

# Expressing Contracts and Equity using REA Semantics

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## Abstract:

This paper looks at how to represent equity using REA semantics: equity representing ownership, which is made up of a number of rights. To support this, we apply REA terms beyond transactions to contracts more generally. Using this extended treatment we look at how rights may be represented as an aspect of an REA Commitment, including general public rights, using the REA concepts to describe social contracts as a class of contract. Some edge cases are considered in which there appears to be something else going on with ownership, and these are disposed of within the same framework. Using the treatments outlined here, it is hoped that these concepts are able to be applied to the more specialized question of equity financial instruments.

This is intended as a discussion paper and the language reflects this, however it is longer than would be expected since some prior work is described in some detail to support these discussions.

## Introduction

One ambition in the work on the REA ontology has been to identify the disposition of equity in terms of REA constructs. Early explorations of this are given in [1] and [2].

In order to adequately deal with equity we need to define ontologically what is the nature of ownership, since equity represents (or is) a kind of ownership.

Prior work within the EDM Council FIBO ecosystem [3] has been continued under the informal community known as the Semantic Shed [4] and as far as the disposition of REA terms is concerned has been two-fold:

- Making use of the ‘aspects’ of Commitment to frame concepts that are necessarily party-specific
- Extending the REA framework itself from economic transactions to contracts and agreements as a whole

In this paper we first look at equity and equity instruments, drawing a distinction between rights or obligations conferred by the equity instrument itself versus the broader set of rights that make up or contribute towards ownership. This takes us into the area of social contracts, where it is shown that these also may be framed in terms of REA primitive concepts once these have been extended to cover all contract types.

The aim of this paper is to seed further discussions on how this whole set of concepts comes together to make up a complete, REA-based account of equity both in general and as understood in the context of equity financial instruments (shares).

## Equity Instruments

Equity financial instruments include shares, fund equity units, equity in limited partnerships and so on. These confer upon the holder a part in the ownership of some concern. In addition, as typified by shares, these may confer voting rights or other rights upon the holder.

Many of the rights conferred on the holder of an equity instrument are distinct from those rights that fall under the general heading of ‘ownership’. These rights can be many and varied and are defined in some contractual instrument, typically the Share Agreement. They are intended to accompany and complement the basic rights understood as being a part ownership of the entity. As such, these contractually defined voting rights and other rights may be removed from the equation in which we consider what is ‘equity’ itself.

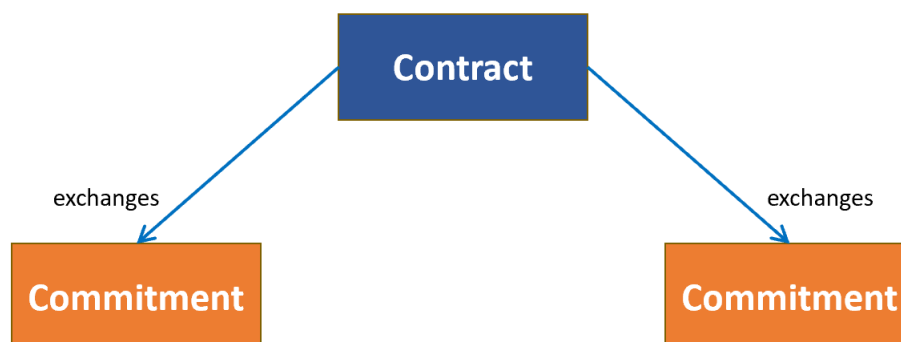
## Prior Work

Two pieces of prior work are brought together in this exploration: an extension of REA concepts to cover contracts as a whole rather than just those that relate to an economic transaction; and the notion of REA Commitment being describable as ‘sides’ or aspects from the perspective from one or another party, giving a formal basis for the notions of rights and obligations.

## Extending REA to All Contracts

The terms given in the REA ontology provide the building blocks for an economic transaction, that is, a transaction between two or more parties in which some bundle of commitments is exchanged by each party to the other, and these commitments relate to some economic resource, such as goods or money.

