Too Complex to Perceive?: Drafting Cash Distribution Waterfalls Directly as Code to Reduce Complexity and Legal Risk in Structured Finance, Master Limited Partnership, and Private Equity Transactions

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Too Complex to Perceive?

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Abstract

The intricate procedural and data-driven decision trees that play a critical role in complex financial contracts like cash distribution waterfalls in structured finance agreement indentures (e.g., collateralized debt obligations (CDOs)), master limited partnership agreements, and private equity fund agreements are inefficiently depicted as written contracts. As Professor Henry Hu explains in Too Complex to Depict?, the difficulty of translation—or depiction—between original mathematical models, plain English prospectuses, legal contracts, and programmed execution means that often the written depictions that form the basis of disclosures do not accurately define the act of execution. To overcome this, the SEC proposed an amendment to Regulation AB that would require disclosure of special-made cash flow waterfalls programs for asset-backed securities (ABS) to escape the limitations of language. British and Australian regulators have already implemented a similar code disclosure regime. Likewise, Professor Hu goes further and supports a “perfect information” model that presumably would require disclosure of the actual computer programs used by, e.g., CDO trustees to execute cash distributions.

These proposals and implementations create a new problem: perception. In the status quo, problems of depiction mean that the two disclosed documents—contract and prospectus (or offer memorandum)—must be interpreted by the parties to determine what the reality of execution of the deal—calculating cash payments—will or should look like. The SEC and Professor Hu add a third, distinct, legally binding depiction: the code. While that code might accurately depict execution before a dispute, in the event of a dispute, all three depictions will be in play and could influence what the future reality of cash distribution will be. Each additional legally relevant disclosure increases the challenge for dealmakers trying to predict what will happen in the event of a dispute.

This Article proposes reducing the number of legally relevant depictions of largely procedural arrangements to one: the code. Rather than add the code as yet another disclosure, in deals between sophisticated investors concerning these complex products, the dealmakers should not only disclose the code but negotiate about the code directly. Following the model of construction contracts that incorporate blueprints, financial contracts should incorporate the code that will be used to calculate the cash distribution. This solves the problems of depiction and perception because the code both describes and executes the agreement, and in turn reduces risk in these deals.

Part I.A. describes the exemplar product: the CDO. Part I.B expands Professor Hu’s description of the intermediary depiction problem by explaining the problem of perception of the future legal reality and its impact on business risk. Part II.A proposes reducing human discretion in procedural financial arrangements to facilitate coded automation of those processes, and in turn incorporating that code into the contract. Part II.B explains how the SEC should adjust its prospectus paradigm and remove unsophisticated investors from certain product markets to permit this proposal. It then suggests the SEC should mandate this deal-making model. Finally it addresses the challenge that the bankruptcy regime poses for this proposal.

*I owe a debt to a banker, a securities regulator, and an industry litigation expert, each of whom provided a fundamental understanding of how these structured financial products are really made, regulated, and fought over without which this paper could not have been written and all of whom asked to remain unnamed. Any mistakes are the author’s own.
Introduction

Consider new home construction contracts. Few homebuilders, homebuyers, or architects would associate “drafting” with “writing a contract.” When contracting for the construction of a new home, the homebuyer does not ask the architect to spec out the details of the house plan in the text of a written contract. No architect would, and probably none could, efficiently, accurately, and precisely explain in full text the height, width, thickness, and style of every door along with each doorway’s specific gap from the door, hinge location and style,
doorstop depth, tolerance for all of the previous measurements, etc. Were the homebuyer to find an ambitious architect–lawyer to draft such a behemoth, in the absence of an equally adept construction worker–lawyer, the construction crew likely could neither understand that contract nor translate it into a home. To “draft” a home in legalese would be a fool’s errand. Of course, no one “drafts” a home layout in the construction contract. Instead, the contract refers to drafted blueprints, diagrams, models, and specification sheets as the determinative legal source for the home design, writing out only the surrounding business operations and asset-quality guarantees for which transactional drafting is well-suited.¹

Now turn to structured financial products.² Complex arrangements ordering the distribution of cash flow from underlying assets to different classes (tranches) of bondholders and equity-holders characterize structured financial instruments like collateralized debt obligations (CDOs) and other similarly tranched products.³ These cash flow distribution arrangements, called waterfalls, are highly complex and include numerous interdependencies

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¹ See, e.g., 2 CONSTRUCTION AND DEVELOPMENT FORMS § 18:3 (2013) (“Contractor agrees to furnish all services, materials, labor, tools, equipment, and all other items required to undertake and complete all work required by the general conditions of the contract attached hereto, and the drawings, plans, and specifications prepared by [name of preparer] for the construction of [description of project]. The following drawings, plans, and specifications identified by the signatures of the parties to this agreement form a part of this contract as if they were set out herein.” (alterations in original)), available at Westlaw CDFMS.
² “There is no universal definition of structure[d] finance.” FRANK J. FABOZZI ET AL., INTRODUCTION TO STRUCTURED FINANCE 1–5 (2006). Fabozzi et al. identify the use of a “special purpose vehicle,” a “bond issue that is asset-backed,” “a combination of interest-rate and credit derivatives,” among other traits, as characteristic of structured financial products. Id. at 2. Providing a slightly different set of criteria, the Bank for International Settlements identified the following three characteristics:

(1) pooling of assets (either cash-based or synthetically created); (2) tranching of liabilities that are backed by the asset pool (this property differentiates structured finance from traditional “pass-through” securitisations); (3) de-linking of the credit risk of the collateral asset pool from the credit risk of the originator, usually through use of a finite-lived, standalone special purpose vehicle (SPV).

³ BIS STRUCTURED FINANCE 2005, supra note 2, at 9–11. Collateralized loan obligations, collateralized mortgage obligations, and certain credit card asset-backed securities also have multiple classes or tranches of bondholders and equity-holders.
between distributions to different classes of investors.\textsuperscript{4} Like a house plan, structured financial product waterfalls are “too complex to depict” accurately\textsuperscript{5} or perceive accurately or precisely from a written contract. In spite of the limitations of the written word to express these agreements, dealmakers in structured finance contracts persist in their attempts to depict “‘complete contract[s]’ that fully specif[y] the rights of all the transaction[s]’ participants and the rules for determining payments to note holders under alternative scenarios of asset pool performance.”\textsuperscript{6} Like the hypothetical Sisyphean architect–lawyer struggling and inevitably failing to depict completely in word-pictures each joist and beam in a home, structured finance dealmakers can waste a great deal of time and resources developing imperfect deal documents that cannot accurately depict the desired or functional (actual) reality of the distribution waterfall.

In order to free dealmakers from this Sisyphean task, this Article proposes that complex structured finance transactions involving sophisticated investors should adopt an analogous solution to the home construction agreements’ strategy of contracting by reference to blueprints. First, dealmakers should, preferably by choice, place as much of their waterfall distribution specification and related inputs as possible into automated, programmatic representations that will be used to make the actual distribution. In many cases, these agreements already have programmatic representations,\textsuperscript{7} so this change should pose relatively few practical challenges logistically. Second, they should, like their counterparts in construction contracts, define the

\begin{itemize}
\item \textsuperscript{4} Id. at 11.
\item \textsuperscript{6} BIS STRUCTURED FINANCE 2005, supra note 2, at 11.
\item \textsuperscript{7} See DARREN SMITH & PAMELA WINCHIE, CASH CDO MODELING WITH EXCEL: A STEP BY STEP APPROACH 1–2 (2010) (discussing the transition from primarily using Excel-based modeling of CDOs to the use of proprietary software solutions); Presentation to the SEC by Intex Sols. (Oct. 19, 2010), available at http://www.sec.gov/comments/s7-08-10/s70810-170.pdf.
\end{itemize}
terms of those waterfalls by reference to their functional representations. The contract should be depicted by the same code that will decide the actual distribution, and that coded depiction should be the legally binding contract. By unifying the functional and legal realities of the structured finance products, dealmakers will avoid wasting resources on creating unnecessary and inaccurate legal depictions, and will also reduce the legal and financial risk created by the imprecision and inaccuracy of perception those poor depictions create.

This article will proceed as follows: In Part I, this Article sets out to restate and expand Professor Henry Hu’s explanation of the intermediary depiction problem with what this Article terms the challenge of perception.\(^8\) Professor Hu observes that the difficulty with the current regulatory disclosure regime is one of imperfect depictions and could be fixed with pure information disclosure. By contrast, this Article contends argue that so long as there are multiple potentially legally determinative depictions, there will be financial, legal, and systemic risk. Because of that, no regime of additional disclosures can, by itself, reduce eliminate those risks; if anything, adding to the number of potentially legally binding disclosures increases risk. Therefore, in Part II, this Article proposes that in complex structured finance agreements’ waterfalls and other similar agreements between sophisticated parties, the functional code that creates the functional reality should, as described above, become the contract by reference in the legal deal document and thus should become the legally determinative reality. This would reduce the confusion that impedes perception of the future reality of the financial product’s cash flow distributions.

\(^8\) Hu, supra note 5, at 1642–43.
I. Too Many Depictions Means Too Many Potential Realities to Perceive

A contract to build a home and its blueprint exhibits merely permit prediction of how the finished house will be built and how it will look.\(^9\) Until the home is finished, there are many potential homes that could exist given how the builders interpret the contract and the blueprints. The number of potential future homes that might exist expands further when many sources generate multiple design documents as well as separate specifications and specific contract terms, all of which might misalign, causing “document coordination errors.”\(^10\) The number grows higher still when the possibility of a dispute arises, because once a court or arbitrator steps in to resolve that conflict, all bets are off as to how the contract and exhibits will be interpreted.\(^11\) And even after the dispute is resolved, the original problem of builder implementation of that clarified contract’s requirements remains.

Structured financial products create a similar, but more difficult challenge of depiction and perception. Currently, there are two legally relevant depictions: (1) legal-English contracts and indentures,\(^12\) and (2) “plain”-English prospectuses, offering memoranda, and other similar customer-facing disclosures.\(^13\) And if the SEC’s proposed amendment to disclosure rules

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\(^9\) There is a debate in the courts and academia about whether and to what exactitude builders should be held accountable to blueprints incorporated into contracts. For an example of this discussion in the context of the “economic waste” standard in the case of construction defects, see Richard D. Schepp, Comment, A Call for Recognition of Owners’ Subjective Valuations in Residential Construction Defect Cases, 1989 Wis. L. Rev. 1139 (1989).


\(^11\) Id. § 7:132 & n.9.

\(^12\) Some dispute the characterization of bond indentures that specify the operation of the trustee—the distributor of the cash flows from underlying assets according to the waterfall, in our case—as a contract. Martin Riger, The Trust Indenture as Bargained Contract: The Persistence of Myth, 16 J. Corp. L. 211, 212–14 (1991). Professor Martin Riger argues that indenture for public bonds are not contracts because the bondholders did not bargain for the terms of the indenture. Id. While there is some validity to this point, in the context of these highly complex structured financial instruments sold primarily to sophisticated buyers, this argument is likely not relevant.

\(^13\) In as much as a misrepresentation in a prospectus about the underlying arrangement can create civil liability, the prospectus can provide an alternate legal reality to the contract for registered securities. For a discussion of liability for misstatements in registration statements, which include prospectuses, see Securities Act of 1933 § 11, 15 U.S.C.
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concerning asset-backed securities, Regulation AB, even reaches final rule status, it will constitute a third legally relevant document.\textsuperscript{14} There are also non-legal formal mathematical depictions and the functional depictions. None of these depictions reflects accurately the desired reality of the parties, assuming there is a single such reality.\textsuperscript{15} Furthermore, in the act of translating between depictions—particularly by translating the legal depiction to the functional depiction that will create the functional reality—the ability to perceive precisely and accurately the legal reality is difficult or impossible because there so many potentially conflicting legal depictions compete to be the legal reality. The combination of inherent and significant complexity within these structured financial agreements and the confusion of different potential legally determinative documents creates business and legal risk.

This Part explains the challenges of depiction and perception, how they increase financial and legal risks and costs for the parties to structured finance deals, and why the status quo as well as current proposals to remedy these difficulties will not solve these problems. Subpart A


\textsuperscript{15} Assuming bonds are contracts, see supra note 12, there remain concerns about whether bond purchasers reach a meeting of the minds with the issuers and underwriters, though Professor David Groshoff argues that they do. David Groshoff, \textit{Would “Junkholder Primacy” Reduce Junk Corporate Governance?}, 13 J. BUS. & SEC. L. 59, 82–83 (2012).
introduces briefly the relevant contractual arrangements. Subpart B demonstrates that presence of multiple legally relevant depictions makes accurate and precise perception of the future legal reality, and thus the future functional business reality, difficult and perhaps impossible.

A. An Explanation of Waterfall Distributions in the Context of CDOs

Stepping back, a brief introduction to our waterfall exemplar, CDOs, is in order to provide the context for what this Article proposes later, and, alas, there is no suitable construction analogy even though CDOs often sit atop residential mortgage securities. This subpart will provide relevant background on the structure and implementation of waterfalls in the context of the CDOs. It will then explain contexts outside of CDOs where waterfalls appear.

A basic understanding a arrangement like a CDO is necessary to follow the remainder of this Article’s discussion of waterfalls and their execution. Starting at the most basic level, bonds are a type of loan. Bonds are also securities, with all of the significance that label carries for regulation. Companies sell bonds to get cash. These bonds receive credit ratings and pay out at different interest (coupon) rates depending upon risk, with one typical CDO bond structure paying out interest throughout the maturation of the bond and repaying principal at maturity. If certain requirements are met, the Trust Indenture Act of 1939 requires the assignment of a trustee

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19 Id. at 26, 28.
to ensure the repayment of the loans for publicly offered bonds.\textsuperscript{20} In any case, the agreement that the trustee enforces is called an indenture.\textsuperscript{21}

As a legal business structure, CDOs typically sit onto top of this trust indenture framework\textsuperscript{22} and add layers of legal and financial complexity onto it. In CDOs, a special purpose vehicle (SPV), sells bonds and sometimes equity shares in order to finance the purchase of assets originated elsewhere.\textsuperscript{23} These assets can be secured home mortgages, credit card loans, student loans, commercial loans, asset-backed securities of these various types of debt, and sometimes other CDOs (called CDO-squared (CDO\textsuperscript{2}), or, if taken a step higher, CDO-cubed (CDO\textsuperscript{3}), etc.).\textsuperscript{24} An investment bank arranges the structure of the relevant organizations and products by serving as a structurer.\textsuperscript{25} This is where things become hairier. The structuring sponsor typically places assets of different risk classes into the SPV.\textsuperscript{26} Cash flow from payments on these loans comes into the SPV, which then pays the trustee to monitor (and in some senses, to manage) the distribution of that cash flow to the bondholders as interest and principal


\textsuperscript{21} WERNER & STONER, supra note 16, at 347. Depending upon the structure of the CDO and the role of the trustee, sometimes the language of pooling and servicing agreement is used in lieu of indenture. See CORP. TRUST COMM., AM. BAR ASS’N, THE TRUSTEE’S ROLE IN ASSET-BACKED SECURITIES 5 (“A pooling and servicing agreement, trust indenture or similar agreement forms the basic document which sets forth the relationship among the parties and the assets.”). For the sake of simplicity, this paper will refer to indentures and trustees.

