing Law Inst., Commercial Law and Practice Course Handbook Series 223, 225 (1985) (stating the MMWA allows consumers to bring a federal action for breach of an implied warranty of merchantability or fitness even if a written warranty has not been given); Annotation, Consumer Product Warranty Suits in Federal Court Under Magnuson-Moss Warranty Federal—Trade Commission Improvement Act (15 U.S.C.A. §§ 2301 et seq.), 59 A.L.R. Fed. 461, 470 n.10 (1982) ("This provision has not only provided a means of enforcing the substantive requirements of the Act, but also has established a federal cause of action for breach of an implied warranty which has arisen under state law even if no written warranty was involved."). "This could arise in a case where a seller makes no written warranties but fails to disclaim implied warranties, such as the warranty of merchantability, which, under state law, accompany all sales by merchants unless properly disclaimed." Marks, Online Terms as In Terrorem Devices, 78 Md. L. Rev. 247, 279 (2019). But see Anderson v. Newmar Corp., 319 F. Supp. 2d 943, 948, 2004-1 Trade Cas. (CCH) ¶ 74471 (D. Minn. 2004) (limiting application of MMWA to warrantors who make express warranties); Gross v. Shep Brown's Boat Basin, 2000 DNH 49, 2000 WL 1480373 (D.N.H. 2000);

While the scope of liability as to who can be sued is enlarged by § 2310(d) of the MMWA, retailers are not liable for simply selling consumer goods that come with a manufacturer's warranty, unless the retailer itself also warrants the goods.[86] The Regulation makes this clear, stating:

> Section [2310(f)] of the Act . . . provides that only the supplier "actually making" a written warranty is liable for purposes of F.T.C. and private enforcement of the Act. A supplier who does no more than distribute or sell a consumer product covered by a written warranty offered by another person or business and which identifies that person or business as the warrantor is not liable for failure of the written warranty to comply with the Act or rules thereunder.[87]

Notably the retailer should identify the manufacturer as the warrantor, and though the retailer may not be liable under the Act for an express warranty, unless it properly disclaims the implied warranties, other provisions of the Act might still apply.[88]

The MMWA applies when a written warranty is made, and

McNamara v. Nomeco Bldg. Specialties, Inc., 26 F. Supp. 2d 1168, 1175 (D. Minn. 1998); Skelton v. General Motors Corp., 500 F. Supp. 1181, 30 U.C.C. Rep. Serv. 846 (N.D. Ill. 1980), order rev'd on other grounds, 660 F.2d 311, 1981-2 Trade Cas. (CCH) ¶ 64333, 32 U.C.C. Rep. Serv. 1118 (7th Cir. 1981).

[86]15 U.S.C.A. § 2310(f) ("Warrantors subject to enforcement of remedies. For purposes of this [S]ection, only the warrantor actually making a written affirmation of fact, promise, or undertaking shall be deemed to have created a written warranty, and any rights arising thereunder may be enforced under this [S]ection only against such warrantor and no other person.").

[87]16 C.F.R. § 700.4.

[88]See, e.g., Voelker v. Porsche Cars North America, Inc., 353 F.3d 516, 526, 52 U.C.C. Rep. Serv. 2d 450 (7th Cir. 2003) (finding a lessor's written, conspicuous disclaimer specifically mentioning merchantability sufficient to safeguard against a lessee's MMWA claim for breach of implied warranty and improperly pled breach of express warranty claim); Hemmings v. Camping Time RV Centers, LLC, 93 U.C.C. Rep. Serv. 2d 1230 (N.D. Ga. 2017) (dismissing a consumer's claims under MMWA § 2310 against a seller after the consumer's breach of express and implied warranties claims failed because the seller had not "adopted the manufacturer's warranty or assumed the performance of [that] warranty" and had conspicuously disclaimed all warranties in its sales agreement); Semitekol v. Monaco Coach Corp., 582 F. Supp. 2d 1009, 1027–30, 2008-2 Trade Cas. (CCH) ¶ 76350 (N.D. Ill. 2008) (upholding a motorhome dealer's

in some jurisdictions, even if no warranty is made, the MMWA will apply if implied warranties are not properly disclaimed.[89] For most retailers, avoiding liability under the Act will simply be a matter of properly disclaiming all express and implied warranties, and making clear, when applicable, that manufacturer warranties are not their warranties. However, retailers (and manufacturers) may also be subject to the Act if they offer service warranties or extended warranties with their products, as the Act specifically applies to service contracts.[90] Drawing upon the hypothetical in the introduction, Best Buy offers on its website a "Geek Squad® Protect & Support Plus" service contract that includes "Hardware Protection" and 24/7 technical support.[91] In such a situation, even if Best Buy makes no express written warranties and disclaims all implied warranties, it will

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disclaimer of implied warranties, which "specifically state[d] 'dealer' in the [S]ection identifying who was disclaiming the warranty," after concluding that two purported promises by the dealer were not written warranties for MMWA § 2308 purposes and thus could not bar the dealer from disclaiming implied warranties); Rokicsak v. Colony Marine Sales and Service, Inc., 219 F. Supp. 2d 810, 815, 48 U.C.C. Rep. Serv. 2d 573 (E.D. Mich. 2002) (protecting a retailer from liability for an alleged breach of the implied warranty of merchantability where the applicable purchase agreement "disclaimed all warranties using clear and conspicuous language" that "ma[de] plain there were no warranties except 'those written warranties provided by the manufacturer' " that "specifically incorporat[ed] the term 'merchantability' into the waiver language and expressly disclaim[ed] any implied warranty of fitness.").

[89]See Marks, supra, at 279.

[90]See Anderson v. Gulf Stream Coach, Inc., 662 F.3d 775, 780, 2011-2 Trade Cas. (CCH) ¶ 77690, 76 U.C.C. Rep. Serv. 2d 12 (7th Cir. 2011) ("It provides a federal private cause of action for a warrantor's failure to comply with the terms of a 'written warranty, implied warranty or service contract.' " (quoting Voelker v. Porsche Cars North America, Inc., 353 F.3d 516, 522, 52 U.C.C. Rep. Serv. 2d 450 (7th Cir. 2003))); Mesa v. BMW of North America, LLC, 904 So. 2d 450, 455 (Fla. 3d DCA 2005) ("[T]he MMWA allows a 'consumer' to sue a supplier, warrantor, or manufacturer who fails to comply with any obligation under the MMWA, a written warranty, an implied warranty, or a service contract." (citing 15 U.S.C.A. § 2310(d) (2001))).

[91]See Best Buy, Inc., http://www.bestbuy.com/site/geek-squad-protecti on/geek-squad-protect-support-plus/pcmcat748300491884.c?id=pcmcat 748300491884 (last visited Jan. 3, 2019) (stating "If something breaks, we'll repair it. It's that simple.").

be subject to the MMWA, and its attempts to disclaim implied warranties on the products sold will be invalidated.[92]

B. The Consequences of Making a "warranty" Under the MMWA

If the Act applies to a transaction, it sets minimum standards for express warranties that are made,[93] provides for a limitation on the ability to disclaim implied warranties, and makes remedies for breach of such warranties easier to access.[94] The Act permits consumers to bring suit in state or federal court[95] and provides that a prevailing plaintiff can recover attorneys' fees.[96]

If a written warranty is made, then a warrantor must conspicuously designate the warranty as either a "full warranty" or a "limited warranty."[97] The Act mandates that a warrantor must "fully and conspicuously disclose in simple

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[92]15 U.S.C.A. § 2310(d)(1) (attaching liability to a "supplier, warrantor, or service contractor" who damages a consumer through its failures to comply with the Act); Lysek v. Elmhurst Dodge, Inc., 325 Ill. App. 3d 536, 259 Ill. Dec. 454, 758 N.E.2d 862, 867, 2001-2 Trade Cas. (CCH) ¶ 73442 (2d Dist. 2001), as modified on denial of reh'g, (Oct. 25, 2001) (holding that "that obligations under written or implied warranties or service contracts can serve as independent bases for private lawsuits under the Magnuson-Moss Act."). Retailers may also be subject to the Act if they do not make clear that the warranties offered on a product come from a manufacturer rather than from them. Such a retailer, through sloppy advertising, may inadvertently make an express written warranty subjecting it to the Act. Colin P. Marks, Online Terms as In Terrorem Devices, 78 Maryland L. Rev. 247, 283 (2019). *Cf.* Freeman v. Hubco Leasing, Inc., 253 Ga. 698, 324 S.E.2d 462, 465–67, 40 U.C.C. Rep. Serv. 408 (1985) (holding that a lessee of a DeLorean automobile was the third-party beneficiary of a contract between the manufacturer and original dealer in which the dealer undertook to address warranty claims, despite the fact that the lessor (who bought the car from the dealer) had disclaimed warranties of merchantability and fitness for a particular purpose).

[93]15 U.S.C.A. § 2304(a), (e).

[94]Eddy, Effects of the Magnuson-Moss Act Upon Consumer Product Warranties, 55 N.C. L. Rev. 835, 851–52, 862, 869–72 (1977).

[95]15 U.S.C.A. § 2310(d)(1). For federal jurisdiction there are threshold requirements, such as the amount in controversy must be at least $50,000. See 15 U.S.C.A. § 2310(d)(3)(B).

[96]15 U.S.C.A § 2310(d)(2).

[97]15 U.S.C.A. § 2303. The Act defines a "written warranty" as:

and readily understood language the terms and conditions of such warranty."[98] The Act then provides a laundry list of items that the FTC may require including:

(1) The clear identification of the names and addresses of the warrantors.

(2) The identity of the party or parties to whom the warranty is extended.

(3) The products or parts covered.

(4) A statement of what the warrantor will do in the event of a defect, malfunction, or failure to conform with such written warranty—at whose expense—and for what period of time.

(5) A statement of what the consumer must do and expenses he must bear.

(6) Exceptions and exclusions from the terms of the warranty.

(7) The step-by-step procedure which the consumer should take in order to obtain performance of any obligation under the warranty, including the identification of any person or class of persons authorized to perform the obligations set forth in the warranty.

(8) Information respecting the availability of any informal dispute settlement procedure offered by the warrantor and a recital, where the warranty so provides, that the purchaser may be required to resort to such procedure before pursuing any legal remedies in the courts.

(9) A brief, general description of the legal remedies available to the consumer.

(10) The time at which the warrantor will perform any obligations under the warranty.

(11) The period of time within which, after notice of a defect, malfunction, or failure to conform with the warranty,

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[A]ny undertaking in writing in connection with the sale by a supplier of a consumer product to refund, repair, replace, or take other remedial action with respect to such product in the event that such product fails to meet the specifications set forth in the undertaking, which written affirmation, promise, or undertaking becomes part of the basis of the bargain between a supplier and a buyer for purposes other than resale of such product.

15 U.S.C.A. § 2301(6)(B).

[98]15 U.S.C.A. § 2302(a).

the warrantor will perform any obligations under the warranty.

(12) The characteristics or properties of the products, or parts thereof, that are not covered by the warranty.

(13) The elements of the warranty in words or phrases which would not mislead a reasonable, average consumer as to the nature or scope of the warranty.[99]

The FTC codified a nearly identical version of this list in 16 C.F.R. § 701.3.[100] Thus, meeting a definition of a "warrantor" under the Act comes with a number of additional informa-

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[99]15 U.S.C.A. § 2302(a).

[100]16 C.F.R. § 701.3(a). This section provides:

(a) Any warrantor warranting to a consumer by means of a written warranty a consumer product actually costing the consumer more than $15.00 shall clearly and conspicuously disclose in a single document in simple and readily understood language, the following items of information:

(1) The identity of the party or parties to whom the written warranty is extended, if the enforceability of the written warranty is limited to the original consumer purchaser or is otherwise limited to persons other than every consumer owner during the term of the warranty;

(2) A clear description and identification of products, or parts, or characteristics, or components or properties covered by and where necessary for clarification, excluded from the warranty;

(3) A statement of what the warrantor will do in the event of a defect, malfunction or failure to conform with the written warranty, including the items or services the warrantor will pay for or provide, and, where necessary for clarification, those which the warrantor will not pay for or provide;

(4) The point in time or event on which the warranty term commences, if different from the purchase date, and the time period or other measurement of warranty duration;

(5) A step-by-step explanation of the procedure which the consumer should follow in order to obtain performance of any warranty obligation, including the persons or class of persons authorized to perform warranty obligations. This includes the name(s) of the warrantor(s), together with: The mailing address(es) of the warrantor(s), and/or the name or title and the address of any employee or department of the warrantor responsible for the performance of warranty obligations, and/or a telephone number which consumers may use without charge to obtain information on warranty performance;

(6) Information respecting the availability of any informal dispute settlement mechanism elected by the warrantor in compliance with part 703 of this subchapter;

tional disclosure requirements. A failure to meet these minimal disclosure requirements can make a warrantor subject to suit by a "consumer who is damaged by [such] failure."[101]

Warranty status also comes with substantive limitations on what a warrantor can disclaim.[102] For instance, a warrantor making a "full warranty" cannot disclaim implied warranties[103] and warrantors making a "limited warranty" can only limit the duration of such implied warranties to the same length as the limited warranty.[104] The Act also provides that warrantors must remedy breaches of express warranties "within a reasonable time and without charge" and requires the warrantor to refund or replace the product, at the consumer's election and without charge, if the warrantor is unable to remedy any alleged defect after a reasonable

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(7) Any limitations on the duration of implied warranties, disclosed on the face of the warranty as provided in section 108 of the Act, 15 U.S.C. 2308, accompanied by the following statement: Some States do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

(8) Any exclusions of or limitations on relief such as incidental or consequential damages, accompanied by the following statement, which may be combined with the statement required in paragraph (a)(7) of this section: Some States do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

(9) A statement in the following language: This warranty gives you specific legal rights, and you may also have other rights which vary from State to State.

[101] 15 U.S.C.A. § 2310(d)(1).

[102] Michael D. Scott, Scott on Computer Info. L. § 7.23 (Aspen Pub. 3d ed. 2019) ("The Act takes a two-prong approach to consumer warranties. The first prong is concerned with ensuring that consumers receive adequate information about any warranties and service contracts covering consumer products . . . The second prong pf the Act's regulatory scheme is more substantive.").

[103] 15 U.S.C.A. § 2304(a)(2) (prohibiting limiting the duration of implied warranties), § 2308(a) (prohibiting suppliers who make warranties or who enter into service contracts within 90 days of the sale from disclaiming or modifying implied warranties).

[104] 15 U.S.C.A. § 2308(b).

number of attempts.[105] The Act further requires exclusions or limitations on consequential damages for breach of any warranties to conspicuously appear on the face of the warranty.[106]

As noted above, there is a second category that comes under the purview of the Act: the service contract.[107] Service contracts are not subject to the same rigorous disclosure requirements as warranties, as the Act only provides that service contracts may be entered into by a supplier or warrantor so long as they "fully, clearly, and conspicuously" disclose their terms "in simple and readily understood language," and also empowers the FTC to "prescribe by rule the manner and form in which the terms and conditions or service contracts shall be fully, clearly, and conspicuously disclosed."[108] In stark contrast to written warranties, the FTC has provided little guidance on what exactly must be disclosed, simply offering that terms which do not qualify as written warranties "should not be offered or described in a manner that may deceive consumers as to their enforceability under the Act."[109] Therefore, the only clear guidance is that a service contract should not identify itself as a warranty. Though service contracts do not have the same informational burdens as warranties, they do share one major limitation in that a supplier who makes a service contract with 90 days of the sale may not disclaim or modify any implied warranty.[110] However, one key limitation that does *not* apply to service, but does to warranties, is the provision that "if the product . . . contains a defect or malfunction after a reasonable number of attempts by the warrantor to remedy defects or malfunctions in such product, such war-

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[105]15 U.S.C.A. § 2304 (a)(1), (4).

[106]15 U.S.C.A. § 2304(a)(3).

[107]16 C.F.R. § 700.11 ("The Act recognizes two types of agreements which may provide similar coverage of consumer products, the written warranty, and the service contract.").

[108]15 U.S.C.A. § 2306(a), (b).

[109]16 C.F.R. § 700.3. See also Lysek v. Elmhurst Dodge, Inc., 325 Ill. App. 3d 536, 259 Ill. Dec. 454, 758 N.E.2d 862, 864, 2001-2 Trade Cas. (CCH) ¶ 73442 (2d Dist. 2001), as modified on denial of reh'g, (Oct. 25, 2001) ("At present, the Federal Trade Commission has not issued any rules governing service contracts.").

[110]15 U.S.C.A. § 2308(a).

rantor must permit the consumer to elect either a refund for, or replacement without charge of, such product or part."[111] Given this last exemption for service contracts, in addition to the lesser informational burden, many suppliers probably prefer their warranties be labelled service contracts for purposes of the Act. The next section delineates the boundaries of these two categories.

C.   Magnuson-Moss' Narrower "warranty" Definition and the Related "service contract" Concept

Given the different treatment of warranties versus service contracts under the Act, how a court labels written promises by a supplier can become quite important. Both terms are defined under the Act, but the definitions themselves leave gaps that are not fully clarified by the FTC. Further, though courts may borrow from the UCC to aid in delineating the metes and bounds of the definitions, particularly with regard to the "basis of the bargain" language, § 2-313 is much broader in the ways in which warranties may be made.

The most obvious way in which the MMWA's definition is narrower than the UCC's is that the MMWA only applies to consumer goods, consistent with its purpose, while the UCC applies to all sales of goods. Beyond the scope of the respective provisions, the definitions themselves are different. The Act defines a "written warranty" as:

(6) The term "written warranty" means—

(A) any written affirmation of fact or written promise made in connection with the sale of a consumer product by a supplier to a buyer which relates to the nature of the material or workmanship and affirms or promises that such material or workmanship is defect free or will meet a specified level of performance over a specified period of time, or

(B) any undertaking in writing in connection with the sale by a supplier of a consumer product to refund, repair, replace, or take other remedial action with respect to such product in the event that such product fails to meet the specifications set forth in the undertaking,

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[111]15 U.S.C.A. § 2304(a)(4).

which written affirmation, promise, or undertaking becomes part of the basis of the bargain between a supplier and a buyer for purposes other than resale of such product.[112]

The first limitation not found in the UCC is the addition of the word "written" to warranty. Under the UCC, oral warranties are actionable, though they may be subject to the parol evidence rule.[113] The Act, however, limits itself to "written warranties."[114]

A second way in which the MMWA is narrower than § 2-313 is in the types of warranties it covers. Recall that § 2-313 covers three types of warranties: affirmations of fact or promises, descriptions, and samples or models.[115] Subpart (a) of the MMWA's warranty definition appears at first to mirror the affirmations of fact or promises language, but then goes on to qualify that the affirmations or promises must "relate[] to the nature of the material or workmanship and affirm[] or promise[] that such material or workmanship is defect free or will meet a specified level of performance over a specified period of time." Drawing upon this language, the FTC has specified that "[c]ertain representations, such as energy efficiency ratings for electrical appliances, care labeling of wearing apparel, and other product information disclosures may be express warranties under the Uniform Commercial Code," and further that such "disclosures alone are not written warranties under this Act."[116] A failure in a labelling or advertisement to list both a specified level of

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[112]15 U.S.C.A. § 2301(6). As noted supra, the Act defines a warrantor as "any supplier or other person who gives or offers to give a written warranty or who is or may be obligated under an implied warranty," 15 U.S.C.A. § 101(5), and defines a supplier as "any person engaged in the business of making a consumer product directly or indirectly available to consumers." 15 U.S.C.A. § 2301(4).

[113]U.C.C. § 2-316, cmt. 2 ("The seller is protected under this Article against false allegations of oral warranties by its provisions on parol and extrinsic evidence and against unauthorized representations by the customary 'lack of authority' clauses.").

[114]15 U.S.C.A. § 2306(a); 16 C.F.R. § 700.3(a) ("The Act imposes specific duties and liabilities on suppliers who offer *written warranties* on consumer products." (emphasis added)).

[115]U.C.C. § 2-313(1)(a) to (c).

[116]16 C.F.R. § 700.3(a).

performance and specified time period will therefore fail to meet the definition of "warranty" under the Act, even if the same would meet the definition under § 2-313.[117]

For instance, in Skelton v. General Motors, Corp.[118] purchasers of cars manufactured by General Motors Corporation ("GM"), brought a nationwide class action on behalf of all purchasers of GM cars manufactured from 1976 through 1979.[119] The plaintiffs claimed that through its "brochures, manuals, consumer advertising and other forms of communications to the public generally and to members of plaintiffs' class specifically," GM warranted that its cars' transmissions were of a certain quality and would meet a specified level of performance.[120] Plaintiffs claimed that, contrary to these warranties, GM substituted inferior transmissions, and that this undisclosed substitution constituted a violation of the MMWA.[121] The district court held that the alleged warranty did not fall within the Act's definition of "written warranty" as "it did not affirm that the transmission would 'meet a specified level of performance over a specified period of time.' "[122] The Seventh Circuit Court of Appeals agreed that a product information disclosure was not a written warranty as it lacked a specified time period, concluding that such a reading is consistent with the FTC's interpreta-

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[117]Compare 15 U.S.C.A. § 2301(6)(A) (requiring that affirmations and promises as to material or workmanship be "defect free or will meet a specified level of performance over a specified period of time") with U.C.C. § 2-313(1), cmt. 3 ("The present section deals with affirmations of fact by the seller, descriptions of the goods or exhibitions of samples, exactly as any other part of a negotiation which ends in a contract is dealt with. No specific intention to make a warranty is necessary if any of these factors is made part of the basis of the bargain.").

[118]Skelton v. General Motors Corp., 660 F.2d 311, 1981-2 Trade Cas. (CCH) ¶ 64333, 32 U.C.C. Rep. Serv. 1118 (7th Cir. 1981).

[119]Skelton, 660 F.2d at 312.

[120]Skelton, 660 F.2d at 312.

[121]Skelton, 660 F.2d at 312–313. The district court also found, however, that "whenever a manufacturer elects to extend a 'written warranty' to a consumer, '(o)ther written promises presented in connection with the same transaction' should also be enforceable as part of the 'written warranty,' "—a conclusion with which the circuit court disagreed. Skelton, 660 F.2d at 320.

[122]Skelton, 660 F.2d at 316, n.7.

tion under the 16 C.F.R. 700.3.[123] In passing, the court noted that "it is quite plausible that the Act's draftsmen defined 'written warranty' . . . so as to exclude general descriptions of consumer products or their components from the reach of the Act, since it would be excessively cumbersome to impose the Act's disclosure rules on every advertisement containing a description of a product or its components."[124]

Other courts have agreed with this conclusion, holding that the Act's definition does not apply to mere descriptions. This is another way in which the scope of warranties is narrower under the Act than under the UCC Descriptions such as "All Natural" or "all natural flavors" would normally qualify as descriptive warranties § 2-313(1)(b).[125] However, many courts have held that such descriptions fail to meet the definition under the Act.[126] The reasoning of these cases draws upon the requirement under § 2301(6) that the sup-

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[123]Skelton, 660 F.2d at 316, n.7. The court also seemingly agreed with the district court's observation that had the alleged warranty read that a "transmission would perform like a THM 350 transmission for the life of the transmission" it *would* constitute a "written warranty," but because the representation was that a "transmission would perform like a THM 350 transmission" it did not not. Skelton, 660 F.2d at 316, n.7. "The arbitrariness of this distinction is apparent, but a certain amount of arbitrariness is inevitable whenever a bright line must be drawn." Skelton, 660 F.2d at 316, n.7.

[124]Skelton, 660 F.2d at 316, n.7.

[125]See U.C.C. § 2-313(1)(b); Anderson v. Jamba Juice Co., 888 F. Supp. 2d 1000, 1003–04 (N.D. Cal. 2012) (distinguishing between description warranties under the U.C.C. and the definition of "warranty" under the MMWA, and holding that the term "All Natural" did not constitute a written warranty under the MMWA; In re Frito-Lay North America, Inc. All Natural Litigation, 2013 WL 4647512 (E.D. N.Y. 2013) (holding "All Natural" label was not a warranty within the meaning of the MMWA); Thurston v. Bear Naked, Inc., 2012 WL 12845621 (S.D. Cal. 2012) (holding descriptive phrases such as "100% Natural" and "100% Pure & Natural" are more similar to product information disclosures than action warranties under the MMWA).

[126]See Anderson v. Jamba Juice Co., 888 F. Supp. 2d at 1004; Viggiano v. Hansen Natural Corp., 944 F. Supp. 2d 877, 898, 80 U.C.C. Rep. Serv. 2d 798 (C.D. Cal. 2013) (finding that Hansen's assertion that its diet soda was "premium" and contained "all natural favors" was merely a description of the product and not a written warranty under the MMWA); Bowling v. Johnson & Johnson, 65 F. Supp. 3d 371, 378 (S.D. N.Y. 2014) (holding that the claim "restores enamel" in relation to the sale of mouthwash was

plier warrants that the product is "defect free or will meet a specified level of performance over a specified period of time."[127] This exclusion of descriptive warranties is supported by the FTC's interpretation that "Certain representations, such as energy efficiency ratings for electrical appliances, care labeling of wearing apparel, and other product information disclosures may be express warranties under the Uniform Commercial Code. However, these disclosures alone are not written warranties under this Act."[128]

Another, perhaps obvious way in which the MMWA definition is narrower than the UCC's is with regard to samples or models. These are specifically recognized under § 2-313(1)(c) as possible ways in which a warranty can be made, but are excluded from the scope of the MMWA by virtue of the requirement that the warranty be written before being actionable. However, if a supplier were in writing to confirm that a product will conform to the specifications in a model or sample, then such an assertion could qualify as a "written warranty" under § 2301(6)(A)—not by virtue of the sample or model standing alone, but due to the additional writing.[129]

So far, only the implications of § 2301(6)(A) of the MMWA have been discussed, but subsection (B) also deserves attention, if for no other reason than it contains language not found in U.C.C. § 2-313. Subsection (B) covers assertions that the supplier will "refund, repair, replace, or take other remedial action with respect to such product in the event that such product fails to meet the specifications set forth in

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not a written affirmation that the product would be defect free over a specified period of time as required by the Act).

[127]15 U.S.C.A. § 2301(6); Anderson v. Jamba Juice Co., 888 F. Supp.2d at 1004 ("The statement 'All Natural' is a general product description rather than a promise that the product is defect free."); Viggiano v. Hansen Natural Corp., 944 F. Supp.2d at 898 (reasoning that descriptions such as "premium" and "all natural flavors" are not assertions that "the product is defect free or that it will meet a specific level of performance over a specified period of time."); Bowling v. Johnson & Johnson, 65 F. Supp.3d at 378.

[128]16 C.F.R. § 700.3(a).

[129]15 U.S.C.A. § 2301(6)(A) (including in the definition of "written warranty" affirmations and promises that materials or workmanship be "will meet a specified level of performance over a specified period of time").

the undertaking."[130] Thus, while subsection (A) requires a promise regarding the quality of the product, such as that it be "defect free," subsection (B) reaches promises to remediate defects, even if no promise regarding quality is made. For instance, in Milicevic v. Fletcher Jones Imports, Ltd.,[131] Milicevic sued Mercedes-Benz under both state breach of warranty and the MMWA when her car required service multiple times for factory defects.[132] Eventually, Milicevic requested a replacement car or a refund, and ultimately sued.[133] The district court found for Milicevic on both state MMWA warranty claims, and Mercedes-Benz appealed. Though the warranty at issue did not promise that the car would be defect free or meet a certain level of performance over a given time period, it did warrant to the owner "that any authorized Mercedes-Benz Center will make any repairs or replacements necessary to correct defects in material or workmanship at no charge for parts or labor."[134] Thus, the court found that the warranty fell within the definition of the MMWA.[135]

It is worth noting that the Milicevic court also treated the repair or replace provision as a warranty under state law.[136] Other courts have similarly found that a repair or replace provision is a warranty under U.C.C. § 2-313,[137] but this is not always the case. A provision that makes no assertion as

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[130]15 U.S.C.A. § 2301(6)(B).

[131]Milicevic v. Fletcher Jones Imports, Ltd., 402 F.3d 912, 2005-1 Trade Cas. (CCH) ¶ 74736, 66 Fed. R. Evid. Serv. 1059 (9th Cir. 2005).

[132]Milicevic, 402 F.3d at 913–14.

[133]Milicevic, 402 F.3d at 914.

[134]Milicevic, 402 F.3d at 919.

[135]Milicevic, 402 F.3d at 919.

[136]Milicevic, 402 F.3d at 915–16.

[137]See, e.g., Duffy v. Samsung Electronics America, Inc., 62 U.C.C. Rep. Serv. 2d 206 (D.N.J. 2007) (treating a repair or replace provision as an express warranty); Tomassini v. FCA U.S. LLC, 2015 WL 3868343 (N.D. N.Y. 2015) (deciding repair or replace warranty on "bargain of the basis" grounds); Standard Alliance Industries, Inc. v. Black Clawson Co., 587 F.2d 813, 818 n.10, 12 Ohio Op. 3d 246, 25 U.C.C. Rep. Serv. 65 (6th Cir. 1978) (rejected on other grounds by, Chemtrol Adhesives, Inc. v. American Mfrs. Mut. Ins. Co., 42 Ohio St. 3d 40, 537 N.E.2d 624, Prod. Liab. Rep. (CCH) P 12112, 9 U.C.C. Rep. Serv. 2d 88 (1989)) ("Both parties,

to the quality of the goods, but only states that the seller will repair or replace defects may more appropriately be labelled a limited remedy provision.[138] Indeed, some courts have seized upon the last line of § 2-313(1)(a), and held that the failure to warrant that "the goods shall conform to the affirmation or promise" removes such promises from the express warranty provisions. In Miler v. General Motors, LLC[139] the court explained:

> A "repair-or-replace" provision in a vehicle sales contract that does not "explicitly state that [the] plaintiff's vehicle will be free from defects, but rather states that the manufacturer will repair or replace any defects that arise during the specified period," does not constitute an "express warranty" within the meaning of the Michigan UCC, MCL § 440.2313. Although the repair-or-replace provision is a "promise made by the seller to the buyer which relates to the goods and becomes a part of the basis of the bargain," it does not create an express warranty "that the goods shall conform to the affirmation or promise."[140]

In such jurisdictions, the MMWA definition of warranty may actually be broader that U.C.C. § 2-313.[141] However, the importance of this distinction under state law is relevant

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throughout trial and on appeal, have referred to defendant's agreement to repair or replace defective parts as an express warranty. This provision does appear to meet UCC s 2-313's definition of express warranties in that it is a 'promise made by the seller to the buyer which relates to the goods and becomes part of the basis of the bargain . . .' ").

[138]Grosse Pointe Law Firm, PC v. Jaguar Land Rover North America, LLC, 317 Mich. App. 395, 894 N.W.2d 700, 705 (2016) ("A promise to repair or replace instead provides nothing more than a remedy for a product that breaks"); Standard Alliance Indus. v. Black Clawson Co., 587 F.2d at 818 n. 10 ("It is perhaps more accurate to term defendant's promise to repair or replace defective parts as the Remedy to be invoked if the mechanical performance warranties are breached. This is apparently the view taken in UCC [section] 2-316 which distinguishes between excluding or modifying warranties and limiting remedies for breach of warranty.").

[139]Miller v. General Motors, LLC, 95 U.C.C. Rep. Serv. 2d 1282 (E.D. Mich. 2018).

[140]Miller, 2018 WL 2740240, *4 (quoting Grosse Pointe Law Firm, PC v. Jaguar Land Rover North America, LLC, 317 Mich. App. 395, 404, 894 N.W.2d 700 (2016)).

[141]Grosse Point Law Firm, PC v. Jaguar Land Rover N. Am., LLC, 894 N.W.2d at 709 (Beckering, P.J., concurring) (noting that though the repair or replace provision did not fit under the definition of U.C.C. 2-313, it did meet the definition of warranty under the MMWA).

more to statute of limitation issues than with whether an enforceable promise is made, and the distinction does not always meet the general expectations of consumers, especially when the provision at issue is labelled a "warranty." This was noted by the Pennsylvania Supreme Court in Nationwide Insurance Co. v. General Motors Corp.,[142] which held that, despite "repair or replace" provisions not fitting neatly into section 2-313, nonetheless such provisions were best treated as warranties.

> We recognize that the document does not create a classic warranty that fits neatly within the UCC view of warranties . . . However, even if "repair or replace" warranties are viewed as remedies rather than as warranties, they do not fit strictly into the conceptual framework established by the provisions of the UCC, and a conceptually satisfactory resolution cannot be achieved. We also note that, although "repair or replace" warranties are not traditional warranties, they do fit within the modern concept of warranty. [The court then quotes 15 U.S.C. § 2301(6)(B).] Furthermore, we will not permit Appellee and other sellers who draft similar documents to escape the consequences of presenting them to the consumer as "extended warranties."[143]

1. Magnuson-Moss's "service contract" Definition

Based on the Act's definition of a "written warranty," it would appear that this definition requires: 1) a writing, 2) from a supplier to a buyer, 3) that either a) promises that the goods are defect free or will meet a specified level of performance over a specified period of time or b) undertakes to refund, repair, replace, or take other remedial action if the goods are defective, and 4) such writing is a "basis of the bargain." So, what of promises that do not meet this definition, but that are also related to the sale of the goods? The MMWA has created a residual category for "service contracts" that captures some additional representations. As noted earlier, the consequences of a provision being labelled a "service contract" rather than a "written warranty" impacts the maker's obligations to ultimately refund or replace the products, and so this distinction can become important.

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[142]Nationwide Ins. Co. v. General Motors Corp./Chevrolet Motor Div., 533 Pa. 423, 625 A.2d 1172, 21 U.C.C. Rep. Serv. 2d 277 (1993).

[143]Nationwide Ins. Co., 625 A.2d at 1177–78.

The MMWA defines a "service contract" as "a contract in writing to perform, over a fixed period of time or for a specified duration, services relating to the maintenance or repair (or both) of a consumer product."[144] Unlike the "written warranty" definition, there is no requirement that the writing come from a supplier, nor a requirement that the writing promise the goods will meet a specified standard, or to repair if they fail to meet certain specifications.[145] Furthermore, service contracts need not become a basis of the bargain to be recognized under the Act.

Comparing this definition with the "written warranty" definition found in the Act, it would appear that a service contract could arise in at least one of three ways. The first would be when a supplier makes a promise that does not fit into the definitions of § 2301(6)(A) or (B). For instance, if a car dealership held a Memorial Day weekend sale and offered that all cars bought during the weekend would get free oil changes every six months for two years. Such a promise could be in writing and could definitely be argued as a basis of the bargain, but would not be a promise or affirmation as to the product being defect free or guaranteeing a specified level of performance, nor would it be a promise to "refund, repair, replace, or take other remedial action."[146]

The second way the service contract could be invoked is when someone other than a supplier makes a promise that might otherwise fall under § 2301(6)(A) or (B). For instance, if a consumer purchased a used car "as is" from a dealership, and a third-party warrantor sold the purchaser a three-year warranty to cover repair and replacement of defective parts, this would be a service contract. Though the warranty would meet the substantive part of § 2301(6)(B), because it would

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[144]15 U.S.C.A. § 2301(8).

[145]Compare 15.U.S.C.A. § 2301(6) with § 2301(8).

[146]16 C.F.R. § 700.11(c) ("An agreement which relates only to the performance of maintenance and/or inspection services and which is not an undertaking, promise, or affirmation with respect to a specified level of performance, or that the product is free of defects in materials or workmanship, is a service contract. An agreement to perform periodic cleaning and inspection of a product over a specified period of time, even when offered at the time of sale and without charge to the consumer, is an example of such a service contract.").

not be from a supplier, as that term is defined under the Act, the three-year warranty would not really be a "written warranty" for the purposes of the Act (and the FTC admonishes that the third-party should avoid using the word warranty).[147]

The final way that a service contract may be created is when a supplier offers a warranty that does qualify under § 2301(6)(A) or (B), but the promise or undertaking failed the "basis of the bargain" provision.[148] In this regard, "written warranties" under the Act are subject to the same defense that sellers under the UCC can raise. If a court were to follow the state court interpretations of the "basis of the bargain" language, one would expect a court to adopt one of the three approaches outlined in part II.B.2., i.e. a "reliance" approach, a "no-reliance" approach, or an "intermediate" approach.

Returning to the example in the introduction, assume that a consumer wants to purchase a television. Faced with numerous retailers to choose from, the buyer decides to purchase from Best Buy, because the consumer also wishes to take advantage of the extended Geek Squad plan, which, for an additional cost, will cover repair of defects for five years after the purchase. As Best Buy would qualify as a "supplier" under the Act, and the promise to remedy defects would be a writing to "refund, repair, replace, or take other remedial action with respect to such product in the event that such product fails to meet the specifications set forth in the undertaking," the only remaining question would be if the writing is part of the "basis of the bargain." Even under the strictest "reliance" approach to this question, the consumer would have the opportunity to show that the extended Geek Squad coverage was relied upon as part of the purchasing decision, and in a "no-reliance" jurisdiction, it would presumptively be a part of the basis of the bargain. However, the FTC's guidance in the Regulation has worked mischief with these jurisdictional approaches.

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[147]16 C.F.R. § 700.3 (stating that terms which do not qualify as written warranties "should not be offered or described in a manner that may deceive consumers as to their enforceability under the Act.").

[148]16 C.F.R. § 700.11(c).