Under the REA ontology any transaction can be considered as an exchange of two or more sets of Commitments, with a Contract reflecting the terms of that exchange (Figure 1).



**Figure 1: The REA Ontology: Contracts and Commitments**

In the Semantic Shed the group took the opportunity to revisit the FIBO model and opted to extend REA primitive concepts to cover any kind of agreement, including any kind of contract. See [5].

Among the kinds of term that may exist in contracts, there are those that describe things that are not measurable in economic terms, i.e. that may not be valued in terms of their exchange for some other economic resource, such as cash or goods given as payment in kind. While it may be argued that a contract in general must involve some ‘consideration’, not everything in that contract – not every Commitment – need be capable of being defined in economic terms.

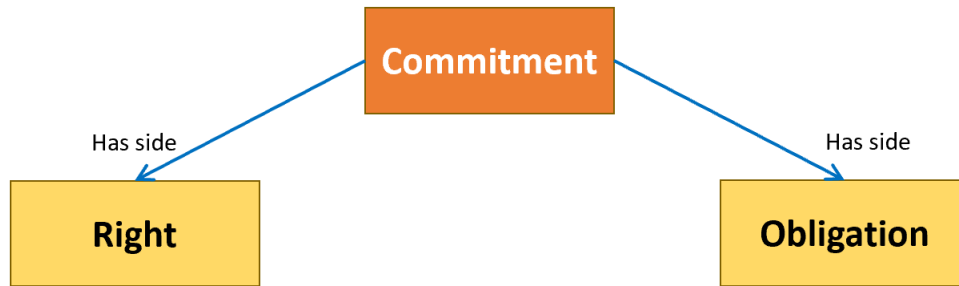
The basic ontology of the REA concepts remains unchanged: There is an exchange of ‘Commitments’ between parties, these commitments being defined in some Agreement.

The implication of this approach was that if a ‘Commitment’ can be any kind of commitment, then it need not always be the kind that can be measured in monetary or other value-exchange terms. For example I may make a commitment not to whistle in the hallways of a certain place, as part of an agreement relating to that place. The resulting ontology defines Commitment at the highest level, with a kind of ‘economic’ commitment as a specialization of that. The REA Claim, being an imbalance in Commitments at some point in time, requires that these commitments may be compared in some unitized e.g. monetary terms; this is a specialization of the more general Commitment concept.

All Contracts may be considered as being ‘Economic’ contracts, assuming they involve some ‘consideration’. However, not all Commitments need be measurable economic commitments.

### Aspects

An ontological trick developed in the earlier EDM Council FIBO ‘conceptual’ work (since continued in the Semantic Shed), was to frame the notion of an ‘aspect’ or ‘side’ of any kind of thing using the Top Level Ontology (TLO) notion of ‘Relative Thing’ to frame an aspect or side as being what some thing looks like (is defined as) from the specific perspective of one party. Figure 2 shows this trick.



**Figure 2: Aspects of a Commitment**

In this case, the ‘aspects’ of some Commitment are seen from the perspectives of one or other party: the obligor and the beneficiary. The two sides of a Commitment as seen from these parties’ perspective we call a Right and an Obligation. These Rights and Obligations, as seen from the perspective of some party, can then be reflected in books of accounts as assets and liabilities respectively, provided these can be expressed in monetary terms, as in transactions for goods or services.

## Applying These Techniques

### Ownership

We define equity in terms of ownership. The holder of some instrument that confers equity in something upon them, is the joint holder, with other such parties, of those rights that make up ownership.