\textsuperscript{22} 1 FRANK J. FABOZZI, HANDBOOK OF FINANCE 399 (2008). The following describes only one of many types of financial and business structures for a CDO for purpose of providing an example.

\textsuperscript{23} Id. at 396.

\textsuperscript{24} FRANCESCA CAMPOLONGO ET AL., QUANTITATIVE ASSESSMENT OF SECURITISATION DEALS 4 (2010); FABOZZI, supra note 22, at 396. For useful diagrams of more complex types of securitization structures, see ANN RUTLEDGE & SYLVAIN RAYNES, ELEMENTS OF STRUCTURED FINANCE 136–38 (2010).

\textsuperscript{25} FABOZZI, supra note 22, at 398.

\textsuperscript{26} See, e.g., id. at 399.
payments and, if any cash remains, to the equity holders. The trustee or its subcontractor ensures that the distribution aligns with the indenture.

Adding to the complexity of the indenture that specifies cash distributions to bondholders, there are typically many classes or tranches of bondholders and the interest and principal cash flows pay each bond class successively. The cash pours down the waterfall of tranches, and if there is not enough to fulfill each tranche’s distribution requirement, then the lower tranches and the equity holders receive nothing. There are often (but not always) different waterfalls for interest and principal as well as unique waterfalls in the case of a default. Within the waterfall, shortfalls in the ability to pay interest or changes in the overcollateralization of underlying assets relative to stated bond principal amount can also change the ordering of cash flows. External to the waterfall itself, the criteria for how the waterfall reacts to changes in assets’ credit ratings or the meaning of default are often defined idiosyncratically in each indenture agreement.

The indenture that specifies the cash flow and other terms of the security acts as a written legal contract, but knowing what a legal document is supposed to do is different from knowing

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27 Id. at 72.
28 Id. at 208.
29 Id. at 399–400.
30 Id.
32 FABOZZI, supra note 22, at 400–01.
34 The relationship of the trustee, obligor entity (in this case the SPV), and the investor is more complicated than a traditional contract. For more discussion of the subtleties of the role of trust indenture as, among other capacities, trust and contract, see ROBERT I. LANDAU & JOHN E. KRUEGER, CORPORATE TRUST ADMINISTRATION AND MANAGEMENT 22–30 (5th ed. 1998); see also supra note 12 (discussing critics of the idea of indenture as contract).
how that transaction was made and then how the trustee implements it as a practical matter.\textsuperscript{35} First, a banker, often a financial engineer or other quant, develops a mathematical or algorithmic model of the structure of the assets and the indenture.\textsuperscript{36} Then the deal is arranged by teams of lawyers for the sponsor, underwriter, trustee, documentation managers, and in some cases the investors.\textsuperscript{37} With varying degrees of interaction with the original financial engineer, the lawyers draft a written contractual representation as the indenture.\textsuperscript{38} The attorneys also craft a prospectus or other similarly definitive and effectively binding disclosures (prospectuses or offer memoranda/circulars), which they can do before, during, or after the drafting of the indenture.\textsuperscript{39} The business team provides models designed in proprietary software like CDO Edge and Intex’s solutions that link programmed models of the waterfall to past asset data, which then investors and others use to simulate and stress test the product.\textsuperscript{40} The deal is then closed, and bonds and shares are sold.

At this point, the trustee or other paying agent creates or modifies a preexisting Excel spreadsheet or some other cash flow model made in other proprietary software, such as Moody’s CDOnet Trustee.\textsuperscript{41} Periodically the trustee enters data about cash flow from assets and other data, such as interest rates into the model. Often, there is a great deal of human intervention


\textsuperscript{36} GEOFF CHAPLIN, CREDIT DERIVATIVES: TRADING, INVESTING, AND RISK MANAGEMENT 319 (2d ed. 2010).


\textsuperscript{38} See \textit{id}.

\textsuperscript{39} JEFFREY C. HOOKE, SECURITY, ANALYSIS, AND BUSINESS VALUATION ON WALL STREET: A COMPREHENSIVE GUIDE TO TODAY’S VALUATION METHODS 42 (2d ed. 2010).

\textsuperscript{40} Letter from Kevin F. McCarthy, Managing Dir., Intex Sols., to Elizabeth M. Murphy, Sec’y, Secs. \\ & Exch. Comm’n (July 30, 2010), \textit{available at} http://www.sec.gov/comments/s7-08-10/s70810-57.pdf.

involved in the process of calculating the cash flows. The collateral manager and the trustee also deal with questions of how to characterize when a missed payment—or some other covenant violation such as falling out of the asset pool quality requirements—constitutes a default. Also, some CDOs are actively managed, meaning that the underlying assets are actively traded in and out of the asset pool to change the configuration of the underlying pool, per limitations in the indenture’s covenants. Through this combination of programmatic depictions, human intervention, and sometimes surprisingly extensive amounts of discretion, cash distributions are determined and executed.

As a final point of background, it is important to note that similarly styled waterfalls are used in other securitized products like collateralized loan obligations, collateralized mortgage obligations, and credit card debt backed master trusts. Master limited partnerships (MLPs) also can use waterfalls. MLPs are a creature of the tax-system used by pipeline entities and other entities with relatively stable cash flow (though less stable cash flows have become more common). MLPs issue market-tradable limited partnership interests and have a similarly, if not equally, complex structure of prioritized payments to interest-holders. The arguments and

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42 This assertion is based off of a conversation with an individual who designed CDO models for a major investment bank and who asked to remain anonymous.

43 See, e.g., Robert J. Coughlin, Caught in the Cross-Fire: Securitization Trustees and Litigation During the Subprime Crisis 11–12 (2009), available at http://www.nixonpeabody.com/files/securitization_litigation_subprime_crisis.pdf (discussing a case in which a bondholder disputed the determination of the majority of the class of senior tranche notes that a default event had occurred).

44 Fabozzi, supra note 22, at 72.


46 Id.
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proposals made throughout the rest of this paper are equally applicable to MLP waterfall structures.

Structurally complex waterfalls also characterize private equity funds’, hedge funds’, and venture capital funds’ cash distributions between general and limited partners. In private equity funds, “Depending on a fund’s performance, the [general partner (GP)] may receive more than its pro rata share of proceeds based solely on its invested capital; these additional amounts potentially payable to the GP are referred to as ‘carried interest.’”

Two members of the field expressly identify in the fund context the insufficiency of drafting to translate a model into language and language into implementation. And, like the waterfalls in structured finance products, waterfalls in private equity firms have multiple variations (e.g., American versus European), contingencies (clawbacks, catch-ups), and linguistic vagaries (e.g., how often should interest compound). These agreements suffer from the safe complexity and drafting challenges as a CDO and thus this proposal could be applicable to them.

B. Mutually Inaccurate Depictions Interfere with Precise Perceptions of the Future Functional Reality of Cash Distribution, Creating Business, Legal, and Systemic Risks

CDO waterfalls are, as Professor Hu examines in his article “Too Complex to Depict?” and as members of the industry recognize, fairly complex systems, and the “slippages” between different depictions—models, prospectus, contract, and functional (“effective”) reality—can sometimes be substantial. This subpart will first explain how the various depictions are inaccurate relative to one another and imprecise if examined as collections of depictions,

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47 See generally Estrada & Karen, supra note 37 (explaining the difficulties in designing waterfalls and translating between the legal, business, and back-office management teams).
48 Id. at 13.
49 Id. at 14.
50 Hu, supra note 5, at 1636–42.
following a similar line of argument as Professor Hu raised. Then, moving beyond Professor Hu’s discussion of depiction, this subpart will show how these multiple depictions impede precise and accurate perception of the desired and future legal and functional realities. This subpart will finally explain how the inability to perceive precisely and accurately the future legal reality creates risk in the creation of the functional implementation reality that will actually dictate cash flows.

As a preliminary matter, it will be helpful to define depiction, perception, and reality. Depictions refer to mathematical models and business plans, prospectuses and offer memoranda or circulars, contracts and indentures, and programmed models. Furthermore, to depict is to create these depictions. Perception is the understanding derived from reading, observing, probing, or analyzing the relevant depiction in order to decide how the reality of the world—in this case the distribution of cash flows for a CDO—should be ordered. And reality is the result of the perception that represents a sort of determinative truth that predicts or defines what happens in the real world—i.e., the desired reality and the predictive reality predict the real world or the future real world. Sometimes we try to perceive depictions for purposes of building the world, and other times we try to perceive in a determinative or predictive fashion what reality will be in the future to evaluate risk by looking to depictions of that reality.

Some additional terms are relevant to understanding the relationship between various depictions, perception, and reality. At a high level, these are the concepts of accuracy and

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51 This following discussion of depictions agrees with and owes a great deal to Professor Hu’s conception of intermediary depictions discussed in Hu’s “Too Complex to Depict?,” supra note 5, though it does not perfectly align with his description in the details. The concepts of perception and realities are, however, distinct from his discussion.
Accuracy refers to the proximity of the point or depiction of interest to some objective reference point. So, on a dart board, if all of the darts circle closely the inner ring of the bull’s eye, but do not land inside of it, they are relatively accurate because they landed close to the objective reference point: the bull’s eye. Precision, on the other hand, is a reflection of how closely together the various points or depictions of interest are to one another. So, even if all of the darts land in the topmost point of the dart board (hence, they landed inaccurately), so long as they clustered closely together, they are thrown with precision.

1. The Challenge of Accurate, and Thus of Precise, Depiction.—Depiction of a complex idea in different media—each with its own constraints—inevitably results in errors in translation. In the construction context, the differences between artistic representation for the homebuyer, 3-D AutoCAD and physical models for the architect, 2-D construction blueprints for the builder, and the completed built home each reflect the limitations of their separate media. At least with these media and methods of depiction, however, the process of translation between them is professionally standardized and there are generally no disputes about their order of relative priority in the case of a conflict. Those depicting structured financial products have no such luck and far less standardization in the methods of depiction. Unlike in the case of construction contracts, it might be impossible for many types of depictions to convey sufficiently accurate and

52 SOC’Y OF MFG. ENG’RS, TOOL AND MANUFACTURING ENGINEERS HANDBOOK at 12-1 to -2 (Desk ed. 1989).
53 Id.
54 Id.
55 Id.
56 Id.
57 For an example of an analogous discussion of depiction and perception in the context of construction, see MICHAEL JOYCE, RESIDENTIAL CONSTRUCTION ACADEMY: PLUMBING 229–30 (2005).
58 See Estrada & Karen, supra note 37, at 13 (“[Fund] waterfall provisions are often highly negotiated and bespoke arrangements, where nuances in words and implementation often produce significant differences in the calculation and/or timing of distributions.”).
precise information to perceive the present or future reality of how a trustee will distribute cash.

In structured finance, there are several potential depictions, but we will focus on a few of the most relevant: the financial engineer’s model depiction, the contractual/indenture depiction, the prospectus depiction, the predictive model depiction, and the functional implementation depiction.59

First, there are the financial engineer’s model depictions, which are typically expressed as a combination of theoretical mathematical models and technical specifications.60 The structurer works with its quant to prepare business plan documents that relatively precisely

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59 See Hu, supra note 5, at 1636–42 (referring generally to the same categories of depictions though with a slightly different nomenclature).

60 CHAPLIN, supra note 36, at 319.
specify the initial model. They represent a simplified, mathematically idealized version of world—often perception of these depictions constitutes the closest to the desired reality of the quant that will ever exist. Mathematical and technical depictions made by the structurer for purposes of creating the waterfall and the rest of the CDO or other structured financial product typically are the first depiction made outside of the mind where the idea originated.

Then the lawyers come to create the two legal depictions: the prospectus and the underlying contract—in the case of CDOs, the indenture. The indenture is legally binding and the parties negotiate as if it constitutes the legal reality of the cash flow. That said, sometimes the prospectus, if misaligned with the indenture, can create legal liability. And in that case, the prospectus becomes the effective legal reality.