D. The FTC's "additional consideration" Guidance

Rather than adopt one of the three jurisdictional approaches to the "basis of the bargain" question, the FTC has opted to articulate a standard with little basis in the Act or in the law interpreting U.C.C. § 2-313. The Regulation distinguishes "written warranty" and "service contract" as follows:

> A written warranty must be "part of the basis of the bargain." This means that it must be conveyed at the time of sale of the consumer product and the consumer must not give any consideration beyond the purchase price of the consumer product in order to benefit from the agreement. It is not a requirement of the Act that an agreement obligate a supplier of the consumer product to a written warranty, but merely that it be part of the basis of the bargain between a supplier and a consumer. This contemplates written warranties by third-party non-suppliers.[149]

Thus the FTC approaches additional consideration as somehow taking a promise out of the "basis of the bargain." The Regulation reiterates this in the next section, stating:

> An agreement which would meet the definition of written warranty in section 101(6)(A) or (B), 15 U.S.C. 2301(6)(A) or (B), but for its failure to satisfy the basis of the bargain test is a service contract. For example, an agreement which calls for some consideration in addition to the purchase price of the consumer product, or which is entered into at some date after the purchase of the consumer product to which it applies, is a service contract.[150]

This second provision is notable in that it doesn't just take contracts for which some additional consideration was paid out of the "written warranty" definition, but it also rejects, in part, the "no reliance" approach to "basis of the bargain." The Regulation provides that an agreement "which is entered into at some date after the purchase of the consumer product" is not a warranty under the "basis of the bargain" standard, in direct contravention to cases such as Autzen v. John

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[149]16 C.F.R. § 700.11(b). The last line is somewhat confusing and may simply be a reference to situations in which a supplier offers a third-party warranty.

[150]16 C.F.R. § 700.11(c).

C. Taylor Lumber Sales, Inc.[151] discussed supra. But if the FTC was attempting to adopt one of the other standards, it is not clear from the language as, even under the strictest "reliance" standards, a consumer would be given an opportunity to show reliance. The quoted provision affords no such opportunity.

The effect on consumers and the mischief created by the Regulation was demonstrated in the case of Ware v. Samsung Electronics America, Inc.[152] In that case, the Wares purchased a plasma-screen Samsung television from Best Buy for $3,119.00, as well as a five-year Geek Squad Protection Plan ("GSPP") for $519.00, with a bundled discount for both.[153] When the television was incapable of being repaired, the Wares sued for violations of the MMWA, alleging that the GSPP qualified as a warranty under the Act.[154] The application of the "written warranty" provision was important because the Wares were seeking to elect a refund, but the GSPP allowed Best Buy to elect the consumer's remedy.[155] Citing to the Regulation, the district court dismissed holding that, because additional consideration was paid, the GSPP was a "service contract."[156] The court reasoned:

> The fact that the Wares were offered a discounted price for a consolidated purchase, however, is not indicative of whether their television purchase and their purchase of the Geek Squad Protection Plan were part of the same bargain. 16 C.F.R. § 700.11(b). To the contrary, the Wares' repeated allegations that they paid separate amounts for the "bundled" television and Geek Squad Protection Plan purchases clearly indicate that the Geek Squad Protection Plan was not a part of the

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[151]Autzen v. John C. Taylor Lumber Sales, Inc., 280 Or. 783, 572 P.2d 1322, 1978 A.M.C. 2263, 23 U.C.C. Rep. Serv. 304 (1977).

[152]Ware v. Samsung Electronics America, Inc., 2019 WL 398845 (N.D. Ill. 2019).

[153]Ware, 2019 WL 398845, at *1–2.

[154]Ware, 2019 WL 398845, at *1–2.

[155]See Ware v. Samsung Electronics America, Inc., 2019 WL 398845 (N.D. Ill. 2019).

[156]Ware, 2019 WL 398845, at *2–3.

"bargain" for the television's purchase, even if an overall discount was offered.[157]

The facts and the conclusion of the case should give every consumer pause. The Wares alleged that part of the purchasing decision was the discount they received if they also purchased the GSPP. The GSPP was a written undertaking to repair defects in materials and workmanship,[158] and also incorporated and extended the manufacturer's warranties.[159] The GSPP would therefore certainly seem to qualify as a "written warranty" under § 2301(6)(B) so long as the plaintiff could prove that it formed the "basis of the bargain." Under any of the jurisdictional approaches to "basis of the bargain" under the UCC, the Wares would have been afforded an opportunity to show reliance, yet, due to the language of the Regulation, and not the Act itself, the Wares were dismissed under Federal Rule of Civil Procedure 12(b)(6).

IV. The Potential for Abuse Under the FTC's Regulatory Guidance

The Ware case and the distinction between a "written warranty" and a "service contract" may seem to be of little

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[157]Ware, 2019 WL 398845, at *3. The court went on to hold that because the GSPP was "not limited to matters of materials or workmanship, but instead covers failures caused by wear and tear, dust and other environmental conditions, power fluctuations, or failed pixels, addresses a wide variety of potentially covered products, and provides for limited preventative maintenance," that the plan was "best characterized as requiring the performance of maintenance and repair services rather than guaranteeing the material and workmanship of the Wares' television." This part of the holding is dicta, but is also without a basis in the Act. The Act does not eliminate qualifying warranties that also make promises relating to maintenance. In fact, the Act specifically provides that a warrantor may also enter into a "service contract," meaning the two are not mutually exclusive. 15 U.S.C.A. § 2106(b) ("Nothing in this [Act] shall be construed to prevent a supplier or warrantor from entering into a service contract with the consumer *in addition to* or in lieu of a written warranty . . ." (emphasis added)).

[158]See Ware v. Samsung Electronics America, Inc., Plaintiff's First Amended Class Action Complaint, ¶ 53 Exhibit A at 2, Case No.: 1:18-CV-886, 572 P.2d 1322 (N.D. Ill. Jan. 31, 2019).

[159]Ware v. Samsung Electronics America, Inc., Plaintiff's First Amended Class Action Complaint, ¶ 53 Exhibit A at 3, Case No.: 1:18-CV-886, 572 P.2d 1322 (N.D. Ill. Jan. 31, 2019).

impact. After all, even if labelled a "service contract" the MMWA still applies and the make of the service contract cannot disclaim implied warranties.[160] However, the provision that "if the product . . . contains a defect or malfunction after a reasonable number of attempts by the warrantor to remedy defects or malfunctions in such product, such warrantor must permit the consumer to elect either a refund for, or replacement without charge of, such product or part"[161] does not apply to service contracts. Given this, and that service contracts are not governed by as stringent a disclosure regime as warranties, suppliers would be smart to find a way to transform their written warranties into service contracts. The Regulation provides just such a way.

Just as in Ware, in which a promise that could normally be construed as a written warranty was deemed a service contract by the presence of additional consideration, other suppliers could use this caveat to circumvent many of the provisions of the MMWA. For instance, a retailer, in response to a customer's concerns over a product's lack of warranties, could offer, for a small additional fee, a standard warranty including that the product will be defect-free. If a consumer chose to pay this additional fee, it would have paid additional consideration for the warranty, transforming it into a service contract. Manufacturers could also take advantage of this loophole by offering warranty rebates, whereby consumers can mail-in to get a rebate, but which would opt the consumer out of the standard warranty. By not opting out, the consumer would have paid additional consideration, again transforming the warranty into a service contract. Of course, suppliers in both examples would have to be careful not to call the promises "warranties," but artful drafting could address this, perhaps by simply calling them product expectations.

Though a typical § 2301(6)(A) warranty could be transformed in this way, this result would seem particularly ridiculous if the warranty said nothing of repair and replacement of defects and only spoke to the quality of the goods, as such a promise would not fit under the Act's definition of a "ser-

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[160]15 U.S.C.A. § 2308(a).

[161]15 U.S.C.A. § 2304(a)(4).

vice contract." But the Regulation makes no such distinction, lumping § 2301(6)(A) and (B) together stating, "An agreement which would meet the definition of written warranty in section 101(6)(A) or (B), . . . but for its failure to satisfy the basis of the bargain test is a service contract." Perhaps worst of all, this loophole encourages suppliers to do what the Act was specifically designed to prohibit, i.e. making promises only to take them away through clever drafting—or to quote from earlier "The bold print giveth and the fine print taketh away."[162]

One would hope that a judge would see through such an artifice, but counsel for suppliers need not look much further than the C.F.R. to find ample support for avoiding the warranty definition. A more logical approach to the FTC's guidance on the "basis of the bargain," however, would be to treat additional consideration as simply being relevant to a reliance analysis. In other words, perhaps additional consideration should simply present a rebuttable presumption against reliance—one that the consumer could then rebut by showing that the consumer did in fact rely. Though such an approach is not entirely consistent with the UCC, it would at least have some basis in case law. Or, alternatively, once the writing is shown to fall under § 2301(6)(A) or (B), the burden should shift to the supplier to show a lack of reliance, such as in the intermediate approach, and additional consideration can be used as evidence to rebut the presumption. Either of these alternatives would be preferable to a per se approach, and the FTC should offer additional guidance on this issue.

V. Conclusion

One of warranty law's most elusive terms is the "basis of the bargain" language found in U.C.C. § 2-313(1)(a) through (c). Though the Code's commentary indicates that reliance is no longer the standard, courts have developed a variety of approaches, most falling into one or three categories: those that still require reliance, those that view reliance as completely eliminated such that a warranty can even arise after the sale, and those that adopt an intermediate ap-

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[162]H.R. Rep. No. 93-1107, at 22–29 (1974), *reprinted in* 1974 U.S.C.C. A.N. 7702, 7706.

proach, under which the warranty must be shown to have been seen by the buyer, and then a rebuttable presumption arises that it was a part of the basis of the bargain.

The MMWA raises the stakes of warranty status by creating a statutory disclosure framework with substantive limitations on disclaimers and elections of remedies. The definition of a written warranty is in many ways narrower under the MMWA than under the UCC, but it imports the troublesome phrase "basis of the bargain." A promise that is does not become the "basis of the bargain" may be relegated to "service contract" status, which has fewer disclosure requirements, and does provide an election of remedies for the consumer. Given that the term "basis of the bargain" has been a difficult concept since its introduction into Article 2, it is understandable that the term could also present problems under the MMWA. The Act, however, gives the FTC the authority to clarify how to approach this term.

Instead of adopting one of the three dominant approaches, however, the FTC has provided scant guidance that seemingly has little basis in the law developed under its UCC analogue. Instead, the FTC has made additional consideration a per se test for whether a promise that would otherwise qualify as a written warranty under the Act, is, in fact, a service warranty, and gives little more guidance than that. Therefore, a written promise by a supplier, warranting that goods will be defect free, but which was purchased for additional consideration, is to be treated as a "service contract" despite the fact that such a promise would not fit under the definition provided in the Act for a "service contract."

This guidance is an invitation for suppliers of all sorts to game the MMWA statutory framework. By manufacturing additional consideration, a retailer or manufacturer can transform a promise that seemingly has all of the hallmarks of a MMWA written warranty into a service contract. However, this sort of behavior is what led to the passage of the Act in the first place—i.e. giving with the bold print only to take away later in the document, and at the consumer's expense. Courts should therefore treat the guidance found in the Regulation as just that and adopt a presumption system that at least gives consumers the chance to show that a

promise, that otherwise looks like a written warranty under the Act, was a part of the basis of the bargain.

Sense, Sensibility and Smart Contracts: A View from a Contract Lawyer

Jeanne L. Schroeder*

Abstract

In Jane Austen's *Sense and Sensibility*, two sisters are plunged into genteel poverty upon their father's death. Their conflicting responses reflect their contrasting personalities. Elinor is sense incarnate; ruled by her head she rationally assesses her family's reduced prospects. Marianne is pure sensibility; ruled by her heart she heedlessly follows her romantic infatuations. Although Austen is more inclined to sense, she illustrates the flaws of both extremes, showing how each must be tempered by the other.

Responses to the blockchain—the technology underlying bitcoin and other cybercurrencies—tend to fall into the extremes of sense and sensibility. Sensible critics dismiss it as a fad, a hysterical bubble. Romantic proponents tout it as life changing, radically upending existing economic, legal and perhaps political institutions. This dynamic can be seen in the reaction to the phenomenon that is the subject of this paper: Smart contracts i.e. economic or legal arrangements embodied in code in such a way as to be supposedly self-enforceable. Proponents give in to sensibility and declare that they may eventually virtually eliminate the role of lawyers and courts in contracting. Sensible critics point out that smart contracts are, in fact, neither smart nor contracts.

In this paper I, like Austen, prefer a sensible approach, while occasionally allowing myself a little sensibility. I agree with proponents that blockchain technology holds the pos-

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sibility of making certain legal and economic transactions—such as payments, clearance of trades, and the recording of certain property claims such as security interests—more efficient. Nevertheless, I argue that their utility for contracting will be limited for a number of practical and logical reasons. That is, very few, if any, contracts could be made completely autonomous in the way many proponents hope. Contracts will continue to require external intervention at crucial points because of fundamental limitations of reality—namely time and space—as well as the very nature of human relationships and the logical limitations of all languages, including computer code. The time value of money will make the posting of cybercurrency to smart contracts uneconomic. Particularly with respect to the sale of goods, the necessity not only that title to goods, but physical possession of *conforming* goods means that breach of contract will always be possible.

Moreover, proposals for the use of smart security agreements are flawed for both legal and practical reasons. For example, suggestions that a smart contract could automatically repossess collateral (by, for example, remotely disabling equipment) upon default of the secured obligation ignores the fact that strict foreclosure is a disfavored remedy under Article 9 of the UCC that can only be proposed post-default. Consequently, such a contractual provision would be unlawful.

Contracts are relationships between legal actors that can never be completely to algorithms. Businesspeople will rarely want performance and enforcement of contracts to be automatic because circumstances change in unpredictable ways. Indeed, deciding whether or not to invoke enforcement mechanisms, even in such "simple" transactions as loans, is one of the hardest decisions that a contract party can make. In my experience as a transactional attorney, counterparties only resort to the literal language in their contracts *after* the relationship between the parties has broken down.

I. Introduction

A. Sense and Sensibility

In Jane Austen's *Sense and Sensibility*, two sisters are plunged into genteel poverty upon their father's death. Their conflicting responses reflect their contrasting personalities.

Elinor is sense incarnate; ruled by her head she rationally assesses her family's reduced prospects. Marianne is pure sensibility; ruled by her heart she heedlessly follows her romantic infatuations. Although Austen is more inclined to sense, she illustrates the flaws of both extremes, showing how each must be tempered by the other.

Responses to the blockchain—the technology underlying bitcoin and other cybercurrencies—tend to fall into the extremes of sense and sensibility. Sensible critics dismiss it as a fad, a hysterical bubble. Romantic proponents tout it as life changing, radically upending existing economic, legal and perhaps political institutions. This dynamic can be seen in the reaction to the phenomenon that is the subject of this paper: Smart contracts[1] i.e. economic or legal arrangements embodied in code in such a way as to be supposedly self-enforceable.[2] Proponents give in to sensibility and declare that they may eventually virtually eliminate the role of

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[1]As Max Raskin notes:

Like many technologies, the creators and early adopters of smart contracts are ideologically driven and believe that the invention can radically alter the nature of society and its relationship with the traditional centralized state. Many believe that private enforcement of contracts can reduce the need and extent of monopolized police and legal services provided by the state.

Raskin, The Law and the Legality of Smart Contracts, 1 Geo. L. Tech. Rev. 305, 309 (2017).

[2]"Where traditional legal agreements and smart contracts begin to differ is in the ability of smart contracts to enforce obligations by using autonomous code." Primavera De Filippi & Aaron Wright, Blockchain and the Law: The Rule of Code 70 (2018).

lawyers and courts in contracting.[3] Sensible critics point out that smart contracts are, in fact, neither smart nor contracts.[4]

In this paper I, like Austen, prefer sense, while occasionally indulging in a little sensibility. I agree with proponents that blockchain technology holds the possibility of making certain legal and economic transactions—such as payments, clearance of trades, and the recording of certain property claims such as security interests—more efficient.[5] Neverthe-

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[3]Kevin Werbach and Nicholas Cornell quote one commentator to the effect that "smart contracts don't [need] a legal system to exist: they may operate without any overarching legal framework. De facto, they represent a technological alternative to the whole legal system." Werbach & Cornell, Contract ex Machina, 67 Duke L. Rev. 313, 316 (2917) (quoting Alexander Savelyev, Contract Law 2.0, "Smart" Contracts as the Beginning of the End of Classic Contract Law 21 (Nat'l Research Univ. Higher Sch. of Econ., Working Paper No. BRP 71/LAW/2016, 2016), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2885241 (https://perma.cc/HS7F-PF 3W).

[4]See e.g. Blockchain: Taxation and Regulatory Challenges and Opportunities, Report of the First Multi-Stakeholder Meeting, March 15–16, 2017 ("A 'Smart Contract' is a misnomer, as it is neither a 'contract' in a conventional legal sense, nor is it particularly 'smart.' " It is rather a piece of code, programmed to self-execute if certain conditions are met."). See also, Jeffrey Lipshaw, The Persistence of "Dumb" Contracts, abstract available at http://ssrn.com/abstract=3202484 (" 'Smart contract' is an ironic and unfortunate misnomer. As . . . Steve McJohn, has suggested, bitcoin transactions by way of blockchain aren't that smart and probably aren't contracts."); O'Shields, Smart Contracts: Legal Agreements for the Blockchain, 21 N.C. Banking Inst. 177, 178 (2017); James Grimmelmann, All Smart Contracts are Ambiguous (Jan.14 2018) Penn Journal of Law and Innovation (Forthcoming), abstract available at SSRN: https://ssrn.com/abstract=3315703.

[5]Oddly, one commentator makes the opposite point, touting the relative *inefficiency* of blockchain transactions as a positive feature.

Some major issues with [high frequency tracing] could be solved by using cryptosecurities . . . [E]xperiences like the flash crash would be avoided because it takes time to verify the transactions — even the fastest cryptotechnologies require several seconds before transactions are completed.

Lee, New Kids on the Blockchain: How Bitcoin's Technology Could Reinvent the Stock Market, 12 Hastings Bus. L.J. 81, 118 (2016). She continues:

Because it takes an average of ten minutes for a new block to be added to the Blockchain, it allows enough time to verify each transaction before it is added to the ledger as a verified transaction for everyone to see. Likewise, a cryptosecurities market would require several minutes for a transaction to pro-

less, in this paper I argue that their utility for contracting will be limited for a number of practical and logical reasons. That is, very few, if any, contracts could be made completely autonomous in the way many proponents hope. Contracts will continue to require external intervention at crucial points because of fundamental limitations of reality—namely time and space—as well as the very nature of human relationships and the logical limitations of all languages, including computer code. The time-value of money will make the posting of cybercurrency to smart contracts uneconomic. Particularly with respect to the sale of goods, the necessity not only that title to goods, but physical possession of *conforming* goods means that breach of contract will always be possible.

Contracts are relationships between legal actors that can never be completely reduced to algorithms. Business people will rarely want performance and enforcement of contracts to be automatic because circumstances change in unpredictable ways. Indeed, deciding whether or not to invoke enforcement mechanisms, even in such "simple" transactions as loans, is one of the hardest decisions that a contract party can make. In my experience as a transactional attorney, counterparties only resort to the literal language in their contracts *after* the relationship between the parties has broken down.

Moreover, it is hard to understand who else but fraudsters would want contracts to be anonymous, final and irreversible in the way the most extreme proponents of smart contracts imagine. Even the law of wire transfers—where there is a very strong policy for finality of payments—is modified by traditional rules of restitution and subrogation.

If I had been writing this article even a year ago, it might

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cess, which would help smooth out the issues caused by computer algorithms responding to imaginary signals that the market is starting to drop.

12 Hastings Bus. L.J. at 120. These comments are odd for two reasons. First, most blockchain enthusiasts assume that the technology will eventually be improved (for example, by replacing the current proof-of-work with another confirmation system) so that it can be scaled up to enable almost real time transactions. Second, even if *regulators* would like to slow down transactions, it is hard to understand why *traders* would agree to this. Presumably, market pressure will promote the adoption of whatever system is most efficient in the sense of balancing costs and benefits (speed).

be more optimistic. We have passed the 10th anniversary of the original bitcoin and there is yet to be a "killer app." In the last two years a number of highly touted early uses of blockchain have not—or at least not yet—panned out.[6] Bitcoin, the original blockchain, does not function as a currency partly because of its extreme volatility.[7] In early 2018 it plunged in value 80% since its high in late 2017, only to

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[6]This last year has also seen a re-evaluation of other internet businesses. For example, one article trumpeting the potential of smart contracts argue that lessons can be taken from

> the success of Amazon, Facebook, Netflix, etc. All of these companies are disrupting and "decentralizing" existing business models by eliminating and replacing traditional intermediaries. These companies facilitate more direct "peer-to-peer" transactions between service providers/ creators/producers, on the one hand, and the consumers, on the other.

Mark Fenwick, Wulf A. Kaal & Erik P.M. Vermeulen, Why "Blockchain" Will Disrupt Corporate Organizations What Can be Learned from the "Digital Transformation," at 9. See abstract at https://ssrn.com/abstract=3227933.

> Technologies [like those of Facebook, Twitter, Uber, Airbnb, and Spotify] have the potential to create real level playing fields, transparency and applications that run exactly as programmed without any possibility of downtime, censorship, or third-party interference.

Mark Fenwick, Wulf A. Kaal & Erik P.M. Vermeulen, Why "Blockchain" Will Disrupt Corporate Organizations What Can be Learned from the "Digital Transformation," at 9, available at https://ssrn.com/abstract=3227933. Even ignoring that all of these companies are, in fact, intermediaries, the publicity surrounding the FAANG giants' use of personal information and, particularly in the case of Facebook, their use by third parties to manipulate public opinion suggests that their "disruption" may be more troubling than liberating.

[7]Today, virtually no legitimate business accepts bitcoin as payment for goods and services. Steven Russolillo, Paul Vigna & Akane Otani, Cryptocurrency Market Plumbs New Depths in 2018, The Wall Street Journal (Aug. 15, 2018), available at https://www.wsj.com/articles/cryptocurrency-market-plumbs-new-depths-in-2018-1534241274?mod=searchresults&page=1&po. Chainalysis estimates that trends point to $1 billion dollars equivalent of illegal transactions using cybercurrency (primarily the original bitcoin) in 2019 with "[d]rugs being most prominent category of goods sold, but child porn and stolen credit-card information are also in demand." However, illegal activity is declining as a percentage of transactions—down to approximately 1%. Bitcoin Criminals Set to Spend $1 billion on Dark Web This Year, Bloomberg Law, (July 1, 2019), available at https://www.bloomberg.com/news/articles/2019-07-01/bitcoin-criminals-set-to-spend-1-billion-on-dark-web-this-year.

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recover to 40% of its high in June 2019.[8] The DAO (the "distributed autonomous organization"), an investment vehicle designed to be controlled through smart contracts, crowdfunded approximately $150 million, but was hacked immediately when it went on-line.[9] The promoters eventually created a so-called "hard fork" to take back the value from the fraudsters and return it to the investors before disbanding, disproving the proposition that blockchain transactions are immutable and irreversible.[10] A number of high-profile projects in the finance industry, including the Depositary Trust and Clearing Corporation's ("DTCC") proposed blockchain platform for credit default swap reporting, have yet to have become operative.[11] Although so-called "initial coin offerings" or "ICO's" became a popular means of raising funds in 2017, the Securities and Exchange Commission has

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[8]Steven Russolillo, Bitcoin's Surge Leaves Smaller Digital Currencies in the Dust, The Wall Street Journal, (June 30, 2019), available at ht tps://www.wsj.com/articles/bitcoins-surge-leaves-smaller-digital-currencies-in-the-dust-11561903203?mod=searchresults&page=1&pos=7.

Michael F. Davis & Alistair Marsh JPMorgan to Use Digital Coin to Speed Up Corporate Payments, Bloomberg Law (Feb. 14, 2019), available at https://www.bloomberg.com/news/articles/2019-02-14/jpmorgan-to-use-c ryptocurrency-for-payments-business-cnbc-says. Reportedly, as of February 2019, bitcoin was trading at a price less than the cost of mining it. JP Morgan to Use Digital Coin, Bloomberg Law (Feb. 14, 2019).

[9]Securities and Exchange Commission, Report of Investigation Pursuant to Section 21(a) off the Securities Exchange Act of 1934: The DAO, Release No. 81207 (July 25, 2017), available at https://www.sec.gov/litigation/investreport/34-81207.pdf [[hereafter, the *SEC DAO Report*].

[10]See infra text at notes 270–76.

[11]Anna Orrera & John McCrank, Wall Street Rethinks Blockchain Projects as Euphoria Meets Reality, Reuters (March 27, 2018), available at https://www.reuters.com/article/us-banks-fintech-blockchain/wall-street-rethinks-blockchain-projects-as-euphoria-meets-reality-idUSKBN1H 32GO. Although DTCC hopes to begin clearing over-the-counter derivatives on a blockchain in 2019, it does not anticipate a broader rollout of the technology any time soon. As its CEO, Michael Bodson notes, DTCC processes 60 trillion trades every day (and as many as 90 trillion during peak times) "It would be impossible to do this today using a distributed ledger." Michael del Castillo, Enterprises Building Blockchain Confront Early Tech Limitations, Coindesk (March 23, 2018), available at https:/ww w.coindesk.com/enterprises-building-blockchain-confront-tech-limitations. Bodson noted that the limitations of distributed ledger utility is illustrated by a report by Deloitte that only 8% of the 26,000 blockchain projects that

warned that many of them might be unlawful securities offerings and has appointed Valerie Szczepanik as a "cyberczar" to "coordinate efforts . . . regarding the application of U.S. securities laws to emerging digital asset technologies and innovations including initial coin offerings and cryptocurrencies."[12] The SEC has brought dozens of cases against issuers, promoters and brokers so far and is reportedly investigating many more[13] Honduras's plan to move its real estate records to a block chain seems to have been postponed, if not abandoned.[14] Vermont decided that any benefit of moving its property registration regime to a

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were started in 2016 were still active as of the Spring of 2018. Castillo, Coindesk (March 23, 2018).

In late 2018, DTCC announced that it was about to start testing its distributed leger project for trading credit derivatives with the aid of a consortium including IBM, Axoni and R3. DTCC Press Release: DTCC Enters Test Phase on Distributed Ledge Project for Credit Derivatives with MarkitSERV & 15 Leading Global Banks (Nov. 06, 2018), available at http://www.dtcc.com/news/2018/november/06/dtcc-enters-test-phase-on-distributed-ledger-project-for-credit-derivatiatives-with-markitserv.

Nevertheless, DTTC has reported that private, permissioned, distributed ledger "could process 6,300 trades per second continuously for five hours to meet the 115,000,000 daily trades at peak rates in the markets." Tom Groenfeldt, DTCC Shows Private Blockchain Can Handle US Equity Trade Volumes, Forbes (Oct. 16, 2018), available at https://www.forbes.com/sites/tomgroenfeldt/2018/10/16/dtcc-shows-private-blockchain-can-handle-us-equity-trade-volumes/#d67701238023.

[12]Ms. Szczepanik's official titles are Advisor for Digital Assets and Innovation and Associate Director in division of Corporation Finance. SEC Press Release: SEC Names Valerie A. Szczepanik Senior Advisor for Digital Assets and Innovation (June 4, 2018), available at https://www.sec.gov/news/press-release/2018-102.

[13]SEC Cyber Enforcement Actions, https://www.sec.gov/spotlight/cybersecurity-enforcement-actions. Chairman Jay Clayton, Statement on Cryptocurrencies and Initial Coin Offerings, available at https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11. Nevertheless, ICO's continue apace, raising $11.8 billion in the first five months of 2018. Paul Vigna, Shane Shifflett & Caitlin Ostroff, What Crypto Downturn? ICO Fundraising Surges in 2018, The Wall Street Journal (July 1, 2018), available at https://www.wsj.com/articles/what-crypto-downturn-ico-fundraising-surges-in-2018-1530466008?mod=searchresults&page=1&.

[14]J. Michael Graglia & Christopher Mellon, Blockchain and Property in 2018: The End of the Beginning, Annual World Bank Conference on Land and Poverty (March 2018).

blockchain could not be justified by the cost at this time.[15] A much-ballyhooed project to sell downloads of music in exchange for micropayments through a smart contract ended up raising a sad $133.20.[16] To date, one of the most successful projects on Ethereum, a smart contract platform, has been "Cryptokitties"—a game in which one can buy and breed computer cats—and even this was a fad that has already peaked.[17] This does not mean that similar ventures will not be successful in the future, however.

One of the so far intractable problems with cyber has been the inability to scale up. Bitcoin can only process somewhere between 3.3 and seven transactions a second, and Ethereum, the system underlying most smart contracts to date, does barely better at 10.[18] This is to be contracted with Visa, which regularly processes 1,700 transactions per second.[19] This may also be changing. Facebook recently released a whitepaper outlining its intention to launch a stable coin called Libra

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[15]Vermont State Archives and Records Administration, Office of The Vermont Secretary of State, White Paper: Blockchains for Public Recordkeeping and for Recording Land Records (Jan. 15, 2019), available at https://www.sec.state.vt.us/media/914631/blockchains_for_public_record keeping_white_paper_v1.pdf.

[16]David Gerard, Attack of the 50 Foot Blockchain 129–30 (2017).

[17]Although, this fad may have already peaked. Jeff John Roberts, The Blockchain Bubble's Latest Victim: Digital Cats, Fortune (June 18, 2018), available at http://fortune.com/2018/06/18/cryptokitties.

[18]Alistair Marsh, MIT, Stanford Academics Design Cryptocurrency to Better Bitcoin, Bloomberg Law (Jan. 17, 2019), available at https://www.b loomberglaw.com/document/XB90A1IC000000?udv_expired=true.

[19]Alistair Marsh, MIT, Stanford Academics Design Cryptocurrency to Better Bitcoin, Bloomberg Law (Jan. 17, 2019), available at https://www.b loomberglaw.com/document/XB90A1IC000000?udv_expired=true. Sue Halpern notes that Visa "processed a hundred and seventy-five billion payments in [2018], which works out to about fifty-five hundred transactions a second . . . At the height of Bitcoin's popularity, in late 2018, there was so much activity on the network that it could take as much as a week for a transaction to go through . . ." Sue Halpern, Facebook's Audacious Pitch for a Global Cryptocurrency, The New Yorker (Jul. 7, 2019), available at https://www.newyorker.com/tech/annals-of-technology/faceboo ks-audacious-pitch-for-a-global-cryptocurrency.

as a payment system, claiming that it will be able to process 1,000 transactions per second.[20]

In this paper I will be making a different point. Sense tells me that even if blockchain technology can be scaled up so that it is possible to process thousands of smart contracts per second, they cannot live up to the claims of their promoters. At most, they will be an incremental, not revolutionary, increase in the efficiency of certain contract functions.

I will, however, give in to sensibility and make a prediction. Blockchain technology, including smart contracts, may eventually have a significant impact on our economy and markets, but it will not be because it will supplant existing contract law and practice which works pretty well. Rather, it will likely be used in ways that are today completely unforeseen. Who at the Department of Defense working on the development of ARPANET in the 1970's would have imagined that primary purposes of the internet would include on-line shopping, pornography and cat videos. The very concept of social media would have been incomprehensible.

B. Smart Contracts

In an excellent essay, Eliza Mik notes the smart contract narrative is often laden with ideologically charged arguments that associate certain technological features of blockchains (e.g. decentralized consensus) with broader social and economic issues, such as the disenchantment with financial institutions or the (perceived) lack of trust in the legal system. Many claims made in technical writings are tainted by the assumption that certain technological features (decentralization, again . . .) are absolute values and must be preserved at any cost. In the same vein, it is often assumed that because a particular technology is innovative or revolutionary, it is also commercially useful or capable of

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[20]Elena Lacey, The Ambitious Plan Behind Facebook's Cryptocurrency, Libra, Wired (June 18, 2019), available at https://www.wired.com/story/ambitious-plan-behind-facebooks-cryptocurrency-libra/. Facebook's blockchain technology is different from the open, public permissionless one used by bitcoin. See also supra note 11, for a discussion of DTCC's private, permissioned distributed ledger that seems capable of processing transactions quickly.

solving actual legal problems. This, however, is often not the case. Arguably, the entire idea of smart *contracts* may be the result of a series of terminological misunderstandings.[21]

One problem has been, in the words of contract law scholars, Kevin Werbach and Nicholas Cornell, that "[o]ne group conspicuously absent from the debate over smart contracts [has been] contract law scholars."[22]

I would make a slightly different point. Although there is a nascent legal literature on smart contracts, a group that is still conspicuously missing seems to be contract *attorneys* who actually negotiate and draft contracts. It is an old joke among transactional attorneys, such as myself in my prior career, that we know nothing about contract law. By this we mean that all those issues of contract formation with which contract professors love to bedevil first year law students— offer, acceptance, consideration, statute of limitations, battle-of-the-forms, etc.—almost never come up when you negotiate and draft contracts. These are issues that concern commercial *litigators*—and contract professors reading caselaw.

Werbach and Cornell assert "[c]ontract law is a remedial institution. Its aim is not to ensure performance ex ante, but to adjudicate the grievances that may arise ex post."[23] This is contract law as it is reflected in *appellate litigation*, not as practiced by contract negotiators and drafters. For us, contract law is a forward-looking tool that enables us to help our clients achieve their goals.

Consequently, it is also a cliche among transactional lawyers that to try to learn about contracting by only reading cases is like trying to learn about health by only visiting

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[21]Mik, Smart contracts: Terminology, Technical Limitations and Real World Complexity, 9 Law, Innovation and Tech. 2 (2017). Research Collection School Of Law, available at http://ink.library.smu.edu.sg/sol_research/2341.

[22]Werbach & Cornell, supra note 3, at 317.

[23]Werbach & Cornell, supra note 3, at 317 (citations deleted). They assert "Contract law does not exist to alter our reasons going forward — though it surely does that. Rather, it exists to adjudicate the justice of a situation ex post. It is backward looking. Its basic function is to decide whether one party has wronged another party by failing to perform a promised action." Werbach & Cornell supra note 3, at 361 (citations omitted).

a hospital trauma ward where medicine is a remedial practice. Reading about failed negotiations and contracts gives one a distorted view of both the prevalence of poor contracting, and, as Mik points out, a conflation of contract *performance* and contract *enforcement*.[24] Proponents of smart contracts claim that they are automatically *enforceable*. This is incorrect. No one enters into a contract with the intent of enforcing it against someone else—indeed, they hope *never* to enforce it. Consequently, Werbach and Cornell more accurately state that "Smart contracts [are supposed to] eliminate the act of remediation by admitting no possibility of breach."[25]

Proponents of smart contracts implicitly adopt a number of empirically suspect assumptions. First, the fact that they seek to make contracts that are automatically performed/enforced reflects an assumption that contract performance is a problem. I doubt both that this is the case as an empirical matter and that their proposed "solution" is workable as a practical one.

Parties enter into contracts to achieve goals. Consequently, the vast majority of contracting parties expect to perform them, and, as an empirical matter, the over-whelming majority of all contracts are *performed* in the ordinary course and are *not enforced*. Our society and economy would not function if this were not the case.

The conflation of performance with enforcement, also implicitly assumes that the preferred remedy for breach is specific performance. Rather, it is *damages*—for good reason. Contract law is not punitive; we allow people to walk away from contracts so long as they compensate their counterparty. Do some people take advantage of this, intentionally breaching in the knowledge that their counterparty may not risk the expense and uncertainty of seeking judicial help in enforcing their rights? Of course.[26] But, why should these exceptions to the general rule of performance justify a radical change in practice?

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[24]Mik, supra note 21, at 10.

[25]Werbach & Cornell, supra note 3, at 317.

[26]For example, my law firm had a client whose business plan was essentially to not pay his vendors in the expectation that they would eventu-

Second, the proponents of smart contracts also assume that contract ambiguity is a common problem and a major cause of disputes. They believe that this results from the flaws of natural language. They believe that this can be solved by the precision and immutability of code.[27] Not only does this ignore, once again, the fact that the vast majority of contracts are performed in the ordinary course. But it also ignores the fact that the *flexibility* of contract language is, to invoke another cliche, a positive feature, not a flaw or glitch to be eliminated.[28] If there is "ambiguity" it is often because of the logically inevitable openness of all human interrelations, including contracts. As such, a contract written in code would *not* accurately represent the agreement of the parties and could hinder beneficial renegotiation and informal modification of contract terms if circumstances change or unanticipated contingencies occur. Mechanical performance of contract language based on the parties' assumptions when the contract was drafted can defeat, not further, their intentions if those assumptions are proven to be incorrect.

Third, proponents of smart contracts are worried that contracts require people to trust each other or, perhaps worse from a libertarian perspective, the need to rely on what they deride as "trusted third party" intermediaries such as banks. Smart contracts are supposed to eliminate the need for trust in commercial transactions with the impartial, objective certainty of code and disaggregation. Mik notes that these proponents view the world as a scary Hobbesian world and have almost a dogmatic belief in the virtues of de-

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ally settle for a discounted price. As you might guess, we parted ways when he tried to stiff us for our fees.

[27]See infra text at notes 248–69.

[28]In Mik's words:

For a developer, the failure to do so evinces the limited skill or incompetence of the lawyer. By virtue of their training developers perceive ambiguity as inherently bad. It is important to understand, however, that ambiguity has both advantages and disadvantages. While . . . developers fail to recognize that in contract law, ambiguity is a feature not a bug. Apart from the natural ambiguity accompanying all human languages and the ambiguity that results from sloppy drafting, many contractual provisions are deliberately written in a broad, slightly imprecise manner to ensure a certain degree of leeway.

Mik, supra note 21, at 19.

centralization.[29] I argue that smart contracts in fact would often require *more* not less trust between counterparties than conventional contracts. For example, letters of credit—which depend on the mediation of trusted banks—*enables* actors to act as though they trust each other *even though* they are strangers because the third party can do the due diligence necessary to vet the paying party, and to examine documents that are evidence that the counterparty has performed. Moreover, proponents of smart contracts in fact anticipate the intervention of external third parties known in the literature as oracles.

At least in this country, contract disputes rarely arise because of the failure or perfidy of intermediaries.[30] Moreover, although smart contract proponents see these third parties merely as transaction costs, they often perform necessary economic functions in addition to their supposed superfluous role as intermediaries. That is, they provide financing to mediate the cash flow shortfalls, and provide investment opportunities protecting the time-value of money for payors who do have the purchase price. Indeed, as I argue, it is precisely the inability for smart contracts to meet these needs that will prevent them from ever being completely autonomous.