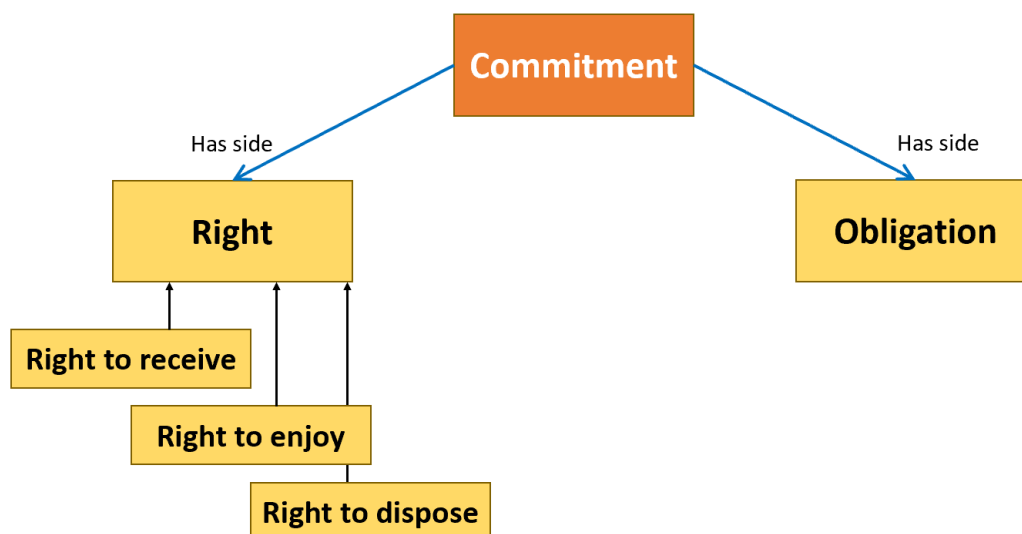
For this initial exploration we take the view that ownership is defined in terms of some kinds of rights, and that as a minimum these include such as the right to hold a thing, the right to dispose of it as one sees fit and the right to control a thing.

### The Social Contract

Contractual exchanges have two dualities:

1. The duality of Commitments: one Commitment is exchanged in consideration for another;
2. The dual viewpoints of each Commitment, as an Obligation to one party and as a Right to the other

In terms of Rights, we speak of certain inalienable rights, such as the right to free expression, the right to life and so on as though these are singular things in their own right. However, even these universally enjoyed rights may be framed as one aspect of something in the nature of a Commitment.



**Figure 3: What it Means to Own Something**

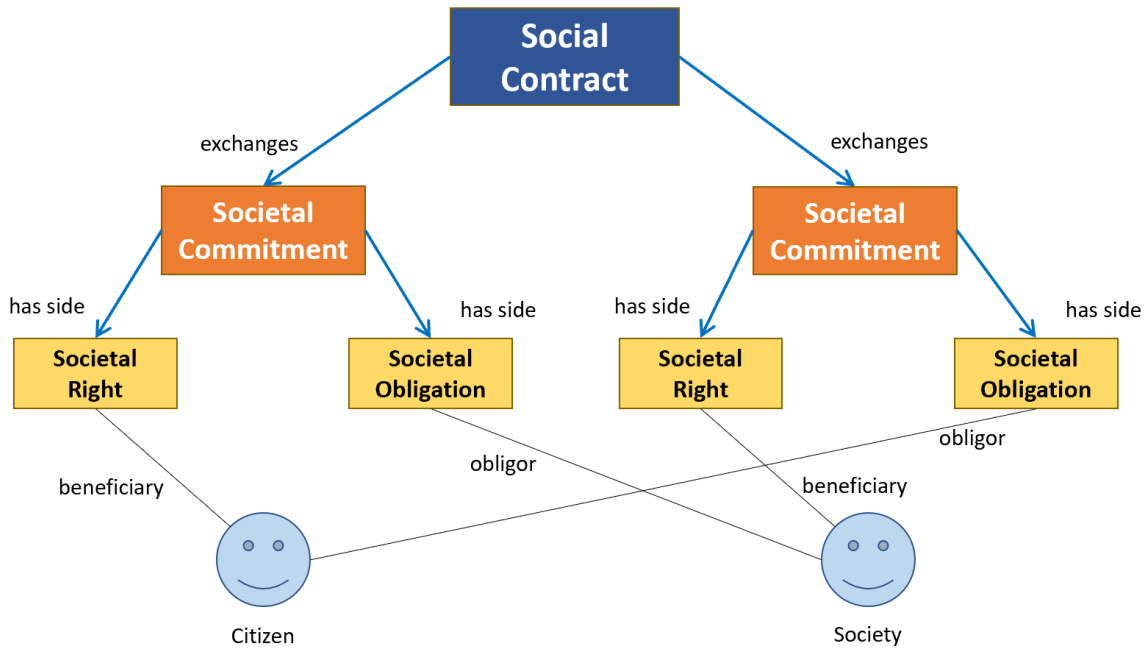
Consider for example what it means to own something (Figure 3). Ownership consists of a number of rights; for example the right to hold something, the right to dispose of that something as the owner sees fit, the right to benefit from that something in various ways, and so on. There is more detail to be found in formal literature on the subject, which was not explored for this work to date.

