Claims Debt and Equity in REA with FIBO Extensions

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Abstract

This paper presents an ontological analysis of the concepts proposed for extensions to the REA ontology to accommodate or define Debt and Equity. Earlier work aimed to use the REA concept of 'Claim' to provide the language in which to create a symmetrical treatment for Debt and Equity, however no such symmetry was apparent. The exploration given here uses the Design Science Research (DSR) methodology to take a step back and consider the range of possible concepts to which the word 'claim' may be mapped, comparing these to the canonical REA concept for Claim. We analyzed three such concepts, rejected one, found another to be coextensive to Debt and were left with a third, useful concept that does not precisely map to REA Claim. We established that the concepts needed for Debt and for Equity can be defined using existing REA concepts, by abstracting Commitment to a broader usage in agreements generally. Finally, we identify work that remains to be done to unify the models developed in this exploration, with canonical REA concepts.

Keywords

REA, Commitment, Claims, Debt, Equity

1. Introduction

This paper presents a conceptual analysis of the concepts proposed for extensions to the REA ontology to define Debt and Equity. Ontology provides a means to define concepts independently of words. Words can later be mapped to those according to usage context. We do not ask "What does this word mean?", but rather "How is this meaning worded?" Put more clearly and avoiding the problematic word 'meaning' altogether, what we do here is to define concepts. This is done using intensional definitions of each concept, where these intensions are framed in set-theoretic or first order logic. This reversal of direction from 'words-to-meaning' to 'concepts-to-words' is important, because in this exploration we will not ask "What does Claim (a word) mean" at all. Instead, we will map out the conceptual space in which the notion of Claim is seen to operate and ask which of the various concepts can most effectively be used to derive the concepts of Debt and Equity. Meanwhile the word 'Claim' has a reserved meaning in REA; we aim to define enough concepts that we should eventually be able to accommodate the meaning of REA 'Claim' (with a big C) along with existing natural language meanings of 'claim' (little c).

The following sets out our understanding of the concepts given in REA and some notes on these, along with the conventional and REA meanings of 'claim'.

Debt: Debt represents an imbalance in Commitments, whereby taking the position of the parties overall, one party has a net right to receive funds from the other.

Equity: Equity refers to shares, trust units etc.; for the sake of this discussion we shall treat them as the same and refer to them as Equity Units. Considerations of differences can be deferred without affecting the principle. Equity Units evidence ownership of a heterogeneous resource. As with any owned Resource, the owner is entitled to control the resource or dispose of it as they see fit, however

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these rights are shared collectively among equity holders and cannot be exercised unilaterally: the owner has no right (individually) to require any entity to deliver any portion of the heterogeneous resource. Depending on control rights, holders may agree to deploy the shared resource as they see fit.

Value: A value expresses the quantity of a resource parcel in terms of another resource (typically, but not necessarily money). We can envisage valuation as the "estimation" of an exchange rate of one resource parcel for another (an exchange rate or price).

Agreement: An agreement is a mutual exchange of bundles of Commitments negotiated between two Parties.

Party: Party is defined (as in English) to mean some entity having a part in, or being 'a party to' some formal matter in which they may participate, such as a Transaction, a Contract or a Commitment. Party is a kind of Relative Thing, that is a concept defined in some context. Each Party has a property identifying the actual entity that plays the role (or participation) defined in the Party concept. In FIBO this is called PartyInRole, here we use 'Party'.

Commitment: A Commitment is an undertaking to act. Its defining property is a relationship to some action to be carried out by one party to that Commitment (the Obligor), for example delivery of goods or currency, in favor of the other (the Beneficiary). The action in question may (and in the scope of REA, does) relate to some Economic Resource.

Position or Imbalance: From any given party's perspective, we can aggregate those parties' commitments. For each Economic Resource under consideration we can quantify the amount that is owed or the amount of benefit. This can be done for all commitments under a single agreement or across multiple agreements. We can derive a surplus, deficit or balance which represents a net "position" between two Parties. Since the commitment specifies when an action is due to be made, this also has a timeline. Commitments may be "due" or "overdue" in relation to this timeline, and this has implications for certain potential meanings of the word 'claim'.

Claim: The most general natural meaning of 'claim' is that I have the right to demand something of you. Meanwhile the REA concept of a claim is much more specific, and addresses the imbalance between the events specified by commitments under an agreement.