Smart contracts may be post-modern in the pejorative as well as the positive senses of the term. As Slavoj ŽiŽek has

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[29]Mik notes that many proponents of smart contracts:

reflect a surprising lack of trust in humans. As the latter are perceived as inherently biased and unreliable, things should be left to computers. Humans, especially bankers and judges, are fallible and *not* trustworthy. Computers, on the other hand, are objective, infallible and trustworthy. The very idea of smart contracts is thus inextricably tied to the elimination of human judgement, the reduction of dependence on financial intermediaries and, in many instances, a detachment from the legal system.

Mik, supra note 21, at 2.

[30]Grimmelmann lists corruption (along with ambiguity and enforcement) as one of the three concerns proponents of smart contracts believe plague natural language contracts. Grimmelmann, supra note 4, at 4. Although I do have friends in other countries who have cited judicial corruption in certain jurisdictions as a major impetus for pursuing smart contracts, I have not seen it discussed much in American legal literature.

argued, post-modernism in a sense precedes modernism.[31] That is, although presented as something new—as a wry, self-conscious and self-referential, critique of modernism—it is too often merely a regression to pre-modern ideas. Naive post-modernism is reactionary—a romantic attempt to reconstruct an imaginary lost pre-modern past.

Sense tells me that some writing on smart contracts is postmodern in this pejorative sense. It is not a *reconceptualization* of contract theory, but an inadvertent reversal of the great achievement of the Uniform Commercial Code (the "UCC")—wrenching contract law out of a pre-modern paradigm based on an agricultural economy into a modern one based on a mercantile economy.[32] That is, it threatens to bring back the common law that tried to answer all sales disputes by reference to location of "title" of the good. Similarly, some analysts have suggested that sales disputes could be avoided if we recorded ownership of personal property onto a blockchain.[33] This is because the problems that arise to many personal property disputes involve not who *owns* the property but who has physical custody and control and whether the property conforms to the contract.

Karl Llewellyn, the father of the UCC, correctly argued that title analysis implicitly viewed sales as "events," whereas modern sales are processes that take place over time.[34] By irrevocably pre-programming execution at the time of contracting, smart contracts *attempt* to collapse the process back into an event—in the words of Werbach and Cornell to "break down the . . . line between executory and executed contracts."[35] I will show how this is inadequate because the economic and empirical reality that underlies contracts remains a process—most contracts are, in fact, executory processes that take place over time and space. To

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[31]See e.g. Slavoj Žižek, Less Than Nothing: Hegel and the Shadow of Dialectical Materialism 255–56, 603–04 (2012); Slavoj Žižek, Living in the End Times 172–73 (2010).

[32]See infra text at notes 148–54.

[33]See infra text at notes 71–74, 122–53.

[34]See infra text at note 153.

[35]Werbach & Cornell, supra note 3, at 31.

ignore time and space is to ignore the time-value of money—the *raison d'etre* of many financial contracts.

Nevertheless, sensibility reminds me that there is a sophisticated postmodernism as well. It seeks to examine and bring to light certain aspects of pre-modernism that modernism has claimed to supplant, but in fact have only suppressed. Such postmodernism, although critical of modernism, does not reject it because we cannot return to the past.[36]

In this paper I will make a number of specific points all based on a single proposition—the vast majority of contracts cannot be completely automated and will continue to require human intervention to complete performance. First, I consider the simplest contractual obligation—the payment of money.[37] In order to make a commitment to make a future payment completely self-enforceable, the obligor would have to pre-commit value by transferring cybercurrency to a virtual escrow at the time the smart contract is initiated. That is, a completely autonomous smart contracts, in effect, require the economic equivalent of pre-paying. Most financial contracts in the "real world," however, are executory contracts made on an unsecured basis for good practical reasons. It is inconceivable to me that business people would be willing to tie up their capital pending the performance of a contract. As such, although, the blockchain may prove to be a more efficient way of settling financial contracts, the loss of the time-value of money would make many, if not most, *completely* automated smart financial contracts untenable.

Second, I show how smart contracts have limited application to another very common and very simple contract, i.e. the sale of goods.[38] Even if a smart contract could automatically insure the buyer's obligation to pay the price, it cannot assure performance of the seller's obligation to deliver *con-*

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[36]Sophisticated postmodernism is what G.W.F. Hegel called a "sublation" (*aufheben),* an uneasy reconciliation of two opposing and contradictory concepts in such a way that continues to respect their differences. David Gray Carlson, A Commentary on Hegel's Logic 29–31 (2006).

[37]See infra text at notes 57–65.

[38]See infra text at notes 66–120.

forming goods. Alternately, if a smart contract could be programmed so that payment would only be made upon a buyer's acceptance of goods, it cannot protect the seller from wrongful rejection by a buyer in possession of the goods. Suggestions that these issues could be addressed by registering-title to goods on a block chain is an impracticable non-solution.

Third, in a similar vein, proponents of smart security agreements who argue that technology—such as automobile starter-interrupters—could enable the self-enforcing foreclosure of security interests misstate both the law and practice of secured lending. Although disablement may or may not be a form of, or permitted alternate to, repossession under the UCC, the remedy for breach of a secured obligation is *not* repossession per se, but resale of the collateral in a commercially reasonable manner. This and other subsequent steps will rarely, if ever, be susceptible to complete automation. Moreover, a completely automated automatic enforcement of a security agreement would almost certainly violate the automatic stay of the Bankruptcy Code should the debtor go bankrupt.

Perhaps more importantly, as a matter of good business practice, secured creditors would not ordinarily want a smart contract to automatically foreclose on collateral upon nonpayment. Choosing when to declare a default and what remedy to pursue are difficult discretionary decisions that secured lenders must make on a case-by-case basis.

Finally, and perhaps most importantly, I will consider the non-problem of ambiguity in natural language contracts. It is not merely impractical, it is impossible, to craft any but the simplest contract that will not require some degree of interpretation.

C. Scope

Let me start by listing what I will not do in this paper. Since there is a burgeoning literature that attempts to explain blockchain technology to lawyers.[39] I assume that anyone who is interested in the specific application of smart

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[39]I particularly recommend *Blockchain and the Law*, co-authored by my colleague, Aaron Wright. DeFilippi & Wright, supra note 2.

contracts will already have some familiarity with the concept.

There are also a number of articles discussing if and how "smart contracts" meet the traditional conditions for contract formation and enforceability such as offer, acceptance, consideration and statute of frauds.[40] I agree with my colleague Aaron Wright and his co-author, Primavera DeFilippi, that "[t]he fact that a contract memorializes a contract in code rather than in legal prose will make little difference, at least in the United States."[41] I also think that the common law, which governs many contracts, is flexible enough that it will be able to adapt to new practices as they arise (perhaps with the aid of occasional legislative assistance such as the existing Uniform Electronic Transactions Act and the federal Electronic Signatures in Global and National Commerce Act, as well as future tweaks to the UCC).

Similarly, I will not discuss contract theory *per se* in any detail. Although I do agree with Werbach and Cornell, that the idea of smart contracts seems incompatible with the notion of efficient breach,[42] I postpone a more detailed discussion for another day.

Before moving on, however, I do wish to briefly address the terminology relating smart contracts.

I have already referred to the cliche among critics that smart contracts are neither smart nor contracts.[43] This is both correct and incorrect. They are the opposite of what most lay people mean by "smart" in that they are incapable of what we think of as human intelligence. Without opening the can of worms as to what intelligence (or consciousness) is, smart contracts are not self-conscious, cannot reason, cannot exercise discretion or common sense, etc. Rather, they automatically and mechanically execute pre-programmed instructions—the very opposite of human "smarts." However, they are "smart" in the sense that once

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[40]See e.g. Raskin, supra note 1.

[41]DeFilippi & Wright, supra note 2, at 79.

[42]Werbach & Cornell, supra note 3, at 366. See also Mik, supra note 14, at 12.

[43]See supra note 4.

they are put into operation, they automatically execute their functions without additional, or limited, external input.

But are they contracts? Once again, the answer is yes and no. Some would be and some would not be.[44] The classic example of a smart contract, proposed in a seminal work by Nick Szabo, is supposed to be the vending machine.[45] I agree with Mik,[46] that this misleading example has distorted the conversation.

Although Szabo called a vending machine a smart contract, in fact, the machine itself is not a contract.[47] The contract

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[44]As Mik notes, part of the problem is the lack of precision or agreement in so much of the writing about smart contracts.

There are multiple definitions of smart contracts. Some of them are purely technical and associate smart contracts with pieces of autonomous code operating on a blockchain or with "systems which automatically move digital assets according to arbitrary pre-specified rules." Other definitions associate smart contracts with the formalized expression and automated execution of legal contracts, with the use of code to perform contractual agreements, with protocols that facilitate, verify, execute or embody the terms of a contract or with the embedding of legal terms in hardware and software to prevent breach or to control assets by digital means. Another group of definitions commences with a technical description only to observe that the given protocol will have serious legal implications. In some instances the term "contract" is used informally, with no claims being made as to its legal significance; in others, technical writings take the "contract" terminology seriously and theorize that smart contracts *in general* will obviate the need for lawyers and judges by automating and guaranteeing contractual performance.

Mik, supra note 20, at 4.

[45]See e.g. Raskin, supra note 1, at 306–07; Werbach & Cornell, supra note 3, at 323; Lipshaw, supra note 4; Stuart D. Levi & Alex B. Lipton, An Introduction to Smart Contracts and their Potential and Inherent Limitations, Harvard Law School Forum on Corporate Governance and Financial Regulation (May 26, 2018), available at https://corpgov.law.harvard.edu/2018/05/26/an-introduction-to-smart-contracts-and-their-potential-and-inherent-limitations; Riccardo de Caria, Law and Autonomous Systems Series: Defining Smart Contracts—The Search for Workable Legal Categories, Oxford U Faculty Blog (May 25, 2018), available at https://www.law.ox.ac.uk/business-law-blog/blog/2018/05/law-and-autonomous-systems-series-defining-smart-contracts-search; Ameer Rosic, Smart Contracts: The Blockchain Technology That Will Replace Lawyers, available at https://blockgeeks.com/guides/smart-contracts/.

[46]Mik, supra note 21, at 5.

[47]As Mik states, some more enthusiastic proponents:

often use the term "contract" so liberally that it loses any resemblance to its original definition — that of a *legally enforceable agreement.* One must wonder:

consists of the offer by the operator of the machine to sell a can of soda for a certain price, that the potential buyer can accept by inserting the value. This is no different legally from an offer by a grocer to sell you a can of soda for a certain price that you can accept by tendering the purchase price to a cashier. It would not occur to anyone to call a cashier a "smart contract" even though, in this case, she (unlike the machine) is in fact smart in the conventional sense of the term. In other words, the vending machine—like the cashier—is merely the means by which the seller and buyer perform their contract obligations.[48] We do not confuse the legal regime of payment through checks, wire transfers, credit cards, etc. with the underlying contract requiring the payment. Each of those payment systems are governed by their own legal regimes and contracts that are distinct from the contract between the payor and payee.

As Mik correctly notes, "if 'smart contracts' are nothing but programs that run on a blockchain, there is no need for lengthy academic papers debating their legal implications."[49] In other words, we need to distinguish between programs that merely execute certain functions of a contract—such as making a payment—from smart contracts that are supposed to automate all aspects of a contract.[50] The proposition that a blockchain might prove to be more efficient technology for

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once a linguistic clean-up is completed and once it becomes apparent that many smart contracts are not contracts, will there be anything left worth discussing from a legal perspective?

Mik, supra note 21, at 4.

[48]Raskin has suggests that the vending machine (and other smart contracts) are different from most conventional contract because the buyer accepts by executing the contract (i.e. inserting the coin) rather than manifesting her consent in words. Raskin, supra note 1, at 14–15. This is also incorrect. As the grocery store example illustrates, performance is, empirically, an extremely common mode of contract acceptance.

[49]Mik, supra note 21, at 4.

[50]As Lipshaw notes:

At one end of the continuum, the smart contract is little more than a cybernetic artifact like Bitcoin, a virtual dollar bill having a social ontology and no less a fixed and timeless meaning than a physical Federal Reserve note. At the other end, it is like more than a digitized form into which someone plugs a few chunks of data and comes out with a Kindle book or a mortgage loan. Somewhere in the middle, say in connection with a program that can sort out the puts and takes of ten years' worth of contingency in a 50,000 square foot of-

making payments does not raise particularly interesting contracting issues. I will, therefore, only discuss the practicality of completely automated contracts which proponents claim would be self-enforceable because their performance would be mechanistic and non-reversible.

II. Financial Contracts and the Time-Value of Money

A. Incremental Improvements

The lauded superiority of smart contracts over conventional contracts is supposed to be that they are self-executing. Once they are initiated, they will perform automatically according to their terms without additional input from the contracting parties.[51] Although theoretically, provisions could be added which would allow the parties to make changes in the terms, they could also be made immutable. The only conditions to performance would be those already programmed into the code. Supposedly, because there is no possibility of breach, and because smart contract transactions are supposed to be irreversible there is no need for courts and litigators.

Sensibility suggests that smart financial contracts might be more efficient than conventional ones.[52] Indeed, financial institutions are already in the process of exploring this.[53] However, sense reminds me that many financial contracts

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fice lease, the contract needs to be able to create virtually a complex world of real estate business and law that either maps on or substitutes for the physical version.

Lipshaw, supra note 4, at 7.

[51]In fact, many smart contracts would require occasional infusions of external input—referred to as "oracles"—to function. Oracles could be as varied as on-line data bases that the program could itself search, or human beings who on occasion could input information as needed. See infra note 60.

[52]Werbach and Cornell give the example of option contracts. Werbach & Cornell, supra note 3, at 321–22 (citing Surden, Computable Contracts, 46 U.C. Davis L. Rev. 629 (2012)).

[53]As O'Shields enumerates:

There is no shortage of potential uses for blockchain, or distributed ledger technology, and smart contracts. The World Economic Forum has suggested that they could be used in enhancing global payments, syndicated credit, collateral management, proxy voting, securities issuance, and regulatory and compliance activities. or example, syndicates of lenders could be formed using smart contracts, and smart contracts could perform funding and servicing activities

are already largely automated and smart financial contracts would only be an incremental or evolutionary improvement over current practice, not a major disruption of contract practice.

One of the supposed innovations of smart contracts is that they will eliminate or greatly reduce the role of lawyers in negotiating and drafting repetitive contracts. Lawyers might draft basic forms or "modules" of contract terms, but the contracting parties would be able to download them and put them together themselves. In the words of DeFilippi and Wright:

> Just like other code, smart contracts also are inherently modular and can be broken down into discrete pieces and chunks which can be easily assembled and reassembled. Programmers or lawyers can create libraries of smart contract code specifically designed to implement certain functionalities that routinely appear in legal contracts.[54]

Once again, we must temper sensibility with sense. First, it is already empirically the case that contracting parties do not consult lawyers before entering into most contracts. I have already mentioned the grocery store example. Adults enter into and perform consumer contracts at stores and restaurants on a daily basis. Even though the average lay person probably does not think of these transactions in technical terms, they understand what is expected of them. In the comparatively rare cases where disputes arise in simple contracts and the parties consult their lawyers, they probably find that the default rules of the UCC and the common law provide sufficient guidance so that it can be resolved

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for the syndicates. Central banks are exploring issuing digital currencies, possibly using blockchain technology. Smart contracts could be used to monitor collateral posted for transactions, and facilitate the clearing and settlement of collateral transactions. The British bank Barclays has led an effort that envisions derivatives documentation — such as ISDA master agreements, credit support annexes, and confirmations — being reconstituted into automated smart contracts. . . . Several large banks, including JP Morgan and Credit Suisse, recently completed a successful test of a smart contract prototype for equity swaps, which included complex post-trade services such as margin payment transfers and corporate action processing. The French bank BNP Paribas is also exploring automating legal contracts.

O'Shields, supra note 4, at 182 (citations omitted).

[54]DeFilippi & Wright, supra note 2, at 82.

in a relatively amicable manner. Litigation is the exception that proves the rule.

Other common contracts, such as those governing checking accounts and credit and debit cards are subject to form contracts drafted by bank lawyers (and incorporating UCC Articles 3 and 4 as well as federal statutes and regulation) which are not negotiated on an individual basis. Similarly, on-line sales and licensing contracts are subject to extensive terms and conditions drafted by lawyers which very few customers read before accepting. The typical sales contracts between merchants are also subject to standard terms set forth in catalogs and invoices (as well as the UCC) so that parties only need to fill in certain negotiated terms such as price and delivery date.[55] Moreover, lawyers are also not involved in the negotiation, preparation and implementation of both simple financial transactions—such as commercial letters of credit—as well as complex financial products—such as swaps and repos. That is, although lawyers draft the templates used for such contracts, business people do not need to consult lawyers in filling them out for any specific transaction. This is necessarily so. The hundreds of millions of contracts that are required on a daily basis could not occur if this were not the case.

With respect to modularity: transactional law firms already maintain precedent libraries of standard provisions—hence the additional cliche that transactional lawyers plagiarize for a living.[56] Form contracts for many types of transactions are readily available on-line, as well as ser-

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[55] Over my teaching career in New York City I have had many students in my commercial law survey course who either came from merchant families or were merchants changing careers. Inevitably, when asked a hypothetical, they could correctly describe what could or should happen in such a fact pattern. However, when asked what the legal basis for their answer was they would also, just as inevitably, answer something like "I have no idea, but everyone in my business understands that that is the deal. This is one reason why I am going to law school."

[56] Although we do a lot of copying, this is not plagiarism. Plagiarism is not copying per se, but the attempt to pass of the ideas or expression of another as one's own. When an attorney uses a precedent or form contract she does not present it as original. Only a naif tries to draft a financial contract from scratch for numerous reasons. One reason for this, of course, is to avoid the time and expense of reinventing the wheel. But perhaps as

vices, such as LegalZoom, that enable consumers and small businesses to structure many transactions without help from attorneys. Consequently, there is no reason why law firms (or industry groups) cannot move their electronic precedent files to Ethereum or another blockchain platform. Sense tells me that may or may not be a slightly more efficient—or perhaps egalitarian—way of producing and sharing precedent files. But this does not mean that an inexperienced lay person could easily cobble together anything but the most standard form, let alone a contract that worked so mechanically that it could be made "smart."[57]

B. Example 1: Interest Rate Swaps

Let us look for example at plain-vanilla interest rate swaps as a prime candidate for smart treatment. Almost all swaps are evidenced by the standard form contract promulgated by the International Swap Dealers Association ("ISDA") which consists of a base contract in which the parties can choose and insert modules with the specific terms of the deal.[58] Repeat parties sign master agreements governing their on-

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importantly, courts have held that for the sake of predictability and consistency the actual intent of the parties is not relevant to the interpretation of boiler plate financial contracts. See e.g. Sharon Steel Corp. v. Chase Manhattan Bank, N.A., 691 F.2d 1039 (2d Cir. 1982).

[57]I have already mentioned the trust indenture, certainly one of the most boring and repetitive boiler plate contracts. This is why its drafting is typically assigned to the most junior lawyer on a deal team. However, these attorneys are the least competent to "mark up" the precedents because these contracts are also quite complex.

[58]Raskin uses the example of a credit default swap ("CDS"), noting that although today ISDA typically makes a determination as to whether a triggering event has occurred, a "smart contract using a decentralized blockchain for authorization, a network itself can verify whether an event took place and whether the contract will pay out." Raskinsupra note 1, at 337. Actually, a smart CDS would have to be fairly complex because the amount owed by the swap seller upon a triggering event is often determined, not by the swap parties themselves (and, hence not by the smart contract), but through an auction process run by ISDA in which all swap buyers of debt issued by the defaulting issuer may participate. See Sudip Gupta & Rangarajan K. Sundaram, CDS Credit Event Auctions (Sept. 1, 2011); ISDA, The Credit Event Process, available at https://www.isda.org/a/cKwEE/TheCreditEventProcess.pdf. This is further complicated by the fact that payment by sellers under all CDS's "insuring" debt issued by the same issuer are netted. For example, when Lehman Brothers went

going relations, and merely add a very short addendum each time a new swap is entered into. Although the ISDA form itself was developed over the years by lawyers, business people can easily, and typically, cause their institutions to enter into simple swaps without further consultation with their lawyers.

This is not unique to swaps, however. For example, sophisticated transactions such as repurchase agreements ("repos") routinely are "papered" through industry-wide forms that can be downloaded from websites such as that maintained by SIFMA. This discussion can, therefore, be generalized for any number of financial contracts and derivatives.

Perhaps, more importantly, the performance of swaps is "mechanical" because they consist only of the mutual obligation of two counterparties to pay money at a specific time based on a mathematical formula.

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bankrupt, there was concern about the potential negative effect of triggering CDS's having an aggregate notional value of $72 billion. Nevertheless DTCC (which settles most CDS's) reported that, after netting, a "mere" $5.2 billion actually traded hands. Jean Helwege, Samuel Maurer, Asani Sarkat & Yuan Wang, Credit Default Swap Auctions, Federal Reserve Bank of New York Staff Report No. 372 (May 2009), available at https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr372.pdf.

DTCC could probably automate much of this process through a smart contract. Indeed, it is in the process of moving its CDS reporting to a blockchain. DTCC to Launch Blockchain Credit Default Swaps Reporting in Early 2018, Nasdaq (May 25, 2017) Nasdaq, available at https://www.nasdaq.com/article/dtcc-to-launch-blockchain-credit-default-swaps-reporting-in-early-2018-cm794771. However, "unexpected obstacles" have resulted in a delay from Spring 2018 until 2019. Castillo, supra note 11.

Nevertheless, Ryan Clements argues persuasively that although certain aspects of CDS's could be automated through smart contracts

> there are many barriers to implementation, as well as costs, fragmentation risks, technological deficiencies, and practical drawbacks. As a result, there is some doubt on the extent of Blockchain's short-term transformational value for complex financial structures and mature trading markets. This, at least in part, explains the fact that Blockchain projects are currently slow to materialize in derivatives and other financial market applications.

Clements, Evaluating the Costs and Benefits of a Smart Contract Blockchain Framework for Credit Default Swaps, 10 Wm. & Mary Bus. L. Rev. 369 (2019). He suggests that "a partial implementation [of blockchain technology] is the only feasible application." Clements at 410. "[T]here are costs and benefits to be explored, and right now the costs seem to outweigh the benefits when using Blockchain for CDS." Clements at 410.

For example, in the simplest interest rate swap, the swap contract provides for a "notional" amount, say $100 million. A fixed-rate counterparty agrees to pay the variable-rate counterparty an amount equal to a stated percentage of the notional amount on some future date, for example, 3% of $100 million on December 31, 2019. A variable-rate counterparty agrees to pay the fixed-rate counterparty on the same date an amount equal to a percentage of the same notional amount determined by reference to a floating rate in effect on that date, for example, 25 basis points over the one-year LIBOR on December 31, 2019.[59] On the settlement date, the two counterparties do not pay each other the full amount of their respective obligations. Rather they set them off, with only one counterparty paying the net surplus to the other.[60]

Obviously, the economic point of the swap is that the fixed-rate counterparty is concerned that interest rates are going up and wants to lock in a favorable rate, while the variable-rate counterparty is betting that they that they are going down and that it can make a profit on the swap. Consequently, although they were originally invented in the 1980's

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[59]The London Interbank Offered Rate, which has been the benchmark rate for a significant portion of floating rate financial contracts is being phased out after it was revealed that it had been rigged. As of the writing of this paper it is not yet clear whether the Federal Reserve Banks's proposed Secured Overnight Financing Rate (SOFR) or some other rata will be generally accepted as an alternative. One problem, of course, is that perhaps $200 trillion face amount of outstanding derivative and loan contracts currently refer to LIBOR. See e.g. Wolf Richter, The Fed is Trying to Replace a Decades-Old Benchmark Rate—Here's What You Need to Know, Business Insider (April 4, 2018), available at https://www.businessinsider.com/a-new-benchmark-rate-is-replacing-libor-heres-what-you-need-to-know-2018-4.

[60]For example, presume that the one-year LIBOR on December 31, 2018 goes up to 3.25%. The variable-rate counterparty must pay the fixed-rate counterparty $250,000 (i.e. (3.25% × $100 million) — (3% × $100 million)). If, in contrast, if the one-year LIBOR goes down to 2.75%, the fixed-rate counterparty must pay the variable-rate counter party $250,000 (i.e. ((3% × $100 million) — (2.75% × $100 million)).

If the counterparties had entered into multiple swaps, this would be slightly more complicated since all payments under all swaps covered by the master agreement would be netted. As this is, however, purely a mathematical calculation it can be automated.

as a way of arbitraging between different credit markets, today swaps are a common hedging device.

It would seem that a smart contract could be programmed both to make the calculation as to the net amount to be paid *and* cause transfer of the funds from the net payor to the net recipient. Note, this smart contract is not completely self-contained because the amount the variable-rate counterparty's obligation cannot be pre-programmed but must be determined on the payment date by reference to an external variable. This could be solved by programming the contract to find the relevant rate by accessing a predetermined outside source known in the literature as an "oracle."[61] Today, these contracts are often settled through DTCC. Although

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[61]As explained by DeFilippi and Wright, an oracle is:

> a trusted third-party source . . . Oracles can be individuals or programs that store and transmit information from the outside world, thereby providing a means for blockchain-based systems to interact with real-world persons and potentially react to external events. For example, oracles can be connected to a data feed from a third party conveying the latest London Interbank Offered Rated (LIBOR), or they can be linked to sensors that transmit the outside temperature, humidity, or other relevant information about a particular location. More experimentally, an oracle can also be made to convey the insights of human beings or support private dispute resolution and private arbitration systems (sometimes referred to as judge-as-a-service of arbitration-as-a-service).

DeFilippi & Wright, supra note 2, at 75. Of course, reliance on a trusted third-party defeats one of the supposed advantages of smart contracts over conventional contracts. See Jalinder Singh & Johan David Michels, Block Chain as a Service, Queen Mary University of London School of Law Legal Studies Research Paper No. 269/2017 at 14–15 on the importance of trust in oracles.

The actual smart contract would have to be a little more complex. For example as discussed (supra note 58), LIBOR is being phased out. Since this is well known, parties entering into a LIBOR-based swap today would presumably take this into consideration when drafting. However, as there is always a chance that either a benchmark or a source for determining a benchmark might change or disappear (for example, what if the swap refers to LIBOR as reported on the *Wall Street Journal's* website, and the *Journal* for whatever reason does not publish on that date, ceases reporting the LIBOR or whatever?) The contract would have to be programmed to reference a different source if the first source is unavailable.

In addition, to make a swap absolutely self-executing would change the basic terms of a swap. Swaps today provide that either party can unwind the swap at any time, so long as the terminating counterparty pays a contractual settlement amount. Presumably this could be

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smart swap and derivative contracts would not be a revolutionary change in practice, they could be a more efficient way to effectuate these transactions.

Now my sensibility is once again is tempered by sense because the following proposal by Werbach and Cornell for how a smart weather-hedge contract work in fact, reveals, the fatal flaw for their use for financial contracts:

> Consider a simple insurance contract under which Abby promises farmer Bob, in return for a monthly payment, a lump sum in the event the temperature exceeds 100 degrees for more than five straight days during the term of the agreement. In a traditional contracting arrangement, the parties would likely reduce that agreement to a writing, signed to memorialize mutual intent. If the temperature exceeded the threshold for six straight days and Abby failed to pay, Bob could file suit for breach and present the contract as evidence. To implement a smart contract with the same terms, Abby and Bob would translate the provisions into software code. *Each would make available sufficient funds to fulfill his or her side of the agreement.* An agreed mechanism would be specified to determine performance, such as the daily high temperature for the area, as published on Weather.com. Abby and Bob would then each digitally sign the agreement with their private cryptographic key. One of them would send it as a transaction onto a blockchain, where it would be validated through the consensus process and recorded on the distributed ledger. Bob's payments would automatically be deducted each month and credited to Abby's account. (emphasis added).[62]

As this example illustrates, the only way that a smart contract could be *truly self-executing* and decentralized is if *at the onset of the contract* both parties deposit into the contract itself as a virtual escrow account cryptocurrency equal to the maximum amount that either might be expected to pay at settlement. Otherwise, all the smart contract could do is to determine the amount that is owed, order the net-paying counterparty to deposit money at that time, and then make the transfer to settle the account (i.e. act like an automated DTCC). If the paying party *refused* to deposit funds at that time, this would lead to conventional litigation.

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programmed into the contract by providing that, if one counterparty enters an unwinding notice into the contract, the contract will automatically pay out the settlement amount and terminate other performance.

[62]Werbach & Cornell, supra note 3, at 323.

If that party were *unable* to pay, this might result in a claim in the paying party's bankruptcy or other insolvency proceeding.[63]

In other words, each party must, in economic effect, prepay the contract, unproductively tying up their capital pending the term of the contract. This means that, in the case of an interest-rate swap *both* counter parties lose the opportunity to invest the money between the time the contract is entered into and settlement—defeating the purpose of the swap as a hedge. Werbach and Cornell correctly state that smart contracts try to break down the line between executory and executed contracts—or, in my words, try to change contracts from processes to events *as a legal matter* This ignores the *economic* reality that not only do financial contracts take place over time, but that the time-value of money is of their essence.

Contrast this to a conventional sales contract between sophisticated merchants. The time value of the purchase price—i.e. whether the buyer prepays, pays upon delivery or buys on credit—will be largely a pricing term. In the smart financial contract example, however, neither party will be compensated and both will lose the time-value of money. Because derivatives such as swaps are often based on very small differences and fluctuations in interest rates applied to very large notional amount, even one day's loss of the ability to invest might be fatal.

C. Example 2: Repos

Let us look at another common financial contract that also seems ripe for automation—the classic repurchase agreement or repo. In this alternative to secured lending using securities as collateral, the party seeking financing—the repo seller—sells a security to the financing party—the repo buyer. The parties simultaneously enter into a reverse repo pursuant to which the repo seller agrees to repurchase the

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[63]As I discuss below in my treatment of security interests (see infra text at notes 237–40), ordinarily if one of the counterparties to a transaction were to go bankrupt, the automatic stay would prevent the other counterparty from enforcing its remedies. There is an exception to the automatic stay for settlement of financial contracts including swaps. Holleran et al., Bankruptcy Code Manual § 362(b)(17) (2019 ed.).

same (or an equivalent) security from the repo buyer for a purchase price equal to the original repo price plus a premium representing an interest component. Although repos can theoretically have any term, traditionally they were for very short-term financing—sometime overnight. Obviously, the economic purpose of a repo for the repo seller would be lost if it had to deposit the reverse repo repurchase price into a smart contract and did not have the free use of funds pending the consummation of the reverse repo.

Perhaps less obviously, an automatically executing smart contract would *also* destroy much of the economic purpose of a repo for the repo buyer as well. This is because the security sold in the repo and to be resold under the reverse repo would also have to remain deposited into the smart contract. However, the repo buyer often acquires the underlying security for the purpose of resale. For example, the repo-buyer might enter into a back-to-back repo in which it sells the security to another party against the agreement to buy it back.

In contrast, a true repo does not require the repo buyer to maintain the security pending the exercise of the reverse repo and the repo buyer is not contractually required to re-deliver the *original* security upon consummation of the reverse repo. Rather, the repo buyer is merely required to deliver an equivalent security or its market value. These provisions are necessary not only so that the repo buyer gets the economic advantages of being able to deal with the security, they are also necessary for legal reasons as well. As I have argued elsewhere,[64] without these provisions, the transactions would not be deemed to a "true repo," but merely an Article 9 security interest disguised as a repo. This would be disastrous for the $2.3 trillion *daily* repo market[65] because security interests are not entitled to the Bankruptcy Code's favorable treatment of repos in the event that the repo seller were to go bankrupt.

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[64]Schroeder, A Repo Opera: Reflections on Repos and Criimi Mae, 76 Am. Bankr. L. Rev. 565 (2002); Schroeder, Repo Redux: Repurchase Agreements Under the 1995 Revisions to the U.C.C., 29 U.C.C. L.J. 3 (1996); Schroeder, Repo Madness: The Characterization of Repurchase Agreements Under the Bankruptcy Code and the U.C.C., 46 Syracuse L. Rev. 999 (1996).

[65]SIFMA, US Repo Market Fact Sheet, 2016, available at https://www.sifma.org/resources/research/us-repo-market-fact-sheet-2017.

D. Cash Collateral Distinguished

Sensibility might be tempted to argue that it is not unknown for financers—including swap partners—to require their counterparties to post cash (or other) collateral pending the consummation of certain financial contracts. For example, in my experience, issuers of commercial letters of credits frequently do so.

At further thought, one realizes that depositing funds in a virtual escrow agreement is *not* the economic equivalent of posting collateral for the life of the contract. Cash collateral does not consist of delivering piles of dollar bills to be placed in a safe held by a lender or escrow agent.

Cash collateral consists of either granting a security interest in a interest-bearing deposit account maintained with a bank or financial institution or the pledging of other highly liquid assets. Consequently, the party posting the collateral earns interest on the funds pending the settlement of the contract secured by such collateral. One of the supposed virtues of smart contracts is that they eliminate third-part intermediaries—but this means that they also eliminate the interest paid by such intermediaries. There would be no such earnings opportunity for posted cryptocurrency precisely because there are no third-party intermediaries in a smart contract.

To my surprise, I have found only one commentator who has discussed this problem and he admits that he does not have a workable solution. Michael Abramowicz notes that:

> The peer-to-peer trust . . . lacks one common feature: the ability to invest trust funds. The trust money is set aside until the money is needed, so the investment is ultimately in the cryptocurrency itself, rather than in a diversified form. Ideally, it would be beneficial for the trustee to be able to invest deposited Bitcoins pending trust withdrawals to grow the trust corpus. This is, of course, possible with conventional trust relationships. The trustee simply relies on a financial institution such as a bank or mutual fund, deposits the trust moneys and then withdraws them as needed. Peer-to-peer decision-making could support mechanisms for *deciding* when cryptocurrency should be exchanged for other assets controlled by a bank. The challenge for a cryptocurrency is how to execute that exchange. The problem, however, is that there is no mechanism allowing cryptocurrency accounts to own virtual assets. For a peer-to-peer institution to own assets besides virtual

currency, some interface is needed between the virtual and real worlds.[66]

In other words, in order to invest and protect the time-value of money, which is of the essence of all financial contracts, there must be a provision in the smart contract transferring the deposited cybercurrency to a trusted third party who will invest the funds in conventional assets and then later redeposit them onto the contract. This would destroy the two essential aspects of a truly smart contract—the elimination of third-party intermediaries and self-execution.

Consequently, blockchain technology may be a superior way of settling financial contracts. It may also be possible to automate certain aspects of a contract—indeed we do so already. However, *at this time* financial institutions are unlikely to enter into completely self-executing smart financial contract for a future payment because of the opportunity cost of devoting capital to the contract. A similar point can be made for any other smart contract for future performance.

Once again, I indulge in sensibility. Blockchain technology might progress so that someday income-bearing instruments could themselves be registered to a blockchain. For example, under a smart swap, rather than depositing cybercurrency into a digital escrow account, the counterparties could instead post cyber-commercial paper issued by a third party, with the smart contract automatically collecting and distributing interest to the parties. Back-to-back smart repos might be linked together on a single blockchain. This might allow the repo buyer to transfer the repo'ed security out of the smart repo pending consummation of the smart reverse

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[66]Abramowicz, Cryptocurrency-Based Law, 58 Ariz. L. Rev. 359, 411 (2016). Facebook's new Libra coin does anticipate interest. The Libra would be a stable coin backed by a pool of conventional currencies such as the U.S. Dollar the Euro which would be invested in interest bearing accounts of some sort. Apparently, transactions would be confirmed by up to 100 founding members who would be entitled to collect this income. Lacey, supra note 20.

Perhaps in the future, parties who wish to create smart contracts using the Libra blockchain could buy Libra with conventional currency and also participate in this income stream. Of course, this system is dependent on "trusted" third party intermediaries.

repo, with the smart back-to-back smart repo automatically providing for the transfer of a substitute security to be delivered to the repo seller.

III. Sales of Goods

A. Smart Contracts and UCC Article 2

In the previous section, I showed that, although smart contracts for the payment of money in financial contracts *could* be made "self-executing" (if we allow for the use of oracles), in the near term they can be expected to have limited utility because, under current technology, a completely autonomous smart contract would require at least one paying party to tie up its capital pending the performance of a contract. The problem with using smart contracts for executory contracts for the sale of goods is somewhat different than that for financial contracts. For financial contracts, the primary problem is one of time—neither party is compensated for the time-value of money. One might be tempted to assume that time is not the problem with contract of sales. I have already suggested that the question as to who gets the benefit of the time-value of money pending the creation of the contract and its consummation—i.e. must the buyer pre-pay or can it buy on credit—seems largely a question of purchase price to be negotiated by the parties.

But this ignores the role of cash flow. Take for example, the extreme example of the market for toys. The biggest marketing event for manufacturers of toys in this country is the International Toy Fair held every February in New York City. Although, toys are sold year around, 50% of total retail revenues are earned in the last quarter of the year[67] because of the December holidays. This causes a mismatch between the cash needs of retailers and wholesalers. A retailer would not have the cash to enable it to deposit cybercurrency into a virtual escrow when it enters into a purchase contract in the first quarter of the year. Moreover, although a wholesaler needs cash to manufacture toys in the second and third quarters, a smart contract presumably would not deliver cash to the wholesaler/seller until it makes delivery of the

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[67]Frederique Tutt, Let's Reconsider Discounting Toys for Christmas, NPD, available at https://www.npd.com/wps/portal/npd/us/blog/2017/lets-r econsider-discounting-toys-for-christmas.

goods to the retailer/buyer in the fourth quarter. Consequently, either or both parties will require third-party financing.

The unique issues that arise with respect to sales, however, are matters of space—good have physical characteristics and are physically possessed by either the buyer, seller or a third party such as a carrier. A blockchain cannot alter physical reality.