61 Id.


63 See Howard Darmstadter, Legal-ease, ABA SECTION OF BUS. LAW, BUS. LAW TODAY, July/August 2000, http://apps.americanbar.org/buslaw/blt/blt7-legal.html (“The prospectus gives investors rights that the indenture can’t undo. . . . It’s tempting — and most lawyers yield to the temptation — to imagine that the indenture is the sole source of the bondholders’ rights, and that the prospectus description of the bonds is just a gloss on the indenture. . . . In a sense, the indenture is the bond issue. But that doesn’t mean that it’s the only, or even the best, description of the bonds.”). Regulation AB requires the prospectus to include detailed descriptions of all aspects of the cash distribution arrangement in ABSs. 17 C.F.R. § 229.1113. Prospectuses have a plain English requirement. 17 C.F.R. § 230.241. Misstatements and failure to comply with prospectus requirements can lead to SEC and private actions. See Securities Act of 1933 § 11, 15 U.S.C. § 77k (creating liability for misstatements and omissions made in registration statements for public offerings); id. § 12, 15 U.S.C. § 77l(a)(2) (providing liability for public offerings made in violation of the registration requirements); 2 THOMAS LEE HAZEN, TREATISE ON THE LAW OF SECURITIES REGULATION § 7.0-.11 (2013) (outlining the various liability regimes for public offerings of securities). Regulation AB does not apply to private placements in the secondary market, though the SEC’s proposed “Regulation AB II” rules could bring a similar disclosure regime to the unregistered market as a condition for registration safe harbors. See Re-Proposal of Shelf Eligibility Conditions for Asset-Backed Securities, Securities Act Release No. 33,9244, Exchange Act Release No. 34,64968, 76 Fed. Reg. 47970–71 (re-proposed July 26, 2011) (requesting further comment on the proposal). See also supra note 13 (discussing prospectus liability and the SEC’s efforts to expand disclosure requirements to unregistered securitized products).
Starting with the depiction as a legal contract or indenture, with varying degrees of direct collaboration with the designers of the CDO, attorneys begin drafting the prospectus and the indenture agreement in varying order depending upon their drafting preference. Some in the banking industry have warned that in the context of private equity waterfalls—which are typically less complex than CDO waterfalls—that best practices should require more direct involvement of the finance team with the legal team to ensure that the deal docs are correctly designed. As a JP Morgan manager and Simpson Thacher partner explain, for example, in the context of private equity, the business side should not depend on legal staff to correctly depict the desired reality using the financial model depictions as a basis, a concern that grows even larger when dealing with CDOs and bespoke CDOs and other arrangements that introduce a great deal of potential discretion and ambiguity into arrangements. Seasoned finance and accounting professionals—including those at experienced private fund administrators—know from firsthand experience that no matter how precise the drafting, prose often fails to translate perfectly to mathematical implementation in a manner that is completely free of ambiguity—or that does not require the making of some unwritten assumptions.

As Professor Hu explained, quoting Professors Robert J. Coughlin and Ripley E. Hastings, those drafting indentures have found that the complexity of drafting has “seemingly

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64 HOOKE, supra note 39, at 42.
65 Estrada & Karen, supra note 37, 13–14.
66 Estrada & Karen, supra note 37, 13–14 (discussing waterfalls in the context of private hedge fund waterfall distributions).
67 A bespoke CDO is “a CDO tranche designed to meet the needs of a particular client with the investment bank taking on the responsibility of hedging or laying off the risk relating to the rest of the CDO.” How Big Is the Difference Between CDOs and CDS?, SYNTHETIC ASSETS (Apr. 27, 2010), http://syntheticassets.wordpress.com/2010/04/27/how-big-is-the-difference-between-cdos-and-cds/.
68 Id.
outpaced discipline in drafting.\textsuperscript{69} Combined with the difficulties of time constraints in drafting, these limitations of expression mean that the contract depictions do not express the same desired reality as the mathematical model depiction. Furthermore, as Professor Hu observed, as with other contracts, lawyers introduce ambiguity into contracts to add flexibility and the ability to cope with the unknown, but in doing so they make the legally reality less determinable.\textsuperscript{70}

Turning to the prospectus, the other potential legal reality, lawyers drafting the prospectus face as significant a challenge depicting the indenture as a plain English depiction as those drafting the contract faced depicting the desired reality as a contract.\textsuperscript{71} The SEC imposes restraints of plain language on prospectuses, though those are rarely met.\textsuperscript{72} And in the case of

\textsuperscript{69} Hu, \textit{supra} note 5, at 1637 & n.178 (quoting Robert J. Coughlin & Ripley E. Hastings, \textit{Survival Skills Amid the Rubble: Life as a Trustee in a Market Collapse}, 16 J. STRUCTURED FIN. 37, 42 (2010)).

\textsuperscript{70} Id.

\textsuperscript{71} Id. at 1640–42.

\textsuperscript{72} 17 C.F.R. § 230.241
Regulation AB, which specifies additional requirements for asset-backed securities prospectuses for registered, publicly offered products, there are requirements to disclose the indenture as well as to provide diagrams and aggregate statistics if they would be useful. But while the reading level can be lowered in the prospectus and instances of “heretofore” reduced in number, these waterfalls are inherently complex and made only more so by the contractual depiction.

Structurers and other parties to the deal also create predictive models in tools like Intex and CDO Edge for purposes of analyzing the risk in the cash flow against past asset performance and assumptions about the exogenous world (i.e., interest rates). These tools do not usually analyze the actual static or dynamic pool of assets included in the specific deal, and instead use past asset information and information from other deals. They also apply various mathematical stress tests. These predictions are used by credit rating agencies to calculate credit risk and advise structurers how to improve credit ratings of the products. Sophisticated investors also use, or others use on their behalf, these predictive modeling tools in order to analyze hypothetical risk as well as the structure of the waterfall. The models are often programmed by third-party vendors, like Intex, and then are put into large databases of models.

73 17 C.F.R. §§ 229.1103–1113. See also supra notes 13 and 63
74 McCarthy, supra note 40, at 6 (“[I]ssuers will often make available their waterfall to actual or potential investors. We estimate that as many as 80% of deals are modeled by the dealer, with the issuer then subsequently, and in timely fashion, providing the model to the investor.”); MOODY’S ANALYTICS, CDOEDGE – A CDO CREDIT MODEL 1 (2011), available at http://www.moodysanalytics.com/~/media/Brochures/Structured-Analytics-Valuation/CDOEdge/CDOEdge-Brochure.ashx.
75 E.g., Cashflow Models and Data, INTEX, http://www.intex.com/main/solutions_cashflow.php (explaining that Intex sells data products that reflect historical performance of CDOs as well as that attempt to keep up with information released on a specific product in investor reports).
76 E.g., Global Regions, INTEX, http://www.intex.com/main/solutions_markets.php (“Each model contains the relevant cashflow characteristics of the deal, thereby enabling our users to apply their own prepayment, default, delinquency, and interest rate assumptions for rigorous stress-testing and cashflow analysis.”).
78 McCarthy, supra note 41, at 6.
79 Id.
Currently, predictive models do not have the same legal potency as disclosures and companies such as Intex who build these models strongly oppose efforts by the SEC to have these or other models treated like legally relevant disclosures. In 2010, the SEC proposed that issuers should have to disclose custom-programmed Python-language models of the waterfalls for the same purpose, and that these models be subjected to significant testing and verification. These models would create legal liability to the degree they do not align with the functional reality of cash flow distribution, and presumably would also create legal problems if they conflicted with the prospectus or the indenture itself. Vendors do not currently guarantee that the predictive model is an accurate depiction of the legal or functional reality and there are often programming errors as well as inaccuracies in depictions.

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80 Id. at 4–5.
81 Id.
84 See supra note 63 (explaining the legal structure of disclosure liability, including liability for representations that would be made under a revision of Regulation AB).
85 McCarthy, supra note 41, at 4–5.
Then there is the functional reality (what Professor Hu calls the “effective reality”)\(^86\) that is created by depictions that are used by the trustee to distribute cash flow. These can be made in spreadsheet tools like Excel using a combination of formulas, macros written in Visual Basic, and separate programs written in compiled or other languages that feed data into Excel.\(^87\) Some trustees use tools like CDOnet Trustee that serve a similar purpose by more closely integrating with the cash flow waterfall models used to create the predictive models.\(^88\) Intuitively, functional depictions suffer from the same problems of translation as predictive models. As Professor Hu and members of industry have observed, participants in industry take such slippages between legal and functional reality as givens.\(^89\) Spreadsheets are error-prone and do not encourage good software design practices.\(^90\) And programming a model to reflect all contingencies can impose a burden if written in Excel rather than programmed in a specialized software, so current functional depictions often neglect to include all relevant conditions.\(^91\) Returning to the JP Morgan and Simpson Thacher article on private equity waterfalls:

If we add to all of this the effect of increasingly complex fund terms and structures, it is clear that the time is now past when we can hope to rely with any confidence on the ability of a lone back-office worker—often armed solely with an Excel spreadsheet—to correctly implement the provisions of this critical legal documentation.\(^92\)

The takeaway is that, as Professor Hu and others have recognized, depicting structured finance agreements, and in particular the waterfalls and their inputs, can create significant

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\(^86\) Hu, supra note 5, at 1642.

\(^87\) SMITH & WINCHIE, supra note 7, at 19.

\(^88\) MOODY’S ANALYTICS, supra note 41, at 3.

\(^89\) Hu, supra note 5, at 1638–40; Estrada & Karen, supra note 37, at 13.


\(^91\) Hu, supra note 5, at 1639.

\(^92\) Cesar & Karen, supra note 37, at 13.
inaccuracy relative to some absolute hypothetical truth, desired reality, legal reality, or functional reality. And, furthermore, these depictions are imprecise with respect to one another.

2. Incongruous Depictions Yield Imprecise Perception and Imperceptible Future Realities.—As the previous section demonstrates, there are many incongruous depictions of structured financial products. These slippages create two levels of problems. First, it becomes hard to perceive any given reality, particularly in the future (or even present) legal and functional realities.93 Second, because those two realities are themselves dissimilar and because the legal reality presumably ever more strongly influence and eventually usurp functional reality in the event of a legal dispute and eventual legal decision, dealmakers cannot perceive the future functional reality even if they could perceive the separate future legal and presumed functional (but really predictive) realities.

93 This argument is derived from the ABA’s point in their comments on proposed Regulation AB’s Python proposal that the SEC’s proposed programmatic models are merely predictive, and those predictive models are thus simply another potential source of confusion. See Letter from the Jeffrey W. Rubin & Vicki O. Tucker, Am. Bar Ass’n’s Bus. Law Section, to Elizabeth M. Murphy, Sec’y, Secs. & Exch. Comm’n at 58–59 (Aug. 17, 2010).
The first challenge facing dealmakers anticipating the functional reality for risk evaluation and the trustees executing these deals—legal and functional—are difficult potentially inaccurate depictions that could be a given reality’s source. Take the legal reality. The indenture agreement and other relevant contracts should dictate the legally relevant structure of the waterfall. They presumably represent a meeting of the minds that purportedly occurs between the parties when making CDO deals about the waterfall, among other terms. And yet, as discussed in the previous section, these deal documents often intentionally or accidentally suffer from ambiguity even in parts like the waterfalls that should be relatively procedural in

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94 But see supra note 12 (criticizing the idea that indentures represent a meeting of the minds).
Furthermore, often multiple relevant deal documents feed into the structure of the waterfall, a problem that itself introduces ambiguity in the structure of the deal.

Piling on higher to the legal confusion, there are also the prospectus or circulars and their exhibits, which themselves can be inconsistent relative to the contract (or vice versa) as well as potentially ambiguous and internally contradictory within themselves. And, through liability for prospectus misrepresentations, these prospectuses and related attachments also become legally relevant to the structure of the agreement despite attempts to avoid that by incorporating the indenture by reference into the prospectus. Finally, if treated as legally relevant (à la the prospectus) disclosures of either the industry’s predictive models (e.g., Intex), the SEC’s predictive Python models, or even Professor Hu’s impliedly proposed disclosure of the actual program used by the trustee to manage cash flows, liability for each of these additional disclosures adds even further to the uncertainty about how all of the parts will sift into the legally legal reality.

But intra- and inter-document inconsistencies and vagaries provide only the first part of the first problem of perceiving what the legal reality is. The future legal reality becomes fuzzier in light of the risk of a tribunal—a court or arbitrator—resolving the dispute. When courts interpret a contract or indenture, they quite often face the same challenges of interpretation as do the parties administering the document because they are not experts in the field, and as a result the outcome can be unpredictable. If arbitrators take on the task of assigning meaning to (or

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95 See supra notes 62–70 and accompanying text (discussing CDO drafting difficulties).
96 See supra notes 71–73 and accompanying text (addressing prospectus drafting difficulties).
97 Darmstadter, supra note 63.
98 In fact, it is not entirely clear when a court versus a jury (or judge as fact-finder) should interpret a contract. Kenneth R. Berman & J. Charles Mokriski, Judge, Jury, or Anybody’s Guess: Who Decides What a Contract Means, BOS. BAR. J., Sept./Oct. 2006, at 10, 10–11 ("While these principles are easy enough to state, it is difficult to
gap-filling) a contract, then, in light of the absence of precedent or even useful persuasive authority on these agreements’ language, arbitrators’ decisions are partially unpredictable. Even aspects of the deal like waterfalls, which are procedural and presumably deterministic, are subject to many possible meanings. Only when a definitive interpretation arises and is given compulsory force has the legal reality been discovered.

Examples of ambiguous or vague waterfalls abound in the courts and elsewhere. In one, a CDO in deferral—i.e., not paying interest—had a waterfall that did not specify at which step the deferred interest should be paid. The waterfall placed various classes’ interest payments before all classes’ principal distributions, and did not specify whether deferred interest constituted interest or principal in its definitions. If deferred interest was interest, then lower tranche bondholders would receive their deferred interest before senior bondholders were paid.

predict whether a court will find conflicting interpretations reasonable and let the question go to the fact-finder, or find one interpretation unreasonable and pick the other as a matter of law.”). Furthermore, in the case of incomplete contracts that do not address all possible contingencies, scholars have recognized that courts (and by implication arbitrators) are not the best entities for filling in the gaps. Gillian K. Hadfield, Judicial Competence and the Interpretation of Incomplete Contracts, 23 J. LEGAL STUD. 159, 160–64 (1994).


101 See supra note 100.
103 Id.
their principal. On the other hand, call it principal, and lower bondholders are unlikely to ever receive that interest.

Ambiguity can also crop up in the calculation of the collateral value input for the waterfall’s overcollateralization test. An overcollateralization test determines whether the CDO has a certain amount of assets beyond the tranche principal specified in the indenture. Assets with a lower credit rating are adjusted to reflect their lower quality as collateral. This adjustment is called a haircut, the amount of which is specified in the indenture. These assets are actively evaluated by the credit rating agencies, and one or more of the agencies could

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104 Id.
105 Id.
107 E.g., id. at 6–7.
108 E.g., id.
decrease an asset rating. This creates ambiguity. Where the indenture specifies when a haircut should apply, the word “or” may be used: if S&P or Moody’s downgrades an asset below a certain standard, then apply the haircut. The parties intend that when both agencies downgrade an asset it enters a state of default, but lawyers use “or” to take into account situations where there is only one rating available. Most of the time this is not a problem, but frequently the ratings diverge, and in those cases whether an asset should have the haircut applied, and thus whether the overcollateralization test is passed, depend upon whether or not “or” means “and,” or, alternatively, whether “or” simply defines the possible members of the set of credit ratings but not the test itself. A related problem that can arise in this same context is that the indenture and the functional implementation accidentally apply the haircut twice, once for each credit rating agency’s downgrade, when in fact it is only supposed to be applied once.