In this paper we use the Design Science Research (DSR) methodology [1] to progress the discussions on claims, debt and equity in REA and in the wider uses of these terms, the projected deliverable being this written account of these terms and their potential expression in an ontology. This is intended to provide a suitable starting point for more substantive ontological analysis of these concepts. Section 2 of the paper describes prior work in FIBO and subsequently by the Semantic Shed community of practice. Section 3 describes the exploration of possible conceptualizations to which the term 'claim' may be considered to apply, and how the different conceptualizations considered may be used in defining debt and equity. Section 4 sets out the conclusions and lays the ground for more substantive future work in this area.

2. Extensions in pre-FIBO work and Semantic Shed

2.1. Extending REA

The REA concepts [7] were generalized to any kind of contract or agreement, not only those typically considered to be transactions. We extended the normal scope of Commitment in REA (in which Commitment is both economically measurable and realizable), to the broader sense of any commitment to act, also including commitments to refrain from acting, thereby covering any kind of agreement, not only those that can be characterized as representing transactions.

2.2. Sides or Aspects of Things

The model for the sides of things is derived from the Top Level Ontology (TLO) notion of contextually Relative Thing wherein the context (usually a Mediating Thing) is instead defined as any Independent Thing, so that the aspect is simply an aspect or side of some thing, i.e. something described relatively to that thing. For accounting concepts this is used to make a bridge between the REA notion of a

Commitment as seen in the round, and the aspects of that commitment seen from the perspective of one or other party as a Right or an Obligation, and reported more specifically as an Asset or a Liability.

3. Analysis

We considered the various concepts to which the word 'claim' can refer. Concepts considered include a party's perspective on a commitment, an imbalance between commitments and a party's perspective on some net imbalance between commitments. These concepts were modeled in OWL using Cameo Concept Modeler and some suggested equivalency relationships were sketched out using UML dependency relations.

3.1. Claim as perspective on a Commitment (using polyhierarchy)

Given that 'Commitment Side' has as its children the classes of Right and Obligation, one meaning considered for 'claim' was a subclass of 'Commitment Side'. Would this be a third subclass of 'Commitment Side' independently of the classification facet which gives us Right and Obligation? If so, what would be the differentiae by which this new subclass was defined? We found no such differentiae, suggesting a simple equivalence to Right.

Conclusion: The notion that 'Right' may be relabeled as 'Claim Right' and regarded as co-extensive with 'claim' does not represent any notion of imbalance. In natural usage, one would not typically refer to having a claim on some party if the net position between the parties was not first taken into account.

3.2. Claim as Imbalance between Commitments (using Parties concept)

The parties from whose perspective some Imbalance between Commitments is viewed, are not the two parties to one Commitment, they are the two parties to one Agreement. Then assuming a Transaction in which there are two participants (Parties) and two Commitments that are mutually related, the two entities are defined as being parties to the Transaction. We can call them Party A and Party B in the case of a contract that does not have special terms for each, or Principal and Counterparty in a transaction that does make such a distinction.

In the case of a debt transaction (a transaction set up explicitly for the purposes of there being debt i.e. lending), we would call the principal the Lender and the counterparty the Borrower. Now there are two Commitments, mutually related. Starting with the Debt example and then generalizing for all REA based Transactions or Agreements:

Commitment (1): Commitment to transfer funds

- The Lender party to the Agreement is the Obligor to Commitment (1)
- The Borrower party to the Agreement is the Beneficiary of Commitment (1)

Commitment (2): Commitment to repay funds at a future date

- The Lender party to the Agreement is the Beneficiary of Commitment (2)
- The Borrower party to the Agreement is the Obligor to Commitment (2)

Then:

The parties from whose perspective a given Commitment is defined (as a Right or an Obligation), for book-keeping purposes, are the parties to each Commitment:

- To the Lender, Commitment (1) is see as an Obligation; to the Borrower it is a Right
- To the Borrower, Commitment (2) is an Obligation and commitment (1) is a Right

The parties from whose perspective some imbalance between two Commitments (thereby: some imbalance in the Transaction) is defined, are the parties which, at a given point in time, are the owing party and the owed-to party of that imbalance.

3.3. Party Perspectives on Imbalance

Any imbalance between two Commitments in one Transaction, we considered as being by definition a Debt. That is to say, at a given point in time, there is a debt owed by one party to the other as a result of the imbalance between the different Commitments that are involved in the transaction or agreement between those parties. As seen in the round, this debt is owed by one party to the Transaction and is owed to the other party to that Transaction. As seen from one party's perspective, for book-keeping purposes, the debt is seen as being owed by or being owed to the other Transaction party.