Werbach and Cornell describe the goals of completely smart contracts as follows:

> Smart contracts are designed to eliminate the need for legal enforcement. The central feature of a smart contract — what supposedly makes them smart — is that legal enforcement will not be necessary, or even possible. In a very real way, smart contracts are not intended to be legally enforceable. This is not to suggest that they are intended to be legally invalid; rather, the question of legal enforcement should never arise. In this sense, smart contracts are not intended to be enforced in a legal proceeding.[68]

Sensibility makes me sympathetic to this instinct. Although a good contract negotiator and drafter is always acting in the shadow of legal remedies, given the expense and uncertainty of conflict resolution, we try to structure transactions in such a way as to minimize the possibility that disputes might arise.[69]

As I have already mentioned,[70] Mik emphasizes that proponents of smart contracts conflate the very different concepts of performance and enforcement (remedies). Specifically, proponents proclaim that since block chains automatically *execute*, they make transactions final and irreversible. As such, they eliminate the necessity of trust between contracting parties and the need for enforcement. I shall illustrate through the example of a very simple sales contract.

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[68]Werbach & Cornell, supra note 3, at 339.

[69]As I tell my commercial law students, sometimes attorneys do not want to find out whether or not their analysis is "correct" because the only way to do so would be through years of litigation that should be avoided if possible. Nevertheless, sense dictates that the goals of *completely* eliminating enforcement is a pipe dream and not just because of poor contract drafting.

[70]See supra text at notes 24–25.

The fact that one party may have delivered goods and the counterparty has paid money—independent actions that could perhaps be automated through a smart contract—does *not* mean that there has not been a breach and that one of the parties might yet have a claim for breach of contract that could be enforced in a court.

Assume that two parties enter into a smart contract for the sale of goods that provides that the seller will automatically be paid upon the delivery of the good. Assuming that a buyer would be willing to deposit cryptocurrency in the amount of the purchase price when it enters into a smart contract, one can imagine how the contract could be programmed to automatically pay the seller upon the occurrence of some event effectively protecting the seller from one form of possible breach by a buyer. Today, carriers electronically track delivery and could act as oracles to send electronic messages to the smart contract when they drop packages at the buyers' locations. This is far from perfect—we have all experienced mis-deliveries. In some industries, the supply chain is already largely automated[71] and we are, however, on the verge of technology that will allow for complete automated tracking of the location of goods from the seller's warehouse to the buyer, perhaps via a automated drone delivery vehicles, radio-frequency identification ("RFID") or other sensors, and automated locks on the buyer's doors that would provide to the smart contract more reliable evidence that at least something has been actually delivered to the buyer.

Josh Fairfield and Larissa Lee have suggested that the buyer could also be protected if we adopted a system of recording title to personalty on a blockchain.[72] When the smart contract transfers the purchase price from the buyer to the seller, it could simultaneously transfer title from the seller to the buyer. As discussed below, this would not remotely

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[71]See Bradley, Disrupting Secured Transactions, 56 Hous. L. Rev. 967, 987–92 (2019). Based on the fact that individual items of inventory can now be tracked in real time, Bradley makes the quixotic suggestion that we replace the current filing system for perfection of security interest in goods with an electronic notification system.

[72]Fairfield, Bitproperty, 88 S. Cal. L. Rev. 805 (2015); Lee, supra note 5.

solve the problem in the case of the sale of goods.[73] Indeed, under U.C.C. Article 2 as currently in effect, title in the good would ordinarily have already been transferred to the buyer.[74] The buyer of goods is not seeking mere title, she wants physical possession of the good and rights that would be enforceable against third parties in the event of the bankruptcy of its counterparty.

Under modern law, "title" is incompetent to answer such questions. Moreover, as I shall discuss,[75] identifying the performance of a sale with the conveyancing of title would reverse one of the primary innovations of UCC Article 2, returning commerce to a pre-modern agricultural model.

More importantly, the fact that the seller has physically delivered goods to the buyer does *not* in and of itself mean that the seller has performed the contract or that the buyer might not need to seek remedies from a court. A seller's obligation under a contract is to deliver goods that *conform* to the contract. Indeed, the American rule (with an exception for installment contracts) is perfect tender—pursuant to U.C.C. § 2-601 a buyer may reject goods if they "fail in any respect to conform to the contract." Consequently, the buyer has a reasonable time after delivery to inspect (U.C.C. § 2-313) and to either accept or reject the goods (U.C.C. § 2-602). Most importantly, the fact that a buyer has prepaid for the goods, does *not* deprive the buyer of its rights to inspect.[76] In short, payment is not acceptance.

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[73]One author blithely states, "For example, once a good or service has been delivered, the smart contract could enforce payment through the distributed ledger. In the event of nonpayment, it could initiate recovery of the good." O'Shields, supra note 4, at 179. As I shall discuss in this section, the actual law and mechanics of sales are much more complex and it is not clear how a contract could recover physical possession of the goods.

[74]That is, under U.C.C. § 2-401(2) "Unless otherwise explicitly agreed title passes to the buyers at the time and place at which the seller completes his performance with reference to the physical delivery of the goods." The default rule is that where a seller is to ship goods, the contract is a "shipment contract" (U.C.C. § 2-404) in which case, title passes to the buyer at the place of shipment (U.C.C. § 2-401(2)(a)).

[75]See infra text at notes 148–54.

[76]U.C.C. § 2-512 clarifies that "Where the contract requires payment before inspection . . . Payment . . . does not constitute an acceptance of goods or impair buyer's right to inspect or any of his remedies."

An analogy to commercial letters of credit might be helpful. Classically, a commercial letter of credit is issued on behalf of a buyer for the benefit of a seller in a contract for sales, often in international transactions, to insure payment of the purchase price. The issuing bank is required to honor the letter of credit and pay the beneficiary (seller) when the beneficiary presents documents that on their face conform strictly to the terms of the credit. Although the buyer will negotiate that the documents to be presented represent some evidence that the seller has performed, under the independence principle, the issuing bank must pay upon a conforming presentment regardless of whether or not the seller has performed (with a limited exception for fraud).[77] If the issuing bank pays over a conforming presentment, the applicant (in this case the buyer) must reimburse the bank.[78] In any event, because documents generally move faster than goods, the seller/beneficiary is typically paid (and the buyer/applicant becomes liable to reimburse the issuing bank) before the goods are delivered. Nevertheless, performance by the issuing bank under the letter of credit is not performance by the seller under the underlying sales contact. The buyer retains its right to inspect and reject the delivered goods and

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[77] As Article 4 of the Uniform Customs and Practices for Documentary Transactions (the "UCP")—which is typically incorporated by reference in most international, and many domestic commercial letters of credit—states, "In credit operations all parties concerned deal in documents, and not in goods, services and/or other performances to which the documents may relate." U.C.C. § 5-108(a) provides that the issuer "shall honor a presentation that . . . appears on its face strictly to comply with the terms and conditions of the letter of credit . . . [and] the issuer shall dishonor a presentation that does not appear so to comply" This "independence principle" is made further express in U.C.C. § 5-103(d) which states:

Rights and obligations of an issuer to a beneficiary . . . under a letter of credit are independent of the existence, performance, or nonperformance of a contract or arrangement out of which the letter of credit arises or which underlies it, including contracts or arrangements between the issuer and the applicant and between the applicant and the beneficiary.

Similarly, Article 3 of the UCP states:

Credits, by their nature, are separate transactions from the sales or other contract(s) on which they may be based and banks are in no way concerned with or bound by such contract(s), even if any reference whatsoever to such contract(s) is included in the credit.

[78] U.C.C. § 5-108(i)(1).

to pursue its contract remedies in the case of non-conforming delivery.[79]

Specifically, if the goods are non-conforming, the buyer has the right to reject the goods and obtain a refund of the purchase price under U.C.C. § 2-711(1). Alternately, under U.C.C. § 2-714(a), the buyer may accept the goods, in which case, assuming it gives proper notification, it has the right to damages for nonconformity.

Lee tries to demonstrate the superiority of a smart sales contract with the following hypothetical:

The Blockchain replaces the role of the third party typically required to resolve disagreements. As an example, imagine a red-widget factory receives an order from a new customer to produce 100 of a new type of blue widget. This requires the factory to invest in a new machine and they will only recoup this investment if the customer follows through on their order. Instead of trusting the customer or hiring an expensive lawyer, the company could create a smart property with a self-executing contract. Such a contract might look like this: For every blue widget delivered, transfer price per item from the customer's bank account to the factory's bank account. Not only does this eliminate the need for a deposit or escrow—which places trust in a third party—the customer is protected from the factory under-delivering.[80]

This example fails to persuade for several reasons. First, it does *not* eliminate third party intermediaries as funds are transferred between deposit accounts, rather than directly on a block chain. Accordingly, this smart contract is not all that smart because it is not completely self-enforceable. It does not transfer the funds itself. Rather, it originates a payment order to the buyer's bank to effect a funds transfer. Since this is a contract between merchants, this would be governed by U.C.C. Article 4A. This would, of course, require the agreement with the buyer's bank and reliance that the bank would accurately execute the payment order—and er-

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[79]See text at note 75 supra. For simplicity, I am only discussing remedies that would apply if the UCC applied. Obviously, in an international sale, other law might apply, but my basic point as to the impracticality, if not impossibility, of fully automating a sales contract would be the same.

[80]Lee, supra note 5, at 113–14.

rors do sometimes occur. Although I believe that any risks this would create are minimal, this can already be done through existing terminology so that the use of smart contracts would not be the brave new world without banks that block chain proponents envision.

Second, this proposal does not yet truly protect the seller. Merely giving the seller the power to order transfers out of the buyer's deposit account standing alone, does not deprive the buyer from also making withdrawals from the account. That is, the seller has no assurance that there will be sufficient funds in the account at the time payment is due. This could be "solved" by a three-party agreement among the buyer, seller and the buyer's bank depriving the buyer from making withdrawals. In effect, the buyer would be granting the seller an Article 9 security interest in its deposit account perfected by control.

Another alternative is for the buyer to obtain a letter of credit payable in the amount of the purchase price—once again adding the services of a dreaded third-party intermediary. Notoriously, as just discussed, a letter of credit does not eliminate the possibility of breach of the underlying sales contract. Although it almost completely assures the seller that it will get payment, the documents delivered under the letter of credit can at best only give the buyer good reason to believe that the seller has performed. It is always possible the seller will deliver non-conforming goods despite conforming presentation of documents.

Third, it does not solve the problem of the buyer's right to inspection, so that it is not truly self-executing.[81]

However, this proposal does have two advantages. Because it involves bank accounts, the buyer can earn interest pend-

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[81]*Note*, since this is an installment contract the usual perfect tender rule does not apply. Rather, pursuant to UCC § 2-612(2) "The buyer may reject any installment which is non-conforming if the non-conformity substantially impairs the value of that installment and cannot be cured . . ." Nevertheless, the buyers still has the right to inspect and reject any substantially non-conforming installment, subject to the seller's right to cure.

Moreover, pursuant to U.C.C. § 2-612(3), "Whenever non-conformity or default with respect to one or more installments substantially impairs the value for the whole contract there is a breach of the whole."

ing payment, eliminating the tied-up capital problem discussed in the previous section. Second, it involves conventional currency, not cybercurrency. To date, the value of cybercurrencies has been so volatile that they cannot be used as the unit of account for legitimate non-cash sales.[82]

Indeed, the rights of the parties in even a simple contract are somewhat more complex. Even if the goods delivered by the seller were non-conforming, under U.C.C. § 2-508 the seller has the right to cure non-installment contracts in two circumstances. If the time for delivery has not yet lapsed, the seller still has time to make a substitute delivery of conforming goods. If the seller had reasonable grounds to believe that the buyer would accept the non-conforming goods with an adjustment of price, the buyer still has the right to reject, but the seller has an additional reasonable time to make a conforming tender. Under U.C.C. § 2-612, the seller's rights to cure non-conformance in installment contracts is even greater. For example, even if an installment *substantially* impairs the value of the installment, the buyer must accept if "the seller gives adequate assurance of its cure." That is, the law reflects the practice that in most cases, the counterparties seek less to "enforce" their rights, but to "perform," i.e. work things out.

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[82]Presumably, if the parties did want to eliminate banks and use cybercurrency for payment, the contract could be denominated in dollars or another conventional currency, and the contract could access a designated oracle to calculate the purchase price into cybercurrency based on the then prevailing conversion rate on the payment date.

This is similar to what Dell and other sellers who supposedly accepted payment in bitcoins did in the past. They would post the price of the good to be sold in dollars. If a customer elected to pay in bitcoin, a third-party intermediary—Coinbase in the case of Dell—would quote a price in bitcoin based on the then prevailing exchange rate that would be effective for a matter of minutes. The customer would open an account with the intermediary which would sell it bitcoin which would then be transferred to the seller's account with the intermediary. The intermediary would then immediately buy back the bitcoin from the seller at the quoted exchange rate minus a service fee by transferring the bitcoin out of, and transferring dollars into, the seller's account. Schroeder, Bitcoin Under the Uniform Commercial Code, 24 U. Miami Bus. L. Rev. 1, 31 n. 89, 33 (2016) [hereinafter, Schroeder, *Bitcoin*]. Neither Dell nor virtually any other legitimate business are now accepting payment in bitcoin of the sale of goods and services. See supra note 7.

DeFilippi and Wright, recognizing the problem of protecting buyer's rights under Article 2, suggest a different form of smart contract. They suggest that the contract could be programmed to release payment of the purchase price not upon delivery, but upon the buyer's acceptance of the goods shipped. Unfortunately, this raises issues that are the mirror image of those we have just discussed. That is, although it might solve many of the buyer's issues, it shifts risks to the seller. Consequently, as this would require the buyer to manifest its acceptance, it would also not be truly self-executing.

Let us look in more detail as to how this would work. As is often the case under the UCC, there are more than one way to accept goods. The buyer can make an actual affirmative manifestation of acceptance under U.C.C. § 2-606(1). Consequently, DeFilippi and Wright suggest that "the buyer [would] send[] a digitally signed block-chain-based message to the escrow account, which [would] then release[] the amount of the purchase price to the seller."[83]

However, I believe that in the "real world" such affirmative acceptance may be empirically unusual—I don't believe I have ever contacted an on-line seller to accept a delivery. Commonly, the buyer accepts not by affirmatively accepting, but by failing to give seller notice of rejection after a reasonable opportunity for inspection (U.C.C. § 2-606(b)). Presumably a smart contract could provide for payment to the seller upon the earlier of i) the buyer's sending a message of acceptance to the contract or; ii) the lapse of a contractually agreed "reasonable time"; *unless* iii) prior to that time the buyer sends a digitally signed block-chain-based rejection message to the escrow account in which case payment would not be made.

What happens next? The simplest would be for the escrow account to release the purchase price back to the buyer if it sends a rejection notice. However, this would not protect the seller if the buyer *wrongfully* rejects the goods. Moreover, there is yet another mode of acceptance. Even assuming that a buyer had initially *rightfully* rejected the goods, under U.C.C. § 2-606(c), the buyer accepts the goods if it "does any

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[83]DeFilippi & Wright, supra note 2, at 76.

act inconsistent with the seller's ownership [such as, for example, using the good], but if such act is wrongful as against the seller it is an acceptance only if ratified by him." Consequently, to protect the seller, one would have to add another level of complexity to the programming.

DeFilippi and Wright suggest that "if a dispute arises over the quality of the good or if the product simply never gets delivered, a human-based oracle steps in to analyze the facts of the case and determine who should receive the escrowed funds."[84] And so, the smart contract is *not* in fact self-executing, let alone self-enforcing, but is dependent on s a dreaded third-party intermediary—with the term "oracle," in this case, referring to a mediator or arbitrator. Indeed, as discussed below, with respect to consumer sales, the buyer would be worse off than under current law.

But, since consumer transactions raise paternalistic protection issues, let us assume for the time being that the hypothetical smart sales contract only involves merchants. The proposal so far does not adequately reflect the rights and remedies of parties under sales law. Nor does it reflect the procedures under Article 2 which are designed to force the buyer and seller to engage into conversation and give and take *precisely* to avoid submitting the dispute to a third party. That is, in the "real world," merchants are unlikely to submit to a smart contract's binary world of specific performance. Rather, they "work things out."

So let's return to the smart contract and examine how it would have to work under Article 2. First, if would not be sufficient to program the contract to release funds back to the buyer upon receipt of a notice of rejection—indeed, this

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[84]DeFilippi & Wright, supra note 2, at 76. In a footnote, they suggest submitting the issue to an arbitrator.

A few days latter when [buyer] receives the [good], she inspects it and — if satisfied with the product — sends a digitally signed blockchain-based message to the smart contract to release the bitcoin to [seller] The transaction is thus completed without the need for any trusted third party. If, however, the [good] was defective, or was never delivered, [buyer] can appeal to a third-party arbitrator (a human-based oracle) to retrieve her funds. Both parties would submit relevant information to the arbitrator, who would render a decision and release the escrowed funds either to [buyer] or to [seller].

DeFilippi & Wright, supra note 2, at 239 n. 23.

could not be the case if DeFilippi and Wright want the contract to be able to submit a dispute to an oracle.

First, in order to be effective as a rejection, under U.C.C. § 2-605 a buyer must "state . . . a particular defect" in the goods. In addition, upon the request of the seller, a merchant buyer must "in writing"[85] supply "a full and final written statement of all defects on which the buyer proposes to rely." That is, Article 2 pushes the parties into negotiation. Consequently, when the smart contract receives a rejection notice from the buyer it would have to deliver the notice to the seller, and should not release the funds if it receives a notice of objection from the seller within some reasonable time. If the seller does send an objection, the smart contract would then presumably need to give the buyer some means of replying. If the parties come to a resolution, then they could give a multi-signature notice to the contract designating how the funds should be distributed. If they are unable to do so within a specified period of time, then the issue would be submitted to an oracle.[86]

Moreover, it would not be sufficient for the contract to merely provide for the possibility of acceptance and payment or rejection and non-payment. It would also have to provide

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[85]I assume that electronic notice would satisfy this writing requirement.

[86]This back-and-forth of instructions is, essentially, how a well-written stand-by letter of credit works. However, under a "commercial" letter of credit (such as those issued to pay the purchase price of goods), the issuing bank pays the beneficiary when it receives documents designed to give the beneficiary reason to believe that the customer has performed a contract. The parties expect the letter of credit to be drawn down in the ordinary course because most parties in fact perform their contracts.

A stand-by letter of credit, in contrast, is the economic (but not legal) equivalent to a guarantee of performance. The problem is that it is difficult to come up with documents that prove a negative (non-performance). Consequently, the beneficiary's attorney might deliver an affidavit swearing that a breach occurred. The issuing bank would then pay the letter of credit unless the applicant's attorney delivered an affidavit denying the breach. The issuing bank would then only pay the letter of credit when it received either joint instructions from the party or a decision by an arbitrator or other designated third party. Such a stand-by letter of credit, in effect, does not assure the beneficiary that it will be paid quickly, but that funds will be available to pay damages if and when a dispute as to breach is resolved.

for a third option. As already mentioned, if a good is non-conforming, the buyer may accept it non-withstanding non-conformity and (if it follows the notice procedures of Article 2) recover damages under U.C.C. § 2-714, and perhaps incidental and consequential damages under U.C.C. § 2-715. Because the purchase price has not yet been paid, the buyer would have the right to reduce the amount payable to the seller by the amount of damages as a claim in recoupment under U.C.C. § 2-717. Consequently, the contract would need to be programmed to enable the buyer to give a notice of acceptance not withstanding non-conformity, specifying the defect and the amount of funds to be delivered to the seller and the amount to the buyer. Once again, there would need to be a provision for the seller to object, etc.

One can imagine that with respect to mercantile transactions (particularly when the buyer is a merchant who wishes to resell the goods) that the buyer would often be willing to take non-conforming goods with reasonable price adjustment. This is why U.C.C. §§ 2-508 and 2-612(2) give the seller the opportunity to cure a non-conforming delivery.

Consequently, this smart contract is not yet, in fact, self-executing and does not yet eliminate the possibility of default either by the seller delivering non-conforming goods, or the buyer's wrongful rejection. As I just said, for it to be sufficient, it would need to deal with contract remedies. For example, in addition to price adjustment, the buyer may have a right to incidental and consequential damages. (U.C.C. § 2-715) Finally, in the case of non-delivery, under some circumstances, the buyer does have a right of specific performance. (U.C.C. § 2-715). It is hard to see how any of these could be easily programmed into the contract. As we have shall discuss with respect to specific performance, Fairfield and Lee's suggestion that "title" to the good could be transferred on a blockchain is a non-solution.

The potential problems with respect to the seller are even greater if, as DeFilippi and Wright suggest, the goods are physically delivered to the buyer before payment. Assume that the buyer has rightfully rejected the goods. The smart contract itself can not return them to the seller and, therefore, cannot enforce the contract.

Let us look at the party's respective rights and

responsibilities. Under U.C.C. § 2-602(2)(b), the buyer must "hold [rejected goods] with reasonable care at the seller's disposition for a time sufficient to permit the seller to remove them," but the seller must, of course, figure out how to recover them. The buyer does have the right to either store or ship them back under U.C.C. § 2-604, but at the seller's expense. How does the buyer obtain payment?

A merchant buyer's obligations are greater than those of a consumer buyer. Under U.C.C. § 2-603, it must under some circumstances follow instructions of the seller and, "in the absence of such instructions to make reasonable efforts to sell them for the seller's account if they are perishable or threaten to decline in value." If it does so, the buyer must account for the seller for the price received upon sale, but is entitled to reimbursement of expenses. If the buyer has a right to damages against the seller, it has a security interest in the goods. (U.C.C. § 2-711). This means that it can sell the rejected goods, apply the sales price towards payment of damages, and remit any surplus to the seller.

Another complexity is that, even assuming that the buyer initially rightfully rejected the good, any action the buyer takes that is inconsistent with the seller's ownership of the goods—such as using them or throwing them away—is itself an acceptance of the goods (if ratified by the seller) re-establishing its obligation to pay the price. (U.C.C. § 2-606(a)(c)). Moreover, any "exercise of ownership" of the buyer after rejection—such as using them or throwing it away—is wrongful vis a vis the seller, giving it the right to damages for conversion. (U.C.C. § 2-602(2)(a)).

In other words, the obligations of the parties after a non-conforming delivery goes way beyond merely the non-payment of the price that could be easily programmed into a smart contract. And, we have not yet even considered the right and remedies of the parties if the buyer wants to revoke acceptance.

Once again, a smart contract, even if supplemented with an oracle, cannot make this self-performing, let alone self-enforcing. All the oracle can do it to declare that the seller has the right to the goods, or that the buyer has an obligation to either allow the seller to pick them up or to send them back. If the parties refuse to do so, there is no way for

the *contract* to make it happen. Remember, the recalcitrant party refused to do so before the dispute mechanism was triggered. Why would one think that it would do so now that some third party tells it to?

Consequently, all the oracle could do is transfer the funds already deposited. With respect to physical recovery of the goods, the seller would have to take the oracle's disposition to a court and reduce it to a judgment (assuming that the oracle constitutes a legally cognizable arbitrator). The plaintiff would then have to turn the judgment into a lien (and probably hire a sheriff to grab the goods). In the meantime, if the possessory buyer had gone bankrupt before the lien attached, the seller would be a general creditor who is unlikely to have a meaningful recovery. If the buyer were to go bankrupt after the lien attaches, the automatic stay would prevent the seller from taking possession of the good.[87]

In any event, my point is that a smart sales contract might be an attractive payment system for the seller, it cannot be made completely self-executing because of the physicality of the of the goods and, therefore, the rights, responsibilities and remedies to the contracting parties.

One possible ways to program smart contracts to deal with sales law would, in fact, defeat the purpose of smart contracts. One extreme non-solution would be for the seller to disclaim all warranties and for the buyer to agree to accept all goods "as is." Indeed, I attended one panel discussion on smart contracts at which one panelist declared that there could be no breach under a smart contract because the obligations of the parties are merely whatever is in the code and nothing more. This ignores the fact that there is an existent world of contract law and if a "smart contract" is silent on a subject, under basic principles of law, default rules will apply. However, it is possible for the smart contract to waive rights. Consequently, even if the "smart contract" only provides for payment by the buyer and delivery by the seller the buyer has rights unless the contract meets the rules of Article 2 for "as is" sales, i.e. silence in the smart contract is insufficient. There seems to be no *theoretical* reason why the requirements of U.C.C. § 2-316 could not be

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[87]I discuss the automatic stay infra in text at notes 237-40.

written into the code of the contract, so long as notification requirements of Article 2 were otherwise met.[88]

However, supposedly one of the primary advantages touted for smart contracts is to eliminate the need for trust. An "as is" contract where the buyer has no opportunity to inspect before payment, *depends entirely on trust* that the seller will deliver goods acceptable to the buyer despite the fact that the seller would have no legal liability if it did not. It is hard to imagine a buyer who would be so naive to enter into such a contract.

B. Consumer Sales

1. Warranties. I suspect that merchants as a class are savvy enough that they would rarely agree to as-is contracts without a right of inspection. However, Fairfield has suggested that, because smart contracts could be made modular, *consumer* buyers would have the ability to effectively negotiate for more and *better* warranties in on-line contracts than they do now.[89] Extended warranties would, however, keep these smart contracts from being "self-executing." I am also doubtful that the typical consumer who does not now read the terms and conditions of her on-line sales contract will abandon her rational apathy and start to take the time and effort to negotiate the terms.

One of the primary reasons for this is that consumer buyers are currently not now "forced" to accept non-warranty contracts as Fairfield suggests. Fairfield asserts that disclaimer of warranties in on-line contracts are "routine" and have "eviscerated consumer protections offered by the Uniform Commercial Code"[90] citing an article that discusses the enforceability of disclaimers in on-line contracts but, in fact, does not discuss the issue of their prevalence. In fact, it

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[88]A potential issue with "as is" contracts is that complete waivers "must be by a writing and conspicuous" and this can be done by using such "expressions like 'as is.' " U.C.C. §§ 2-316(2), (3). Would a provision solely in computer readable code meet this requirement, or would there have to also be a human readable, natural language document as well?

[89]Fairfield, Smart Contracts, Bitcoin Bots, and Consumer Protection, 71 Wash. & Lee L. Rev. Online 36 (2014).

[90]Fairfield, Smart Contracts, Bitcoin Bots, and Consumer Protection, 71 Wash. & Lee L. Rev at 44.

is my experience that there is tremendous diversity among merchants with respect to disclaimers.[91]

For example, Amazon—which accounts for approximately 50% of online-sales of goods—does *not* disclaim warranties with respect to the sale of goods in its standard terms and conditions,[92] although its subsidiary, Zappos, does.[93] Best-Buy's terms provide that "warrant[ies] on any product sold . . . is provided by the manufacturer of the product" and that "to the fullest extent permitted by applicable law, Best Buy will not be liable for any indirect, incidental, or consequential damages with respect to such product or services."[94] Both Amazon and BestBuy's terms do disclaim any warranties with respect to the website itself, using the "as if" language permitted by Article 2, even though it is very doubtful whether Article 2's warranty provisions would apply since the website itself is almost certainly not a "good." However, as I discuss below,[95] large on-line merchants including Amazon and Best Buy typically adopt almost unlimited refund policies even for conforming goods that go beyond the rights granted by Article 2. Smaller e-tailers tend to feel the market pressure to follow suit.

Moreover, if smart contracts would make it easier for consumers to add warranties to on-line sales, it is not clear that this would be beneficial because of pricing. For example, today sellers of appliances and electronics *do* offer to sell *extended* warranties (i.e over and above the warranty given by the manufacture) *for a price*. However, the reason why they hawk these warranties so incessantly is because the quality of these products have become so consistent that these warranties are relatively rarely exercised. This means

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[91]I personally, have never seen, let alone bought a good that was subject to, a *full* warranty, because it would then have to meet the onerous standards of the federal Magnuson-Moss Warranty Act § 104 (15 U.S.C.A. § 2304).

[92]https://www.amazon.com/gp/help/customer/display.html?nodeId=508088.

[93]https://www.zappos.com/terms-of-use.

[94]https://www.bestbuy.com/site/help-topics/terms-and-conditions/pcmcat204400050067.c?id=pcmcat204400050067.

[95]See infra text at notes 115-16.

that they are usually extremely profitable for merchants and terrible deals for consumers.[96]

Another example of modular contracting that has been of dubious value to consumers is the cafeteria-style pricing adopted by airlines in recent years—charging separate and often opaque fees for such extras as checked luggage, carry-on luggage, seat selection, etc.—that make it difficult to compare pricing across airlines.[97] The Government Accountability Office reported that airlines collected $7.1 billion in fees for "extras" in 2016.[98]

2. Credit Card Sales v. Smart Contracts. As already quoted,[99] Werbach and Cornell assert that smart contracts break down the distinction between executory and executed contracts—as though we could do away with the constraints of time and space which are the *raison d'etre* of financial contracts and the limitation of sales contracts. They argue that smart contracts could be programmed "as if" performance had already occurred, and certain aspects of performance could be made inevitable. As I have argued, the fact that the buyer has paid and the seller has delivered goods does not mean that the seller has performed or that the buyer does not have enforceable remedies.[100]

Werbach and Cornell attempt to contrast self-enforcing, quasi-executed smart contracts with consumer credit card transactions. In fact, they misstate the law and practice of consumer credit contracts and on-line shopping. As such they seem insensitive about how the development of smart sales contracts—if they could be made practicable—would do

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[96]See e.g. Don't Buy Extended Warranties, Consumer Reports (August 26, 2016), available at https://www.consumerreports.org/shopping/don't-buy-extended-warranties.

[97]See Airline Fees Make it Tough to Compare Deals on Flights, Consumer Reports (June 8, 2018), available at https://www.consumerreports.org/airline-fees/airline-fees-make-it-tough-to-compare-deals-on-flights.

[98]U.S. Government Accountability Office, Commercial Aviation: Information on Airline Fees For Optional Services, GAO 17-756 (Sept. 20, 2017), available at https://www.gao.gov/products/GAO-17-756.

[99]See supra text at note 34.

[100]As I explain below (infra text at notes 148-54), the great innovation of the UCC was precisely to argue that modern sales contracts could not be reduced to events.

away with one of the central bulwarks of consumer protection.

They try to distinguish blockchain and conventional consumer on-line contracts as follows:

> Bitcoin tokens are digital bearer instruments, functionally equivalent to cash, yet flexible and scalable in the manner of credit cards. A blockchain-based smart contract, like a cash transaction, therefore involves the complete exchange of value.[101]

In contrast, they claim, when one makes an on-line purchase using a credit card:

> I am in a position to prevent a complete transfer of value, because I can still ask Amazon for a refund, or dispute the charge with the credit card company. This is possible *because my contract with Amazon is executory*—I have traded the e-book for the promise to pay my credit card issuer. Imagining the same exchange with a smart contract, by contrast, it is as though when I click the buy button, a drone picks up a stack of one-dollar bills from my house and flies them to Amazon. The contract fully executes with no human intervention. I can still dispute the transaction with Amazon, but now the contract is fully executed. Amazon has the cash; I am now asking them to return the money, rather than preventing them from receiving it. (emphasis added)[102]

Their statements as to the law of cash sales, however, is misleading and as to the executory nature of credit-card sales is wrong.

Article 9 of the UCC sets forth the conveyancing rules for when a transferee of money takes free of only one subset of adverse claims, namely security interests. Otherwise the conveyancing of money is left to the vagaries of the common law which is surprisingly poorly worked out. Nevertheless, Werbach and Cornell are correct that, *in the absence of fraud*,[103] when a buyer transfers *physical* currency (i.e. bills and coins) to a seller in exchange for goods or services, in

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[101]Werbach & Cornell, supra note 3, at 349.

[102]Werbach & Cornell, supra note 3, at 349.

[103]This is not the case, however, if the seller has defrauded the buyer. In fraud, the buyer continues to have voidable title in the dollars with the right to replevy them. Although, the seller could transfer good title in the actual notes and coins to a good faith purchaser, under general principles

most circumstances the seller will be a good faith purchaser for value of the currency who receives it free and clear of any continuing ownership interest of the buyer. That is, the buyer loses her property interest in the dollar bills conveyed. If the buyer is dissatisfied with the underlying contract, she can sue for damages, but cannot replevy the money paid. This distinction is of the essence, of course, if the seller were to go bankrupt.

There is not yet a common law of the conveyancing of cryptocurrency. It does not constitute "money" for the purposes of the UCC.[104] Rather it is a "general intangible"[105]— the UCC's basket clause for any type of personal property that does not fall within its other enumerated categories (i.e. such as goods, accounts, instruments, etc.).

Article 9 currently treats physical money and general intangibles very differently. U.C.C. § 9-332(a) provides that a transferee of money takes free of a security interest in the money unless the transferee colludes with the debtor in order to defeat the rights of the secured party. U.C.C. § 9-332(b) contains a similar rule protecting transferees of funds out of a deposit account subject to a security interest—the empirically most common mode of payment in this country. Note, these rules are much broader than the common law as they apply to *transferees*, as well as purchasers, and to bad-faith transferees with knowledge of the adverse claims so long as they are not actively in cahoots with the transferor.

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of law, the buyer could replevy any traceable proceeds of the currency from the fraudster. For example, if the seller defrauded the buyer by delivering an empty box rather than a toaster in exchange for $100 in bills, the seller would have a property right to recover those specific dollar bills. If the seller takes those dollar bills and uses them to buy a blender from X, the buyer could not get back those dollar bills from X, but it does have a property right to take the blender away from seller.

[104]This is a completely distinct question as to whether cryptocurrency constitutes "money" for other purposes such as anti-money laundering, tax or securities laws.

[105]Although the statutory language is far from a model of clarity, read in context it is quite clear that the UCC's term "money" is limited to physical currency, and does not even cover the primary form that U.S. dollars are in fact held in this country—i.e. "deposit accounts" maintained at banks. I explain the UCC's treatment of money and cybercurrency in Schroeder, *Bitcoin*, supra note 81, at 19–29.

There is, however, no such exceptions for transferees, let alone good faith purchasers, of general intangibles. Article 9's failure to include a subsection to U.C.C. § 9-332 freeing up cybercurrency is a historical relic. Obviously, cybercurrency did not exist and could not have been anticipated by the drafters the last time NCCUSL proposed substantial amendments to Article 9. However, the import of this is that, once cybercurrency becomes subject to a security interest, cryptocurrency remains subject to the security interest no matter how many times it is transferred and re-transferred. As I have argued elsewhere,[106] despite the fact that the identities of the owners of cryptocurrency might be pseudonymous, one of the beauties of the blockchain is precisely that the chain of title is completely transparent. This means that a secured party may have the ability to trace and foreclose on cryptocurrency even in the "hands" of remote transferees. As such, current law could significantly negatively impact the ability to use cryptocurrency as a substitute for money or other conventional payment modes.

At this stage, absent legislation to answer this question, it is unknown whether in the context of claims *other than security interests* courts will adopt a common law good-faith purchaser rule for transferees of cryptocurrency by analogy to the common law of money, or whether they will look to Article 9 for guidance and find that transferees of cybercurrency take subject to adverse claims. For the limited purposes of this paper, I will assume *arguendo* that judges *will* treat cybercurrency like money in the sales context— that is, that good faith purchasers for value will take cybercurrency free of claims *other* than security interests.

The simplest form of sale is cash sale reflected in the default rule of U.C.C. § 2-507: unless the parties agree otherwise, the seller does not have to deliver the good until the buyer tenders payment and the buyer does not have to deliver the price until the seller tenders delivery of a *conforming* good. However, in Werbach and Cornell's hypothetical on-line sale, the parties have modified the default rule by agreeing that the buyer is to pay for goods with cybercurrency when she clicks "accepted" before delivery of the good,

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[106]Schroeder, *Bitcoin*, supra note 81, at 42–43.

but before the buyer has had the opportunity to inspect. This is not, however, correct with respect to credit card sales.

The typical arrangement between merchants and their acquiring bank for online credit card transactions (as opposed to "point-of-sale" or "POS" transactions) is that the customer's card will be charged, and the merchant account will be credited, not when the contract is entered into, but upon shipment of goods.[107] Nevertheless, they are correct, that the payment is often, if not usually, instituted before the buyer receives the goods. Nevertheless, to reiterate, the point in the last section, the buyer's acceptance of the *contract* is not acceptance of the underlying *good* itself. They buyer still has the right to inspect the goods for a reasonable time after receipt and is entitled to damages if she rightfully rejects for non-conformity.

Whether a buyer rejects a non-conforming good or accepts it while retaining its right to damages, Werbach and Cornell are incorrect in saying that the buyer can "ask . . . [the merchant] to return [all or part of] *the money*." As is the case in cash sales (or cybercurrency sales), absent fraud by the seller, the buyer in a credit card sale does *not* does not have a *property* interest in any funds it delivered to the seller giving it a right of replevy. Rather, absent fraud, the buyer has a mere *contract* right for contract damages *vis a vis* the seller.

If this seems like a distinction without a difference to the layperson, to a commercial lawyer the distinction is of the essence. If the seller were to go bankrupt, a claimant with a property right will be made whole. A contractual claimant, however, is only a general creditor who will probably only receive a small percentage of her claim, or nothing at all.

Moreover, as I shall explain in more detail, in the case of credit-card transactions, this is the case not merely because the common law good-faith-purchase law of money applies.

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[107]See, e.g. Visa's Card Acceptance Guidelines for Visa Merchants, 13, available at https://usa.visa.com/dam/VCOM/download/merchants/card-acc eptance-guidelines-for-merchants.pdf [hereinafter, Visa Guide]; American Express Merchant Operating Guide, United States, Including Puerto Rico & U.S. Virgin Islands Sec. 6.4.1 p. 39 (April 2019), available at https://icm. aexp-static.com/content/dam/gms/en_us/optblue/us-mog.pdf. [hereinafter, Amex Guide].