This legal ambiguity leads to the second problem of perception: parties face equal difficulty perceiving the future functional reality. Assume, for a moment, that the legal reality does not dictate directly how cash distributions in the waterfall will occur. In that case, disclosures currently provide only the predictive reality of what might happen given certain conditions. If the model disclosed is not literally the tool used by the trustee to parcel out cash to beneficiaries of the indenture and equity holders, and we know from the previous section that the various models yield potentially different results, a disclosure of a predictive model can only

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109 E.g., id.
110 Barclays Bank is cited in notes 106–109, supra, solely in order to provide example of the ambiguous haircut criteria about to be described. The decision and pleadings in this case do not concern this ambiguity directly. Instead, the following high-level examples of waterfall ambiguities are based on a discussion with an industry expert who asked to remain anonymous.
111 See, e.g., Barclays Bank Mot. for Summ. J. at 7, Barclay’s Bank (specifying that the indenture in this case specified that either a downgrade by Moody’s or by S&P would result in an event of default). See also supra note 110.
112 See supra note 110.
113 See supra note 110.
provide accurate and precise information about that predictive reality. Everything it says about the functional depiction is an estimate (or guess) that might not hold up under important conditions, like default, just as models failed to hold up in the build-up and aftermath of the financial crisis like in the cases discussed above. Instead, the only way to know the behavior of the functional model is to disclose the functional model, as Professor Hu’s “pure information” goal\textsuperscript{114} would imply should be done.

\textsuperscript{114} Hu, supra note 5, at 1642. Professor Hu says his goal is a pure information disclosure model. While he then proceeds to discuss the SEC’s Python-proposal, that proposal is inherently not a pure information model. It is, as discussed above, a predictive model special-made for prediction of risk. But it is not the model that will be used to execute. So it is not, despite Professor Hu’s lengthy discussion of the SEC’s proposed rule, the Python proposal is not a real example of pure information. Therefore, this Article aims to give Professor Hu’s conceptual model more bite than he seemed to give it credit for, and read “pure information” to mean the disclosure of the model or code actually used to execute the deal and the cash distributions. Because this description of a pure information proposal is arrived at by implication from Hu’s conceptual model, in Part II, this Article first fills in some details about what prerequisites must be attained to get the most out of a pure information disclosure. Only after coloring in the amorphous lines of a pure information disclosure regime does this Article then go on to pivot away from disclosure and deal with the perception problem by reconsidering the deal structure, the types of investors who should participate in these markets, and the legal issues with departing from the disclosure regime.
Ultimately, Professor Hu’s “pure information” proposal’s implied practical implementation actually provides only yet another predictive model because,\cite{fn115} taking away the assumption of the last paragraph, the legal reality will in fact trump the functional model in the event of a dispute between the debt holders, equity holders, and the trustee. When a dispute arises about the trustee’s waterfall payouts—and disputes have arisen—\cite{fn116}—the final legal interpretation and ensuing order to the trustee will prevail over whatever structure the trustee had previously implemented as the functional reality.\cite{fn117} The trustee must interpret that order as a

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure5.png}
\caption{The Hu-esque “Pure Information” Model In Dispute}
\end{figure}

Like in Figure 4, the Hu “pure information” model simply adds another competing depiction, and in the end however the court churns the butter of depictions to determine the legal reality will control the functional reality.

\footnote{This argument owes its origination to the American Bar Association’s comment to the SEC’s Python proposal, and holds equally valid as a reply to the solution implied by Professor Hu’s argument. Letter from the Jeffrey W. Rubin & Vicki O. Tucker, Am. Bar Ass’n’s Bus. Law Section, to Elizabeth M. Murphy, Sec’y, Secs. & Exch. Comm’n at 57 (Aug. 17, 2010).}

\footnote{See supra note 100 (listing cases of courts interpreting waterfalls in CDOs and other similar indentures). For an overview of litigation strategies and a list of CDO cases that are in part related to contractual ambiguity in the indenture, see JONES DAY, AMERICAN AND ENGLISH PERSPECTIVES ON CDO LITIGATION (2008), available at http://www.jonesday.com/files/upload/Tambe_American_English_Perspectives.pdf.}

\footnote{Trustees file interpleader actions in order to have a judge settle the correct interpretation of the indenture. Eric S. Adams, CDOs in the Financial Crisis, J. STRUCTURED FIN., Winter 2010, at 11, 12.}
new document and must create another functional depiction (and thus another functional reality) to reflect its interpretation of that order. In fact, intuitively, the act of perceiving and implementing the order will face similar challenges as the problems of perceiving the original indenture used in the first place. In any case, this potential legal risk means that even if the actual functional model of the waterfall is disclosed to an investor and any other relevant party, as has been suggested might be desirable, the fact of the legal reality’s existence and power to trump that functional reality makes the future functional reality difficult to perceive accurately.

The necessary result of these difficulties of perception is that disclosure merely facilitates predictive triangulation onto what the future reality will be, and, like most predictions, that predictive reality is inaccurate relative to the actual functional reality and imprecise between the various predictive depiction sources.

3. Indefinite Reality Creates Business, Legal, and Systemic Risks.—Because the future functional and legal realities remain uncertain with respect to waterfalls, CDOs and similarly structured arrangements face related material business and legal risks.

From the business perspective of the structure and issuer, deal documents and indentures make for poor specification diagrams. Those designing these models start with the “Σ” and “f(x)” rather than the “heretofore” and “dispute, controversy, or claim” for a reason: the model is a better guide for analyzing risks and eventually building the tools that the trustee will use to distribute cash than the written, legal transactional documents. And yet the business managers must devote their time and money to contributing to the creation of the language and then at least try to ensure that the tools and predictive models they build reflect the legal depiction rather than

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118 Cf. Scott Moïse, Plain English, S.C. LAWYER, Nov. 2002, at 49, 50 (referring to applying the same rules of interpretation to court orders as are applied to statutes and contracts).
the more useful depiction. Through these many translations, the original business objective can be lost and energy is wasted in an effort to make “complete” deal docs as well as the rest of the tools. Error is inevitable and thus the structurer’s ability to understand its risks becomes tainted through that imperfection.

The investor faces similar risks. The investor wants to know the future functional reality. That future functional reality of the waterfall is imperceptible in the status quo, as discussed in the previous section. If the investor did not have to expend its money and time analyzing waterfall structures and related aspects of the indenture, it might instead devote those resources to assessing risks outside of the waterfall structure, such as the quality of the representations made by the issuer and sponsor about the underlying assets. As matters now stand, in a world of limited resources, the investor must divide attempt perceive both the risks in the waterfall reality and the risks in the underlying assets. Its inability to perceive the future functional waterfall reality is a risk. Furthermore, the distraction of the waterfall risk hampers its already (and always) imperfect knowledge of the real economy risks it faces by investing in a given CDO. This is an inefficient use of its resources and increases the business and legal risk faced by the investor.

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119 Cesar & Karen, supra note 37, at 13.
120 See supra subpart I.B.2.
121 While this is only a counterfactual, perhaps institutional investors would have been caught less flatfooted had they paid their attorneys and bankers to engage in due diligence of the assets underlying CDOs rather than analysis of the legal payout structure—though considering that institutional investors apparently did not even use the data they were given, perhaps that is a pipe dream. Kevin G. Brolley, Occupy The Buy Side: Institutional Investors Deserve Far More Blame For The Financial Crisis, BUS. INSIDER (Jan. 25, 2012 10:34 A.M.), http://www.businessinsider.com/occupy-the-buy-side-institutional-investors-deserve-far-more-blame-for-the-financial-crisis-2012-1.
The trustee and servicer also face risk in this management of the indenture’s cash flow.\textsuperscript{122} The trustee must monitor that waterfall distributions occur according to the terms of the indenture using tools that it built, to some extent in concert with the sponsor.\textsuperscript{123} It also must ensure other conditions of the indenture governing asset quality and management are met.\textsuperscript{124} But when there is a dispute, the trustee can find itself at the center of the fight between senior and junior tranches of the CDO over contractual terms about the various tests and other decision-points in the waterfall.\textsuperscript{125} The inherent instability of the interpretation of the indenture means that a once acceptable arrangement to all parties involved can, in the right (or wrong) context, become a legal risk to the trustee. Just as with the other parties to the deal, the trustee can find itself in court over its implementation or over the demands placed upon it to reinterpret parts of the indenture by majority holders of the senior tranche.

Taking the broader view of the markets for these products, the inability to perceive how a CDO waterfall will function in various circumstances limits the ability of market participants, clearinghouses, exchanges, self-regulatory entities, and government regulators to perceive the market in these products. A contract or indenture must be translated into a predictive or functional model into order to be stress tested for its sensitivity to various inputs and conditions of underlying assets and other factors in the real economy. In the status quo, predictive models are available for analysis against past data sets, but they suffer from the problems of inaccurate

\begin{enumerate}
\item \textsuperscript{122} COUGHLIN, supra note 43, at 1.
\item \textsuperscript{123} For example, U.S. Bank’s Global Corporate Trust Services provides the technology to provide “[c]ash flow modeling and payment distribution” as a “CDO trustee.” Products and Services - CDO and Securities Services, USBANK (2013), https://ustrustgateway.usbank.com/portal/public/collDebtObligSvc.do.
\item \textsuperscript{124} Nicola Cetorelli & Stavros Peristiani, The Role of Banks in Asset Securitization, FED. RESERVE BANK N.Y. ECON. POL’Y REV., July 2012, at 47, 58.
\item \textsuperscript{125} Professor Steven L. Schwarz discusses the difficulties of the trustee as fiduciary during “tranche warfare” and provides an example of this type of conflict generally in Steven L. Schwarz, Fiduciaries with Conflicting Obligations, 94 MINN. L. REV. 1867, 1870–72 (2010).
\end{enumerate}
Too Complex to Perceive?

depiction and imprecise perception discussed earlier. As such, the market in these products is relatively more imperceptible than it could be if the waterfalls were perceivable. If they were perceivable, they could be connected with the ever more granular, accurate, and timely information about underlying assets, real economy data, and market position data. This interconnect would permit more accurate predictive models of the market to be created and analyzed and in doing so, would reduce systemic risk to participants and those indirectly harmed by their risk-taking choices.

Written contracts make poor specs for structured finance’s more procedural aspects, like CDO indenture waterfalls. They inaccurately depict the desired reality and do not facilitate accurate or precise perception and creation of the functional reality. And because accurate perception of the future legal reality is necessary to accurately predict the future functional reality, their ineffectiveness at permitting perception of the relevant realities imposes risk both upon the parties to the deals and the system as a whole.

II. Make the Functional Depiction of the Waterfall the Legal Reality, Reducing Legal, Business, and Systemic Risks

Dealmakers structuring CDO waterfalls and other similarly procedural and numerical processes—e.g., calculating overcollateralization, interest rate test, cash allocation, etc.—should follow the lead of construction law practitioners and adopt the functional depiction by reference in the legal depiction. Furthermore, in order to maximize the portion of the indenture or contract that can be usefully expressed in an automated functional depiction like a program or Excel file, the CDO should be structured to minimize human intervention and discretion to few or no points in the waterfall and its inputs. By defining the waterfall and its related inputs through reference to its blueprint—the functional depiction that will be used by the trustee to distribute cash—the
legal reality will then equal the functional reality. Because the functional depiction is necessarily
determinative as a programmatic representation, it will not suffer from the same problems of
perception that the written contract does, and this combined future legal and functional reality
will not suffer from the imperceptibility of a written contract. This will reduce the risk to market
participants and the financial system caused by an inability to perceive definitively the future
functional and legal realities of an indenture waterfall.

Subpart A below will explain in greater detail a proposed to include the functional
depiction by reference in structured finance contracts and will explain the benefits for
dealmakers and parties to these agreements of using that model. Subpart B will address whether
regulatory agencies should require waterfalls and similarly procedural arrangements to be made
in this way and whether they can do so as a matter of law, and what role the bankruptcy regime
might play in this proposal’s viability.

A. Dealmakers Should Contract for Waterfalls through Negotiations About the
Programmatic Functional Depictions

This Article’s proposal has three parts, two instrumental and one ultimate proposal, the
latter of which the former two facilitate. First, minimize the amount of unnecessary discretion
and imperfect specification intentionally included in CDO indentures and analogous
arrangements. Second, structurers and other dealmakers should automate the waterfall portion of
the contract using Excel, proprietary software, or other tools. This is facilitated by this reduction
in the number of points of human discretion involved in what should otherwise be a very
procedural waterfall cash distribution process. Finally, these models, built as part of the deal-
making process, should be incorporated by reference as the legally determinative blueprints of
the waterfall to the exclusion of other depictions. This new approach to legal depiction of
waterfalls would reduce initial legal costs as well as legal risks. Accordingly, it is a desirable business change for structurers, investors, and trustees alike.

1. Minimize Discretion Where It Does Not Independently Add Value.—As discussed earlier, CDO indentures often suffer from many levels of ambiguity introduced throughout the design process and often include discretion solely for the purpose of overcoming drafting challenges. Reducing discretion will limit the problem of slippage and facilitate a programmatic representation of a waterfall. While nothing inherent in the nature of a programmatic depiction limits the opportunities for human intervention, the greater the amount of human manipulation of data and processes, and the more discretion introduced into a program, the less it resolves the problem of contractual depictions. Therefore, those planning the desired structure of CDO waterfalls and inputs should minimize discretion to expressly limited points in the structure where human judgment adds value to the product.

Qualitative and subjective judgments seemingly do not add value, for example, to resolving the question of whether the overcollateralization or interest tests in the waterfall have been met. Nor does discretion add value if it concerns the meaning of default in the context of standardized underlying assets where all parties know what they think constitutes a defaulted asset. Similarly, if the CDO itself has defaulted and that affects the choice of waterfall, discretion does not belong in that judgment and results should instead be determined according to certain specified rules based on the underlying cash flows and asset classes. The question in these cases is often whether cash available for interest payments is greater or less than that due or

126 See supra subpart I.B.
whether the overcollateralization test has or has not been met for underlying assets. These are not questions in need of human judgment any more than the question of whether five is greater than four.