There are Commitments, of which each of these rights is an aspect. For the corresponding Obligation, the counterparty to the owner is society as a whole. If you live in a society where the concept of ownership exists, then society, in conferring upon you the right to enjoy a thing that you own, participates in (is a party to) that Commitment by virtue of committing not to interfere in your enjoyment of that thing.

There are societies in which this concept of ownership may not exist, or may be framed in different terms [6]. It is a given society or culture that recognizes the concept of ownership and the specific rights involved. Where ownership is supported in a society, it is that society which enables the existence of the societal commitment under which the Owner gets to benefit from the thing and the rest of society, as obligor to that same commitment, is obliged to recognize those rights.

The ‘Contract’? in these cases is the ‘Social Contract’. We will ignore for simplicity the question of whether the Social Contract is based in society at large, in government or in the legal system.

As a contract, The Social Contract is something in which two sets of Commitments are exchanged. In one set are things like the Ownership ‘Commitment’, along with those Commitments of which the rights we enjoy are the rights to life, to free assembly, to free expression and so on. Figure 4 shows the overall picture.



**Figure 4: The Social Contract**

If the Social Contract is a Contract, what is the other Commitment given in exchange? This is our own commitment to society: the commitments not to steal, not to prevent the exercise of free speech and so on. On that side of the Social Contract are those Commitments of which the individual is the Obligor: obliged to do or refrain from doing those things that impact on the rights of others in society, and thereby of society as a whole.

As an example, society and the government it appoints has an obligation to maintain the peace. In the early days in the UK this was called 'The King's Peace'. The use of such a name suggests this was conceptualized as a thing in itself, i.e. as the commitment rather than some aspect. Government has an obligation to maintain the Peace and individuals have the right to enjoy it. On the other side of the social contract, one of the commitments we have entered into represents (to us) our obligation not to disturb the Peace.

## Conclusions

The model given here identifies a double duality of rights: rights are both an aspect of a Commitment (often unnamed), and that Commitment is itself only one side of a contract, the social contract, in which there is another such Commitment given in exchange by the citizen.

The Social Contract defines any kind of publicly enjoyed rights, including those that follow from ownership of a thing. When I sell you a thing, I transfer to you any ownership rights that I might have over that thing.

Some apparent edge cases occur when I sell you something but with certain limitations, for example in an IP transaction I may confer upon you the right to play a piece of music only to groups of 5 people or fewer, or to only install a given program on a fixed number of computers. A simple resolution to this apparent edge case is that if, when I sell you something, I still get to say what you can do with it, then it should be clear that you do not own it. Only if I retain 'ownership' in the sense defined under the social contract, can I impose upon you any limitation to what you can do with the

thing I have ‘sold’ to you. In fact I have sold certain specific rights, defined in the contract between me and you – and none of the rights defined in the contract between society and you.

If ownership is defined only in terms of certain unfettered rights, then these rights are conferred by the social contract.

### Winding Up

If and when a business is wound up, all of this changes and the shareholders have some kind of ‘claim’ in the sense understood under REA, and will take their place alongside other creditors as defined in the applicable law. This is separate to what is covered in this paper, and provides a basis for considering equity in relation to REA Claims (imbalances in Commitments), in a current or possible future winding up event.

Similarly, the notion of ‘Claim’ as defined in REA represents some imbalance between Commitments, and therefore applies at a point in time during the life of that Commitment. These considerations should be unaffected by the ideas explored in this paper for the framing of equity itself, as ownership.

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