More importantly, it is because Werbach and Cornell do not internalize that, unlike a simple cash sale, a credit-card transaction is a three-party, not a two-party transaction. The consumer's rights of charge back spring not from any executory duty to perform a contract, but are granted by a consumer protection statute.

Werbach and Cornell's infelicitous language suggests that the difference between cash, debit card and smart contract sales on the one hand and credit card sales on the other is that the former are executed and the latter executory on the buyer's part. That is, they implicitly assume that in the credit card context the buyer does not complete its performance of the sales contract until the buyer pays her credit card bill—i.e. *after* delivery (and presumably inspection and acceptance) of the underlying good. This is incorrect.

Under contract law, the buyer has paid for the goods when the merchant's bank (in the parlance of the trade, the "applicant's bank") credited its account with the purchase price. As mentioned, in the case of on-line sales, this is typically done when the merchant ships the goods. Consequently, an on-line credit card sale is typically a *prepayment* of the purchase price to the merchant upon shipment but prior to delivery. The buyer's obligations *vis a vis* the merchant under the contract are executed, not executory, by the time delivery is made. The buyer has no property right in the funds transferred to the seller, and no right to ask for the seller to "refund" the money. Rather, under Article 2, if the goods are nonconforming, she has a contract right to damages.

What no doubt confuses Werbach and Cornell is that § 170 of the federal Truth in Lending Act ("TILA")[108] gives consumers who purchase goods and services using a credit card statutory rights *against the bank that issues her credit card*, and *not against* the merchant who sold her the goods or services over and above the rights she has against either the merchant or the bank under contract law. The credit card networks have responded to this by adding the notorious "charge-back" provision to their contracts with merchants. To understand TILA, we need to take a detour into the law of credit sales.

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[108]15 U.S.C.A. § 1666i.

Variation 1: Simple credit sale. B wants to buy a toaster from S for $100 but does not want to pay cash. S agrees that B can pay for the toaster 90 days after delivery. Upon delivery of the toaster, B inspects it and finds it defective. The defective toaster is worth $80. Upon appropriate notice to S, B can either reject the toaster and hold it for S to pick up, or she can accept it and maintain her right to damages for $20 (i.e. the difference between the value of a conforming toaster and the value of the toaster as delivered). B has a "claim in recoupment" against S. Under basic principles of commercial law, B does not have to pay S the entire $100 purchase price and then sue for the amount S owes it for breach. Rather, she can setoff the amount that S owes against the amount B owes. i.e. B now either owes nothing or only $80 depending on which remedy she elects.

Variation 2: Factoring. This time, although S has agreed to sell the toaster to B on credit, S has cash-flow concerns. Accordingly, S seeks financing from a bank, X. X will advance funds to S on the condition that S transfers an interest in S's rights against B—which the UCC calls an "account"[109] to X. X may either lend S money, or buy the account—either way, the right X acquires in B's obligation to S is an Article 9 security interest.

B inspects the toaster, finds that it is defective and only worth $80. UCC § 9-404(a)(1) provides the basic rule that X's rights in the account are no greater than S's. This means that, if the toaster is defective, B may assert the claim in recoupment she has against S against X. That is, B only owes X nothing or $80 depending on the remedy she elects.[110]

Variation 3: Third-party credit to buyer. This time, although B wants to buy on credit, S refuses to extend credit,

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[109]U.C.C. § 9-102(a)(2).

[110]U.C.C. § 9-403 provides an exception to this rule, if the account debtor agrees in writing that it will not assert defenses and claims in recoupment against an assignee of its account. If it does so, and if the secured party acquiring the account otherwise meets the conditions of U.C.C. § 9-403 (which parallel those of being a holder in due course of instruments), then the secured party takes free of claims and defenses That is, the account debtor must pay the secured party the face amount of the account and seek redress from the seller. U.C.C. § 9-403(e) notes that this exception may be subject to extra-Code consumer protection law.

insisting on cash. Consequently, B goes to a bank, Y. Y lends B $100. B in turn uses these funds to pay S for the toaster. For simplicity, but rather unrealistically, assume that Y hands B a crisp $100 bill, which B in turn hands over to S. If, as in the earlier variations of this hypothetical, B finds that the toaster is defective, she still has the right to reject or accept the toaster. Under the common law, however, (absent fraud) S takes the $100 purchase price from B free and clear of any *property* right in the payment of B. In the case of breach, B has a contract claim against S for damages. Most importantly, B has *no right* to assert this right to damages against Y as a claim in recoupment, because Y is a stranger to the contract between B and S. Consequently, B must repay Y in full and seek redress from S.

Variation 4a: Credit-card debt without TILA. Today, the more typical way for a consumer to obtain a loan to buy goods and services is to obtain a credit card, in this case issued by bank, Z. A credit card is a revolving credit facility pursuant to which the issuing bank agrees to make loans to the consumer for the purposes of purchasing goods and services when she and the merchant comply with the conditions and procedures that Z and the credit card network have established. When it lends under a credit card, however, the issuing bank does not transfer the loan proceeds directly to the cardholder-borrower. Rather, it remits the funds directly to the merchant from which the cardholder is purchasing goods and services.[111]

From the perspective of basic state contract and com-

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[111]The actual procedure is somewhat more complicated. There are five legal functions in a credit card transaction, 1) the buyer, called the customer, 2) the bank that issues the credit card, 3) the seller, called the merchant, 4) the bank through which the merchant maintains its credit card transactions, called the acquiring bank, and 5) the credit card network that communicates and settles transactions between the issuing and acquiring banks. As an empirical matter the issuing bank and the acquiring bank might be the same, but the legal relationships remain distinct. When a transaction is approved, the charge is posted to the customer's account and funds are transferred from the issuing bank to the acquiring bank (minus a fee charged by the issuing bank) and then to the merchant's account at the acquiring bank (minus a fee charged by the acquiring bank). The details of settlement do not concern us here. The largest credit-card network is operated by Visa, followed by MasterCard.

mercial law principles, Variation 4a is identical to Variation 3: It is as though Z hands a $100 bill to B, which B then turns over to S. B's obligation to pay S for the purchase price is final in the sense that S received these funds free and clear of any property claim by B. If the toaster is defective, B has a contract claim for damages against S. B cannot, however assert its claim for damages against Z as a claim in recoupment because Z. Consequently, under commercial law, B must pay Z the amount of her credit card loan in full, and seek redress against S.

Variation 4b: Credit-card transaction under TILA. TILA, however, gives B additional rights *if, and only if*, this is consumer credit card transaction. TILA § 170[112] grants a consumer-credit cardholder a *statutory* right to assert any defenses (claims in recoupment) she might have against the merchant (i.e. S) against her credit card lender (i.e. Z).[113] That is, in my continuing hypothetical, if the toaster is defective and B follows the procedures set out in TILA, she will only need to pay nothing or $80 *to Z* depending on the elected remedy.[114] Consequently, if the consumer-customer thinks she has a claim against the merchant, she contacts her issuing bank who must promptly reverse the charge on her account pending an investigation.

TILA does not set forth the relative rights of Z, the

American Express does not merely operate the network, it also performs the functions of both the issuing and acquiring bank.

[112] 15 U.S.C.A. § 1666(i).

[113] TILA § 170 provides: "[A] card issuer . . . shall be subject to all claims (other than tort claims) and defenses arising out of any transaction in which the credit card is used as a method of payment or extension of credit" . . . 15 U.S.C.A. § 1666(i). There are a number of conditions in the statute including the requirement that the transaction occur in the same state as, or within 100 miles of, the consumer's billing address. In fact, credit card issuers routinely waive this geographic restriction—perhaps in part because of uncertainty as to where online transactions are deemed to occur. American Express has handled numerous disputes for me with respect to transactions in many different states and countries.

[114] Under TILA § 162 the consumer has additional rights if the goods or services are never received at all or she has rejected them. These are considered "billing errors" which the issuer must delete from the customer's statement if the consumer follows certain procedures. 15 U.S.C.A. § 1666.

customer's bank, S and S's acquiring bank. This is left to contract. Pursuant to the standard contract, if a customer asserts her statutory rights against the issuing bank, the issuing bank will charge back the disputed amount against the acquiring bank which will, in turn, charge this amount back against the merchant.[115] The exact charge-back procedure followed by the credit card network and the banks do not concern us here.

Werbach and Cornell's confusion probably arises from the pro-consumer procedures that the credit card network and issuing banks have set up to effectuate this. When the consumer reports the dispute to the issuing bank, it typically reverses or suspends the disputed charge on the customer's account pending resolution of the dispute. If it determines the customer's claims are meritorious, the amount is permanently expunged from the account. If it is found not to be, the charge is reposted to the customer's account.

In other words, Werbach and Cornell are incorrect to assert that the customer's obligation to pay the merchant is executory and that the customer has a contractual right of charge back *against the merchant*. Rather, the customer has a *statutory* right to assert its claim to damages against its issuing bank, and the issuing bank has a *contractual* right of charge back against the merchants.

Why then do Werbach and Cornell mistakenly believe otherwise, i.e. that they have a right against Amazon? Because Amazon, and many other big internet merchants, by practice, usually act *as though* they do for two practical business reasons. First, particularly with respect to small purchases, it might be cheaper for the merchant to pay for the customer to return the good, then to dispute the matter.

Moreover, there is a widespread perception among merchants, accurate or not, that the credit card networks tend to support customers over merchants regardless of the merits of the claim. Consequently, there is an incentive for the merchant to treat the customer as though she had a right to charge back so that she does not pursue the more expensive statutory remedy.

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[115]See e.g. Amex Guide supra note 106, at §§ 11, 73–85.

Secondly, and more importantly, Amazon, like many other large merchants that deal with consumers have decided that it is excellent public relations to act as though their customers have rights beyond those established by either state or federal law. (It might also be cheaper to allow returns than to dispute, or even respond to, customer complaints.) It is not merely that these merchants will pay damages for nonconforming goods. Amazon, for example, generally permits free returns for any or no reason.[116] If it decides that a specific consumer has abused this privilege, it stops accepting her orders.[117] Because Amazon and other large on-line merchants have such great market power, smaller merchants often feel the competitive pressure to do the same.

This suggests that Fairfield is also somewhat incorrect to suggest that on-line merchants use their market power to force customers to accept warranty-free contracts.[118] Whether or not the terms and conditions disclaim warranties as a legal matter, as a *practical* matter they give better than a money-back guarantee for the average consumer.

We are now in the position, once again, to see why smart sales contracts require *more* not less trust than other sales contracts in the consumer context. Because a smart contract

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[116]See e.g. Amazon, About our Return Policies, available at https://www.amazon.com/GP/help/customer/display.html?nodeId=201819200.

[117]Kadeeja Safdar & Laura Stevens, Banned From Amazon: the Shoppers Who Make Too Many Returns, The Wall Street Journal, (May 22, 2018), available at https://www.wsj.com/articles/banned-from-amazon-the-shoppers-who-make-too-many-returns-1526981401.

[118]By coincidence, while I was procrastinating while typing the first draft of this paper, I opened a delivery by Sephora. This was the first time I had ordered on-line from it as it has three locations within a few blocks from my home and office. Much to my annoyance, it sent me the wrong color lipstick. Under Article 2, I clearly had the option to reject this nonconforming delivery. However, rather than raising my common law and TILA rights, much to my satisfaction, the package contained instructions as to how I could return the product free of all re-delivery charges for any or no reason. Moreover, it offered me free over-night delivery of a replacement. This was a sound business decision because, given my initial disappointment, without the offer I would probably have never placed another order.

would not be a credit card,[119] TILA would not apply. *Pace* Werbach and Cornell, the buyer has a right to pursue the seller for breach whether or not the transfer of the funds is "final." However, having a right to damages and being able to enforce it are two different things. This potential problem is exacerbated by the potential pseudonymity of the seller under a smart contract[120] and the fact that almost all on-line terms and conditions contain arbitration and waiver-of-class-action provisions.

Consequently, although a smart sales contract might be more attractive to a merchant, it is unclear as to why a buyer would be interested—unless the price offered under a smart contract were so much less than that offered under a conventional contract to compensate the buyer for the additional risk of non-conforming delivery.[121]

Of course, the vaunted pseudonymity offered by smart contracts would probably have little effect as a practical matter. As already stated,[122] Amazon and other online merchants have made the calculation that business reputa-

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[119]TILA § 103(l) defines a credit card as "any . . . credit device existing for the purpose of obtaining money, property, labor, or services on credit." 15 U.S.C.A. § 1602(l).

[120]In a conventional contract, the buyer will usually know the identity of its seller (absent fraud) and will know who to pursue if a delivered good is non-conforming. This right may be of questionable value in the case of a dishonest or insolvent seller, particularly if it is located in a foreign jurisdiction, but it is still exists.

Despite the common misperception, bitcoin transactions are not anonymous. They are pseudonymous in that parties are identified by a public key—very roughly analogous to an email address. Consequently, it is theoretically possible that the buyer will not know who to sue if non-conforming goods are delivered. I say "theoretically" because I assume from this that few sophisticated purchasers would agree to make payments through smart contracts unless they have actual knowledge of the identity of the seller. That is, it must have reason to trust the seller. In any event, at first blush, these examples may suggest reason why a merchant *seller* might be interested in entering into pseudonymous smart contract, but not why a buyer would want to, unless the items being purchased were illegal drugs or other contraband.

[121]Of course, there are consumers who pay for on-line purchases with debit cards which are not protected by TILA § 170. I presume that this seemingly irrational behavior is driven by ignorance.

[122]See supra text at notes 115–16.

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tion is extremely important—maybe even more so than for brick and mortar merchants since the buyer can't inspect the goods in the store. Consequently, not only do merchants treat customer's as though they have greater rights than the law grants, online customers are constantly barraged with requests to fill out customer service forms or to rate then on Yelp or other websites. We see a similar reliance on customer ratings in internet services that match purchasers of goods and services with strangers such as Uber, AirBnB, Angie's List, eBay, etc. Consequently, very few reputable on-line merchants could be expected to choose to remain anonymous.

C. Title

1. Personal Property. Fairfield and Lee propose that a blockchain be used to record title in *personal* property. In Lee's words "[s]mart contracts could be used for virtually anything that can be owned — tangible property like homes, cars, phones, and computers, and intangible property such as intellectual property rights could all be purchased using smart contracts."[123] This begs two questions i) because we *could* do so, is not an argument as to whether we would want to do; and ii) the fact that we purport to move legal title onto a blockchain, does not mean that it would have any legal implication absent legislation.

I argue that, in fact, a general personal property title recording system would be a step backwards for commercial law. Fairfield starts his article with the dubious empirical assertion that "The vast bulk of owned wealth is recorded in systems that tell users who owns what."[124] This is misleading with respect to personal property. Currently, we record ownership and leasehold interests in a small subset of personal property, such as motor vehicles at the state level,

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[123]Lee, supra note 5, at 14. Even in an otherwise extremely insightful article, that is otherwise skeptical of some of the more extreme claims for smart contracts, Abramowicz suggests that "what makes Bitcoin remarkable is that it settles the most controversial issue-who owns wealth-without need for a law enforcement apparatus. Bitcoin can be seen not just as a currency, but more grandly as an institution that creates and enforces property rights." Abramowicz, supra note 65, at 361. At least with respect to goods, determination of "ownership" (title) does not decide many if not most legal disputes.

[124]Fairfield, supra note 71, at 807.

and airplanes and airplane engine at the federal. What these objects have in common is that they are expensive, uniquely identifiable and have a long usable life so that they often pass through multiple hands. Being relatively identifiable, long-lived and valuable, they are particularly attractive to be used as collateral for secured financing. Registered property often tends to be potentially dangerous. The government has good reason to want to be able to identify the owner of a car seen speeding from an accident or a gun found at a crime scene.

In contrast, most tangible personalty is relatively inexpensive, fungible and short lived. When the original owners no longer want them, they are more likely to throw them away than resell them. As Article 9 recognizes, secured parties take pools, rather than individual items, of many types of personal property as collateral.

Certain claims with respect to certain categories of intangibles are also subject to recording regimes. To be generally enforceable, copyrights and trademarks must be filed with the federal government, and patents can only be issued by the federal government. What they have in common, other than being intangible, is that they are grants by the government that give the owner a limited monopoly over certain intellectual property. By definition, each patent, copyright, and trademark is unique and identifiable.

Certain types of investments—such as stock and publicly traded debt—are recorded *privately* on the books of the issuer.[125] This is for the practical reason that the issuer needs to be able to identify who is entitled to vote, and receive dividends and other distributions. Tax authorities also have an interest, particularly with respect to debt, in knowing who is the recipient of interest and other payments which is why bearer bonds issued by U.S. companies are now virtually unknown. However, as is the case with vehicles and intellectual property, investment securities are characterized by uniqueness and scarcity. That is, although each share of a security issued by an entity might have identical rights with

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[125]For example, Del. Gen. Corp. Law § 159 provides that transfer of common stock is governed by Article 8 as in effect in Delaware. Article 8, in turn, provides for registration of directly held securities on the books of the issuer.

every other security of the same class, the rights of each class will be unique and there will, at any given day, a limited number of securities of that class outstanding.

We do not, however, have a comprehensive property recording system for securities either at a governmental or public level. *Beneficial* ownership of securities frequently, if not usually differs from record ownership. For example, the majority of equity securities in this county are owned indirectly through brokers, banks and other intermediaries that are the record owners.[126] As a practical matter, under both Article 8 of the UCC and the federal securities laws, these indirect interests are typically recorded on the books of these financial intermediaries, but with some exceptions neither the issuer of the securities, the public or the government knows or cares about their identities.[127]

However, these are the exceptions that prove the rule. *Most* types of claims in most types of personal property, tangible and intangible, need not be recorded. In order to be enforceable generally against third parties, *security interests* in personal property are must subject to a notification *but*

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[126]Consequently, in 1984, Article 8 of the UCC, which governs investment securities, was radically amended better to reflect the prevalence of indirect ownership of securities through intermediaries. Now, only direct holdings of investments in the name of the investor are defined as "securities" (U.C.C. § 8-102(b)(15)). Investments held indirectly fall under a new definition of "securities entitlement." (U.C.C. § 8-102(b)(17)). I discuss this regime extensively in Is Article 8 Finally Ready This Time? The Radical Reform of Secured Lending on Wall Street, 1994 Calum. Bus. L. Rev. 291 (1994) and Schroeder, *Bitcoin*, supra note 81, at 47–55 (2016).

By far, the largest securities intermediary is DTCC, a subsidiary of the Depositary Trust and Clearing Corporation which is the record owner of more than 1.3 million active securities issues valued at US$54.2 trillion. http://www.dtcc.com/about/businesses-and-subsidiaries/dtc.

[127]A noted exception is that under the Williams Act, individuals or groups that acquire beneficial ownership of 5% or more of a class of publicly registered securities must give notice to the issuer of the securities and the SEC. 15 U.S.C.A. § 78m(d). Public companies must also disclose the beneficial ownership of their securities owned by directors, executive officers and 5% shareholders. 15 U.S.C.A. § 78m(d). Public companies must also disclose the beneficial ownership of their securities owned by directors, executive officers and 5% shareholders. 17 C.F.R. §§ 401, 403. But, importantly, these are mere disclosure provisions and do not constitute a legally recognized registration of ownership.

not a registration regime. This "notice filing" system is very different from recordation, in that is not necessary to specify specific items of property is covered. Moreover, perfection, by filing or otherwise, is *not* however necessary for the enforceability of security interests between the debtor and the secured party.[128] In addition, although filing is the only perfection formality permitted for some classes of collateral, such as accounts and general intangibles, other perfection formalities are available for some types of collateral. Indeed, sometimes filing is not even permitted.[129] Consequently, a general requirement for recording *ownership* of specific items of personalty on a blockchain or otherwise would be a radical change.

In his article *Bitproperty*, Fairfield proposes what he calls a theory of "property as information."[130] He claims that his way of thinking about property is superior to traditional approaches such as first-appropriator, personality, and economic efficiency theories of property.[131] I believe that Fairfield is incorrect from both a theoretical and empirical perspective. Indeed, he never discusses these alternatives directly which are variously explanatory, justificatory or descriptive in nature. However, in this paper, I will limit myself to a purely practical critique.

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[128]U.C.C. § 9-203, Although in most cases this agreement must be objectified in the sense that there must be a record containing a description of the collateral authenticated by the debtor (traditionally, this required a signed agreement, but the modern language contemplates electronic signatures), unlike perfection, attachment does not require a public record. Rather, its formality is, according to Official Comment 2, an "evidentiary requirement." Accordingly, depending on the type of collateral, physical possession or "control" are permitted alternatives.

[129]For example, first-generation original security interests in deposit accounts can *only* be perfected through "control." U.C.C. § 9-312(b)(1). The exception to this rule is provided by U.C.C. §§ 9-315(c) and (d)(2). Second-generation security interests in cash proceeds, including those in the form of deposit accounts, are automatically perfected and remain perfected if the security interest in the original collateral was perfected. For example, if the original, first-generation security interest was in inventory perfected by filing, then cash proceeds deposited in a deposit account would continue to be perfected by that filing.

[130]Fairfield, supra note 71.

[131]Fairfield, supra note 71, at 842–44.

Fairfield argues, as do others, that a blockchain provides a way of recording information about property claims that would be more secure and less ambiguous than traditional means.[132] Fairfield asserts that a "major use of the internet is the transfer of property interests," giving eBay and Amazon as examples.[133] By this he seems to mean that people, particularly consumers, do a lot of on-line shopping. This is true in the sense that the UCC defines a "sale" as "the passing of title from the seller to the buyer for a price."[134]

Fairfield suggests that these transfers could be done on a distributed ledger.[135] Unfortunately, the fact that we *could* record title on a blockchain does not help us decide the fundamental legal and jurisprudential issues concerning what intellectual property claims society *should* recognize.[136] Moreover, the fact that it might be possible to record prop-

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[132]Fairfield, supra note 71, at 808–08, 873–74.

[133]Fairfield, supra note 71, at 816.

[134]U.C.C. § 2-106(1).

[135]U.C.C. § 2-106(1) at 838–42, 869–70, and 873–74.

[136]For example, in Carpenter v. U.S., 484 U.S. 19, 108 S. Ct. 316, 98 L. Ed. 2d 275, 14 Media L. Rep. (BNA) 1853, 5 U.S.P.Q.2d 1059, Fed. Sec. L. Rep. (CCH) P 93423, R.I.C.O. Bus. Disp. Guide (CCH) P 6785 (1987) and U.S. v. O'Hagan, 521 U.S. 642, 117 S. Ct. 2199, 138 L. Ed. 2d 724, Fed. Sec. L. Rep. (CCH) P 99482, 191 A.L.R. Fed. 747 (1997), the Supreme Court adopted the misappropriation theory that analyzes material non-public information as property of the source of such information for the purposes of federal wire and securities fraud law, respectively. Nevertheless, courts and scholars in this and other contexts disagree as to whether society *should* decide to analyze trade secrets and other confidential information in terms of property law, as opposed to contract, tort or, perhaps, a hybrid or *sui generis* legal regime. Personally, although I have argued that trade secrets can be coherently analyzed in terms of property, I disagree with the Supreme Court's application in the misappropriation theory. Schroeder, Unnatural Rights: Hegel's Theory of Personality and Intellectual Property, 60 U. Miami L. Rev. 453 (2006).

On a related matter, Christopher Bradley suggests that, because we soon might be able to tag individual goods electronically, we should replace Article 9's perfection-by-filing regime. Bradley, supra note 70. Although my critique of this proposal is beyond the scope of this article, I basically believe that he elevates issues of technologically over jurisprudential policy. For example, primarily because of technological difficulties, he proposes doing away with automatic attachment and perfection of security interests in proceeds, thereby throwing out the baby of hundreds of years

erty claims on a blockchain does not shed any light on why we might want to do this in any specific situation.

Fairfield does not limit himself to special cases such as copyrights, cars, guns or even securities and, perhaps in the future, the fine arts. Nor does he limit himself to security interests where property disputes are potentially common. He argues, that property is information.[137] From this he draws what I believe is the non sequitur that, therefore, blockchain recording should be considered for all forms of personal property.[138] The reasoning seems to be that a blockchain has the possibility of being an effective way of conveying information.

I agree that information—publicity—is necessary for a property regime to function. It does not follow from this, however, that property *is* information, as Fairfield argues. Fairfield's approach conflates what Henry Smith has identified as means and ends[139] That is, making information about property available through recording may or may not be an appropriate means to achieve certain goals of property law.[140] One must, therefore, first identify what one believes the function of property is before one can decide if recording is appropriate or even useful.

For example, from the perspective of personality theory, information is directly relevant to only one of the three traditional elements of property.[141] This is possession understood as the identification of a specific object to a

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of the law of restitution with what he sees as the bathwater of inconvenience.

[137]Fairfield, supra note 71, at 811.

[138]Fairfield, supra note 71, at 873–73.

[139]Smith, Property as the Law of Things, 125 Harv. L. Rev.1691, 1698 (2012).

[140]Indeed, it might not be particularly practical in the context of a wide variety of material non-public information which would be constantly changing and not particularly subject to recordation—and certainly not for publicity.

[141]The other two being rights of use and alienation. As I explain elsewhere, I reject the "bundle of rights" analysis of property—i.e. that there is no core definition of property—that was fashionable among legal academics in the late-20th century. Following Hegel, I argue that the supposedly myriad rights supposedly identified by bundle-of-rights proponents

specific identifiable claimant which necessarily includes the exclusion of other claimants.[142] Other theories, such as economic efficiency (which Fairfield sometimes invokes) also agree that property claims should be knowable by other economic actors for practical reasons. From this perspective, information is neither property nor possession *per se*, but publicity (information) is necessary or useful for claims of possession to be effective, i.e. it is a means not an end. But even if one agrees that property interests should be publicized, it does not follow that recording, on a blockchain or otherwise, is the appropriate, let alone, best method to do so.

I also agree with Fairfield that much legal analysis is hampered by an implicit identification of the norm of property being ownership of tangible things and the related tendency to conflate the empirical fact of the *physical* possession with the *legal right* to possession.[143] Indeed, I think that it is unfortunate and potentially confusing that, although never expressly defined, read in context, the UCC uses the word "property" to mean not merely the legal right of property, but the object that the right[144] relates to and uses the term "possession" to mean physical custody of tangible things—goods, instruments, and money understood as coins and notes.[145] It does not follow from this, however, that physical custody of *tangible* things should be *irrelevant* to property disputes relating to tangible things—such as the sale of goods. *Physical* possession has traditionally been recognized as an effective means of publicizing one's claim to a good. It

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all, in fact, fall within the three traditional categories defined very broadly. Jeanne Lorraine Schroeder, *The Vestal and the Fasces: Hegel, Lacan, Property, and the Feminine* 37–52 (1998) (hereinafter, Schroeder, *Vestal*). Why this is analytically important is beyond the scope of this paper.

[142]The personality theory sees property as a means of establishing subjectivity of a person through recognition of her legal rights. Consequently, claims to possession require publicity to make them recognizable. Schroeder, *Vestal* at 38–45.

[143]This is one of the primary themes of my first book. Schroeder, *Vestal*, supra note 140.

[144]See for example " 'Collateral' means the property subject to a security interest . . ." U.C.C. § 9-102(a)(12).

[145]I set forth the UCC's use of the word "possession" in Schroeder, *Bitcoin*, supra note 81, at 23–26.

is can also be an effective way of exercising one's rights. For example, one cannot exercise one's right to use a good without first having physical possession. A secured party's physical possession of pledged goods traditionally protects it from unauthorized transfers by the debtor.[146]

To return to the analysis of the use of smart contracts to automatically execute sales contracts. Fairfield suggests that by registering title in goods, the blockchain could be used to automatically transfer title to a good.[147] This might be true, but as I have already shown in my discussion of sales contracts, it is almost entirely irrelevant. First, unlike real-property, most objects of personal property that are not currently subject to recording regimes are not unique, but fungible. This is particularly true of consumer goods bought on-line. That is, when a consumer orders a toaster from Amazon, she does not care whether she obtains legal title to any specific toaster. Rather, she wants to obtain physical custody of a toaster meeting the on-line catalogue description. Second following from this, unlike priority disputes between rival secured parties, most disputes between buyers and sellers are not property disputes. The buyer does not claim a specific toaster, she wants *a* toaster, or her money back. Third, to elaborate, the buyer wants not title to a toaster, but physical delivery of a conforming toaster so that she can use it,[148] or if she herself is a merchant, perhaps to resell it. Moreover, as discussed in previous sections, even physical custody is not

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[146] This why, after the notorious case of Tanbro Fabrics Corp. v. Deering Milliken, Inc., 35 A.D.2d 469, 318 N.Y.S.2d 764 (1st Dep't 1971), order aff'd, 29 N.Y.2d 690, 325 N.Y.S.2d 419, 274 N.E.2d 751 (1971) in which a non-possessory buyer was found to have taken goods free and clear of the security interest of a possessory secured party, the definition of "buyer in the ordinary course" was clarified by the addition of adding "Only a buyer who takes possession of goods or has a right to recover the goods from the seller under Article 2 may be a buyer in the ordinary course of business." U.C.C. § 1-201(b)(9).

[147] Fairfield, supra note 71, at 820, 826–27, 834–35.

[148] For example, in the Summer of 2017 I ordered eclipse glasses from Amazon in what I thought was plenty of time for the big event. They never arrived, although I was assured by the USPS's tracking service that they did. Much to amazement, without my asking (I was responsible for a typo in the delivery address), Amazon eventually reimbursed me when it somehow determined that they had, in fact, been mis-delivered.

sufficient, because the consumer needs the ability to inspect it to determine that it in fact conforms to the contract.

2. Title Under the UCC. Most importantly, Fairfield's (and Lee's) suggestion concerning the registration of title in goods generally would reverse the great achievement of Karl Llewellyn and his fellow realists in drafting what became Article 2 of the UCC. That is, it would be post-modern in the negative sense I identified at the start of this paper. It would merely replicate pre-modernity, albeit disguised in contemporary dressing.

Article 2 expressly rejects common law title analysis of the sale of goods. Note, this is not a rejection of "title" per se, as is sometimes said about Article 2. Title is just another word for ownership. The legal realists who drafted the UCC were thorough-going capitalists and not Poudhonian socialists who believe that property is theft. Notably, UCC § 2-106(a) defines a sale as "the passing of title from the seller to the buyer for a price" and Article 2 is replete with rules as to when title passes. Rather, Article 2 rejects the common law's attempt to resolve all or most contract disputes concerning the sales of goods by identifying which of competing claimants had "title" to the goods.[149]

I have explicated Llewellyn's theory extensively elsewhere[150] and will only summarize it here. Llewellyn believed that by overemphasizing the location of title, the common law incorrectly conflated all sales law with property law— i.e. rules of conveyance—when many issues are merely contractual in nature.[151] It is not that Llewellyn thought that common law judges applying title analysis *always* made bad decisions. Rather, it was that title analysis required judges to twist themselves into conceptual pretzels in order to obtain results that were pragmatic and intuitively satisfying

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[149]See infra text at note 154.

[150]Schroeder, *Vestal*, supra note 140, at 191–208; and Schroeder, Death and Transfiguration: The Myth That The U.C.C. "Killed" Property, 69 Temple L. Rev. 1281 (1996).

[151]For example, the common law purported to allocate the risk of casualty loss to a good in accordance to whom the sales contract designated as the title owner. In fact, the allocation should more appropriately be determined by which party is in the better position to prevent or protect against loss and, therefore, to buy insurance (or self-insure).

despite self-serving and often irrelevant contractual statements as the location of title.

More specifically, Llewellyn thought that common law "title" analysis implicitly assumed that the archetypal sale was, what he called, a "farmer's transaction,"[152] reflecting an outdated, pre-modern, agricultural economy. In a farmer's contract, a sale is an event. The buyer transfers cash and the seller transfers a good—a horse in Karl Llewellyn's continuing hypothetical—simultaneously. The sale would classically take place at a market which would be held a few times a year. The buyer would have the opportunity to literally look the horse in the mouth before the sale. The buyer would then manifest his acceptance of the horse by tendering payment. Consequently, when the parties shook hands, and the seller handed the reins to the buyer, the contract was fully performed by both parties and the buyer could ride off into the sunset on old Dobbin. The collapsing of all contract into executed "farmer's transaction" is the dream that smart contract enthusiasts wish to replicate.

That is, in a farmer's transaction, all incidence of a sale occurs simultaneously so that there is no delay between the time of contract creation and performance. There is no credit. There is no need to transport the good. Consequently, there is never any ambiguity as to who has title in the goods and who has what rights in the goods. The seller has both the fact and right of possession of the horse before, and the buyer has them after, the handover. There is no question as to who has risk of casualty loss. There is no question as to acceptance and rejection of the good because the buyer inspects the good before, not after, delivery. There are no issues of enforcement because the contract has been performed on both sides (absent fraud).[153] That is, the farmer's transaction (i.e. a cash sale) is indeed an executed contract.

In contrast, Llewellyn thought that the farmer's paradigm (sale as discrete event) was ill suited to what he thought the

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[152]Llewellyn, Across Sales on Horseback, 52 Harv. L. Rev. 725, 727 (1939).

[153]For example, there is always the possibility that old Dobbin was stolen property. The basic Anglo-American rule is that a true owner can replevy a good even from a good faith purchaser for value, in which case buyer would be left only with an *in personam* claim against the seller.

modern norm had become—a merchant's transaction in which the sale is a process that took place over time.[154] Article 2 does make a cash sale the default rule that applies *absent agreement to the contrary*,[155] in the understanding that merchants will almost always in fact agree otherwise as a practical matter. That is, the cash sale is the empirical exception, not the norm. Although Werbach and Cornell argue that a smart contract tries to treat an executory sales contract *as though* it were an executed on in that it makes certain aspects of performance automatic at the time the contract is entered into, the empirical and economic incidences of the contract continue to take place over time and space—that is, they remain executory processes.

Once one internalizes that the archetypical merchant's transaction is a process that takes over time, then the location of title is revealed to be unhelpful in deciding the many issues that can arise over the process. It is clear that the seller had "title" before the sales process began, and the buyer will have title when all aspects of the sale have been consummated, including transit of the good, final payment on credit, inspection, etc. But, between these two extremes the totality of the benefits and costs of ownership is divided between the two parties.

Consequently, Llewellyn argued that the law would be simpler and clearer if it jettisoned most of title analysis (and its agricultural imagery) and develop practical rules to deal directly with recurring issues. This is why, famously U.C.C. § 2-401 provides that:

> Each provision of this Article with regard to the rights, obligations and remedies of the seller, purchases or other third parties applies *irrespective of title* to the goods except where the provision refers to such title. (emphasis added).

Following what Llewellyn thought were good practical reasons, including the actual practices of merchants, many Article 2 rules depend in part on the location of physical custody. For example, U.C.C. § 2-401(2) continues:

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[154]Schroeder, *Vestal*, supra note 140, at 198–200; Llewellyn, supra note 151, at 730–31; Karl N. Llewellyn, Cases and Materials on the Law of Sales 220 (1930).

[155]U.C.C. §§ 2-507(1), 511(1).

> Unless otherwise explicitly agreed title passes to the buyer at the time and place at which the seller completed his performance with reference to the physical delivery of the goods, despite any reservation of a security interests . . .

To install a rule that registration of title on a ledger would govern most property interest in goods would be to regress back to the formalism of the common law that Karl Llewellen and the other realists who drafted the UCC wanted to supplant.

D. Intangibles

So far, I have concentrated on the sales of goods. However, I agree with Fairfield that it is misleading to think of goods as the archetypical object of property and contract law. If Llewellyn's modern mercantile paradigm replaced the common law's pre-modern agricultural one, perhaps it is due to be replaced by a truly post-modern digital one.

I do not speculate as to whether a blockchain would be a technologically superior means for delivering digital content than those currently available. However, it might be practical to create smart contracts for conveyancing *electronic* content that can be entered into a blockchain. Freed from the limitations of space that govern tangible property, the simultaneous exchange of value and intangible property online might be possible.

For example, Juliet Moringiello has suggested that the blockchain could solve practical problems with security interests in electronic chattel paper.[156] Although, security interests in chattel paper can be perfected by filing,[157] security interests perfected by filing are traditionally subordinate to certain second-in-time security interests perfected by possession. When Article 9 was amended to anticipate the use of electronic chattel paper, this principle was expanded

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[156] Juliet Moringiello, Electronic Issues in Secured Financing, in Research Handbook on Electronic Commerce Law 285, 293–95 (John A. Rothchild, ed. 2016). Chattel paper is a record evidencing both a monetary obligation and a property interest (such as a security interest or a leasehold) in a specific good. U.C.C. § 9-102(a)(11). A classic example would be the interests that a financing car dealership has against its customers.

[157] U.C.C. § 9-312(a).

to second-in-time priority to perfection by control.[158] However, control of electronic chattel paper required "a system employed for evidencing the transfer of interests in the chattel paper [that] reliably establishes the secured party as the person to which the chattel paper has assigned," a standard that could be met if there were "a single authoritative copy . . . which is unique, identifiable and [with certain exceptions] unalterable."[159] This, as Moringiello correctly notes, "import[s] a paper-world concept . . . into a world in which perfect copies could be made electronically."[160] In other words, Article 9's test was nonsensical at the time it was adopted.

However, blockchain technology, although not preventing copies of a chattel paper contract to be printed out, would make it possible to establish the type of ownership system that Article 9 anticipated, retroactively importing sense into the UCC.[161] Chattel paper is a pretty narrow category, and I would suggest, antiquated financial device. One can, however, imagine that in the future Article 9 could be amended by permitting super-priority perfection by control of other forms of electronic assets.

Fairfield argues that the blockchain could eliminate certain other problems he sees with current contracts for electronic content. For example, he bemoans the fact that a reader is merely the licensee, not the owner, of her e-books.[162] Infamously, because of copyright concerns, Amazon on at least one occasion deleted e-books from customers' devices that they had naively thought they had purchased.[163] He ascribes this to failures of the current intellectual property law regime. He suggests this could be solved through a

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[158]U.C.C. § 9-330(a), (b).