Participants in the deals creating these CDOs should recognize that discretion left in the hands of asset managers and even fiduciaries like the trustees creates business risk. While discretion in asset management can add value, discretion in the hands of the trustee in the context of the cash distribution waterfall and inputs such as default status probably does not. Discretion in the hands of a trustee is a great deal like the court’s or arbitrator’s power of interpretation. It creates problems of perception of the future functional reality. Thinking along the same lines as the Theory of Second Best, as soon as more than one dimension is not measurable or, more commonly, is restricted from being optimal in a multidimensional setting, the interaction between the different dimensions makes predicting the result of changing another factor unknowable. Discretion adds infinite possibilities on one dimension and adds yet another layer of complexity to any stress testing analysis done upon a security. And when those points of discretion do not specify criteria for the decision-making process or leave broad (perhaps even

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128 id.
129 This proposal has independent value even in the event that the second and third proposals are not followed. Failure to tackle ambiguity and leave effective discretion in execution in the hands of trustees has and will continue to create business and legal risks for the reasons already discussed.
130 The general theory of second best had one of its earliest explanations in R.G. Lipsey & Kelvin Lancaster, The General Theory of Second Best, 24 REV. ECON. STUD. 11 (1956). Judge Richard Posner and Professor Joseph Rebello provide a more approachable explanation:

The problem of second best deals with the question of whether interventions directed at specific market imperfections can improve overall social welfare. According to the theory of second best, correcting specific market imperfections while leaving others untouched will not necessarily improve social welfare. . . .

The theory of second best in general states that in a system where conditions are such that a Pareto optimum exists, if one condition is changed so that it is no longer at its optimum state, then to reach a second best optimum (because the first best optimum cannot be reached), all the other conditions must be changed from their original first best optimum states.

carte blanche) discretion to accommodate unpredicted future circumstances, risk is taken on by the parties.

Those tasked with limiting discretion might respond that it is necessary to leave discretion to cope with the unknown. That is not true. There should be no unknown inputs. Structured financial products effectively define a function $f(x_1, x_2, \ldots, x_n)$ where $n$ is less than infinity (often, far closer to zero). The numbers of variables $n$ can never approach infinity because the sponsors designing the financial model lack infinite time and infinite mental capacity to conceive of such a model that takes an infinite number of inputs. And every input into the model is placed into the model intentionally as a variable cannot write itself into a model, contract, or program. Models are by definition simplified depictions of a more complex reality, but in the case of these waterfalls this simplified reality creates and defines the extent of the actual reality of cash flow distribution. As an example, in the Great Recession, financial participants did not fail to understand their inputs; rather, they misestimated the reasonable ranges of the inputs.\(^{131}\) And if within the function there are not conditions to cope with, for example, situations where $x_i$, which could be asset default, is greater than even a conservative analyst might allow for (say, because the correlation of housing foreclosures was greater than anyone expected . . .\(^{132}\)), then that possibility, however remove, should be able to accounted for, even if it is accounted for by defaulting on the CDO to the detriment of all of the relevant parties. It might require more work, but it is little more than asking that when those designing structured

\(^{131}\) Even those who will likely oppose a proposal like the one made in this Article agree with this point. For an accessible discussion of poor prediction of housing price correlation as one of the (many) causes of the Great Recession, see Felix Salmon, *Recipe for Disaster: The Formula That Killed Wall Street*, W\(\text{IRED}\) (Feb. 23, 2009), http://www.wired.com/techbiz/it/magazine/17-03/wp_quant?currentPage=all.

\(^{132}\) See, e.g., McCarthy, *supra* note 40, at 1–2 (“Rather, the problems arose from shoddy lending standards, inadequate disclosure of loan level collateral detail . . . , and incorrect assumptions regarding housing prices and mortgage default rates by market participants.”).
financial instruments decide what they want to do when $x_1 > 50$ they should also decide what to do with $x_1 \leq 50$ rather than leaving that decision for the day disaster strikes. The cost in up front effort is not tremendous, and the benefit in risk reduction and perception is substantial.

There might be unknown an variable $x_{n+1}$ that was not and could not be anticipated at the time the model was made but that should or will have an effect on the cash flow distribution of $f(x_1, x_2, \ldots, x_n)$. But, in fact, a mechanical process of determining cash flows according to collateralization, money available to pay interest and other costs is, as demonstrated above, a determinative process, and the parties can be expected to have determined how the relevant criteria will affect outputs. The only way that $x_{n+1}$ can affect output is if one or more of the set of variables $\{x_1, \ldots, x_n\}$ is a function of $x_{n+1}$, $x_n(x_{n+1})$. Unless $x_{n+1}$ represents some exogenous legal power from another part of the contract or from outside of the contract, the same argument made above applies here: parties should anticipate how they will react to the entire range of possible values of, for example, $x_n$, and if they do, then they can cope with any output of $x_n = x_n(x_{n+1})$. If $x_{n+1}$ is an external business or legal factor that trumps the waterfall, then this Article’s proposed removal of discretion cannot address that directly. Removing discretion from the waterfall does not remove the potential need for discretion outside of the waterfall in the business structure of the CDO, even though that weakens the power of the overall proposal to minimize risk.

2. **Automate the Waterfalls and Interpretation of Inputs Wherever Possible.**—Reducing discretion maximizes the parts of the waterfalls and surrounding framework of inputs that can be automated. The more that quantitative data directly is fed into determinative criteria, the less

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133 And they should take care not to make the same mistake as the author made in an early draft and test only for $x > 50$ and $x < 50$ while neglecting $x = 50$. 
human intervention is required, and the more useful is a automated programmatic functional
depiction. The more of the waterfall and the surrounding inputs, including collateralization
models for feeding into the overcollateralization tests, are automated into a programmatic
functional depiction, the greater the utility the functional depiction has for informing sponsors,
investors, trustees, and regulators of how the cash distribution will actually change given
different economic assumptions about the assets and exogenous factors.

Automation is in principle a good choice for businesses because it reduces the need for
trustees to hire large back-office staffs, which have a capacity for error,\textsuperscript{134} to manage inherently
procedural cash flow processes.\textsuperscript{135} It also reduces liability arising from those likely mistakes.
The effort to create management systems to cope over the long run with the continuous risk of
human error almost certainly equals the cost of upfront investment in building functional
depictions to manage most cash flow processes. Admittedly, there are costs to developing these
systems initially, but those costs are likely minimized by the fact that currently there is already
software on the market like CDOnet Trustee for managing many aspects of day-to-day cash
distribution by the trustee and other parties. Because the tools already exist to build these
models, it is important to shift that construction to a point in time before the transaction has been
completed and to focus more resources on making sure that the automation is correctly designed.

Programming these models does not mean removing human oversight, as might be
mistakenly presumed. The trustee and the other parties and beneficiaries to the CDO have a role

\textsuperscript{134} See, e.g., PF2 Securities Evaluations, \textit{Is your CDO Leaking, EXPECT[ED] LOSS} (May 14, 2009),
http://expectedloss.blogspot.com/2009/05/is-your-cdo-leaking.html (describing an instance of a CDO waterfall
distribution being incorrectly calculated by $4 million because of a waterfall implementation error by the trustee).

\textsuperscript{135} Others have considered the possibility of writing certain types of contracts in a formal language like
programming code of pseudo-code, but none so literally as this Article proposes. Because the functional reality is
literally created by code, waterfalls agreements can be expressed as operational code rather than simply formal
language designed to reduce ambiguity. E.g., \textit{A Formal Language for Analyzing Contracts}, NICK SZABO'S PAPERS
to monitor performance against predictive models to ensure everything outside of the waterfall and its inputs operates correctly. Furthermore, just as with long-term manual data manipulation, these programs are, of course, man-made and thus subject to error. But, as the next section will discuss, all parties will and should refocus their analytical and error-checking efforts towards ensuring that the functional depiction actually represents their desired functional reality. And there should always be the opportunity to renegotiate if the parties agree that the structuring suffers from an obvious programmatic error, but *caveat emptor* (buyer beware), *caveat venditor* (seller beware), and “*caveat commissarius*” (trustee beware) all need to apply if the functional depiction is to constitute the legal reality.

A question related to automation is whether the code should be open or closed to investors and regulators. Open source code, as distinct from the SEC’s emphasis in its Python proposal on using an open source programming language,\(^{136}\) is necessary for there to be productive, informed negotiations about the nature of the cash distribution. Many in the industry already release a great deal of modeling information to investors in this context.\(^{137}\) And the predictive models can be made to disclose the underlying code used to make them.\(^{138}\) There is

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\(^{136}\) [Asset-backed Securities, Securities Act Release No. 33,9117, Exchange Act Release No. 34,61858, 75 Fed. Reg. 23380 (proposed Apr. 7, 2010)]. Open source code refers to the idea that the code can be seen by the relevant parties rather than hidden behind a compiled binary executable. *The Open Source Definition, Open Source Initiative*, http://opensource.org/osd. What is important is not that the language be open source in the sense of the licensing agreement—which the open source community would disagree with, see *id.*—but that the models themselves are open. Python in particular is a programming language the design and interpreter for which are open source. *Python Programming Language—Official Web Site, Python*, http://www.python.org. To my mind, it is not as important that these models be designed in an open source language as it is that the models themselves are open source/open code in whatever language is the best-suited for the industry. What is important is that there are a limited number of languages used and that the models themselves have some sort of standardized, non-obfuscated coding methodology. Code can be just as incomprehensible as the written word regardless of the language used. *See Obfuscated Python*, (Feb. 2, 2013 8:43 PM) P-NAND-Q.COM, http://p-nand-q.com/python/obfuscated_python.html.

\(^{137}\) [McCarthy, *supra* note 40, at 6].

no fruitful discussion of terms as well as a meaningful audit of the code, as is necessary to fairly implement a *caveat emptor* rule, without open code. The risks of open code in terms of proprietary methods are minimal in light of what appears to be current industry practice of sharing models. And the underlying data and analytical methods used to calculate some of the inputs, while they should likely also be open and disclosed, could be agreed by the parties to be treated as black boxed functions with open APIs\(^\text{139}\) if not integral to the structure of the waterfall indenture itself.

Closed source models, while less desirable for purposes of active negotiation, could also be an option in general, though they would require extensive stress test based negotiation, which, because of the number of possible inputs and interactions, could end up making the functional depiction effectively predictive for purposes of the negotiation. In a way, closed source would fall half-way between current practice and the present proposal, in that the functional reality would still be the legally determinative depiction, but the parties would negotiate over its output instead of over the code itself.

Open source without standardization of programming language or modeling tool, interfaces, and outputs, just like a contract or indenture without standardization, also poses serious challenges of comparability and comprehensibility. While this topic is beyond the scope of this Article, it seems likely that the industry would coalesce around a few products that already have a substantial infrastructure and network. Models built in tools like Intex, CDO

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\textsuperscript{139} API means application programming interface, and is the collection of functions that a program makes “public” for use by other programs, versus functions that are accessible only internally within the program. Martin Reddy, *API Design for C++* xvii (2011). The relevance of an API (or an analogous structure by any other name) in this context is that an API permits a user or programmer to interface with already written and compiled code and order it to run certain commands and return certain results without revealing how the process works. While a blackbox is not desirable, it is feasible and in fact is a common way to organize software even when the code is available for technical reasons separate and apart from the secrecy implicated here.
Excel spreadsheets are widely used, understood, and exchanged as means of providing predictive information to investors and other market participants. The market coalesced on these products naturally and not as a result of regulation. Markets likewise should grow around a subset of products and the industry should develop internal standards for presentation and interface, especially as many of the investors have equal bargaining power to and experience as the sponsors and issuers.

3. **Make the Automated Waterfalls the Contract by Reference.**—These largely automated procedures, expressed in code with minimal discretion, should, like blueprints, replace the waterfall and surrounding input contract language as the legal depiction in CDO indentures and similar documents. By including the functional depiction by reference in the legally binding

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140 McCarthy, supra 40, at 2.
contract as a substitute for written contractual depiction of the indenture waterfall and other procedural inputs, drafters will reconcile legal and functional depictions and thus reconcile legal and functional realities. While the functional depiction might not match perfectly the desired reality, parties will at least focus on making sure that the implementation that will create the cash distribution regime is as accurate as possible relative to the desired reality and any limitations will be set out clearly in the implementing code.

This change to a legally binding functional depiction will reduce the problems of perceiving the future legal and functional realities and thus decrease the legal risk faced by businesses. Rather than operating through legal intermediaries to structure and depict the waterfall and its inputs, structurers, investors, and other relevant parties can directly negotiate about whether the code or formulas represent both the method and results that they desire. This removes problems of lawyers depicting and describing waterfalls in the text of contracts and then of back-office programmers depicting contracts as code. It also removes the problem of perception because there is only one depiction to perceive, and that depiction is not subject to interpretation or dispute because of its very nature as deterministic code.

Furthermore, this change means that lawyers, advisors, and negotiators can focus on other, higher risk parts of the indenture and related agreements, like the guarantees for representations about the underlying asset quality as well as reviewing the quality of that information directly before settling the transaction. As an example, lawyers are better equipped to evaluate the quality of due diligence and secure against misrepresentations and other macro level risks to the deal than the nitty-gritty back-office procedures necessary to correctly calculate cash distributions. This proposal promotes a more efficient allocation of legal resources for the participants in the deal.
This change to reduce legal risk for all parties needs a reinforced regime of *caveat emptor*, *caveat venditor*, and *caveat commissarius*. This means that parties who purchase these CDO bonds, build these bonds, and are paid to manage these bonds must retain the risk of verifying that the code reflects their desired reality. When these waterfall programs become subject to dispute about their result, many of the benefits of using code instead of language are lost because multiple potential realities can exist. But, if each participant retains the responsibility of ensuring the code operates correctly, the code will be better vetted, the results will align better with the desired reality, and the risk of dispute based on misunderstanding will be reduced.

Of course, disputes will still exist about the remainder of the indenture that cannot be expressed in code. Questions of the meaning of certain asset structure requirements, points of discretion, and perhaps some of the inputs qualitative categorization will remain. But there will be a reduced dispute or risk of dispute about the waterfall itself, which is a reduction in hazard faced by parties. Risks of misrepresentation and fraud will remain. Some party may claim to the tribunal that the code is not what they agreed to. That said, in this contractual regime, unless that party can prove something that generally voids the contract from principles of general contract law—fraud, adhesion, etc.—tribunals should have little sympathy for that party’s inability to evaluate the code directly.