Critically, the parties from whose perspective we might consider debt is being owed to or as being owed by, are not the same as the parties to one specific commitment or to the other specific Commitment. However, at any given point in time, the imbalance between two commitments will be reflected in the books of either party as being an imbalance between the opposite aspects of the two Commitments that are combined by the Agreement (Transaction).

3.4. Beyond Lending

In the case of a lending contract (specifically engineered for there to be a debt between the parties during the life of the Agreement), the difference looks the same as the position on the one outstanding Commitment since the other one (the commitment to transfer funds right away) is pronounced dead (discharged) soon after the signing of the agreement. In a range of other cases, the two Commitments may both survive for a period of time. In these cases, the imbalance becomes more interesting, since it is the imbalance between these at any given point in time.

3.5. Claim and Debt

There are Asset and Liability positions relating to any specific Commitment, but debt is framed as being the difference between related (mutually exchanged) Commitments. The reporting of Debt from the perspective of one or the other party simply indicates whether the debt is owed to you or owed by you. It is still Debt, so Debt is always the Imbalance, seen in the round. If we define any imbalance between two Commitments (at some point in time) as being Debt, which we think it is, then one usage of the word 'claim' is coextensive with this.

3.6. Equity

An Equity instrument (e.g. a share) is a Contract. Having extended the REA and Commitment concepts to cover all types of agreement, these include the contract that constitutes an equity instrument. The terms of the contract are generally given in the Share Agreement or Share Terms. Note that this is not the same as any transaction for the ownership of the equity instrument (share) in the secondary market since what is transacted there is the right to hold one side of this equity contract. Here we are considering the share contract itself. A publicly issued share is held by a number of share holders. These are anonymous parties to that agreement. Like any Agreement, the Share Agreement makes several commitments on the part of the Issuer to the Holder as the counterparty to that Agreement.

For Equity contracts it is possible to describe the imbalance between each Commitment by the Issuer and any corresponding commitment on the part of the Holder, as an imbalance between these commitments. There are generally no commitments on the part of the shareholder, though some corporate actions will require decisions or actions on their part as and when they happen. Therefore, any imbalance across the two sets of commitments in the case of Equity, are co-extensive with the position at any point in time, of the or any commitments made by the Issuer to the Holder. There are usually no such commitments that are realizable or measurable in monetary terms, as would be needed to express any imbalance between them in such terms.

3.7. Claim as ownership Entitlement (using Equity)

In the Equity context we may talk about ownership entitlements, but these are not claims in the sense that there is no enforceable right. The differences encapsulate the conceptual difference between the accounting concepts of Liability and Owners' Equity (also called Proprietorship). Accountants typically create categories of proprietorship (e.g. valuation reserve, provision, retained earnings). In accounting, we talk of Owners' Equity as a "claim" by the owners upon the business. This is another legitimate use of the word but is quite different to commitment-based concepts previously explored. This could be referred to as "ownership claim" but semantically we must distinguish it from a claim on an Obligor to a Commitment.

3.8. Equity as Claim

One question addressed was, does Equity represent a prima facie claim of the sort represented by Debt? We were hoping to identify some symmetry between Debt and equity expressible in REA terms, perhaps using REA Claim. See the Mike Bennett paper from VMBO 2015 [3] on this. The conclusion in [3] is that there is no such symmetry: equity represents a kind of claim only in the event of the entity winding down, but that at other times it represents ownership. The paper concludes by providing definitions for two legal concepts, 'Chose in Action' and 'Chose in Possession'. It is not clear at the conclusion of this paper whether Equity is to be framed in terms of one or other of these specifically. There is also a note to the effect that one of these two concepts (Chose in Action) appears to itself encompass two distinct concepts: the right to receive or recover something from the other party right away and the right to possess something that the other party holds, in the future. This concept seems also to relate things to which the holder has the 'Chose' right, being wrongfully held by the other party, such that actions may be appropriate for recovery of those things. These notions clearly map to broader natural language uses of the word 'claim' but do not contribute to further understanding or use of the REA 'Claim' concept.

Conclusions: Equity is a 'claim' (in a natural language sense) only in the event of the issuing entity being wound up. If the issuing entity is wound up, then it is no longer a party to the claim being made by the equity holder as claimant. During 'normal' times, the equity does not represent a claim on the company. In terms of the 'chose' concepts in [3], equity appears to represent neither of those. What it seems to represent is simply the rights of ownership of the entity.