[159]U.C.C. § 9-105.

[160]Moringiello, supra note 155, at 293–94.

[161]Moringiello, supra note 155, at 294.

[162]Fairfield, supra note 71, at 839–40.

[163]The customers were, of course, reimbursed. Brad Stone, Amazon Erases Orwell Books From Kindle, The New York Times (7/18/2009), available at https://www.nytimes.com/2009/07/18/technology/companies/18amazon.htm. The irony that the two books that were the subject of this "Orwellian" action were George Orwell's *1984* and *Animal Farm* was not lost to commentators. Stone, Amazon, The New York Times (7/18/2009).

blockchain property registry that could enable Amazon and other merchants to sell and record the ownership right to read a specific e-book to a specific buyer.[164]

Sense suggests, however, that the proper question is not whether parties *could* enter into such smart contracts, but whether they would have an economic incentive to do so. *If* a customer's insecurity in access to her reading material (or music or video downloads) is really a problem, it is more one of relative market power than of technology or law. Content providers do not want to grant any greater rights in their content to their customers than they have to. Today, with no change in the law or the development of a blockchain registration system, the owners of the content of e-books could give their customers a close economic equivalent to ownership by granting them perpetual, unconditional, transferable, prepaid licenses.[165] It would take a change in the competitive environment, not technology or the law, for them to decide to do so.[166]

An object lesson might be taken from the recent history of recorded music. Until the turn of this century, music recordings were embodied in physical media—vinyl records, tapes, and then CD's—that were sold to users like books. The buyer was merely the licensee of the content so she was not permit-

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Of course, the fact that this event generated publicity suggests that it is a very rare occurrence — the exception that proves the rule.

[164]Fairfield, supra note 71, at 839–41.

[165]It is true that under current law there are circumstances where a perpetual license might not be equivalent to ownership.

[166]One set of authors assert:

The main distinction between granting a license and performing a sale is the actual and exclusive transfer of ownership of the copy of software. The problem with intangibles such as software is that, as per current international conventions, intangibles cannot be possessed, and thus, ownership cannot be sold in exchange for a price.

Greenbaum, Gelbart and Sheinberg, Digital Delivery of Physical Goods Shipping in the 3D Printing Era-Problems and Solutions, 41 Tul. Mar. L.J. 395, 412 (2017). Having specialized in technology transferring and licensing when I was in practice, I cannot even begin to fathom what these authors have in mind. Of course intangibles are sold and exchanged in the ordinary course. It is true that they, by definition, cannot be *physically* possessed (which is how the UCC implicitly, and confusingly, defines possession). But they can be possessed in the legal sense of being subject to an enforceable right to exclude another's use.

ted to copy it. However, as she was the owner of the physical record etc., under the first sale doctrine,[167] she could transfer the right to listen to the content by transferring or even lending the record to another person.

In the 2000's, led by iTunes, these media were largely, but not entirely, supplanted by downloads. The issue of rights *vis a vis* Apple and its customers with respect to music on their iPods parallel those between Amazon and its customers with respect to e-books on their Kindles—i.e. they were mere licensees, not owners of the downloaded music.[168] Currently, downloading of music is being supplanted by streaming services, where the listener has even lesser rights in her music. That is, rather than acquiring a permanent license in a song downloaded to a specific device, a consumer acquires the temporary right to listen to it on any device either by paying a monthly fee or submitting herself to advertisements. In other words, we seem to be moving further away from, not closer to, the ownership of digital content.

There has been a similar movement away from "sales" to subscriptions in the distribution of other intangibles such as software.[169] One of the practical issues of acquiring operating systems and other software is keeping them updated, rendering previous releases obsolete. Apple, Google, etc. have

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[167]17 U.S.C.A. § 109.

[168]In a reverse of the Amazon book deletion gaffe, Apple created a public relations debacle in 2014 when all iPhone owners found that a new album by U2 (unofficially the most pretentious rock group of all time) had been placed on their device. Moreover, it was initially impossible to delete it without also removing the ability to download new purchases on ITunes. After a week, Apple issued an apology and a custom deletion tool to expunge the intrusion. Yijith Assar, Apple's Devious U2 Album Giveaway is Even Worse Than Spam, wired (9/16/2014), available at https://www.wired.com/2014/09/apples-devious-u2-album-giveaway-even-worse-spam/.

[169]Probably the example most familiar to consumers is video streaming services like Netflix which has largely supplanted the business of selling and renting DVD's. See e.g. Tiffany Hsu, The World's Last Blockbusters Has No Plans to Close, The New York Times (March 16, 2019), available at https://www.nytimes.com/2019/03/06/business/last-blockbuster-store.html. Microsoft now offers its Office suite of software for both personal and business as a software as services subscription (https://www.office.com/). Apple's music as a service subscription platform, Apple Music, now supplements, but does not fully replace, its older iTunes music individual license purchase model. See Apple Previews macOS Catalina (June

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always permitted (or, forced) owners of phones and tablets to download new releases of their operating systems for free. More recently, rather than "selling" (i.e. granting a perpetual license) new releases of software, software developers are increasingly marketing month-to-month subscriptions, such those offered to businesses by Salesforce[170] and Adobe Cloud,[171] that automatically include upgrades. In other words, the market seems to be moving away from more permanent ownership type interests of end users, to more and more short-term temporary licensing. Or, perhaps, more accurately, rights to software is moving away from an implicit analogy of purchasing a good, to, in the current faddish terminology, "X as a service."[172] Once again, blockchain technology might prove to be an efficient way of managing subscriptions, but the technology alone is unlikely to drive the business model.

Now I that I have allowed sense to criticize Fairfield, I will indulge him with little sensibility. A well-known problem with internet commerce is how to "monetize" content. For most websites, the alternatives are either advertisements—which consumers find annoying and try to avoid with adblocking software—or monthly subscriptions. It is, however, expensive to subscribe for premium services for very many websites. It is likely that we are about to face a similar issue with video streaming services. Multiple "cafeteria-style" streaming services arguably give consumers more choices, but the evolving market may at least in the

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3, 2019), available at https://www.apple.com/newsroom/2019/06/apple-prev iews-macos-catalina.

[170]Salesforce Master Subscription Agreement, http://www.salesforce.co m/assets/pdf/misc/salesforce_MSA.pdf.

[171]Adobe Creative Cloud Pricing and Membership Plans, https://www. adobe.com/creativecloud/plans.html. The large cloud computing services, such as Amazon Web Services, help their customers to create and maintain their businesses on a SaaS model. https://aws.amazon.com/partners/saas-o n-aws/.

[172]See Adam Rubin, The Subscription Economy (unpublished paper 2017 in possession with author). Indeed, some businesses are offering access to goods on a subscription basis. Tien Tzuo & Gabe Weisert, Subscribed (2018).

short to intermediate term become too expensive, with different services cannibalizing each other.[173]

This may be where cryptocurrency, blockchain technology and, indeed, smart contracts may have a role to play. The success of iTunes showed that consumers are willing to pay for content if they believe that the price is fair. However, a consumer may not be willing to pay for a monthly subscription for an entire magazine service when she only wants to read one article on one day, to subscribe for premium YouTube service when she only wants to watch one video or to subscribe to be a patron to numerous Patreon creators when she only wants to browse content. She might, however, be willing to pay a fraction of a cent to do so.[174]

These micro-payments and licenses are impractically expensive using conventional payment technology—the interchange (colloquially the "swipe") fee charged on a credit or debit card would be greater than the charge itself. At most, a payment system might be able to "run a tab" and transfer value to the content provider when it cumulated above an amount that would justify the fee.

As of the time I am writing this paper, bitcoin transactions have become both slow and expensive. The one widely publicized debut of a service to sell downloads through a smart contract under which a customer would be able to listen to a song in exchange for a micropayment, which the contract would then automatically distribute to the talent and the producer was hardly auspicious—grossing only $133.20.[175] However, it arguably showed that such arrangements might be technologically possible, if not yet practical. It is widely assumed that blockchain technology will eventually be "scaled up" to make micro-transactions practicable. If and when this happens, it does present the major changes in

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[173]For a discussion of the heated competition among video streaming subscription services see Jonah Weiner, The Great Race to Rule Streaming TV, The New York Times Magazine (July 14, 2019), available at http s://www.nytimes.com/2019/07/10/magazine/streaming-race-netflix-hbo-hul u-amazon.html.

[174]DeFilippi & Wright, supra note 2, at 76.

[175]As blockchain skeptic Gerard notes, the venture "literally got more press articles than sales" and was ended in 2016. Gerard, supra note 16, at 130.

electronic commerce, although sense reminds me that we probably cannot predict what these might be.

IV. Smart Security Agreements

A. Repossession

Another of the proposed uses for smart contracts is self-enforcing security interests. Lee asserts:

> This could easily be implemented with car purchases. A car could contain code that is tied to the smart contract. If the borrower becomes late on a car payment, the parties could agree on a code that would forbid the keys from opening the car until the default is cured. If it gets to the point where the lender needs to repossess the car, the code could automatically provide that the lenders keys could open the door in that situation. *Finally, when the final payment is made, the smart contract could provide that the lender no longer has any legal rights to the car, and the borrower has full rights.*[176] (emphasis added)

Proponents of smart security agreements typically cite with approval this legally dubious current practice of remote shut-off switches in cars as a prototype for a self-enforcing security interest.[177] Unfortunately, sense shows that this example reveals that the writers have a fundamental misunderstanding of both the law and practice of secured transactions. Indeed, this example illustrates the impracticality of smart security agreements. As is the case of the

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[176]Lee, supra note 5, at 114.

[177]See e.g. Raskin, supra note 1, at 319; Werbach & Cornell, supra note 3 at 182; Lee, supra note 5, at 14; O'Shields, supra note 4, at 182; Mik, supra note 14 at 10; Fenwick, *et al*, supra note 6, at 15. Werbach and Cornell criticize Raskin's analysis "The starter interrupter is a mechanism introduced, after an agreement is reached, to enforce its terms; but, unlike smart contracts, this mechanism has nothing to do with the substance of the agreement. By contrast, a smart contract literally contains the terms of the agreement, transformed into machine-readable scripting code." Werbach & Cornell, supra note 3, at 347. I think that this is an unfair reading of Raskin.

Surprisingly, even Karen Levy, who in her excellent article otherwise takes a skeptical view towards the possibility that most contracts should or could be made self-executing in the way that proponents suggest, cites automatic ignition shutoff as an (unfortunate) exception. Levy, Book-Smart, Not Street-Smart: Blockchain-Based Smart Contracts and The Workings of Law, 3 Engaging Sc., Tech., and Soc'y 1, 11 (2017).

recurring example of the vending machine, it is extremely misleading and has unfortunately distorted the discussion in the literature.

First, to go back to Mik's point, we must distinguish between performance, execution and enforcement of contracts. To do this, we must understand the positive law of secured lending, the remedies under Article 9 of the UCC and the limitations imposed by bankruptcy law as well as the business considerations involved. We will see that it is probably not possible—or desirable—to make most security interests self-enforcing with two potential exceptions—a security interest in a demand deposit and a security interest in financial assets held in securities accounts.

Second, we must consider the business and economic reality of secured lending. Although there is no way to verify this empirically, based on my experience, I believe that secured parties would rarely want their security interests to "enforce" themselves automatically. Interestingly, the most important exceptions to this generalization are margin loans, where the secured party's discretion is limited by federal regulation—is also one that can be made largely, if not perfectly, self-enforcing.

The rub, however, is that these exceptions are precisely those that are almost effortlessly enforceable by secured parties using current technology. Consequently, although blockchain technology might make these transactions slightly more efficient, it is unclear what, if any advantage, a smart contract would have over current practice.

Let us look at the recurring example of automobile ignition cut-off devices.

Today some car financers install devices in motor vehicles that enable a creditor or lessor to remotely disable it. As we move into the "internet of things" presumably more and more equipment (and consumer goods) will become susceptible to remote disablement. Although not free from question in the case of consumer transactions, this might be permissible under the UCC with merchant debtors.

U.C.C. § 6-609 expressly provides for disablement in only one circumstance:

(a)   after default a secured party:

    (1) may take possession of the collateral: and

> (2) without removal, *may render equipment unusable*
> and dispose of collateral on a debtor's premises under
> Section 9-610. (emphasis added)

"Equipment" is defined in U.C.C. § 9-102(a)(33) as "goods other than inventory, farm products, or consumer goods." An automobile or other motor vehicle held for business would be equipment. However, if it is "used or bought for use primarily for personal, family, or household purposes" it would be a "consumer good" under U.C.C. § 9-102(a)(23), so the provisions expressly permitting rendering equipment unusable would not apply. The question is whether the express reference to disablement in U.C.C. § 9-609(a)(2) should be read as implying by negative pregnant that disablement is an alternate to, rather than a type of, repossession permitted by U.C.C. § 9-609(a)(1)? Alternately, should this provision be read as merely clarifying that disablement is a permitted form of repossession in the case of equipment, leaving the question as to when it is appropriate for other categories of goods to the courts?

Three states, California, Colorado and Connecticut have adopted statutes authorizing, but limiting, remote disablement of cars.[178] Moringiello notes that the Connecticut and Colorado statutes, which are non-uniform amendments to U.C.C. § 9-609, seem implicitly to adopt different interpretations of this provision. Connecticut, by expressly referring to consumer-owned cars, without amending subsection (a)(2) seems to assume that disablement *is* a form of repossession under subsection (a)(1).[179] Colorado, in contract, adds a new subsection to UCC § 9-609 referring expressly to motor vehicles suggesting that it believes that it is *not* a form of repossession under subsection (a)(1).[180]

Moringiello further suggests that other states may or may not allow disablement of consumer-owned cars under "general principles guiding the exercise of self-help

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[178] Cal. Civ. Code § 2983.37; Colo. Rev. Stat. § 4-9-609(e), (g); Conn. Gen. Stat. § 42a-9-609(d). Moringiello, supra note 155, at 297–98.

[179] Moringiello, supra note 155, at 298.

[180] Moringiello, supra note 155, at 298–99.

repossession."[181] If so, the issue would become if and when disablement would constitute a prohibited breach of the peace because of the possibility of injury (concerns of the Colorado and Connecticut statutes).[182] Although she seems to conclude that, by analogy to caselaw in other contexts, remote disablement of cars, at least on a public street, would probably not be prohibited, this is less clear with respect to the remote disablement of other smart consumer goods located within the home because the common law of self-help has considered the home to be sacred.[183] She notes that the unloved proposed Uniform Computer Information Transactions Act, which was only adopted by two states and is not expected to be introduced into any others, banned remote disablement of any software as self-help.[184]

Nevertheless, for the limited purposes of this paper, I will assume that the courts would permit the remote disablement of automobiles that constitute consumer goods (as a form of repossession) as well as equipment so long as some obvious limitations for public safety (for example, one should not be able to disable a car that is operating).

However, repossession (and disablement) is neither performance of the secured obligation nor is it the same thing as enforcement of a security interest. First and foremost, one must remember that an economically rational secured party is not interested in enforcing its security interest, *per se*, let alone in repossessing collateral. Rather it wants to receive payments with respect to its secured obligation. The threat of enforcement is, of course, one way of incentivizing an obligor to pay.[185] However, as discussed below,[186] there may be circumstances where the secured creditor may rationally

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[181]Moringiello, supra note 155, at 299.

[182]Moringiello, supra note 155, at 298–302.

[183]Moringiello, supra note 155, 301–02.

[184]Moringiello, supra note 155, at 302–03.

[185]Under the idiosyncratic terminology of the most recent version of Article 9, a "debtor" is defined not as the person owing a debt but as the person who has "an interest, other than a security interest or other lien, in the collateral, whether or not the person is the obligor." U.C.C. § 102(a)(28).

[186]See infra text at notes 241–46.

decide that it would be *less*, not more, likely to be paid if it enforces its security interest then if it allows the debtor to use the collateral.

Raskin suggests an (I hope facetious) example of automatic enforcement: "if an individual . . . were to install a device in his brain that would cause crippling pain if . . . [he breached a smart contract] there is a case that the contract is in a stronger sense self-enforcing."[187] Of course, this such a contract would also be illegal, and would no doubt be void as against public policy. Moreover, it is *not* really self-enforcing in the sense usually meant in the smart contract literature because it does not *guarantee* performance *ex ante*—i.e. it is *possible*, albeit painful, for the debtor to breach. It is a threat of punishment for non-performance that serves as a very strong incentive for performance—rather like a loan shark's threat to knee cap a borrower that doesn't make her vig.

But, we don't need to rely on criminal law or a court's ability to invoke public policy to test the limits of smart contracting. U.C.C. Article 9, which governs all secured transactions in personal property regardless of its form sets forth an exclusive set of permissive remedies for non-performance. Physical harassment is not one of them.

Consequently, smart security agreements would be limited to the remedies and subject to the procedures set forth in Article 9 Part 6. Moreover, in the not-unlikely case that a defaulting debtor is also bankrupt, they are subject to the Bankruptcy Code. As is also the case with Article 2 sales law, Article 9 remedies are designed to be compensatory for the non-breaching party not punitive for the breaching party. In the case of a security interest that secures an obligation, Part 6 of Article 9 only permits the secured party to use the collateral in certain commercial reasonable ways in order to raise money to pay the secured obligation.[188]

Although, under U.C.C. § 9-603, the debtor and secured party may contractually agree to standards to govern their behavior, they cannot be "manifestly unreasonable." More-

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[187]Raskin, supra note 1, at 311.

[188]In this section I am only discussing security interests that are assignments of collateral to secure the payment or performance of an obligation. See infra text at note 196.

over, under U.C.C. § 9-602, some debtor rights and secured party obligations—including those governing disposition—cannot be waived. The disposition is subject to a number of conditions, including notice to the debtor, secondary obligors and junior secured creditors and lienees, and the right of those parties to redeem the collateral.

The basic remedy for collateral that is a good, such as an automobile, is not foreclosure but commercially reasonable disposition under U.C.C. § 9-610—with foreclosure being a preliminary step in this process. After disposition, the secured party must account to the debtor for any surplus remaining after application of foreclosure proceeds under U.C.C. § 9-615, first, the expenses of collection (most importantly legal and often a sheriff's fees), second, satisfaction of the secured obligation and third, satisfaction of any junior secured obligation or lien. Any leftover proceeds belong to the debtor.

U.C.C. § 9-620 contemplates an alternate remedy of strict foreclosure—the retention of the collateral as satisfaction or all or part of the secured obligation. Strict foreclosure is, unfortunately for the proponents of smart security agreements, disfavored and *cannot* be proposed to the debtor until *after* default of the secured obligation. That is, it is permitted only as part of a negotiated settlement.

One reason for this should be obvious after a little thought. An insolvent debtor may not care about maximizing the value of his equity in the collateral because it will just go to his other creditors. Consequently, he may be willing to agree to walk away from the transaction. Junior secured creditors, secondary obligors, lien creditors and unsecured creditors, however, do want to maximize debtor equity, so we give the debtor's bankruptcy trustee the right to insist on a sale.

More importantly for the automobile example, U.C.C. § 9-620(e) *completely prohibits* strict foreclosure of security interests in consumer goods if

(1) 60 percent of the cash price has been paid in the case of a purchase-money security interest . . .; or

(2) 60 percent of the secured obligation has been paid in the case of a non-purchase security interest . . .

Another complication is that, even if the 60% limitation of U.C.C. § 620(e) does not apply, U.C.C. § 620(a)(3) permits

strict foreclosure of security interests in consumer goods only if they are "not in the possession of the debtor when the debtor consents to the acceptance." As I have shown elsewhere,[189] although the U.C.C. never defines the word "possession" if the over one hundred times it uses the word are read in context it becomes apparent that it means not the legal right of possession, or even practical control over an object, but the empirical fact of physical possession in the layperson's understanding of the term. Consequently, a secured party cannot strictly foreclose on a disabled automobile that is still within the consumer debtor's possession, but must hold a foreclosure sale.

In other words, repossession of tangible collateral is neither performance of the secured obligation not itself enforcement of a security interest—it is only a preliminary step towards enforcement. It would be unlawful to have a debtor enter into a "smart" security agreement that would allow the secured party to disable the collateral and terminate the debtor's ownership interest—as Lee suggests—because a debtor may not pre-commit itself to a strict foreclosure in a security agreement.

It is not clear whether all of the steps for a commercially reasonable sale of most collateral could effectively be programmed into a smart security agreement given current technology. As noted in the language quoted above,[190] we currently have the technology that would give a secured party the ability to unlock and drive a car away—indeed, if self-driving cars actually become the norm, the car might be able to drive itself to the secured party. But this is nothing new in concept. The repo man has long been a fixture in American life. But, this is a feature that is probably unique to cars and other motor vehicles.

Other forms of equipment that could be foreclosed through disablement would not be so easily movable. Indeed, as Official Comment 6 to U.C.C. § 9-609(a)(2) notes, the very justification of repossession through disablement is that "[i]n the case of some collateral, such as heavy equipment, the

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[189]Schroeder, *Bitcoin*, supra note 81, at 23–27.

[190]See supra text at note 175. Indeed, this is how car "sharing" services like Zipcar works.

physical removal from the debtor's plant and the storage of the collateral pending disposition may be impractical or unduly expensive." Moreover, one must remember that although a secured party may enter a debtor's property to repossess its property, in doing so, it cannot breach the peace. This is why, as a practical matter, a secured party may need to obtain the services of a sheriff to repossess or sell the collateral.[191]

Let us look at the foreclosure sale procedures. Before a sale, the secured part must give reasonable notice not only to the debtor but to secondary obligors and certain other secured parties and lien holders claiming an interest in the collateral (U.C.C. § 9-611). If the collateral is of a type that is perfected by filing, and assuming that the relevant state has a computer searchable filing system,[192] the contract could consult an electronic oracle that would search the UCC filings to determine to whom other notices need be sent and arrange to send the notice. However, this raises another problem.

Currently, UCC filings are done on a state-by-state basis. If the collateral is of a sort that can be perfected by filing, the place for filing with respect to most types of collateral[193] is the state of the debtor's location. U.C.C. § 9-307 governs the location of the debtor, which varies by the type of debtor. The basic rules are that individuals are located at their principle residence, registered organizations (i.e. corporations, limited liability companies, limited partnerships, etc.)

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[191]U.C.C. § 9-609(a)(2) expressly permits the disposal of disabled equipment "on a debtor's premises." This is, however, subject to the general requirement of U.C.C. § 9-610(b) that "[e]very aspect of a disposition of collateral, including the method, manner, time, place and other terms, must be commercial reasonable."

[192]Under current practice, this will vary state by state. For example, although one can do an on-line search in New York, the website contains a disclaimer that it is maintained by a contractor and that, although the data from the state, it does not constitute the official state record. New York Department of State, Division of Corporations State Records & UCC, available at https://appext20.dos.ny.gov/pls/ucc_public/web_search.main_fr ame.

[193]U.C.C. § 9-301(1). There are exceptions. For example, the law of filing for fixtures, timber and as-extracted collateral (i.e. minerals, oil, gas, etc.) is governed by their physical location. U.C.C. § 9-301(c)(4).

are located in their states of organization and other organizations (such as general partnerships) are located at their chief executive office. What if the debtor changes location? If it does so, the search of the debtor's original location will not be accurate. Moreover, change of location can cause the perfection of the security interest to lapse. Although perfection is not necessary for the enforcement of an attached security interest outside of bankruptcy, an unperfected security interest will be subordinated to a rival perfected security interest, and to other liens that attach after lapse perfection.[194] Moreover, an unperfected security interested will fall to the strong arm power of Bankruptcy Act § 544(a)(1) should the debtor go bankrupt. In other words, at the time the smart security agreement "automatically" enforces the security interest, the secured party may not have the legal right to do so. Under current practice there is no way to completely automate this. At most, the debtor might covenant to give the contract notice should it change its location, but if it fails to do so, there is no way for the contract to autonomously discover the correct location.

Of course, this problem would be obviated if the UCC were to be amended to provide for a national filing system. This will almost certainly not happen in the foreseeable future for a very practical reason—state by state filing results in significant income from filing fees. I have suggested elsewhere[195] that blockchain technology might, however, be able to ameliorate this problem. Under the UCC there is no reason why a state cannot delegate the task of maintaining its UCC filings to a contractor and no legal reason why these files could not be maintained on a blockchain. A single contractor could, then, maintain the records for a consortium of states (or, eventually, all states and other U.S. jurisdictions that have adopted the UCC). The contractor could (perhaps through a smart contract) collect the relevant filing fees and remit them to the appropriate jurisdiction. This could enable a single nationwide filing search. This would not eliminate the problem of lapse of perfection upon change in jurisdic-

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[194]The priority rules for lapsed security interest vis a vis other security interests and liens that attached prior to the lapse are complex and beyond the scope of this paper.

[195]Schroeder, *Bitcoin*, supra note 81, at 46–47.

tion (because a dishonest or negligent debtor might still fail to inform the secured party or the contact of the change), however, if a second-in-time third party were to file a financing statement in the new location, this would show up in the search.

Nor would it work in the case of a security interest in an automobile used by the debtor because perfection of motor vehicles is not accomplished by filing a financing statement with the a state's UCC filings, but by complying with the procedures of a state division of motor vehicles.[196] Luckily, all bankruptcy petitions can be located on-line through the U.S. government PACER (Public Access to Court Electronic Records) system that an electronic oracle could search. Presumably, the contract would have to be programmed to not commence a foreclosure sale if it discovered anomalous UCC or bankruptcy filings.

Another factor that would prevent a completely automated security agreement is that, under U.C.C. § 9-613 the notice sent to the debtor and other parties must state the time and place of the foreclosure sale. This information would have to be entered into the contract after the loan is called and the collateral repossessed. Although U.C.C. § 9-624 provides that any of these parties can waive this notice, this can only be done by an agreement entered into *after* a default in the secured obligation. Consequently, it is not clear what advantage a smart contract would have over conventional contracts.

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[196]There are certain other types of collateral where perfection by filing is not accomplished by centralized filings that are even more problematic. For example, security interests in fixtures are filed in the place for the registering of real estate interests where the building is located—a notoriously local and paper-based system. U.C.C. § 9-501(a)(1).

There are other exceptions U.C.C. § 9-109(c) proves that Article 9 does not apply to "to *the extent* that (1) a statute, regulation, or treaty of the United States preempts this article" (emphasis added). Federal regulation provides that all property interests (including security interests and leases) in airplanes and airplane engines must be recorded with the Federal Aviation Administration. 14 C.F.R. Pt. 45, 47, 49. As the regulations do not set forth a substantive rule of security interests in aircraft, the result is that Article 9 applies, but perfection is accomplished by filing with the FAA. Schroeder & Carlson, Airplanes in Bankruptcy, 4 J. Bankr. L. & Prac. 203 (1994).

One more complication with the foreclosure of consumer goods is that U.C.C. § 9-614 requires the notice to the debtor include a telephone number that would enable her to receive information concerning her right or redemption and a telephone number or mailing addresses to enable her to receive other information. Programming the contract to include this information in the notice would presumably not be problematic. But, the smart security agreement could not perform the secured party's duties completely autonomously because this language, while it does not strictly mandate, implies that the secured party must supply a human being to communicate with the consumer-debtor.

Sensibility suggests that, although it is not the case now, one can anticipate commercially reasonable electronic foreclosure auctions of collateral like motor vehicles could develop in the not too distant future. Indeed, on-line auctions have become common in other contexts. Consequently, after an oracle determines that the notice requirements of Article 9 have been met and that a bankruptcy petition has not been filed, the contract could automatically put a vehicle up for sale in an on-line auction and transfer the ability to drive the car to the highest bidder who would transfer value to the smart contract (assuming that on-line auctions will eventually be deemed commercially reasonable). If the collateral is a car or other motor vehicle that is subject to registration there is, of course, the necessity that the secured party be able to transfer title to the person who wins the auction. The problem, of course, is that currently, title is registered with the appropriate state division of motor vehicles and security interests and other liens are noted on a *physical* certificate of registration that would have to be physically delivered to the buyer along with the necessary documentation that would enable it to have the care re-registered in its name with prior liens expunged. Although one might imagine that this system will eventually be digitized, this is not yet the case. Consequently, this part of foreclosure cannot yet be fully automated.

Once again, the contract would have to be a little more complex in order to fully execute a foreclosure. Pursuant to UCC § 9-623, any time prior to the disposition in the foreclosure sale, "(a) A debtor, any secondary obligor or another secured party or lienholder may redeem the collateral" (b) by

tendering "(1) fulfillment of all obligations secured by the collateral; and (2) . . . reasonable expenses and attorney's fees . . ." A procedure could be no doubt programmed into the contract that would stop the sale if one of the parties were to exercise its right of redemption. However, under current law this procedure could not be entirely automated, because, even though Official Comment 2 does clarify that this tender requires "payment in full of all monetary obligations," a secured party could not require that this tender be made electronically in cybercurrency through the contract. Consequently, human input such as oracle, or more likely, a sheriff would be needed to handle the redemption.

Once the sale is consummated, presumably the sales proceeds could be converted into cybercurrency that could be deposited into the contract, upon which the contract could automatically distribute the sales proceeds in accordance with Article 9. According to U.C.C. § 9-615, proceeds must go first towards the expenses of enforcement including sheriff's and attorney's fees, payment the secured obligation, satisfactions of obligations secured by junior security interests and liens and finally, if there is any balance, to the debtor. Although the amount of the secured obligation (including interest through the day of sale) could be calculated by the contract itself, the amounts owed to the sheriff, the lawyer, other secured parties, etc. would have to be calculated by a third party oracle and entered into the contract at that time. Once again, smart contracts might or might not make parts of this procedure slightly more efficient but could not result in a significant change in current practice. In fact, my sense is that the use of a smart contract is likely to complicate, rather than simplify, the procedure.

A final fly of in the ointment of sensibility, of course, is the possibility that the debtor goes bankrupt. I will consider this possibility and smart contracts shortly.

B. Accounts and Other Rights of Payment

Sense suggests that smart security agreements covering collateral that consists of rights of payment may be able to make enforcement somewhat more efficient, but would also probably not be a game changer. In addition to assignments for security for any type of right of payment, Article 9 also governs the outright sale of accounts, chattel paper, payment

intangibles (a subset of general intangibles) and promissory notes.[197] U.C.C. § 9-102(a)(3) defines the persons owing money under accounts, chattel paper and general intangibles (but not promissory notes) as "account debtors." To oversimplify, there are two basic types of secured financing using rights of payment (although hybrids combining aspects of both are possible)—notification financing and non-notification financing. Under notification financing, the secured party notifies the account debtor of the security interest and the account debtor pays its obligation directly to the secured party. As its name suggests, in non-notification financing, the account debtor is not so notified and makes payments to its obligee (confusingly called the debtor).[198]

The secured party can initiate enforcement of non-notification security interests by making them into notification security interests. That is, U.C.C. § 9-607 provides:

(a) . . . after default, a secured party:

(1) may notify an account debtor or other person obligated on collateral to make payment or otherwise render performance to or for the benefit of the secured party;

Presumably, contact information for the account debtors could be entered into the contract and, if the debtor failed to make a timely payment, the contract could then automatically send out such notices. (I'm assuming here, that electronic notice would eventually be considered commercially reasonable).

The smart security agreement could not, however, be entirely autonomous. Security interests in accounts, general intangibles and chattel paper are often made as part of a revolving credit arrangement. That is, the secured party will

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[197]U.C.C. § 9-109(a)(3). Note, sales of other certain other rights of payment, such as letter-of-credit rights are not governed by Article 9.

[198]One of the most important differences between notification and non-notification financing is that (unless the "account debtor has made an enforceable agreement not to assert defenses or claims") the assignee-secured party is subject to all defenses and claims in recoupment that the account debtor may have against the debtor arising from the transaction giving rise to the assigned transaction, but only subject to other defenses that accrued before notification. U.C.C. § 9-404(a). In other words, account debtors may setoff extra-contractual claims against non-notification secured parties but not against notification secured parties.

agree to advance funds to the debtor from time to time up to a percentage of a borrowing base of qualified collateral. When account debtors pay (or default on) their obligations so that they are no longer outstanding or qualify for the borrowing base, the debtor needs either to assign new collateral to the secured party to replenish the borrowing base or pay down the secured obligation in an amount to re-establish the percentage. Consequently, a mechanism would be needed to update the information programmed into the contract as the identity of the account debtors change. Once again, the smart security agreement could not be completely autonomous, but would require periodic external intervention.

More importantly, just as repossession of goods is merely a step towards the remedy of foreclosure, notification of account debtors is merely a step towards the remedy of collection of the assigned obligations. The contract itself could not do this autonomously.

Like all other aspects of enforcement, collection by a secured party is subject to the standard of commercially reasonableness.[199] I cannot imagine that any judge today would find that it would be commercially reasonable to demand that account parties pay their debts in cybercurrency to be deposited into the contract. Consequently, the secured party would have to collect these debts by conventional non-smart procedures—such as ordering the account debtors to wire funds to a deposit account maintained by the secured party.

Assuming that, in some hypothetical future when mandatory payment in cybercurrency would be deemed reasonable, then the contract could, presumably, be programmed to remit funds as required by Part 6. This would be relatively simple if the transaction were an outright sale—all funds received would be remitted to the secured party.[200] If, however, "the security interest . . . secures payment or performance of an obligation" then the collection proceeds shall be applied in accordance to the usual priorities, i.e. first to the payment of collection expenses, second to the satisfaction of the secured obligation and third to the satisfaction of

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[199]U.C.C. § 9-607(c)(1).

[200]U.C.C. § 9-608(b).

junior claimants with the debtor entitled to any surplus.[201] This would raise the same issue of the mechanics of disbursement discussed above in connection with foreclosure sales.

Finally, one must consider the problem that, inevitably, some account debtors will not pay the assigned obligation. This could be because a account debtor asserts a defense or claim in recoupment against the obligation or is insolvent or otherwise. In any event, the secured party would have to resort to the usual legal tools—negotiating, suing, obtaining liens, filing claims in bankruptcy, etc.—to actually enforce its interest.

C.   Exceptions

So, if sense tells us that completely self-enforcing security agreements even outside bankruptcy are not practical with respect to most categories of collateral, our sensibility will be gratified by at least two possible exceptions. These are security interests in deposit accounts, and margin loans secured by indirectly-held investment securities. Indeed, a number of companies are in the process of establishing on-line lending platforms that would make the equivalent of margin loans secured by cryptocurrency or other crypto-assets, rather than conventional securities, pursuant to smart security agreements. However, with respect to the first two types of loans—current law and practice already allows for essentially automatic foreclosure. Consequently, sense suggests that "smart contracts" would at best add a marginal improvement to practice—perhaps worthwhile, but not revolutionary. Certainly, it would not supplant the role of lawyers, who now draft the standard form contracts used by banks and brokers. Indeed, all a smart contract would do is to deprive the secured party of the discretion that it might elect to exercise in certain cases.

1. Deposit Accounts. One of the most important categories of assets in our economy are deposit accounts, i.e. the UCC's term for checking and similar bank accounts.[202] This is the primary way that "money" and "cash" are held in our

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[201]U.C.C. § 9-608(a).

[202]U.C.C. § 9-102(a)(29) defines a deposit account as "a demand, time, savings, passbook, or similar bank maintained by a bank. The term does not include investment property or accounts evidenced by an instrument."

economy. Consequently, as already mentioned,[203] the UCC's implicit limitation of the defined term "money" to mean physical currency is very misleading.

One of the goals of blockchain enthusiasts is to minimize the roles of third parties such as banks and brokers in the payment and investment holding systems. Consequently, to them, my discussion of deposit and securities accounts may be only of interest in the short run, as they should be expected to fade away in the long term. This is misguided.

If and when blockchain technology is able to be scaled up, it could play an important role in payments and securities holding. However, acting as intermediaries is only one of the roles played by banks and brokers. The others include investments, lending and financial services. Individuals and businesses often do and want to hold cash. But, "cash," once again, should not be confused with money.

Blockchain enthusiasts assume that persons will hold cash in the form of cybercurrency on blockchains. But, this would be as foolish as to hide dollar bills under ones mattress.[204] When one reads that companies like Apple own billions of dollars in cash, this does not mean they have vaults filled with greenbacks, or for that matter, deposits in non-interest bearing accounts. Rather, it means that they hold these funds in the form of highly liquid investments like money-market accounts (which is how I hold most of my "cash," other than the small amounts currency I carry around for

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[203]See supra notes 104–05.

[204]If one holds bitcoin or another cybercurrency as an investment, hoping that it will increase in value, then one is treating it, not as money, but as a commodity, which is how the Commodity Futures Trading Commission (the "CFTC") analyses it. (See Commodity Futures Trading Commission v. McDonnell, 287 F. Supp. 3d 213, Comm. Fut. L. Rep. (CCH) P 34222 (E.D. N.Y. 2018), adhered to on denial of reconsideration, 321 F. Supp. 3d 366, Comm. Fut. L. Rep. (CCH) P 34289 (E.D. N.Y. 2018) upholding the CFTC's position that virtual currency is a commodity for the purposes of the Commodity Exchange Act).

Indeed, whether or not bitcoin falls with the definition of "money" for one or another legal regime, one reason why bitcoin does not yet functioned as "money" in the tri-partite economic sense of a unit of account, store of value, and means of exchange, is that its extreme volatility vis a vis conventional currencies reflects the fact that it is held as a speculative investment.

buying groceries and other small purchases). Although the interest paid on these funds is small, any return is better than no return.

Moreover, banks and other financial institutions are not merely places to deposit one's "cash," they are sources of financing. And, deposit and similar accounts often serve as collateral for loans.