That said, the regime of *caveat emptor* creates some concerns for unsophisticated and relatively less sophisticated investors. It has been reported that even sophisticated investors in CDOs and other ABSs relied at times almost entirely upon statements about the waterfall
structure in the circulars plus the credit ratings. And in particular, these investors relied upon the credit rating agency’s evaluations of a particular tranche to determine the size and scope of the risk they faced. If sophisticated investors were unable or unwilling to assess directly the risk of the contracts and the predictive models, then it seems highly unlikely that individual or small as well as less sophisticated investors will have the capability to understand, let alone stress test, programmatically represented waterfall indentures. This indicates that, in order to maximize the benefits of the coding the contract regime and avoid accusations of abusing unsophisticated investors, CDO bond and share dealers should not deal to unsophisticated investors, an issue that will be discussed in the next subpart.

Limiting the role of discretion will make it easier to perceive the future legal and functional reality of complex cash distributions like those involved in CDOs. It will also facilitate automation, which in and of itself should be desirable for the structurers and other parties involved in creating CDOs. Automation will decrease the cost of manual management and human error, and in doing so is inherently a desirable business move for those designing these products. Lastly, and most importantly, these automated programs, expressed preferably as open source code to all of the parties, should replace the written indenture as legally binding specification and deal doc for the waterfall and its relevant inputs. This will reduce business and legal risk faced by dealmakers designing CDOs, who will no longer have to waste resources building indeterminate legal depictions of waterfalls. Instead, there will be one depiction of the

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143 FEIN, supra note 142, at 13-7.
waterfall, perception of which is deterministic and, while perhaps complicated in details, is not subject to interpretive discretion and multiple legal depictions. The combination of these three proposals is risk-reducing for all of the parties to a CDO or other structured finance arrangement.

The technology is already being used, the models are already being built, and what needs to be done now is to remove the unnecessary, risk-creating legal depiction and substitute these automated tools. And in fact, as the swaps markets demonstrate, a change to programmatic representation is feasible.\footnote{As an aside, this proposal has partial precedent in the massive swaps market, which often negotiates over programmatic descriptions of standardized swap deals before creating the deal documentation. Other financial securities markets already negotiate over coded representations that more usefully describe the transaction’s execution than can the deal documents. \textit{Gordon F. Peery, Borden, Ladner, Gervais LLP, Swap Documentation Must Conform to Three Final CFTC Rules by July 1, 2013} at 1 (2013), available at \url{http://www.martindale.com/members/Article_Attachment.aspx?id=1081999&id=1853564&filename=asr-1853568.Swap.pdf}. Swaps are often communicated, for example, using a descriptive language called FpML. \textit{FpML Frequently Asked Questions}, FpML, \url{http://www.fpml.org/about/faq.html} (last visited Aug. 15, 2013). Information concerning the different legs of the swap (e.g., the different interest rates to be swapped), the timing of payments, etc., are specified in this language, and the models made in this language can also be used to monitor the transaction and execute payment(s). \textit{2 FpML Overview}, FpML 5.1 RECOMMENDATION, \url{http://www.fpml.org/spec/fpml-5-1-6-rec-1/html/confirmation/} (note especially parts 2.2 and 2.8). The relevant master agreement, confirmation, supplement, and other related contract documents are produced at different times, depending on the dealmakers. Sometimes they are made before the deal is conducted and only the specific swap terms have to be set in the confirmation, sometimes simultaneously, oftentimes after the electronic FpML-based deal has been made, and in some cases never at all. \textit{Peery, supra}, at 1.}

Problems have arisen because non-procedural parts of the deal—primarily the dispute resolution process—has been left out when deals were made without proper deal documentation. \textit{Id.} at 1–4. These dispute resolution terms and related ambiguities, like analogous elements of the general proposal of this paper, are elements that largely are not rote and procedural and do in fact have a place in traditional legal drafting rather than programmatic representation. The failings of these electronic-only deals are largely a function of insufficient planning and drafting of the master agreements and relevant supplement documents to account for basic good practice in transactions. These problems are beyond the scope of this proposal to resolve.

The larger takeaway, however, is that this proposal is a credible one. Swaps are being made in unambiguous and programmatic forms that serve both to facilitate dealmaking and execution. The only remaining step is for these swap transactions to leave behind the paper trail for the core elements of the deal that are best expressed in terms of, for example, a document description language like FpML, in order to remove any of the potential ambiguities and coordination problems that might arise in the swaps context for the same reason they have arisen in the CDO context.
B. Regulators Should and Can Facilitate and Require Dealmakers to Contract for Waterfalls in Code

The proposals just discussed are desirable as a matter of legal–business strategy for the market participants to implement of their own volition. Using the transaction model of code as contract would save legal costs at the time of the transaction and reduce legal risk in the future. Market participants could adopt a standard or standards for coding as contract of their own volition, spiraling around a product like Intex or similar product just as they have in the market for predictive models. Given the dollar amounts in CDO or other structured finance transactions, the relative technological sophistication of the market participants on both sides of the deal, and the existence of commonly used tools in the market, the idea that market forces would lead participants to further develop their coded depictions and coalesce around a standard is quite feasible.

However, should government regulators have a role to play in facilitating or requiring the code as contract proposal? The discussion below will explain some of the current SEC rules that must change to facilitate coding the waterfall indenture and why the SEC should make those changes. Following that is the question of whether the SEC, CFTC, or some other regulatory entity should or can require that waterfalls be contracted for as code. Finally, this discussion will conclude with recognition of the challenge that the bankruptcy regime, as a court-driven regulatory system, places in the way of this Article’s proposal.

1. The SEC Needs to Adjust Its Disclosure Rules to Permit Code as Contract.—The code as contract proposal facilitates the reduction of the number of legally relevant depictions. And, as mentioned above, this implies making the prospectus and other similar disclosures less or not legally relevant. If the prospectus remains legally relevant, and if the SEC’s proposed Regulation AB II rules that would expand similar disclosure requirements to some classes of
unregistered securities is adopted as drafted (or even in a form similar to what was drafted), there will be numerous legally relevant depictions to analyze for purposes of evaluating risk.

First, under the current statutes and regulations, the SEC requires issuers of publicly offered securities, including bonds like those involved in CDOs, to register the security with the SEC. In order to register and sell the securities, the issuer must provide a prospectus that explains the relevant payouts and underlying assets. Misstatements in the prospectus can create legal liability. Regulation AB permits the waterfall structure to be disclosed and explained using diagrams and tables if helpful. Regulation AB only applies to publicly offered securities, however, and might not cover certain types of actively managed CDOs.

Privately placed CDOs are in a slightly less clear position with respect to the legal effect of disclosures. As it stands, privately placed CDOs need not be registered under the Securities Act, and thus need not disclose information like what is contained in a prospectus, though typically they do disclose offering memoranda or circulars. CDOs are often sold in the primary market to accredited investors, and thus can take advantage of the statutory exceptions

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148 Id. § 12, 15 U.S.C. § 77l.
149 17 C.F.R. §§ 229.1103(a)(vi)–(ix), .1113.
150 Regulation AB includes an elaboration of the general prospectus requirement and does not bypass the Securities Act of 1933 § 4 exemptions for privately issued securities. Letter from Jeffrey W. Rubin & Vicki O. Tucker, Am. Bar Ass’n’s Bus. Law Section, to Elizabeth M. Murphy, Sec’y, Secs. & Exch. Comm’n at 83–86 (Aug. 17, 2010).
151 17 C.F.R. § 229.1101(c)(ii).

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to registration.\textsuperscript{153} The SEC specifies safe harbors for exceptions to registration in Regulation D, and in particular Rule 144A, for private offerings of sales to qualified institutional buyers.\textsuperscript{154} The SEC has proposed modifying Rule 144A to condition using the safe harbor for asset-backed securities disclosures upon sellers making disclosures similar to those required under proposed Regulation AB II.\textsuperscript{155} Relevant to coding the waterfall contract is that this would potentially include the Python proposal, though that appears to still be in notice and comment.\textsuperscript{156} In any case, the American Bar Association has argued persuasively and the SEC agrees that these safe harbor conditions cannot apply, however, to offerings that fall expressly under § 4(1) and § 4(2), and instead would only cover those products that fall into the safe harbor provisions but not into the statutory exceptions.\textsuperscript{157}

\begin{footnotes}
\footnote{17 C.F.R. 230.144A(d). The rule then explains what a qualified institutional buyer is.}
\footnote{Any of the following entities, acting for its own account or the accounts of other qualified institutional buyers, that in the aggregate owns and invests on a discretionary basis at least $100 million in securities of issuers that are not affiliated with the entity[.]

\textit{Id.} § 230.144A(a)(i). The rule proceeds to list off examples, including insurance companies, investment companies, state employee benefit plans, trust funds, investment advisers, dealers, and others. \textit{Id.}


\footnote{\textit{Id.} at 23395 (“The underlying transaction agreement for the securities must grant to purchasers, holders of the securities (or prospective purchasers designated by the holder) the right to obtain from the issuer of such securities the information, upon request, that would be required if the transaction were registered under the Securities Act and such ongoing information as would be required by Section 15(d) of the Exchange Act if the issuer were required to file reports under that section.”).}

\end{footnotes}
To remove the requirement of multiple legally relevant depictions of the waterfall, the SEC some options. First, for publicly traded securities, the SEC could permit the issuer to incorporate by reference into the prospectus as well as the contract the coded representation of the waterfall. This would resemble to current practice of those in the industry who try to incorporate the indenture or other agreement into the agreement.\footnote{Darmstadter, \textit{supra} note 63 (“[M]any prospectuses still incorporate goodly chunks of the indenture without any explanation, concise or otherwise. The SEC has apparently acquiesced in the view that prospectus recitals of indenture provisions are ‘magic words’ that investors expect to see recited verbatim.”).} What the SEC could allow, however, is that when the coded waterfall is incorporated by reference, no other description need be provided. And, furthermore, the SEC could recognize, if not dictate, that parties can agree that no matter what the prospectus states, the coded representation prevails.\footnote{Securities Act of 1933 § 28, 15 U.S.C. § z-3 (“The Commission, by rule or regulation, may conditionally or unconditionally exempt any person, security, or transaction, or any class or classes of persons, securities, or transactions, from any provision or provisions of this title or of any rule or regulation issued under this title . . . .”).} This leaves the

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Figure 7. The Prospectus Problem for the Code as Contract Model
In public offerings, and perhaps also in private placements if the SEC moves on its Regulation AB II proposal with respect to 144A for ABS offerings, the prospectus comes back into play, competing to define the legal reality, with the legal reality able to trump the functional reality once again.

To remove the requirement of multiple legally relevant depictions of the waterfall, the SEC some options. First, for publicly traded securities, the SEC could permit the issuer to incorporate by reference into the prospectus as well as the contract the coded representation of the waterfall. This would resemble to current practice of those in the industry who try to incorporate the indenture or other agreement into the agreement.\footnote{Darmstadter, \textit{supra} note 63 (“[M]any prospectuses still incorporate goodly chunks of the indenture without any explanation, concise or otherwise. The SEC has apparently acquiesced in the view that prospectus recitals of indenture provisions are ‘magic words’ that investors expect to see recited verbatim.”).} What the SEC could allow, however, is that when the coded waterfall is incorporated by reference, no other description need be provided. And, furthermore, the SEC could recognize, if not dictate, that parties can agree that no matter what the prospectus states, the coded representation prevails.\footnote{Securities Act of 1933 § 28, 15 U.S.C. § z-3 (“The Commission, by rule or regulation, may conditionally or unconditionally exempt any person, security, or transaction, or any class or classes of persons, securities, or transactions, from any provision or provisions of this title or of any rule or regulation issued under this title . . . .”).} This leaves the
possibility of private Securities Act of 1933 § 11 and § 12 claims based upon reliance upon the prospectus if descriptions are still provided, but by removing unsophisticated investors from the market, most or all sales of these products would take place in private placements without a prospectus requirements to create liability.

Alternatively, the SEC could remove the prospectus requirement entirely in the context of explaining waterfalls, and could discourage the use of written descriptions as risky representations bordering on deceptive under § 10(b) of the Securities Exchange Act of 1934. This would remove potential for private suits based on textual descriptions of the waterfall because making those descriptions would be unacceptable. On the other hand, textual descriptions in the prospectus or offering memorandum could remain useful as a starting point for understanding a coded representation. The real issue is not the presence of such descriptions or even necessarily of legal depictions in the indenture, but rather their potential as a legal trump against the functional depiction. So while this proposal would be the purest solution in terms of limiting the number of depictions, the first solution is likely the better one for providing useful information.

An objection to these proposals for publicly offered securitized products is that these products are already dangerous and hard to understand for sophisticated investors, many of whom relied upon credit ratings rather than their own evaluations of the products in the lead-up to the crisis. Unsophisticated investors, who could potentially purchase these products if they

\begin{itemize}
\item Id. § 11, 15 U.S.C. § 77k; id. § 12, 15 U.S.C. 77l.
\item Id. § 28, 15 U.S.C. § 77z-3
\item MELANIE L. FEIN, SECURITIES ACTIVITIES OF BANKS 13-7 (4th ed. 2013); Fanni Koszeg, Will CDO Managers Be Held Accountable for Their Role in the Financial Crisis, BLOOMBERG LAW, http://about.bloomberglaw.com/law-reports/will-cdo-managers-be-held-accountable/.
\end{itemize}
are publicly traded, face an even greater handicap at understanding the risks if the representations are made in coded form. This leads to a second component of the SEC’s considerations: how to cope with unsophisticated investors’ purchases of products with waterfalls like those in CDOs. The possible solutions range from banning the sale of these products to investors through FINRA suitability provisions\(^{164}\) to making a carve-out from this proposal that keeps the status quo prospectus-focused regime. Even under the current regime of suitability, a sale of such a high risk product to an unsophisticated investor might run afoul of FINRA suitability rules binding broker–dealers.\(^{165}\) But, assuming that they are suitable in the status quo, the SEC should push FINRA and other self-regulators to reduce or eliminate sales of CDO-type products with complex waterfalls to “unsophisticated” investors, perhaps arguing that they are inherently deceptive given the relevant buyer’s presumed inability to understand them. If, however, the SEC does not want to block sales of these structured financial products to unsophisticated investors, the SEC should likely carve out any non-qualified institutional investor from the code as contract regime.