3.9. Equity Dividends

Ordinary share dividends do not represent a commitment up front in the Equity contract, so there is no kind of claim defined in relation to a commitment on this. Preference share dividends do represent a commitment up front. They in no way represent debt, even though like debt coupons they represent a firm commitment. Further, we believe that the seemingly firm commitment to pay dividends on Preference or Preferred Shares can only be met in the condition that there is a suitable class of funds from which to pay these dividends. So the commitment is in effect conditional on the availability of those funds. We defined 'Conditional Commitment' for this and comparable kinds of commitment.

Shares also generally have voting rights. These are described in the agreement for the equity instruments. Different classes of shares may have whatever terms the issuer chooses for them, so different classes of shares and preference or preferred shares may vary in terms of how the dividends and voting rights and other potential rights are set up. These may include multiple votes per share or no votes per share. Where such rights are set up in the contract, these are (by definition of 'Right') a perspective on a Commitment made in that share agreement, with the corresponding Obligation being the perspective on that Commitment as seen by the Issuer. Voting Rights are not measurable in monetary terms and therefore not expressible as any kind of imbalance between Commitments.

For Ordinary Share dividends, although there is not a commitment up front in the contract to pay these dividends, there is a commitment made at a point in time, when the dividend is declared. At that point, there is a firm commitment to all shareholders that they will receive their apportionment of the dividends. This means that there is a Commitment, and therefore a Right and an Obligation (as perspectives on that), but that these Commitments are instantiated only at the moment that the dividends are declared. There is a Conditional Commitment in the original contract: that if and when there is a dividend declaration, the holders of the shares are entitled to receive their apportioned amounts of that dividend.

4. Conclusions

Three concepts were identified to which the word 'claim' could be associated in natural usage (among others), but these did not correspond to the REA meaning of Claim. These were:

1. A perspective on some Commitment
2. An imbalance between Commitments in an Agreement
3. A perspective on an imbalance between Commitments

We concluded that (1) was too semantically distant from the normal word sense of 'claim' to be useful.

In (2) we consider the notion of Claim as something seen in the round, separately from how this is seen from the perspective of one or other party to a transaction or agreement. This 'claim' concept is the imbalance between the two related commitments in a transaction and is coextensive with Debt.

Concept (3) is a net right accruing to the beneficiary of some imbalance at a given point in time and as such is a perspective on concept (2). Where the commitment is a commitment to transfer monies at some point in the future, the claim or imbalance may be accounted for, from the perspective of any one party to the transaction, as the difference between the asset position on one of the commitments and the liability position on the other commitment.

The REA concept of Claim is closest to (3) but is framed in terms of the difference between the promised Actions specified in a Commitment, whereas the concepts we unpacked in this work were imbalances between Commitments themselves; a fine distinction, since a Commitment is defined explicitly in terms of to what action it commits the obligor.

The treatment explored here should be fully generalizable. We extended the REA concept of Commitment beyond transactions (having measurable and realizable Commitments), to any kind of Agreement, being exchanges of bundles of any kind of Commitment, including Conditional Commitments. This was demonstrated with reference to Equity contractual terms such as voting rights.

In terms of being able to build a treatment of Debt and Equity around REA concepts or their extensions, we were able to do this. Natural language meanings of Claim were compellingly useful in describing many aspects of Equity but these were clearly not the same concept as REA Claim, and were separate from the commitment-related concepts exploited in this and earlier work. Conversely, Debt did correspond to a notion of claim as an imbalance in commitments, but as seen in the round not from a party's perspective, and did not map directly to REA Claim. Other meanings of claim were beyond the scope and not explored, for example insurance claims, claims on rights (claiming one's birthright; land; mining claims; a prize).

In order to flesh this treatment out fully, we need to retain this word / meaning distinction and consider imbalances between commitments that are not currently due and claimable, including interest payment commitments, conditional ordinary share dividend commitments and so on. In the case of temporally sensitive commitments such as the one that comes into force after a dividend has been declared, the claim or imbalance will change upwards as well as downwards over time as different commitments start to exist (the dividend declaration) or come into force in the case of conditional commitments. Whether or how the REA notion of Claim as an imbalance between (committed-to) 'Events' can be applied to this remains a separate but open question.

5. References

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