The law with respect to security interests in deposit accounts reflects two basic principles. First, original, first-generation security interests in deposit accounts can only be perfected by "control"—a defined term that roughly means the ability to direct withdrawals from the account over the debtor's objection.[205] Second, pursuant to U.C.C. § 9-327, priority disputes are, in most cases, to be determined not by the temporal "first-to-file-or-perfect" rule that governs most other categories of collateral.[206] Rather, priority is determined primarily by the identity of the secured party and the mode of perfection. Although the details of the perfection regime is beyond the scope of this paper, as a practical matter this means a secured party that is the bank at which the deposit account is maintained will prevail over other secured parties, unless the bank authenticates a subordination agreement to the contrary.[207]

A security interest granted by a debtor in the deposit account it maintains with a secured party that is also its bank could easily be made largely if not entirely self-enforcing, since a deposit account is itself an electronic record of a debt. However, it is not clear what, if any, benefit a smart contract

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[205]U.C.C. § 9-312(b)(1). This is to be contrasted to second-generation security interests in cash proceeds in the form of deposit accounts which can be perfected by other means. U.C.C. § 9-315(d)(2).

[206]U.C.C. § 9-322(a)(1).

[207]U.C.C. § 9-327(3). An alternate way a secured party could obtain priority over the bank is to cause the debtor to transfer the account into the secured party's name so that it is substituted for the debtor as the bank's customer. U.C.C. § 9-327(4). For a discussion of the priorities in deposit account, see David Gray Carlson & Jeanne L. Schroeder, Three Against Two: On the Difference Between Property and Contract in the Context of Bank Accounts, Emory Bankruptcy Developments Journal (forthcoming 2019). U.C.C. § 9-339 permits a secured party to contractually subordinate its priority.

would have over current practice. Indeed, it would have the disadvantage of hindering the secured party of exercising discretion in the perhaps rare times when they would choose to forebear rather than foreclose.

To understand this, it helps to take a brief detour into the law and practice of deposit accounts because it is anti-intuitive and the terminology of banking is archaic and misleading. Indeed, despite the fact that deposit accounts are involved in almost every bankruptcy, courts evince confusion as to the basic mechanics.

When a customer "deposits" money "into" a deposit account, it is doing no such thing insofar this language implies that she retains a property interest in the deposited funds and that there is some sort of custodial or fiduciary relation between customer and bank. Rather, the customer is making a demand loan to the bank, i.e. the customer loses all property interest in the funds transferred to the bank.[208] The relationship between the customer and the bank is purely contractual in nature, governed by the checking account agreement that includes and is subject to the provisions of UCC Article 4 as well as state and federal banking law and regulation.[209]

It is easy to understand how a third party could take a security interest in the depositary bank's obligation to repay the customer—this is conceptually the same as taking a security interest in any other obligation owed to the debtor, such as an "account."[210] It might seem peculiar that a bank could take a security interest in its own obligation to its

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[208]U.C.C. § 9-327(3).

[209]Traditionally, the customer makes its demand to be repaid by use of a check which is an order to the bank to pay funds to a named payee. Demands are increasingly made via debit card or ACH instruction, in the case of consumers, and wire transfers, in the case of businesses.

[210]U.C.C. § 9-102(a)(2) includes in the definition of an account a number of rights of payment including, but not limited to what are generally known as accounts receivable, i.e. money owed for goods sold or services rendered. Assume that a X has sold goods to Y on credit. Y's obligation to X would be an account. Vis a vis this two-party relationship between X and Y, this is a purely contractual relationship. Assume that X needs financing and approaches bank, B. X could either borrow from and assign its rights against Y to secure its obligation to repay the loan. Or, X could sell all of this interest to B. Either way, in this three-person uni-

customer. Indeed, prior to the 2000 amendments, one occasionally found statements to the effect that it was logically impossible.[211] Nevertheless, Article 9 now not only recognizes such security interests, it provides, as just stated, that such a security interest claimed by the bank at which the deposit account is maintained usually has priority over security interests claimed by other secured parties. I have shown elsewhere how such security interests are, in fact, conceptually coherent and distinguishable from a bank's right of set off.[212] This is beyond the scope of this paper.

The primary reason why such a security interest can easily be made self-executing is that the remedy for default on a bank's security interest in its own obligation under a deposit account is, effectively, setoff. That is, suppose the debtor has granted the bank a security interest in its deposit account to the depositary bank. That debtor owes bank $100 and there is $80 "in" the deposit account maintained with that bank (i.e. technically, the bank owes the debtor $80). When payment is due, pursuant to U.C.C. § 9-607(a)(4) the bank can net the $80 it owes to the customer against the $100 the customer owes to the bank, so that the customer now owes the bank only $20.[213]

Interestingly, as I have shown elsewhere,[214] this means that, when the bank "takes" the funds in the deposit account pursuant to this provision, the secured party/bank is techni-

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verse of X, Y and B, the account is now collateral with the status of property (i.e. UCC § 9-102(a)(12)) defines collateral as "the property subject to a security interest" B's property interest in the account is an Article 9 security interest (U.C.C. §§ 1-201(a)(35), 9-109(a)(1), (3)).

[211] Carlson & Schroeder, supra note 206.

[212] I explain why it is, in fact, logically coherent for a bank to have a security interest in its own debt in Carlson & Schroeder, supra note 206.

[213] U.C.C. § 9-607 provides:

(a) If so agreed, and in any event after default, a secured party:

. . .

(4) if it holds a security interest in a deposit account perfected by control under Section 9-104(a)(1) [i.e. the provision that governs control by a secured party which is the bank with the deposit account is maintained], may apply the balance of the deposit account to the obligation secured by the deposit account;

[214] Carlson & Schroeder, supra note 206.

cally "foreclosing" its security interest under U.C.C. § 9-607—i.e. from a technical legal matter, it is not that the debtor is performing or paying its secured obligation. Rather, the secured party is enforcing its remedy.

Consider a simple revolving credit facility secured by a security interest in a deposit account. Assume that a customer may borrow from a bank an amount up to 80% of its balance in a deposit account maintained with that bank in which the bank has a security interest, i.e. if the base is $100, the debtor may borrow $80. If the base goes down to $90 because of withdrawals from the deposit account, the borrower must repay $8 in order to reestablish the 80% borrowing base.

Now it is possible, that this transaction could be made automatic through a smart contract. However, when the secured party is the bank at which the deposit account is maintained, there is no particular advantage of using a smart contract—the bank can automatically program its computer to set off the bank account whenever it dips below a certain dollar amount of percentage of a borrowing base, Indeed, a common provision in these transactions is a periodic automatic, "sweep" of the account.

A smart contract, however, may be a possibly more convenient device if the secured party is *not* the bank at which the deposit account is maintained. As mentioned, the only way to perfect a first-generation security interest in a deposit account is through control.[215] The typical way a security party that is not the bank at which the deposit account is maintained obtains control is under U.C.C. § 9-104(a)(2) by having "the debtor, secured party, and bank . . . agree[] in an authenticated record that the bank will comply with instructions originated by the secured party directing disposition of the funds in the deposit account without further consent by the debtor." Assuming arguendo that an electronic "smart contract" can constitute "an authenticated record" (which is almost certainly the case), it is simple to imagine how a smart contract could be programmed to instruct the bank to automatically transfer money out of the debtor's account and into an account maintained by the secured party at the same bank upon pre-programmed instructions—such as a periodic sweep.

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[215]U.C.C. § 9-312(b)(1).

An example of how this can work can be seen in the case of Garner v. Knoll, Inc. (In re Tusa-Expo Holdings, Inc.)[216] Although the 5th Circuit Court of Appeals analysis of this complex case is confused, it illustrates how a secured arrangement that could be made "smart." In this case, a secured party that was not a bank had a security interest in a debtor's deposit account maintained at a bank. The secured party had "control" over the deposit accounts pursuant to a U.C.C. § 9-104(a)(2) three-party control agreement. Pursuant to this arrangement, the debtor would make deposits into the deposit account from time to time. The bank was instructed by the secured party to "sweep" the deposit account at the end of every business day and pay the money to the secured party as partial payment of the balance of the outstanding secured obligation.[217] That is, the bank would debit the debtor's deposit account by an amount equal to its entire balance, and credit that amount to a deposit account the secured party maintained at the same bank. The secured party would, then, automatically apply these funds towards the debtor's secured obligation.

That is the secured party would consensually foreclose on its security interest in the deposit account under U.C.C. § 9-607 that reads:

(a) If so agreed, and in any event after default, a secured party:

. . .

(5) if it holds a security interest in a deposit account perfect by control under section 9-104(a)(2) . . ., may instruct the bank to pay the balance of the deposit account to or for the benefit of the secured party.

Since this arrangement was already "automatic" (i.e. the depositary bank had standing instructions to make the sweep every business day), there is no reason why it could not be completely automated—with the program irrevocably instructed to "sweep" the deposit account every day. Indeed, in a totally "smart" world, we could conceivably remove the

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[216]In re Tusa-Expo Holdings, Inc., 811 F.3d 786, 62 Bankr. Ct. Dec. (CRR) 24, 74 Collier Bankr. Cas. 2d (MB) 1743, Bankr. L. Rep. (CCH) P 82917, 88 U.C.C. Rep. Serv. 2d 990 (5th Cir. 2016). I analyze this case and the 5th Circuit's opinion in Carlson & Schroeder, supra note 206.

[217]811 F.3d. At 789–90.

depository bank entirely from the transaction. Rather than making occasional deposits in dollars into a deposit account, the debtor would post cybercurrency to the smart contract which would, in turn, transfer these payments to the secured party on a daily basis.[218] This would do away with the bank entirely.

Why then maintain the traditional transaction pattern at all? The first is my point about the time-value of money. This fact pattern was unusual in that the debtor's deposit account was swept on a daily basis. In my experience, it is more common for sweeps to be done periodically, such as weekly or monthly so that the debtor could earn interest on its account. Also, it is not unusual for the debtor to retain the right to continue to use the deposit account in the ordinary course pending default and to make withdrawals so long as a minimum balance is maintained.

The second is that, under Article 9 as it currently exists, security interests in cybercurrency are problematic. As already mentioned,[219] cybercurrency does not fall within the definitions of money or deposit account—it is a general intangible. This makes is unsuitable to serve as collateral if it is held directly (i.e. rather than indirectly through an intermediary). Moreover, in contrast to non-colluding transferees of physical money and funds held in a deposit account, even good faith purchasers for value of general intangibles take subject to security interests.[220]

This means that, once cybercurrency is subject to a security interest, it remains so subject until the secured obligation is completely satisfied (and the secured party has no commitment to make future loans) or the secured party releases the interest. This makes cybercurrency a very unattractive vehicle for the holding and transferring of value because—unlike money and checks—the transferee can never be sure of receiving clear title.

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[218]Actually, the facts are somewhat more complex. The debtor's account debtors (i.e. third parties who owed money to the debtor for goods sold or services rendered), were instructed to pay their accounts via wire transfers directly into the deposit account in which the secured party had a security interest.

[219]See supra text at note 104.

[220]See supra text at notes 105.

As I have shown elsewhere, currently, the only way to escape this trap, is for the debtor to agree to hold its cybercurrency indirectly through a "securities intermediary,"[221] in which case it can elect to have it treated as a "financial asset" under Article 8.[222]

My conversations with certain attorneys for lenders who are planning to take cybercurrency as collateral indicates that they agree with my analysis and insist on debtors transferring the cybercurrency to banks or brokers as securities intermediaries. Of course, once one reintroduces an intermediary into the transaction, we are back in the traditional forms and we have destroyed one of the supposed advantages of cybercurrency—the elimination of intermediaries.

2. Margin Loans. Investment securities have traditionally been used as collateral. One common form of these are "margin loans" made by brokers and banks to their customers. These are loans made for purchasing and carrying securities,[223] secured by margin securities. Margin loans by brokers, banks and other financial institutions are heavily regulated, so there is little room for discretion in enforcement. Consequently, these loans, are likely candidates for automation as smart contracts.

We need to take a brief tour of Article 8 of the UCC which

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[221]Schroeder, *Bitcoin*, supra note 81, at 47–48. U.C.C. § 8-102(b)(14) provides that:

"securities intermediary" means:

    (i) a clearing corporation; or

    (ii) a person, including a bank or broker, that in the ordinary course of its business maintains securities accounts for others and is acting in that capacity.

[222]U.C.C. § 8-102(a)(9) includes within the defined term "financial asset":

(iii) any property that is held by a securities intermediary for another person in a securities account if the securities intermediary has expressly agreed with the other person that the property is to be treated as a financial asset under this Article.

[223]Federal Reserve Regulations T (12 C.F.R. § 220) and U (12 C.F.R. § 221) regulate margin credit extended by broker-dealers and by banks (and other non-broker-dealer lenders), respectively.

governs the conveyancing of investment securities. Most investment securities, whether in certificated or uncertificated form, are not held directly by investors. They are held indirectly as book entries in securities accounts on ledgers maintained by brokers, banks and other third-parties which Article 8 calls "securities intermediates."[224] Indeed, securities intermediaries often do not own securities directly either, holding them indirectly through DTCC—a company formed and owned by the brokers and banks for which it performs securities holding and clearing services. A large percentage of all publicly traded securities are held directly by its subsidiary, the Depository Trust Corporation through its nominee CEDE & Co.[225] This means that the ultimate investor having the economic interest and right to vote the security is typically not the record owner on the books of the issuer of the securities, and, therefore, has no direct right *vis a vis* the issuer to vote or receive distributions with respect to those securities. Within the language of Article 8, such indirectly owned investments are not "securities" at all—a term limited to investments held directly by record owners—but "securities entitlements"[226] with respect to "financial asset"[227] held in a "securities account"[228] maintained with a "securities intermediary."[229]

The investor is called a beneficial owner under federal se-

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[224] U.C.C. § 8-102(a)(14).

[225] The Depositary Trust and Clearing Corporation, Disclosure Framework for Covered Clearing Agencies and Financial Market Infrastructures 9–10 (December 2017).

[226] U.C.C. § 8-102(a)(17).

[227] U.C.C. § 8-102(a)(9).

[228] U.C.C. § 8-501(a).

[229] U.C.C. § 8-102(a)(14). Making one's way through Article 8's arcane vocabulary can be daunting for the neophyte. The definition of security in UCC § 8-102(a)(15) does not specifically refer to direct holding. However, U.C.C. § 8-301 provides that a security can only be delivered if the purchaser (or someone, other than a securities intermediary, acting on her behalf) takes possession of a certificated security, if a certificated security is registered or endorsed in the name of the purchaser (or someone, other than a securities intermediary, acting on her behalf), or if an uncertificated security is registered on the issuer's books in the name of the purchaser (or someone, other than a securities intermediary, acting on her behalf).

curities laws[230] and an "entitlement holder" under U.C.C. § 8-102(a)(7). A securities entitlement is a *sui generis* legal interest defined purely functionally as "the rights and property interests of an entitlement holder with respect to a financial asset specified in Part 5."[231] For most purposes, however, a securities entitlement with respect to a specific security held by a securities intermediary is economically equivalent to direct ownership because, pursuant to Article 8 Part 5 and the federal securities laws, the securities intermediary who is the record owner of the underlying security must pass all rights it has against the issuer down to the entitlement holder. For example, when an issuer pays a dividend on its common stock owned by a securities intermediary, the securities intermediary must pay the amount it receives pro rata to its entitlement holders who have a securities entitlement with respect to that stock.[232]

It is common for securities intermediaries to make loans to their customers secured by the securities entitlements maintained with them in securities accounts. Federal Reserve Bank Regulation T[233] governs margin loans—i.e. loans for the purchase or carrying of margin stock—made by broker/dealers and Regulation U[234] governs margin loans by banks and certain other lenders. The regulations provide margin borrower must always maintain a margin over the loan balance and the value of eligible securities in the portfolio securing the loan—hence their name. For over 40 years, the margin has been two-to-one for eligible securities[235]—that is, for every $1 in loans, there must be at least $2 in qualified collateral.

Obviously, the value of investment securities fluctuates over the trading day. To simplify, if the aggregate value of the collateral dips below the margin, the lender must make

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Acquisition and transfer of securities entitlements, in contrast, are governed by Article 8 Part 5.

[230]See e.g. 17 C.F.R. § 240.13d-3.

[231]U.C.C. § 8-102(a)(17).

[232]U.C.C. § 8-505.

[233]12 C.F.R. § 220.

[234]12 C.F.R. § 221.

[235]https://www.federalreserve.gov/bankinforeg/regucg.htm.

a "margin call." That is, it must give a notice to the customer informing her that she must either pay down the loan or post additional collateral to restore the margin. If the debtor does not do so, the securities intermediary is required to liquidate a portion of the collateral to pay down the loan in an amount that will re-establish the margin.

As this system has already been largely computerized, it is not a stretch to think that it could be made completely so. As we have seen in our discussion of other contracts, smart margin contracts cannot be made completely autonomous in that the valuation of collateral must be made by reference to external factors. However, as least in the retail investor context, these valuations can be based on publicly available databases that a mechanized oracle could access.

The contract could then automatically send the debtor a margin call. If the debtor neither pays down the debt nor posts additional collateral in amounts to re-establish to margin within a specified time, the contract would then commence the process to sell collateral. Although the exact details of such a procedure would have to worked out, under existing technology, much of the sale process could probably be automated.

In the last year, I have spoken to a number of attorneys and promoters who are in the process of trying to set up lending facilities that would take bitcoin, and perhaps in the future, other cyberproperty, as collateral. Because these assets do not fall within the definition of "margin securities,"[236] technically these facilities would not seem to fall within existing regulations. However, some are looking at traditional margin facilities as a possible template.[237] Some are also using my Article 8 structure—requiring lenders to hold their

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[236]Basically, margin stock is defined as publicly traded equity securities, securities convertible into and options to acquire such securities, and securities issued by certain investment companies. 12 C.F.R. §§ 220.2, 221.2.

[237]See for example the margin-lending facility offered by SALT, http s://saltlending.zendesk.com/hc/en-us/sections/115002568828-Collateral-Ma rgin. On the other hand, one potential lender I have spoken with hopes to avoid the margin-loan approach and, instead, protect itself from the extreme volatility of the price of cybecurrency through a proprietary hedging technique.

cybercurrency indirectly through securities intermediaries so that they can be treated as financial assets. Because all aspects of these transactions would be electronic, these promoters believe that all, or substantially all, of the functions can be automated onto smart contracts.

D. The Automatic Stay

As Raskin has noted,[238] one potential fly in the ointment for smart security agreements is the automatic stay of Bankruptcy Act § 362(a). If a debtor were to become subject of a bankruptcy proceeding then the debtor's creditors are stayed from taking any act to enforce their claims outside of the proceedings. Among the acts stayed are:

> (3) any act to obtain possession of property of the estate or of property from the estate or to exercise control over property of the estate;
>
> (4) any act to create, perfect, or enforce any lien against property of the estate;
>
> (5) any act to create, perfect, or enforce against property of the debtor any lien to the extent that such lien secures a claim that arose before the commencement of the case under this title;

Once the stay is in effect, a secured party cannot enforce its security interest without first petitioning the bankruptcy court to lift it. This means that no security agreement with respect to most types of collateral,[239] no matter how smart, could be entirely self-performing because of the possibility that the debtor could go bankrupt. If the security party attempts to enforce the security agreement after bankruptcy, such actions are void.

Raskin suggests that one way to deal with this is to have the contract consult an oracle to search public filings (such as PACER) to see if a petition has been filed with respect to a debtor before commencing repossession. Once again, Raskin tries to illustrate this with the example of automatic

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[238]Raskin, supra note 1, at 322.

[239]There are numerous exceptions to the automatic stay, including for settlements of securities contracts, commodities contracts, repos, swaps and certain other financial contract by brokers and certain other financial institution. The workings of these exceptions are beyond the scope of this paper.

ignition shutoff on a car which would become inoperative if a petition is filed—i.e. the ability to shut-off would be shut-off.[240]

This, alone, would not be sufficient. To recap, although disablement may be an alternate to physical repossession of collateral, repossession is ordinarily not the secured party's Article 9 remedy. The normal remedy is commercially reasonable sale of the collateral and repossession is just (usually) necessary step in accomplishing this. Even if the secured party were to disable the collateral before the filing of the petition, any *additional* action it took after the filing—including taking physical possession of the disabled car, let alone disposing of it, would violate the automatic stay. Consequently, in the case of car loans, when a debtor files for bankruptcy between the time of repossession and the time of the foreclosure sale, upon the debtor's request, the current practice is for the secured creditor to redeliver the car back to the debtor.[241] Similarly, because continued disability of the car would probably be an impermissible exercise of control over the collateral, the smart contract would have to be programmed to end the ignition cutoff and allow the debtor to drive the car.

The automatic stay illustrates how smart contracts cannot supplant the legal system. Once a bankruptcy petition is filed with respect to a debtor secured creditor must file a claim in the bankruptcy proceeding and, if it wishes to foreclose on its security interest, petition the judge to lift the automatic stay—acts that require appearance by the secured party in court.

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[240]Raskin states:

A bankruptcy court in Arkansas ruled that the installation of a starter interrupter, while not per se illegal, violated the Bankruptcy Code's automatic stay because it prevented the debtor from the normal use of her car. The court noted that the creditor could have remedied the situation by "taking action to ensure that Debtor had the correct code to operate her car each month, such as by mailing the correct code to Debtor each month." A line of code written that would honor a court's grant of an automatic stay motion by allowing the car to operate is another potential remedy. The automatic stay, like the prohibition on selling alcohol to minors, acts as an external condition that the smart contract must incorporate into its terms if it is to comply with the law.

Raskin, supra note 1, at 332 (citations deleted).

[241]See In re Weber, 719 F.3d 72, 69 Collier Bankr. Cas. 2d (MB) 1168, Bankr. L. Rep. (CCH) P 82484 (2d Cir. 2013).

E. Discretion

In addition to my initial economic concern about tying up capital, and the legal concern of the automatic stay, the biggest *pragmatic* roadblock to the wide use of smart self-enforcing security agreements may be that secured parties and other creditors can be expected to want to maintain the ability to exercise discretion concerning if, when, and how to enforce their claims. Although, here I concentrate on security agreements, my concern about discretion can be generalized to other types of contacts.

First and foremost, secured parties do not want to foreclose on their security interests *per se*. They want their secured obligation to be *paid* or otherwise performed. Foreclosure of a security interest is at best an imperfect means to that end. As anyone who has represented creditors knows, sometimes whether to foreclose or forebear upon default can be one of the most difficult decision a creditor can face. Indeed, enforcement of security interest is often a last resort.[242] As Karen Levy says with respect to the enforcement of contracts generally, "Strategic non enforcement—may serve social and strategic—one bargains in the shadow of law—this is not merely because of the high costs of going to court avoid the "all or nothing" consequences of litigation—threat of litigation may encourage bargaining."

The layperson's intuition that creditors "own" their debtors is an incorrect extrapolation from their individual experience, or fears, as a consumer. In the world of finance, however, it is often the debtor who "owns" the creditor. In the immortal words of J. Paul Getty, "If you owe the bank $100 that's your problem. If you owe the bank $100 million, that's the bank's problem."[243]

There are a number of reasons why a secured party might choose to forbear upon default. First, a secured party may

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[242]Levy, supra note 176, at 9. She, accurately in my opinion, asserts

[*C*]ontractual *obligations are enforced through all kinds of social mechanisms other than the legal system proper; concomitantly, contracts serve many functions that are not explicitly legal in nature, or even designed to be formally enforced.* This insight is important for understanding the real-life effects of automated contracts.

Levy, supra note 176, at 4.

[243]https://www.brainyquote.com/quotes/j_paul_getty_129274.

decide that there is a chance that it is will be able to raise *more* money in the future by not foreclosing. Think of the simple auto loan—the recurring and misleading example of the smart security agreement in the literature. The resale price of a used automobile is relatively low. If a secured creditor repossesses (or disables) the debtor's car, it might negatively affect the debtor's ability to work and earn money to pay back the loan. A bank may decide that the present value of its collection is likely to be greater if, rather than foreclosing and selling its collateral, it refinances and continues to collect an income stream of perhaps smaller payments over a longer period of time.

Even in the case where a bank has a security interest in a deposit account that the debtor maintains with it—an arrangement that I have argued *could* be susceptible to be automated in a smart contract—a bank may not want to do so. Unless the balance of the deposit account is significantly greater than the outstanding secured obligation, the bank might rationally decide that forbearance might make it is more likely to get paid.

The case of Myers v. Christensen[244] illustrates why a depositary bank might not want its security interest in a bank account to be automatically enforcing. In this case, a bank continued to allow a debtor to make withdrawals from a deposit account in which it had a security interest after default. The Nebraska Supreme Court noted that, in doing so, the bank was making a conscious decision that its best chance to receive payment in full would be for the debtor to succeed in its business. This would require that it be able to make withdrawals from its deposit account to pay expenses.[245] The bank's gamble in this case did not pay off and the debtor eventually went out of business, but this does not mean the bank's decision was not rational at the time it was made.[246]

This leads to the second, but closely related point. When a

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[244]Myers v. Christensen, 278 Neb. 989, 776 N.W.2d 201, 70 U.C.C. Rep. Serv. 2d 577 (2009).

[245]776 N.W.2d 203, 207 (Neb. 2009).

[246]In this case, a second-in-time lien creditor argued that, by allowing the withdrawals, the bank had waived its security interest. Although a lower court found for the lien creditor, the Supreme Court correctly over-

debtor defaults on its security interest, the universe in which the secured party is located is no longer the two-party world of borrower and lender, but the three party one of borrower, lender and other creditors. If a debtor has defaulted on one debt, it is likely to be on the brink of insolvency, if not actually insolvent. If the secured creditor seeks to enforce its security interest, it might cause of other creditors to seek to enforce their interests. Indeed, many loan facilities have cross-default clauses such that the secured party's action might automatically cause defaults under other debts causing other creditors to accelerate their debts.

In either such event, foreclosure is likely to cause the debtor or its other creditors to file a bankruptcy petition to impose the automatic stay. In bankruptcy, although the secured party is entitled to the value of its collateral as of the petition date, this does not mean that it will be made whole. Under the rule of United Sav. v. Timbers of Inwood Forest,[247] only oversecured creditors can collect interest during the bankruptcy, and then only up to the amount of their surplus. Undersecured creditors are not entitled to post-petition interest. Obviously, given the time-value of money, every day without interest is an economic loss to the creditor. Given the considerable amount of time that can pass between the filing of a petition and either the lifting of the automatic stay or distribution of assets in a bankruptcy, it can be economically rational for the secured creditor to try to work things out and even renegotiate the terms of the secured loan rather than taking enforcement action.

V. Ambiguity and Natural Language

A. The Necessity of "Natural Language"

Proponents of smart contracts explicitly or implicitly assume that ambiguity of contractual language is a significant problem in contract performance and enforcement. They also believe that ambiguity is a regrettable flaw of natural

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ruled it. Myers, 776 N.W.2d at 205. See Carlson & Schroeder, supra note 206.

[247]United Sav. Ass'n of Texas v. Timbers of Inwood Forest Associates, Ltd., 484 U.S. 365, 108 S. Ct. 626, 98 L. Ed. 2d 740, 16 Bankr. Ct. Dec. (CRR) 1369, 17 Collier Bankr. Cas. 2d (MB) 1368, Bankr. L. Rep. (CCH) P 72113 (1988).

language. Consequently, they argue that a primary advantage of smart contracts is that the use of code will enable us to eliminate ambiguity. In Raskin's words:

> When lawyers or the programmers they hire write contracts in code, there is less of a chance for ambiguity than in natural language if only for the simple fact that artificial language must be complete and predefined, whereas natural language is infinite. That is to say a person can walk around and verbally recite lines of code and people can at least understand what he is saying; a machine cannot understand human language that it is not programmed to understand. All of this is simply to say that the problem of ambiguity is reduced in the smart contract context.[248]

DeFilippi and Wright state:

> Like other software, smart contracts also provide comparable advantages when it comes to clarity, precision, and modularity. Despite best intentions, legal contracts *routinely* suffer from poor drafting. Inconsistent terms creep into complex agreements — especially those drafted under tight timetables — clouding the parties' actual intent. (emphasis added)[249]

Sense tells me that this is incorrect both empirically and logically. First, it is unclear whether ambiguity is a material problem in contract performance at all, let alone one that can be "cured" through the use of smart contracts. In the United States mot contracts are performed in the ordinary course—breach is the empirical exception. If this were not the case, our market economy would not function.

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[248]Raskin, supra note 1, at 325.

[249]DeFilippi & Wright, supra note 2, at 81 (citations omitted). They then cite "Allan Farnsworth — one of the most renowned legal scholars on contracts" for the proposition that probably every lawyer will agree with that the canons of interpretations are often retroactive "rationalizations" for judicial decisions. DeFilippi & Wright, supra note 2, at 81–82. But this is hardly unique to contract law—it is probably true that as a general rule, judicial opinions are intended for justifications for a decision and may or may not accurately reflect the judge's actual thought process. Indeed, although this is beyond the scope of this short essay, philosophical and psychological theory since at least Immanuel Kant question whether we can ever know the "true" reasons for our decisions. This does not mean that decision making is necessarily irrational or in bad faith. Rather, it is that rationality is applied retroactively as we attempt to justify our decisions, and reject decisions that we cannot. See Jeanne L. Schroeder, The Interpreter, The Lawyer and The Scientist, in Economies of Interpretation (Peter Goodrich & Michel Rosenfeld eds. forthcoming 2019).

Second, so-called "ambiguity" in contracts does not result from a flaw in natural language. Rather, linguistic, psycho-analytic and mathematical theory agree that all symbolic (intersubjective) relations are open and dynamic as a matter of logical necessity. That is *flexibility* is a characteristic of contracts understood as the agreement between the parties, not a flaw in the language used to memorialize the agreement. The dream that there could be a closed, perfectly correlative contract is imaginary—a "fantasy" in the technical psychoanalytic meaning of the term. As this is not a theoretical paper I will not discuss this literature further here.

Proponents explain that smart contracts would be unambiguous because they are a series of pre-programmed instructions in the form of "if A, then B; if B then C, etc." In the words of Lipshaw, who is otherwise skeptical of smart contracts:

> What makes the potential digital automation of contracts tantalizing is the fact that most contracts and contract law have a deductive "if-then" structure that can be expressed in formal first order logic. But many of the natural language predicates useful in drafting contracts are capable of inclusion in formal logic, but not sufficiently precise to be expressed in code without some translation of continuous characteristics into discrete units.[250]

However, to claim that this structure could effectuate the agreement between the counterparties is to assume (as Lipshaw seems to in this passage) that the legal relationships that constitute a contract are, in fact, a series of "if A, then B" propositions. This is an unsupported empirical assumption. All or parts of some contracts can be, and have been, so reduced and automated—such as interest rate swaps. Other familiar examples are algorithmic securities trading and Google advertising contracts. Many, if not most, others probably cannot because human relations do not follow this form, as Lipshaw elsewhere acknowledges.

Jerry Kaplan, a professor of artificial intelligence at Stanford University, argues that the assumption that such simple computer-type logic also characterizes human intelligence is a mis-conception that has held up the development of artificial intelligence. Consequently, the modern approach

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[250]Lipshaw, supra note 4, at 7.

of researchers is to study how rational humans *actually* think and then consider if and how computers can be programmed to replicate this process.[251] Apparently, the smart contract crowd has not yet received the memo and believe that they can force contract parties to act like computers.

This mis-perception that precise artificial languages are superior to natural language has arisen repeatedly and has been debunked, before. For example, as Abigail Shrier points out:

> Perhaps the greatest philosopher of the 20th century, Ludwig Wittgenstein, argued in his canonical work, "Philosophical Investigations," that complaints about the imprecision of language actually presuppose an accepted standard for judging it. In his day, that unnamed standard was symbolic logic, which virtually all philosophers regarded as a perfected form of thought and reasoning. The mistake they'd made, according to Wittgenstein, was to assume that symbolic logic was the

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[251]In a recent Wall Street Journal essay, Kaplan states, the development of artificial intelligence needs to go beyond "fine-tuning" computer readable algorithms:

> For the first 30 years or so [i.e. of the history of AI research] research focused on pushing logical reasoning ("If A then B") to its limits in the hope that this approach would prove the basis of human intelligence. But it has proved inadequate for many of today's biggest practical challenges. That's why modern machine learning is trying to take a holistic approach, more akin to perception than logic. How to pull that off — to achieve "artificial general intelligence" — is the elusive holy grail of AI.

Jerry Kaplan, Why We find Self-Driving Cars So Scary, The Wall Street Journal C.5 (June 2–3, 2018).

This does not mean, of course, that legal analysis and contract drafting entirely eschew "If A then B" operations. For example, when I teach my commercial law survey course, I often recommend that students try translating unfamiliar sections of UCC into the "if A, then B" form. This is because the UCC, generally provides operational rules for specific fact patterns rather than setting forth basic principles of law. But this is a starting, not an ending place—the code is not a series of algorithms that can be mechanically applied to reach determinative results. The UCC is a paradoxically common law code that in which generalized principles must be induced from the specific examples. Moreover, it incorporates such open-ended concepts such as reasonableness, good faith, etc. requiring factual determinations that allow a judge to reach the "right" result (i.e. both correct as well as just) if a dispute arises. Moreover, many provisions (particularly in Article 2) are merely default rules that the drafters thought were or should be the norm in commercial transactions, that can be varied by the parties—suggestions rather than instructions.

correct standard for judging human language. In fact, he argued, language *is exactly as precise as people need it to be.* Philosophers were creating the problem. (emphasis added)[252]

Linguist Grace Q. Zhang has made a similar point that "the ability to use vague language is as important as, if not more important than, the ability to use other types of language (e.g. precise language)."[253] To rephrase this, the relative flexibility or precision of language in any specific instance represents the human relationship that the language is attempting to capture.[254] Consequently, to make language *more* precise may, in fact, make it a *less* accurate representation of the intentions of the parties.

Despite his earlier statements as to the "it-then" structure of contracts, Lipshaw notes

> Much (if not most) of the natural language lawyers use to draft contracts resists the complete non-ambiguity or vagueness of computer code. Professor Bayless Manning captured this in his "law of the conservation of ambiguity": Elaboration in drafting does not result in reduced ambiguity. Each elaboration introduced to meet one problem of interpretation imports with it new problems of interpretation. Replacing one bundle of legal words with another bundle of legal words does not extinguish debate; it only shifts the terms in which the debate is conducted.[255]

Consequently, Harry Surden, a law professor and computer programmer who was a proponent of "computable

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[252]Is It 'Human Error' When a Robot Fouls Up?, The Wall Street Journal (A 15 (June 16–17, 2018)).

[253]Quoted by Lipshaw, supra note 4, at 39.

[254]In Levy's words:

Though smart contracts may serve . . . goals in some contexts, I suggest that we should temper our enthusiasm about the transformation of modern contracting practice. This is because smart contract boosters tend to understand contracts chiefly as *technical artifacts*, rather than as social resources. Under this view, contractual agreements are bare financial transactions that can, and should, be optimized through code; term ambiguity and enforcement costs are understood as inefficiencies that plague the system of exchange. Understanding contracting practices within their broader social and relational contexts, by contrast, reveals that contracts are in fact much more than this: they "work" in a multitude of ways and accomplish a multitude of aims that are unaccounted for by the smart contract framework.

Levy, supra note176, at 2.

[255]Lipshaw, supra note 4, at 31.

contracts" even before the recent interest in blockchain-supported smart contracts, is very sensitive to their limitations. He states:

> Parties often draft contracts with terms deliberately specified at varying levels of discretion, open-endedness, or abstraction to allow flexibility given future uncertainty. Computer-based assessment in such scenarios appears problematic. People are able to respond reasonably in contexts involving judgment, abstraction, or uncertainty by employing sophisticated cognitive processes. By contrast, while contemporary computer systems can perform feats of apparent analytical sophistication in certain scenarios, as of yet, they are unable to act in cognitively demanding contexts at levels anywhere comparable to, for example, trained attorneys.[256]

In my experience as a counselor, so long as the counterparties are relatively satisfied in on-going legal relationships, they tend to use contractual language as guidance—looking to its spirit. What engineers would call the imprecision of language, is the flexibility that allows the parties to work things our and continue to do business. When the counterparties start asking the lawyers to parse contractual language, it is often a sign that the relationship is trouble for other reasons.[257] That is, it is not so much that the ambiguity of language causes disputes, but that disputes leads to argu-

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[256]Surden, supra note 51, at 633–34 (citations deleted). See also

> But until computer programs can exhibit general artificial intelligence, they will lack judgment. They will not, for example, be able to determine whether vague contract provisions have been satisfied. Cryptocurrencies cannot solve the problem of incomplete contracts, and as long as contracts are incomplete, humans will need to resolve ambiguities.

Abramowicz, supra note 65, at 362 (citing Robert Scott, A Theory of Self-enforcing Indefinite Agreements, 103 Calum. L. Rev. 1641 (2003), for the proposition that contract parties often deliberately leave contracts incomplete).

[257]Lipshaw makes a very similar observation;

> In short, such merchants may want their relationships to be governed primarily by non-legal norms under which the same antecedents could generate different outcomes. Our natural language, with all its elasticity, allows for that flexibility. But they still do not want their contracts to replicate the entirety of a complex business relationship. They want a relatively simple backup set of unambiguous rights to which they can turn formalistically when the relationship breaks down.

Lipshaw, supra note 4, at 418. See also

> Law, it turns out, works through all kinds of avenues other than formal adjudication. Contracting, in particular, is a deeply social practice in which

ments about language as ex post facto justifications for their positions.

Despite this, DeFilippi and Wright assert that "For decades, scholars have recognized that symbolic logic, like software, can decrease contractual ambiguity by turning promises into objectively verifiable technical units," citing one law review article from the 1950's.[258] They say this despite the fact that they acknowledge that many contractual terms (such as standards of good faith) are not susceptible to codification in logic and that parties to contract *intentionally* leave some contract terms open, particularly in long-term "relational" contracts.[259] I would suggest that there are good practical reasons why lawyers have not adopted the decades old suggestion other than the fact that many lawyers are math-phobic. If this were a superior or more efficient way of drafting contracts, the code-savvy minority of attorneys would have used this as a competitive advantage. Indeed, Lipshaw shows that even though many or most contracts can be expressed *in symbolic logic,* this does not mean that they can they can be reduced to digital code.[260]

James Grimmelmann goes further. He argues not merely that contracts cannot be reduced to code, but that even if they could that would not eliminate ambiguity because code is itself ambiguous. "Smart contracts do not eliminate ambiguity, they hide it."[261] To paraphrase his highly technical argument, code is a language and, as such, is as socially

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parties engage for all sorts of purposes, and the effects of contract negotiation reverberate outside of the four corners', or a formal agreement, in both time and space.