Sophisticated (“accredited”) investors can likely already implement the code as contract regime in private transactions.\(^{166}\) Proposed Regulation AB II’s expansion to the disclosure requirements of private placements, unless it includes the Python model, will not interfere with their ability to choose the best legal depiction. FINRA’s Rule 5123 also only requires that documents used in the offering document be filed, but does not specify what those documents


\(^{165}\) See FINRA, REGULATORY NOTICE 12-03, COMPLEX PRODUCTS: HEIGHTENED SUPERVISION OF COMPLEX PRODUCTS 2 & n.9 (noting that FINRA has brought regulatory actions for transactions in complex financial products unsuitable for the relevant investors).

\(^{166}\) See supra note 154.
should include.\textsuperscript{167} It appears, though it remains an open question, that the SEC does not have any rules standing in the way of private placements programming their waterfall indentures and incorporating that functional depiction as contract.\textsuperscript{168}

In summary, the SEC should remove unsophisticated, unaccredited investors from the market for complex structured finance products using waterfalls, and then should remove the legally binding characteristic of the prospectus as much as possible in order to facilitate the use of the code as contract transaction model for these products. The SEC does not, however, need to do anything to facilitate the use of this model in the private offering setting as its current additions to the private offering requirements do not as of yet create additional legally binding depictions of the waterfall.

\textsuperscript{167} FINRA Rule 5123.

\textsuperscript{168} The role of regulation by Europe in the international market for securities products like CDOs also requires consideration. The European Securities and Markets Authority (ESMA), a European Union (EU) entity, promulgates directives and mandates that are then implemented by member states. See KATE BALL-DODD & JUSTINE USHER, MAYERBROWN, UK IMPLEMENTATION OF AMENDMENTS TO THE PROSPECTUS DIRECTIVE – WHERE ARE WE NOW? (2012), available at http://www.mayerbrown.com/files/Publication/c070727b-ec23-445f-9264-ab4c80ddcd64/Presentation/PublicationAttachment/a5547bccB9c66B4dabB89a9Bb0ae6dc4f855/UK_Implementation_of%20amendments_to_the_Prospectus_Directive.pdf. Like the US, public offerings of debt securities (like CDO bonds) are subject to a prospectus disclosure requirement with an exception for private placements with qualified investors. Directive 2010/73/EU, of the European Parliament and of the Council of 24 November 2010 Amending Directives 2003/71/EC on the Prospectus to Be Published When Securities Are Offered to the Public or Admitted to Trading, 2010 O.J. (L 327) 1, 6. The EU also provides an exception for the “wholesale market” in bonds as determined by the proxy that the minimum bond issue denomination size must be no less than €100,000 (anything smaller is the “retail market”), in which only a limited prospectus is required. Id. at 6.

Like in the U.S., the qualified investor category for private placements is likely the most relevant as it means that the EU Prospectus Directive would not apply, analogous to Rule 144A qualifying offerings in the US, meaning that in private placements the prospectus regime poses not challenges to the code as contract proposal. For public offerings of debt, including those in the wholesale market, ESMA should adopt modifications to the prospectus directive analogous to those suggested in this Article. For a useful discussion of debt security prospectuses under EU regulations, see PWC, GUIDE TO LISTING DEBT ON EUROPEAN STOCK EXCHANGES (2013), available at http://www.pwc.ru/en_RU/ru/capital-markets/publications/assets/Generic_EU_debt_offering_brochure_eng.pdf.

2. The SEC Should Encourage or Require the Use of the Code as Contract Model.—

While individual market participants might want to adopt the code as contract model for drafting indenture waterfalls, they might face a problem that could be characterized as an absence of an economy of networks. As the first telephone invented lacks value until there is a second telephone to answer the call, participants in the CDO and structured finance market might not adopt this Article’s code as contract proposal unless several investors agree to play ball at once. Many institutional investors that purchase CDOs, however, might not want to make the leap to using the code as contract model until several issuers adopt it in order to achieve economy of scale. And neither side will want to make the initial leap to spend adoption costs unless there is a standard or standards among participants. This is a classic case for government regulatory intervention where, unless private self-regulating entities or large collectives of market participants agree among themselves to adopt, adoption might not occur. Government or self-regulatory organization (FINRA) promotion or mandate could remove this network deficiency problem.

The SEC has started the discussion about the standardization of disclosure of a programmatic representation in its proposed Regulation AB II, asking for more comments on how to best implement its disclosure proposal. This knowledge-gathering exercise means that the industry and regulators are engaged in a discussion about the specific form a coding standard to represent waterfalls and inputs could take. The discussion the SEC has started could by itself be sufficient to facilitate the market players coalescing around a particular standard without

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170 See id. for an analogous example oriented around fax machines.
action by the SEC. Unfortunately, there has not been a similar discussion about this Article’s proposed code as contract model of waterfall transactions, but reaching some consensus about what a coded disclosure could look like would overcome one of the largest business hurdles facing a code as contract transaction regime.

Beyond the benefit to the dealmakers of mandating a code as contract proposal, such a rule offers a positive externality to the public. If all complex structured finance waterfalls are depicted as code that has been thoroughly vetted by structurers, investors, and trustees, then the SEC will have access to accurate cash flow distribution models with which to analyze its newly gathered data. The SEC is currently considering asset-level data disclosures as part of an amendment to Regulation AB and related proposals about safe harbor criteria. This information will provide the agency a greater ability to stress test both individual products and markets in these products in a manner comparable to that used by investors and credit rating organizations themselves. It will also permit a broader analysis of the market in these products in order to understand the risks they actually entail, rather than what they might entail if predictive models are used.

The SEC should propose and invite comment on a rule to require that waterfalls be represented by code as contract rather than using disclosures of prospectuses and contracts. It has a few legal approaches it can take. One approach would be to require as a disclosure a programmatic representation that has a legally effective characteristic, and by requiring this disclosure create the new legal reality. This would require the disclosure of a legally determinative coded representation of the waterfall. Two parts to such a requirement could

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cause protest. First, there is the disclosure of something that does not yet exist: the disclosure of a coded representation of the waterfall. Second, this disclosure must be legally binding on the parties.

Looking at the first, the SEC has already begun to think about this in its Python proposals. Legal protests from the ABA to that proposal demonstrate some of the difficulties of finding statutory authority for even that relatively modest proposal, let alone the more dramatic change proposed in this Article. As the ABA argued in a comment to the SEC’s Python proposal, the code disclosure is not a “statement” under the Securities Act of 1933, and therefore no liability can be assigned for misstatement through incorrect coded depictions. The ABA’s most interesting argument is that since a computer program cannot be a misstatement, an idea that sits at the heart of my proposal, it cannot constitute a statement. This is not persuasive because misstatement is still possible if the disclosure is a computer programs. The wrong code, for example, could be disclosed and that would constitute a misstatement in the form of code. Furthermore, if code is not a disclosure, then neither is disclosure of tables of data, which also carry with them no facial ambiguity and can only be false in representing miscalculations of the use of the wrong data. Beyond these semantic games, § 15(d) of the Securities Exchange Act, added under the Dodd–Frank Act, orders the SEC to adopt regulations requiring data disclosure “regarding the assets backing that security,” and to “set standards for the format of the data provided by issuers.” This also seems to give the SEC a great deal of discretion to determine how to format the data to make it useful as a disclosure, and the SEC could readily hang a code

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174 Id.
as contract requirement on this language even if it could not use the traditional sources of authority in the Securities Act.

A more difficult question is whether the SEC can require that disclosure to have certain characteristics such as being legally binding using disclosure provisions. There does not appear to be a precedent of the SEC dictating the structure of a financial product transaction directly, and almost certainly none of the agency dictating the structure of a private placement transaction. The most likely statutory hook would have to be in the provisions for deceptive practices in securities. And in particular the famous § 10(b) of the Securities Exchange Act of 1934.

It shall be unlawful for any person, directly or indirectly, by the use of any means or instrumentality of interstate commerce or of the mails, or of any facility of any national securities exchange—

. . . .

(b) To use or employ, in connection with the purchase or sale of any security registered on a national securities exchange or any security not so registered, or any securities-based swap agreement (as defined in section 206B of the Gramm-Leach-Bliley Act), any manipulative or deceptive device or contrivance in contravention of such rules and regulations as the Commission may prescribe as necessary or appropriate in the public interest or for the protection of investors.¹⁷⁶

Rule 10b-5 further provides:

It shall be unlawful for any person, directly or indirectly, by the use of any means or instrumentality of interstate commerce, or of the mails or of any facility of any national securities exchange,

(a) To employ any device, scheme, or artifice to defraud,

(b) To make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or

(c) To engage in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person, in connection with the purchase or sale of any security.¹⁷⁷

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¹⁷⁷ 17 C.F.R. 240.10b-5.
While this pair does require scienter and faces other significant impediments as an enforcement mechanism, its wide reach into private and public offerings as well as into just about any form of securitized products makes it an ideal place to grab hold of for purposes of regulating the nature of a product. The SEC then need “only” evaluate how past experiences with contractual and prospectus explanations of waterfalls have impeded the effective comprehension by investors in CDOs. Assuming the SEC concurs, can confirm it with additional fact-finding through research and notice and comment, the SEC could then promulgate a rule declaring per se deceptive the use of written contractual and prospectus waterfall arrangements in the contexts where they pose the greatest risk. The SEC could even argue directly from § 10(b) rather than operating through Rule 10b-5 in order to permit itself greater leeway with respect to court-created precedent surrounding that rule, among other issues.

The SEC can require the use of the code as contract model, though it might face challenges in the D.C. Circuit on the basis of whether it is arbitrary and capricious. However, considering the potentially significant benefit in removing legal doubt and the fact that it might alleviate a market failure (a weak network) that could stand in the way of this proposal’s implementation, it appears that the benefit side of such a regulation would be substantial. Furthermore, the cost side is likely relatively small in the long run given the substantial current use of predictive models by market participants. As for whether such a regulation fits the intent of Congress, it appears clear from § 10(b) that Congress intended to give the SEC flexibility to

180 For an extensive discussion of the D.C. Circuit’s repeated decisions overturning SEC rulemaking, see James D. Cox & Benjamin J.C. Baucom, The Emperor Has No Clothes: Confronting the D.C. Circuit’s Usurpation of SEC Rulemaking Authority, 90 TEXAS L. REV. 1812 (2012).
decide what is deceptive for consumers, and furthermore § 15(d) indicates that Congress wanted the SEC generally involved in regulating structured financial products.

The CFTC’s role in regulating products like CDOs remains unclear. In interpretive letters, the CFTC first announced that very limited forms of asset-backed securities and special purpose vehicles that use swaps could avoid regulation by the CFTC.\footnote{Request for Exclusion from Commodity Pool Regulation for Securitization Vehicles, Replying to Letter from Am. Securitizations Forum & SIFMA, CFTC Interpretive Letter No. 12-14, at 4–6 (Oct. 11, 2012), available at http://www.cftc.gov/ucm/groups/public/@lrlettergeneral/documents/letter/12-14.pdf.} A second interpretive letter established that any product regulated under SEC Regulation AB or privately issued but otherwise like a product regulated under Regulation AB would not be considered a commodity pool, a characterization that would pull CDOs into the CFTC’s bailiwick.\footnote{Further Exclusions from Commodity Pool Regulation for Certain Securitization Vehicles; No-Action Relief for Certain Securitization Vehicles Formed Prior to October 12, 2012, CFTC Interpretive and No-Action Letter No. 12-45, at 1–4 (Dec. 7, 2012), available at http://www.cftc.gov/ucm/groups/public/@lrlettergeneral/documents/letter/12-45.pdf.} Other products where there is active trading or where the swaps play a more significant role than credit enhancement might be commodity pools and thus subject to CFTC regulation, though the CFTC has expressed its willingness to operate on a case-by-case basis for the moment through no-action letters.\footnote{Id.} This is a very unstable area of law, and until the CFTC and SEC sort out their jurisdictional turfs, what role the CFTC could play in requiring the implementation of the code as contract model will remain uncertain.\footnote{The risk of regulatory arbitrage rears its head in the case of almost any regulation that has the potential to require upfront investment. See generally, e.g., Christian A. Johnson, Regulatory Arbitrage, Extraterritorial Jurisdiction and Dodd-Frank: The Implications of US Global OTC Derivative Regulation (Univ. Utah College of Law, Research Paper No. 16, 2012), available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2169401## . In this case, the risk is that the market in these securities products could run to European markets, closing down US trade in these financial products. There are two answers to this concern. First, as this Article has gone to lengths to demonstrate, the code as contract regime is better for participants in the market because it reduces risk and complexity in the deal-making process. A mandate to adopt this regime could be seen as welcome by market-participants if the details are handled.
3. The Problem of the Bankruptcy Regime.—While regulatory challenges discussed above are difficult, they can likely be overcome through relatively minimal agency and self-regulatory organization action. The Bankruptcy Code, however, presents a more substantial challenge to the code as contract proposal. The waterfall cash distribution is effectively designed to specify priorities in the event of a cash shortfall or other event of default.\textsuperscript{185} Some events of default resemble insolvency by the CDO.\textsuperscript{186} In those cases, the bondholders can turn to pushing the trustee to seek bankruptcy or seek a bankruptcy court to force involuntary bankruptcy on the CDO.\textsuperscript{187} Once in bankruptcy, the problems begin to mount for a waterfall, whether it is written in words or programmed in contract. First, if the waterfall flips its order in the case of insolvency, that might constitute an illegal \textit{ipso facto} clause, which is a clause in a contract (unsuccessfully) designed to end a contract (or dramatically change a contract) upon bankruptcy of a party.\textsuperscript{188} Second, even apart from an \textit{ipso facto} clause attack, creditors might seek involuntary liquidation that would restructure the waterfall without resistance from the trustee.\textsuperscript{189} 

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appropriately. If executed well, the market in these complex financial products very well might prefer the deal-making structure under the code as contract model and move more of their business in these products to the US.
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Second, this Article contends that ESMA should itself adopt a code as contract mandate for these goods. It looks like the EU will soon grant ESMA significant power to ban financial products it deems dangerous in emergencies, and will also be able to coordinate with member states’ regulatory bodies to arrange bans on specific products. \textit{Commission Proposal for a Directive of the European Parliament and of the Council on Markets in Financial Instruments Repealing Directive 2004/39/EC of the European Parliament and Council}, at 184, COM (2011) 656 final (Oct. 20, 2011). Between this forthcoming capacity to ban certain products as well as its role in establishing the technical standards for prospectuses through the Prospectus Directive, ESMA should have the authority to implement technical disclosure standards. It would be going too far afield, however, for this Article to consider the administrative authority of ESMA, which is most lucidly explained by ESMA itself in \textit{Frequently Asked Questions, A Guide to Understanding ESMA}, at 4–5 (Jan. 3, 2011), and the future of which appears to be in dispute at the moment. Elan Mendel, \textit{Fight Over ESMA Continues in EU}, CFTCLAW (Feb. 3, 2012), http://www.cftclaw.com/2012/02/fight-esma-continues-eu/.

\textsuperscript{185} See \textit{In re Zais Inv. Grade Ltd. VII}, 455 B.R. 839, 842–43 (Bankr. D.N.J. 2011) (describing the structure of a CDO\textsuperscript{2} waterfall including its liquidation specification in the case of a default not of payment but of indenture covenants).

\textsuperscript{186} See, \textit{e.g.}, id. (describing a covenant default that provides for trustee-managed liquidation in which assets are changed to passive management and the only activity is a paying down of the bonds to the senior tranche holders).

\textsuperscript{187} \textit{E.g.}, id. (explaining that senior tranche holders sought an involuntary petition for bankruptcy for the CDO).

\textsuperscript{188} 11 U.S.C. § 365(e); 11 U.S.C. § 541(c)(1)(B). The text provides as follows:
The fact that these “bankruptcy-remote” CDO SPV entities can be dragged into bankruptcy court and liquidated like pretty much any other business entity creates a potential alternate legal reality on the bankruptcy courts’ and senior creditors’ tabula rasa. The senior creditors and the bankruptcy court can significantly restructure the debt within the limits of the Bankruptcy Code and without regard to the indenture. What structure this new waterfall and asset structure will have, none of the creditors who purchased the CDO bond could have predicted from any functional depiction or legal depiction provided at the time of sale. Furthermore, a New Jersey bankruptcy court in a case called Zais held, junior creditors are not entitled to defend themselves by challenging the right of the senior creditors to propose a new payout structure. The relevant parties are renegotiating the deal and redesigning the waterfalls

Except as provided in paragraph (2) of this subsection, an interest of the debtor in property becomes property of the estate under subsection (a)(1), (a)(2), or (a)(5) of this section notwithstanding any provision in an agreement, transfer instrument, or applicable nonbankruptcy law . . . that is conditioned on the insolvency or financial condition of the debtor, on the commencement of a case under this title, or on the appointment of or taking possession by a trustee in a case under this title or a custodian before such commencement, and that effects or gives an option to effect a forfeiture, modification, or termination of the debtor’s interest in property.

11 U.S.C. § 541(c)(1)(B). For an example of a court characterizing a shift in waterfall as potentially an illegal ipso facto clause, see Lehman Bros. Holdings, Inc. v. Ballyrock ABS CDO 2007-1 Ltd., 452 B.R. 31, 38 (Bankr. S.D.N.Y. 2011) (denying a motion to dismiss a claim based on an ipso facto clause argument). Ballyrock was a CDO vehicle and a Lehman subsidiary had contracted for a swap arrangement with Ballyrock. Id. at 1, 4–5. Ballyrock’s trust indenture placed repayment of this swap in third priority in the waterfall except in the event that Lehman entered bankruptcy, in which case Lehman was placed very low in the waterfall. Id. at 6–7. Under the swap terms, Lehman was owed money and claimed that money under its swap contract from Ballyrock. Id. at 7–8. Id. at 10–11. Ballyrock pointed to the clause placing Lehman near the bottom of the waterfall, while Lehman argued that it was an invalid ipso facto clause because it was triggered by bankruptcy. Id. The court agreed with Lehman, and removed the contingency from the waterfall, and permitting the suit to go forward. Id. at 13. For a discussion of this case generally, see ALSTON+BYRD LLP, COURT HOLDS THAT A BANKRUPTCY TERMINATION PROVISION THAT SUBORDINATES AN IN-THE-MONEY DEBTOR’S RIGHT TO A DISTRIBUTION MAY BE AN UNENFORCEABLE IPSO FACTO PROVISION (June 16, 2011).

189 See, e.g., Zais, 455 B.R. at 843–44 (describing the trustee’s inaction).
190 SCHULTE, ROTH & ZABEL, BANKRUPTCY COURT APPROVES PLAN TO LIQUIDATE CDO 1 (2012).
191 See, e.g., Zais, 455 B.R. at 843–44. (explaining that creditors proposed the new liquidation payment plan).
192 Id. at 846.
subject to a vote of the bondholders, as many indentures permit.\textsuperscript{193} Instead, bankruptcy is a change of the waterfall effected through the all-but fiat of the senior tranche holders. Add to this the problem of cross-jurisdictional contradiction in bankruptcy court interpretations of waterfalls, as in the recent Dante case where British and American courts reached opposite conclusions about a CDO waterfall prioritization, and problem posed by the bankruptcy regime is worsened further.\textsuperscript{194} Bankruptcy proceedings, by creating an alternative legal reality based on late-created depictions in the forms of motions and bankruptcy proposals, create a low probability but potentially high cost risk that a coded waterfall will not always be the legal reality.

Given the real risk of bankruptcy’s legal reality trumping the coded waterfall’s legal and function reality, two questions arise: should dealmakers do something about this problem, and, if so, can they. Putting aside the question of whether \textit{ipso facto} clauses in general should be permitted or not, which has be discussed at length by others,\textsuperscript{195} the answer is probably that yes, dealmakers should probably seek to find a way to make these deals more bankruptcy proof. CDO deals are inherently about allocating risk to meet the risk preferences of investors—something that becomes even clearer in the case of bespoke CDOs.\textsuperscript{196} The Bankruptcy Code serves a completely different purpose. The same arguments presented earlier in this paper that militate against permitting multiple legal realities in general apply equally to bankruptcy for that

\textsuperscript{193} See, e.g., \textit{id.} at 843 (“Anchorage attempted, without success, to convince ZING VII to rectify the passive holding of its assets. Under the trust indenture, the only way to achieve an orderly liquidation of the assets is to obtain the consent of 66.67\% of all noteholders, which Anchorage deems highly unlikely, if not impossible.”).

\textsuperscript{194} Concerning the prioritization of payments from a waterfall in the event of bankruptcy, again on grounds that the relevant clause changing prioritization was an \textit{ipso facto} clause, a U.S. bankruptcy court held that a change in prioritization of a swap was invalid. \textit{Lehman Bros. Holdings v. BNY Corp. Trustee Servs.}, 422 B.R. 407, 415–20 (Bankr. S.D.N.Y. 2010). An English court addressing the same contractual language found there to be no problem with the switch. \textit{Id.} at 423.

\textsuperscript{195} See generally, e.g., Yeon-Koo Che & Alan Schwartz, \textit{Section 365, Mandatory Bankruptcy Rules and Inefficient Continuance}, 15 J.L., ECON. & ORG. 441 (1999) (criticizing the \textit{ipso facto} clause ban as inefficiently leading bankrupt creditors to continue bad, lossy contracts).

\textsuperscript{196} See \textit{supra} note 67 (discussing bespoke CDOs).
reason. One of the main purposes of the Bankruptcy Code in the commercial context is to allocate collections of debt in the event of a race for assets,\(^{197}\) does not apply in the context of CDOs. If the indenture is followed, and especially if the indenture is coded as proposed in this Article, then the creditors should know and understand how the liquidation process will take place. There is no race to be first at the debtors doors because the trustee will provide no relief unless it is what the indenture specifies. These creditors are not normal businesses, they are sophisticated investment vehicles typically—often SPVs in their own right with no purpose but to hold assets and designed based upon the operation of their own waterfall—and their sole \textit{raison d'être}\(^{198}\) is to assume and allocate risk. Therefore, it does not seem appropriate that they should be freed from the bargain they made when, unlike a home contractor facing nonpayment, these deals and entities have no other economic purpose, and cannot serve that purpose if bankruptcy proceedings trump the structure of their reality.

The solution, fortunately, might not, and should not, require a change of the bankruptcy laws. Instead, the change might be accomplished by requiring trustees, as representatives of the debtor CDO, to challenge the qualifications of senior tranche holders to seek involuntary bankruptcy proceedings. As for how they can fight it, one strategy would be to turn to a legal question that remains open after the New Jersey case \textit{Zais}, which his whether senior tranche holders should be able to escape the trust indenture structure through bankruptcy.\(^{199}\) Junior creditors in \textit{Zais} argued that the senior tranche holders were not qualified to seek involuntary


\(^{198}\) “[R]eason or justification for existence.” \textit{Raison d'être}, \textit{MERRIAM-WEBSTER}, m-w.com.

\(^{199}\) See \textit{Zais}, 455 B.R. at 846 (declining to decide the qualifications of senior creditors to seek involuntary bankruptcy).
proceedings against the CDO under Bankruptcy Code § 303(b)(1)\textsuperscript{200} because their debt was “non-recourse.”\textsuperscript{201} That is to say, the senior creditors had claim only to secured assets and nothing more than the value of those assets,\textsuperscript{202} and thus did not meet § 303(b)(1)’s delimited minimum value required in order to seek an involuntary action.\textsuperscript{203} The Zais court did not reach this question, and it seems a plausible argument for trustees to use. This is, of course, only one legal theory among many others that might be available if only the trustee is required by the indenture to put up a fight.

Even if the trustee cannot win the day on the liquidation waterfall clause by resisting the qualifications of the attacking creditors, the trustee might also lean on § 510 of the Bankruptcy Code, which provides that “[a] subordination agreement is enforceable in a case under this title to the same extent that such agreement is enforceable under applicable nonbankruptcy law,”\textsuperscript{204} in order to preserve the waterfall in general. The case law has several warts, including the absence of a useful definition of subordination, a dependency on bankruptcy court interpretation of state contract law, and so forth, but the consensus appears to be that subordination language remains enforceable so long as other bankruptcy rights are not impeded.\textsuperscript{205} This is not a perfect outcome, it leaves a small possibility of an additional legal reality in which the court chooses to switch to liquidation, but it means that the odds of that outcome are relatively low.

\textsuperscript{200} 11 U.S.C. § 303(b)(1).
\textsuperscript{201} Zais, 455 B.R. at 846.
\textsuperscript{202} See id. (“According to Movants, since the notes are non-recourse, the claims can never be more than the value of the collateral, i.e., the petitioning creditors are secured, but not unsecured creditors.”). For an intelligible explanation of non-recourse loans in the mortgage context, see Carr McClellan, Does Non-Recourse Liability Still Exist?, CARR MCCLELLAN LAW BLOG (Nov. 27, 2012), http://www.carrmcclellan.com/does-non-recourse-liability-still-exist/.
\textsuperscript{203} Zais, 455 B.R. at 846.
\textsuperscript{204} 11 U.S.C. § 510(a).
\textsuperscript{205} For a thorough discussion of the subordination clause, including the “warts” discussed in the text accompanying this note, see Mark N. Berman & David Lee, The Enforceability in Bankruptcy Proceedings of Waiver and Assignment of Rights Clauses Within Intercreditor or Subordination Agreements, 20 J. BANKR. L & PRAC. 6.
This Article has expanded upon Professor Hu's explanation of the challenge of multiple depictions of complex securities waterfalls by adding to the idea of depiction its counterpart of perception. Multiple legally relevant depictions make the act of perceiving the future legal reality extremely difficult, and following the SEC’s, England’s, and Professor Hu’s path, which adds yet more legally relevant depictions into the mix, will only add to that confusion. The more legally relevant depictions there are, the greater the legal risk faced by structurers, trustees, and investors.

Instead, for complex but highly procedural arrangements like CDO, MLP, and private equity fund waterfalls, a better transaction structure would be to negotiate around the actual cash flow distribution program, just like those negotiating a construction contract focus on the blueprint. By devoting business energy to perfecting the actual, functional depiction of the cash flow distribution program, investors will be better informed and able to make more informed decisions.
flow and its inputs, this improves the likelihood of reaching something like the desired cash distribution reality. Furthermore, it removes the slippages between depictions and allows lawyers to focus on what lawyers are good at: structuring language about warranties about other aspects of the deal. Adopting the code as contract strategy is simply good legal–business strategy.

As a corollary, the SEC should adjust its prospectus requirements in order to allow deals with sophisticated investors to avoid the prospectus liability. Furthermore, unsophisticated investors should not be involved in the market. The SEC should consider mandating the code as contract dealmaking regime in order to remove the network effects challenges facing potential innovators seeking to adopt the regime. Not only would such a regulatory move benefit the parties, but it would also facilitate regulatory stress testing of these highly risky products. There are several statutory and regulatory hooks onto which the SEC could hang such a policy change despite how different this policy would be from traditional SEC disclosure-based regulation. And requiring trustees to defend the indenture might in and of itself be an effective strategy to prevent bankruptcy from creating alternative legal realities, and how even if a trustee is not successful, bankruptcy courts tend to respect subordination clauses, despite examples to the contrary.

Additional work follows any recommendation. First, in this case, there is the question of detail. How the code as contract model is adopted and whether it is a good regime depends largely upon technical and legal implementation. Second, there is the question of breadth. This proposal could be applicable to numerous analogous structures in securities and beyond to private equity and master limited partnership arrangements, each of which come with their own legal hurdles. Or, even within the ABS context, a collateralization model for verifying the
quality of assets could be incorporated as part of the deal rather than attempting to specify the
necessary collateralization in words. Outside of securities, anywhere in which complicated but
procedural structures exist, deals are somewhat commoditized and repeated, and the parties to
deals are sufficiently sophisticated, this code as contract model could be useful. Implementing
the code as contract model in the waterfalls context as well as others yet to be considered offers
the possibility to fundamentally alter the framework for dealmaking, overcoming problems of
analyzing risk in a market of products too complex to perceive.