Chaffee, Securities Regulation in Virtual Space, 74 Wash. & Lee L. Rev. 1387. See also Blockchain Challenges Traditional Contract Law: Just How Smart Are Smart Contracts?, 19 Wyo. L. Rev. 87 (2019).

[258]DeFilippi & Wright, supra note 2, at 81.

[259]DeFilippi & Wright supra note 2, at 76–77, 84.

[260]Lipshaw, supra note 4, at 35.

[261]Grimmelmann, supra note 4, at 2.

contingent, and as dependent on, and limited by, syntax as any natural language.[262]

Even if one does not accept the proposition that legal relationships and, therefore, language is open-ended as a logical matter, so-called ambiguity is often a practical or empirical necessity. For example, it is impossible, or impractical, to anticipate all future contingencies and, therefore, to draft language to cover them.[263] Moreover, long term inter-relations like joint ventures and other relational contracts can be expected to evolve change over time.[264] Mik, supra note 21, at 12. A "smart" contract that automatically and predictably executed certain actions would *not* be precise in the sense that it would not reflect the intentions of the parties. Or as Werbach and Cornell say "Humans can interrupt . . . execution at any point. But with a smart contract, complete execution of the agreement, including any transfer of value, occurs without any such opportunity to interrupt."[265] As Raskin himself admits "a computer program cannot rec-

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[262]Grimmelmann, supra note 4, at 10–14. He gives as an example of ambiguity, the notorious DAO contract, discussed infra in text at notes 270–76.

[263]In Mik's words "It is, however, practically impossible to create an exhaustive list of events that could affect the operation of a smart contract." Mik, supra note 21, at 12. See also Abramowicz, supra note 65, at 362.

[264]Mik continues:

A tamper-proof self-enforcing smart contract would continue to operate irrespective of any change in circumstances, which could lead to a situation where it became commercially absurd or even illegal. On a broader level, technical writings fail to appreciate that contractual relationships are usually flexible and dynamic — even in those instances when they are based on fixed legal language recorded in formal documents. In traditional contracts, it is common to amend certain provisions to adapt to external circumstances, such changes in the regulatory or commercial landscape. It is also common to tolerate certain deviations from the agreed performance without formally amending the contract. It could thus be argued that smart contracts are rigid and can become easily disconnected from the transactional reality in which they operate because no such adjustments are technically possible.

[265]Werbach & Cornell, supra note 3, at 332. Nevertheless, DeFilippi and Wright argue that:

Smart contracts also are more dynamic than traditional paper-based contracts, because they can be constructed to adjust performance obligation during the term of an agreement by using a trusted third-party source — commonly referred to by programmers as an *oracle*. . . . With oracles, smart contracts

ognize — outcome[s] that were not contemplated and speci-fied by the parties," discretion is often part of contracts.[266] That is, the supposed lack of ambiguity of smart contracts is an illusion—a false precision. In contract, as in investing and economics, "it is better to be roughly right than exactly wrong."[267]

Some contract term are "ambiguous" because execution requires judgment which, as Immanuel Kant correctly noted, cannot be taught in the sense that it cannot be reduced to rules.[268] In the words of Werbach and Cornell:

> Even without bugs, there are reasons to doubt smart contracts will always operate as desired. First, they require reduction of human-readable language to machine-readable code. This limits their scope to those subjects and activities that can readily be specified . . . some contractual terms simply cannot be expressed through formal logic, because they imply human judgment. A machine has no precise way to assess whether a party used "best efforts".[269]

Similarly, other provisions, such as representations and war-ranties and covenants that reference "material adverse

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can respond to changing conditions in near real time. Parties to a contract can reference an oracle to modify payment flows or alter encoded rights and obliga-tions according to newly received information. Oracles also make it possible to determine or update specific performance obligations based on the subjective and arbitrary judgment of individuals. In this way, parties can rely on the deterministic and guaranteed execution of smart contracts for objective promises are readily translatable into code. At the same time, they can assign to a human-based oracle the task of assessing promises that cannot easily be encoded into a smart contract, either because they are too ambiguous or because they require a subjective assessment of real-world events.

DeFilippi & Wright, supra note 2, at 75.

I find this proposition odd because, of course, contract parties can and do adjust their contract terms in real time in light of changes in cir-cumstances. Having to program this ability into a smart contract and resort to third parties makes this harder, not easier.

[266]Raskin, supra note 1, at 326.

[267]Although this thought is often associated with Warren Buffet or John Meynard Keynes "[a] version of those words came from an 18th century author named Carveth Read in a book on logic and reasoning." Jeff Sauro, Better to Be Approximately Right Than Exactly Wrong (April 12, 2016), available at https://measuringu.com/approx-right.

[268]Immanuel Kant, Critique of Pure Reason A133, B172 (trans. & ed. Paul Guyer & Allen W. Wood 1998).

[269]Werbach & Cornell, supra note 3, at 365.

change," "reasonable grounds for insecurity" and the like cannot be reduced to code.[270] Once could program quantitative tests for materiality, but often *qualitative* materiality might be more important.

Often parties intentionally leave some aspects of contracts unresolved. One might think that a contract lawyer's duties are to negotiate terms and draft language that reflects her client's intent. But, in my experience, one of the most important services a contract lawyer serves for her client is to help it (and its counterparty) discover what their intent is. That is, the attorney generates hypotheticals and interrogates her client precisely to determine whether there is, and/or to create, a meeting of minds. To what extent one can cover all contingencies is subject to practical limitations. Sometimes, the parties do not have the time and money to hash out all contingencies. Sometimes putting too much emphasis on what can go wrong in a deal, can be counterproductive. Lawyers who over-emphasize the trees of unlikely contingencies rather than concentrating on the forest of mutually shared goals, are rightfully condemned as deal breakers, rather than deal makers. The degree of precision to negotiate and draft in a contract is itself a matter of judgment.

Consequently, it is rational for parties either to expressly or implicitly agree to leave some points unresolved with the understanding that they will have deal with them if and when problems arise. I have had some clients who have required that the contract set forth formal procedures for resolving potential future contingencies and disputes. Others have decided that, just as one cannot predict what contingencies might arise, one can also not predict the best

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[270]DeFilippi & Wright, supra note 2, at 77. One might be tempted to argue that one could come up with an "objective" definition of "materiality." This is true, but why would one want to? Lawyers and accountants have often tried to argue, for example, that materiality for securities laws purposes should be pegged to 5% of some measure, such as an issuer's revenues or net worth. The SEC and courts rejected such black-and-white tests because a misstatement or omission may be *qualitatively* material, even if not *quantitatively* so. See e.g. Securities and Exchange Commission, SEC Staff Accounting Bulletin No. 99, Release No. SAR-99 (1999); Litwin v. Blackstone Group, L.P., 634 F.3d 706, Fed. Sec. L. Rep. (CCH) P 96033 (2d Cir. 2011).

procedure to be adopted. Once again there is no right answer—which approach is superior is a matter of judgment.

B. The DAO as Object Lesson

This is not to deny that there are many contracts that are truly ambiguous because they are poorly drafted. Contract drafting is an art, not a science. This is one reason why, when a lawyer drafts complex financial contracts she starts, if at all possible, with a standard form or precedent (i.e. boiler plate) so that one does not try to reinvent the wheel. But this will be the case with respect to smart contracts written in code as well contracts that are truly ambiguous because they are poorly drafted. Contract drafting is an art, not a science. This is one reason why, when a lawyer drafts complex financial contracts she starts, if at all possible, with a standard form or precedent (i.e. boiler plate) so that one does not try to reinvent the wheel. But this will be the case with respect to smart contracts written in code as well.

This can be seen in the reaction of some blockchain enthusiasts who objected to Ethereum's reversal of the notorious hacking of the DAO in 2016. This event is well-known and I will only discuss this briefly.[271]

The DAO, a decentralized autonomous organization, was

[271]For an extensive discussion of the DAO debacle see the SEC DAO Report, supra note 9. Applying the *Howey* test (S.E.C. v. W.J. Howey Co., 328 U.S. 293, 66 S. Ct. 1100, 90 L. Ed. 1244, 163 A.L.R. 1043 (1946)), the SEC concluded that the DAO tokens constituted investment contracts and, therefore, securities for the purposes of federal securities law, that the unregistered offer and sale of tokens violated Securities Act § 5 (15 U.S.C.A. § 77e), and that trading in the tokens would have violated the Securities Exchange Act of 1934. Nevertheless, it declined to bring further enforcement action against the promoters or any other party.

For both positive and negative discussions of the DAO debacle see also Fenwick *et al.*, supra note 6, at 20–24; Jean Bacon, Johan David Michels, Christopher Millard, & Jatinder Singh, Blockchain Demystified; An Introduction to Blockchain Technology and its Legal Implications, Queen Mary University of London, School of Law Legal Studies Research Paper no. 268/2017 at 35; O'Shields, supra note 4, at 185–86; Kolber, Not-So-Smart Blockchain Contracts and Artificial Responsibility, 21 Stan. Tech. L. Rev. 198, 214–18, 222–25 (2018); Raskin supra note 1, at 33; Werbach & Cornell, supra note 3, at 350–52; Usha R. Rodriguez, Law and the Blockchain, University of Georgia Research Paper Series, Paper No. 2018-07 (Feb. 2018) at 24–38, abstract available at https;://ssrn.com/abstract=3127782; Reyes, Nizan Gelevich Packin & Benjamin P. Edwards,

an investment vehicle in the form of a smart contract on the Ethereum platform. It was supposed to allow all investment decisions to be made jointly by the investors without a central authority like an investment manager or board of directors.[272] It quickly crowdfunded investments valued at approximately $150 million in "ether." Notoriously, the first day the DAO went online some person or persons used an exploit in the program to withdraw ether from the DAO valued at approximately $50 million. The Ethereum Foundation created a "hard fork" that effectively reversed the transaction, returning the ether to the DAO, which subsequently disbanded, returning all of its funds to its investors.

A significant and vocal portion of the blockchain community objected to this on two related grounds. First, one of the most important features of a blockchain to many proponents is precisely that all transactions are permanently, immutably and irrevocably inscribed on the blockchain. Indeed, as David Gerard notes in scathing account of the DAO incident, the promoters emphasized the irreversibility of transactions in the promotional materials.[273] If the DAO

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Distributed Governance, 59 Wm. & Mary L. Rev. Online 1, 2–4,17 (2017); Levy, supra note 176, at 5; Grimmelmann, supra note 4, at 18–19; Rodriguez, Law and the Blockchain, 104 Iowa L. Rev. 680 (2019); Reyes, If Rockefeller Were a Coder, 87 Geo. Wash. L. Rev. 374 (2019) (suggesting that future DAO's might be organized as business trusts, reviving an old form of organization).

[272]Although promoted as a revolutionary new form of investment vehicle, it, in fact, largely replicates in digital form of a Lloyd's company—a sui generis business organization formed under the U.K's Lloyd's Act for the purpose of investing in reinsurance contracts on the Lloyds of London market. Although each investor, known as a name, invests a stated amount into the syndicate, and a manager will identify potential contracts for the syndicate to buy, the syndicate will not make the acquisition unless the names approve. One difference between a Lloyd's company and The DAO is that, the DAO would have made an investment proposed by its "curators" if the holders of a requisite majority of the value of the investments approved it, whereas in a Lloyd's company, any name could elect that her portion of the syndicate's assets not be used to make the investment. My understanding, however, is that a practical matter names accept the recommendations of the syndicate managers.

[273]Specifically, the promoters described the DAO as "operating solely with the steadfast iron will of **unstoppable code**." (emphasis in the original) Gerard, supra note 16, at 108.

(or its investors and creditors) wanted to recover from the hackers, the proper remedy would have been to find them and sue them. This would be difficult, if not impracticable, because although Ethereum transactions are not truly anonymous, they are pseudonymous. Although the identities of parties are often discoverable through various forensic techniques, these may often be too expensive for use by private litigants.

But, the most extreme proponents made a second argument. There should be no "remedy" at all because there had been no theft. In a smart contract there is no external standard of right or wrong, only the program itself. That is, the hackers merely found and exploited a feature of the program itself. Any other investor in the DAO could have done so, the "hacker" is just the clever, or lucky, investor who did so first. He or she is entitled to keep the profits of their hard work or luck.[274]

The DAO debacle teaches a number of lessons. First, the autonomous nature of smart contracts is as much a curse as a blessing. Two, the supposed lack of ambiguity of smart contracts in an illusion—the exploit that the hackers used was a hole in the program that the creators and promoters did not intend. Third, blockchain transactions are *not* immutable. The only reason why the minority of DAO investors could argue against the hard fork was precisely because hard forks are in fact possible.

That is, the hard-core DAO minority are, in fact, not making an argument that code is objective. They are making a normative argument because, in fact, it is subjective. Although they purport to claim that blockchains are immutable, the only reason they can argue that *should* not be changed is because they are in fact "mutable." They want to claim that the code is the law, while forgetting that all laws/contracts/codes incorporate and are subject to their own meta

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[274]As Raskin pus it:

> Strictly speaking, however, the hacker did not "hack" the code in a malicious way, but rather used the terms of the existing smart contracts to accomplish something others later found objectionable, i.e. the diversion of their money. Consider this using a legal loophole to effect a result that was clearly within the letter of the law, but not within its spirit (citations omitted).

Raskin, supra note 1, at 337.

law/contract/code provision that governs how they can be amended. Laws usually can be changed by the requisite vote of the legislature or the people, contracts by the consent, and sometimes by the actions of the parties, and blockchains by hard forks. If the DAO exploiters want to argue that the majority cannot complain about their exploiting an unanticipated ambiguity in the code, then they cannot complain that when the majority exploits the forking option.[275]

Fourth, blockchains do not do away with the necessity for trust.[276] The promoters of the DAO implicitly, or unconsciously, trusted that their investors would not seek exploit opportunities that would immediately destroy the DAO, and the other investors trusted that the promoters and the Ethereum Foundation would protect them through a hard fork.

As Grimmelmann states (using, as I do, the DAO as an object lesson):

> Natural languages are embedded in communities of people who use and understand those languages. This introduces ambiguity and uncertainty, because people may use and understand the same words in different ways. But it also provides a backstop on how badly natural-language contracts can fail. In many cases, the meaning of a contract is clear to a large fraction of people in the relevant linguistic community. If a contract isn't worth the paper it's printed on, it is because of corruption or enforcement problems, not because of ambiguity.
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> Programming languages appear to reduce linguistic

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[275]Kolber makes a similar point:

Broadly construed, however, "the code" is all the programming used to run TheDAO as well as the entire Ethereum ecosystem that hosted it. And part of the code underlying the Ethereum ecosystem is the architecture to enable and resolve hard forks. From this perspective, hard forking is not precluded by the code . . . Has forking was just as much a part of the code — again, broadly construed — as the TheDAO exploit was.

Kolber, supra note 270, at 222–23.

[276]A factor strangely omitted from discussions of the DAO is that, as is so often the case with respect to new technology, the promoters mistakenly presume that because the technology is novel, this means that existing law does not already govern it. In this case, if U.S. law applied, the DAO would have almost certainly been a general partnership (as Rodriguez similarly points out, Rodriguez, supra note 270, at 36–37) in which case the exploiters actions would have violated their fiduciary duty to the other investors.

ambiguity. In many cases, they do. Relative to a given implementation, a computer program's meaning is far more definite than a typical natural-language term's. Indeed, the very process of reducing a term to a formal-language expression requires a degree of precision from its drafters that can itself force them to understand and express their intentions more clearly. But because programming languages are formal, constructed systems, when the bottom drops out, it can really drop out.[277]

VI. Conclusion: Sensibility?

The fact that most contracts cannot be made purely automated and that smart contracts are unlikely to radically upend contract law or practice in the near future does not mean that blockchain technology won't have significant legal affects. Large parts of contracts can, already are, and will continue to automated.[278] Blockchain technology holds out great hope to make these contracts, as well as payments and clearing of financial arrangements somewhat more efficient.

However, as contracts today function fairly well, sense tells us that smart contracts are highly unlikely to radically change legal practice or business practices. And yet, and yet, sensibility still beckons. Blockchains seem to hold out the hope of something big—it is just not clear as to what that might be.

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[277]Grimmelmann, supra note 4, at 20.

[278]See e.g. Surden, supra note 51, at 695.

Bringing Drafts Into the Digital Age

Eric Marcus[*]

Drafts are a form of negotiable instrument that are commonly used to settle transactions for the sale of commercial goods. In the United States, the legal framework governing drafts is set out in Article 3 of the Uniform Commercial Code ("UCC"), which covers all forms of negotiable instruments. Currently, Article 3 contemplates that drafts will be in writing, on paper and will be transferred by the transferor endorsing the original draft and physically delivering it to the transferee. As more and more commercial contracts have moved from paper to electronic format, drafts have been left behind, because the laws that enable electronic contracting generally (primarily the Electronic Signatures in Global and National Commerce Act ("E-Sign")[1] at the federal level and the Uniform Electronic Transactions Act ("UETA") at the state level) do not cover drafts. In connection with the current project organized by the American Law Institute and the Uniform Law Commission to update the UCC to accommodate emerging technology, amendments should be made to Article 3 expressly authorizing drafts in electronic form ("e-drafts").

I. Introduction to Drafts

The term "negotiable instrument" is defined in UCC Section 3-104 as "an unconditional promise or order to pay a fixed amount of money, . . . if it: (1) is payable to bearer or to order . . .; (2) is payable on demand or at a definite time; and (3) does not state any other undertaking or instruction by the person promising or ordering payment to do any act

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[1]15 U.S.C.A. §§ 7001 to 7031.

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in addition to the payment of money . . .”[2] A draft is a negotiable instrument in the form of an order (rather than a promise), and “order” is defined in UCC Section 3-103(8) as “a written instruction to pay money signed by the person giving the instruction.”[3]

Switching from the legal language to a practical example, consider a draft arising out of the sale of commercial goods. Assume that the seller and the buyer have agreed that the purchase price will be $100 and will be paid on May 31, 2020.[4] The draft would be prepared by the seller, and would provide, in its simplest form, as follows: “On May 31, 2020 pay to the order of Seller US$100.00 (One Hundred US Dollars and no Cents).” The draft would be signed by the seller and delivered to the buyer for its acceptance. If the buyer agreed with the terms, the buyer would sign the draft below the word “Accepted” and return the original draft to the seller.[5] Such acceptance creates the buyer's liability to pay the draft.

Although the UCC uses the terminology “draft,” the same legal instrument is often referred to as a bill of exchange.[6] Many foreign countries have a legal concept that is very sim-

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[2]Unless otherwise indicated, all references herein to Article 3 of the UCC are to the Revised Version dated 1990 as amended by the 2002 Amendments. Most, but not all, states have adopted the 1990 Revised Version.

[3]A check is a particular form of draft that is either “payable on demand and drawn on a bank or. . . a cashier's check or teller's check.” U.C.C. § 3-104(f). The focus of this article is on drafts used in trade finance and supply chain finance facilities, in which there is significant market pressure to use e-drafts, but the drafts used in such facilities are not checks. Therefore, and because the collection and processing of checks is subject to extensive federal and state law and regulation in addition to Article 3 of the UCC, the author believes that the case as set forth herein for amending Article 3 to authorize e-drafts should be limited to drafts other than checks.

[4]Drafts may be payable at a fixed future date, as in this example, or on demand or at sight. See U.C.C. §§ 3-104, 3-108.

[5]Certain other terms are commonly included in a draft but are not required. Examples are a designation of the place of payment (usually a bank) and a statement that the draft evidences payment obligations of buyer arising under a specific identified contract.

[6]See Official Comment 4 to U.C.C. § 3-104.

ilar to a draft, but they use the term bill of exchange.[7] Because of the prevalence of bills of exchange in international trade, the United Nations Commission on International Trade Law has prepared a Convention on International Bills of Exchange and International Promissory Notes. However, at this time the Convention has not been approved by either the United States or the minimum required number of nations, and it therefore has not yet taken effect.[8] In any event, the Convention does not contemplate electronic instruments; it deals only with tangible instruments in writing that can be transferred by delivery.

II. Settling Sales of Goods by Accounts or Drafts

In many sale transactions, the buyer does not pay for the goods concurrently with delivery but instead pays on 30-day, 60-day or even longer terms. The buyer's obligation to pay is often an "open account" that is evidenced solely by an invoice. Such an open account is classified as an "account" under Article 9 of the UCC. However, the parties may also agree that the buyer's payment obligation be represented by a draft. An impetus for this method of settlement has been a push in recent years by many buyers with bargaining power for payment terms longer than the traditional 30 or 60 days. Although the longer payment terms are helpful for the buyer's cash flow, they are quite harmful for the cash flow of the seller, who has incurred expenses to buy raw materials and manufacture and sell the goods, all without receiving any payment for the goods. In order to manage their own cash flow, sellers have turned to banks and other financial institutions to monetize the obligations due from their buyers by borrowing against or selling these obligations. Such monetization programs are generally referred to as trade finance or supply chain finance facilities and have been the subject of significant growth in the last 10 years. As will be further detailed below, sellers are able to obtain significantly

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[7]Examples are the Canadian Bills of Exchange Act and the U.K. Bills of Exchange Act of 1882.

[8]Although the Convention was proposed in 1988, it has only been adopted by five countries, with the most recent adoption occurring in 2005. Since a minimum of 10 adopting countries is required for the Convention to enter into force, prospects for the effectiveness of the Convention do not bode well.

greater rates of funding under these programs if the obligations are in the form of drafts, rather than accounts.

If a seller holds payment obligations in the form of accounts, it may obtain immediate cash by either selling the accounts or assigning the accounts as collateral for a loan. A financial institution funding the accounts will generally prefer to buy the accounts, rather than lend against them, because in the event of a bankruptcy of the seller, sold accounts will not be part of the seller's bankruptcy estate and the financial institution will not be prevented from collecting the accounts by the automatic stay in bankruptcy. However, even with a sale of accounts, the funder will still be subject to several risks which it must protect itself against. A significant risk is dilution—the possibility that the buyer may not pay the full amount of the account based on a dispute that the purchased goods were defective or did not otherwise conform to the contract or because the buyer has other claims or offsets against the seller. An agreement for the sale of accounts will provide that the seller has recourse for any dilution, but depending on the seller's creditworthiness and the expected amount of dilution, the agreement may also provide for a dilution reserve. In such a case, the funder would reduce the purchase price of the accounts by a dilution reserve, and when the actual dilution was determined, the funder would pay the seller an amount equal to any excess of the dilution reserve over the actual dilution. This issue is not a concern if the funder purchases drafts, rather than accounts, because the buyer has agreed in the draft to pay an amount equal to the full amount of the invoice. Furthermore, if the funder purchases the drafts in such a way that it becomes a holder in due course,[9] the funder will take the drafts free of all claims and defenses (including dilution) other than certain very limited defenses, such as incapacity of any party to the draft (e.g. infancy or insanity), illegality and discharge in bankruptcy. Nearly all draft programs are structured with the intention that the funder will be a holder in due course.

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[9]The requirements to become a holder in due course are set forth in UCC § 3-302(a) and include, among other conditions, that the holder take the instrument for value, in good faith, and without notice of certain specified claims and defenses.

Another risk to the funder purchasing accounts is that although the account may arise under an invoice having 30- or 60-day terms, the invoice terms have traditionally not been viewed as providing an absolute fixed maturity date. Such accounts are routinely paid within a few business days of the applicable term without any penalty. In order to mitigate this risk, an agreement for the sale of accounts will typically include a buffer period (approximating the historical delay in buyer payments) in the calculation of the purchase price for the accounts. Note again that this issue is not a concern for a funder purchasing drafts, because the draft contains a fixed maturity date.[10] As indicated by the foregoing discussion, the purchase price for a draft should be solely a function of the buyer's creditworthiness and the term of the draft, whereas the purchase price for an account must also consider expected dilution and expected payment delay. As a result, the seller should obtain more favorable funding if it is able to sell drafts rather than accounts.

Another distinction between the sale of accounts and drafts is that sales of accounts are subject to Article 9 of the UCC, whereas sales of drafts are not.[11] Accordingly, a purchaser of accounts must make a UCC filing against the seller in order to perfect its interest in the accounts, and a purchaser of accounts will want to confirm the priority of its interest by reviewing a UCC search against the seller. After making its UCC filing, a purchaser of accounts is required to amend the UCC filing or refile if the seller changes its name or jurisdiction of organization, and it must also periodically (usually every five years) file continuation statements to preserve its interest. These UCC perfection requirements result in additional administrative expenses, which are not applicable to a purchaser of drafts.[12]

A purchaser of drafts may also have the benefit of certain expedited remedies which are not available to the purchaser

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[10]The draft may also include a provision for interest on late payments.

[11]U.C.C. § 9-109(a)(3). Of course, a security interest in a draft, granted as security for an obligation, is subject to Article 9.

[12]A purchaser of drafts will rely on its holder in due course status to assure its priority. See U.C.C. §§ 9-330(d), 9-331.

of accounts. For example, in New York an expedited collection procedure, known as a motion for summary judgment in lieu of complaint, is available when the action is based on "an instrument for the payment of money only."[13]

III. Paper Drafts vs. E-Drafts

Although draft purchase programs have many advantages over account purchase programs as described above, draft purchase programs also have some downsides. A particularly cumbersome issue is the creation and transfer of the draft. In order to create and transfer a paper draft, the draft must be circulated to the seller and the buyer for signature and then endorsed and delivered to the funder. In today's commercial world, the three parties are unlikely to be located in the same city, and may not even be located in the same country. Circulating a paper draft to the parties requires several business days at a minimum, as well as close monitoring by administrative staff, and the vagaries of delivery services and weather can result in some uncertainty as to the timing of when the fully signed original draft will be delivered to the funder, which in turn affects the date of funding. Although some techniques have been developed to ameliorate this issue,[14] additional documentation and negotiation is needed, which increases the complexity of setting up and funding a draft purchase program.

A second cumbersome issue is that the draft purchaser must safely store and maintain the original paper drafts. A single supply chain finance program may generate hundreds of drafts annually, and since the financial institutions providing these facilities are likely to have numerous separate programs, the amount of storage space and administrative expense associated with the physical drafts can be daunting.

Neither of the foregoing problems would arise if the drafts were in electronic form, rather than on paper.

IV. E-Drafts and Existing Laws

The current version of Article 3 was promulgated in 1990,

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[13]N.Y. Civ. P Law & Rules 3213.

[14]One party may grant a power of attorney to another party to execute drafts, or one party or a trustee may hold pre-signed signature pages which it is authorized to assemble upon instruction.

which was well before laws dealing with electronic signatures and electronic documents were adopted.[15] Therefore, it is no surprise that the drafters of Article 3 contemplated that negotiable instruments would exist solely as physical writings. As noted above, one of the requirements of a draft is that it is a "written instruction,"[16] and Official Comment 1 to U.C.C. § 3-104 states that a negotiable instrument "is limited to a signed writing." The terms "writing" and "written" are defined in U.C.C. § 1-201 and require a "reduction to tangible form." Accordingly, a draft in electronic form does not satisfy the definitional requirements of a "draft" under Article 3. Moreover, the transfer by negotiation of a draft requires transfer of possession, which in turn requires physical delivery to the new holder (or an agent of the new holder).[17] Since an e-draft cannot be physically delivered, Article 3 does not provide a method for it to be negotiated by a seller to a funder. Furthermore, since negotiation is a condition to a funder becoming a holder in due course, a funder of e-drafts would not be able to become a holder in due course.

In the case of certain other types of documents where electronic versions are currently used, the UCC was amended to specifically allow electronic documentation. For example, electronic chattel paper was added to Article 9 as part of the revision to Article 9 in 2000, and electronic documents of title were authorized in 2003 pursuant to a revised version of Article 7 (with conforming amendments to Article 1). In order to allow commercial law and practices to continue to develop and utilize the latest technology, it is time for Article 3 to be amended to permit the use of drafts in electronic form.

Other laws, such as E-Sign and UETA, providing for the general recognition of electronic contracts and electronic signatures are not helpful with regard to e-drafts. Both E-Sign and UETA exclude from coverage contracts and records governed by the UCC (other than Articles 2 and 2A)

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[15]E-Sign became effective in 2000, and UETA was finalized by the Uniform Law Commission and recommended for enactment by the states in 1999.

[16]U.C.C. § 3-103(8).

[17]U.C.C. §§ 3-201, 3-203(a).

but then provide a special form of coverage for "transferable records" that constitute notes under U.C.C. Article 3.[18] The special provisions for notes are needed, because as noted above, Article 3 does not provide a method for transferring and negotiating notes that are not in tangible form. Both E-Sign and UETA provide that a person having control of a transferable record is the holder, describe a system for providing control of a transferable record and provide that a holder having control has the same rights and defenses as a holder in due course of a note under Article 3, without any requirement of delivery, possession and endorsement. Although these provisions provide a firm basis for the creation and enforcement of electronic notes, drafts are a separate category of instrument under Article 3[19] and are outside the coverage provisions of E-Sign and UETA.

UETA has been adopted in 47 of the 50 states and in the District of Columbia. The three exceptions are Illinois, New York and Washington, each of which has adopted its own statute with respect to electronic signatures and electronic records. Washington State's statute, known as the Electronic Authentication Act, conflicted with E-Sign by requiring electronic signatures to be in the form of a digital signature, which is a special type of coded electronic signature that is created using a key and is verifiable by the recipient, also using a key. Partly due to federal preemption concerns, the Washington statute was repealed in 2019. As a result, transactions governed by Washington State law are now subject to E-Sign, as supplemented by a Washington State statute that applies solely to electronic transactions with governmental entities.[20] The New York statute, known as the Electronic Signatures and Records Act, allows for the creation of electronic negotiable instruments generally (i.e. unlike E-Sign and UETA, it is not limited to notes), provided there is "only one unique, identifiable and unalterable version which cannot be copied except in a form that is readily

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[18]15 U.S.C.A. §§ 7003(a)(3) and 7021 (E-Sign) and UETA Sections 3(b)(2) and 16.

[19]U.C.C. § 3-104(e).

[20]Title 19, Section 360 of the Revised Code of Washington. This statute does not contain any provisions dealing with electronic notes or drafts.

identifiable as a copy."[21] However, the New York statute does not include any provisions comparable to those in E-Sign and UETA granting the holder of an electronic instrument status as a holder in due course. This is a very significant omission, which makes use of the New York statute as a basis for e-drafts questionable. Likewise, the Illinois statute, known as the Electronic Commerce Security Act, allows for the creation of electronic negotiable instruments generally[22] but does not contain provisions detailing how the holder of such an instrument becomes a holder in due course. Accordingly, none of the state statutes provides a comprehensive basis for recognizing e-drafts and according the holders of e-drafts the same rights as the holders of paper drafts.

Even if the New York and Illinois statutes provided a clear method for the holder of an electronic negotiable instrument to become a holder in due course, it would still be risky for funders of e-drafts to rely on these statutes because of choice of law issues. For example, in a contest between the holder of an e-draft and another creditor of the seller or the buyer, the other creditor would have a strong incentive to assert that the law applicable to the e-draft was that of a state other than New York or Illinois, thereby causing the holder to lose the benefits of holder in due course status. Article 3 does not contain a choice of law provision, and it is customary not to include a choice of law provision or a forum selection provision in a negotiable instrument, because of concerns that such provisions might be regarded as an "other undertaking or instruction" which is not authorized by U.C.C. § 3-104(a)(3) and therefore renders the instrument not negotiable. In the absence of a statutory rule or an enforceable contractual provision, the law applicable to an

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[21]N.Y. State Tech. Law § 307.2. This is similar, but not identical, to certain provisions in E-Sign and UETA authorizing a framework for transferable records.

[22]The requirements for an electronic instrument under the Illinois statute are more detailed than in the New York statute. Ill. Comp. Stat. Ann. § 5-120(c)(3) requires that the electronic version of the instrument must be "created, stored, and transferred in a manner that allows for the existence of only one unique, identifiable, and unalterable original with the functional attributes of an equivalent physical instrument, that can be possessed by only one person, and which cannot be copied except in a form that is readily identifiable as a copy."

e-draft would be determined by an analysis that looked at the location of the parties, the place of execution, the place of payment, the place of negotiation and possibly the location of the server where the e-draft was stored.[23] Because the parties to an e-draft are likely to be located in multiple states (or countries), there may well be several different jurisdictions that bear a relationship to the e-draft transaction and whose law would be appropriate to apply.[24] Different substantive results may arise depending on which jurisdiction's law is applied;[25] this unpredictability increases transaction costs and should be eliminated in any proposed UCC amendments. This could be done by modifying U.C.C. § 3-104(a)(3) to specify that a negotiable instrument may contain a choice of law provision and a forum selection clause. Furthermore, a default choice of law provision could be added to Article 3.[26]

Because drafts and bills of exchange are frequently used in connection with cross-border trade transactions, several international industry groups have been working on proposals to facilitate the use of electronic negotiable instruments. In 2017, the United Nations Commission on International Trade Law (known as UNCITRAL) proposed a Model Law on

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[23]Restatement 2d, Conflict of Laws § 216 provides that the law of the state where the negotiable instrument was at the time of transfer determines (1) the validity of the transfer as between persons who are not both parties to the transfer and (2) whether the transferee is a holder in due course. This Restatement was issued in 1971, and the comments to Section 216 make clear that the rule set forth therein is based on a negotiable instrument being a tangible thing with a readily ascertainable location. It is unclear whether or how this rule should be applied to an electronic negotiable instrument.

[24]The general choice of law rule in U.C.C. § 1-301(b) of the does not help to narrow the possible jurisdictions in this situation, inasmuch as it provides only that in the absence of an effective contractual choice of law clause, the law of any particular state may be applied "to transactions bearing an appropriate relation" to such state.

[25]In addition to differences that arise as a result of the recognition of e-drafts in some jurisdictions, but not in others, there are some states, such as New York, that have not adopted the 1990 Revised Version of Article 3. Furthermore, New York and some other states have made nonstandard revisions to Article 3, which may cause different substantive outcomes in certain situations.

[26]Other UCC Articles include choice of law provisions. See U.C.C. §§ 1-301, 4A-507, 5-116, 8-110, and 9-301 to 9-307.

Electronic Transferable Records ("MLETR"),[27] which provides for recognition of electronic transferable records and provides further that control (and transfer of control) of an electronic transferable record is equivalent to possession (and transfer of possession) of a physical transferable record. The International Chamber of Commerce (known as ICC) has been working to draft a Uniform Rules for Digital Trade Transactions, which would permit parties to contractually agree to certain rules for electronic instruments. Additionally, in April 2019 a working group of BAFT (The Banking Association for Finance and Trade) proposed for comment a set of Business Best Practices and related technical specifications for implementing an electronic promise to pay arising out of a trade transaction.[28] Unlike the MLETR and the ICC rules, which are neutral as to the technology employed, the BAFT proposal is intended for use on a digital ledger network. There have been recent press reports of pilot trade finance programs conducted on blockchain platforms, including Marco Polo and we.trade.[29]

The COVID-19 virus pandemic that has triggered a global health and economic crisis in 2020 has also disrupted the ability of banks around the world to process trade finance transactions, which often require bank personnel to review paper documents in their offices. In recognition of these operational problems, the International Chamber of Commerce ("ICC") issued a memo in early April, 2020 calling for emergency action by all governments "to enable banks to process trade finance transactions utilising electronic trade

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[27]https://uncitral.un.org/en/texts/ecommerce/modellaw/electronic_transferable_records. The MLETR has been enacted in Bahrain.

[28]https://baft.org/docs/default-source/default-document-library/baft-dlpc-business-best-practices-(proposed-specifications-for-trial-use)-final-5-20-19.pdf?sfvrsn=2; https://baft.org/docs/default-source/default-document-library/baft-dlpc-business-best-practices-(proposed-specifications-for-trial-use)-final-5-20-19.pdf?sfvrsn=2.

[29]https://www.gtreview.com/news/fintech/first-live-trade-finance-pilots-completed-on-marco-polo-blockchain-platform/; https://www.gtreview.com/news/fintech/exclusive-hsbc-becomes-first-bank-to-complete-financing-transaction-on-we-trade-blockchain-platform/. The Marco Polo pilot programs have been completed, and the platform was released to participants in March, 2020. https://www.marcopolo.finance/payment-commitment/.

documents - removing the need for any documentation to be presented in hard-copy."[30] The ICC expressly included negotiable instruments, such as bills of exchange and promissory notes, in the list of trade documents that should be capable of being presented electronically. The ICC further urged countries to adopt MLETR "to ensure trade finance can be conducted in a paperless manner with a workforce working-from-home." Also in April, 2020, the International Trade and Forfaiting Association ("ITFA") announced a Digital Negotiable Instruments Initiative.[31] ITFA has been lobbying the UK government to revise English law so as to make electronic negotiable instruments legally valid and concurrently has proposed a contract law solution to enable suppliers, buyers and banks to utilize electronic bills of exchange and promissory notes governed by English law. It is very clear that significant commercial pressure is building for a legally certain electronic instrument solution.

Amendments to Article 3 that authorize e-drafts (including procedures to negotiate e-drafts and attain holder in due course status) and provide more certainty regarding the law that would be applied to e-drafts that have a relationship with multiple jurisdictions will go a long way toward aligning Article 3 with current technology, current commercial practices and needs and future demands.

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[30]https://iccwbo.org/content/uploads/sites/3/2020/04/icc-memo-on-essential-steps-to-safeguard-trade-finance-operations.pdf.

[31]https://www.linkedin.com/pulse/itfa-fintechs-joining-forces-digitise-negotiable-using-casterman/.

Current Literature

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