

Using loans and power of contract to gain control of a population
(Applications in CO2 emission rights trading)

Using loans and power of contract to gain control of a population: Applications in CO2 emission rights trading schemes

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ABSTRACT

In this paper I present a situation in which an economic actor called a Banker could gain complete control over a population of other economic actors (be able to dictate their transactions), exploiting a certain scenario. This scenario is erringly similar to modern money mechanics: In the society modeled, there is a definite *power of contract* (no party ever breaks a contract of a certain kind) and every actors requires that a transaction of a certain kind happens (e.g. he purchases a minimal amount of food) at each time period for him not to *die*. I describe the situations in which the Banker will certainly gain complete control over the entire population in a finite amount of time. Complete control in this context means that all other economic actors will behave strictly as he dictates from that moment onwards, with no deviations at all, assuming what the Banker dictates is feasible (e.g. compliant with the physical laws of the world where the economic actors exist).

Introduction

Players

Let's assume our society is made of a finite set of n "regular" players (economic actors): p_1, p_2, \dots, p_n and a Banker. So the set of players is $\{p_1, \dots, p_n, \text{Banker}\}$.

Time

Let's assume the economic game happens in "turns" (or time periods) – they could be days, months or years for e.g.: First at $t = 0$, then $t = 1$, then $t = 2$ and so on.

Resources

Now say that each player in the set has at each moment some non-negative finite quantity available to him of each of a certain kinds of resources (e.g. food, cars, laptops, gold, etc.). We call this amount a *balance* of that kind of resource.

Some resources could be "harvested" by a player or a group of players at a certain moment in the game (e.g. some fruits are picked from a tree, some gold is mined from the ground). Such a harvesting operation then increases the amount of that kind of resources available to all players by a value (which may depend on the player). We call such an operation a *harvesting*.

Each player could choose to spontaneously *consume* some amount of a kind of resource is available to him. In that situation, his *balance* in that kind of resource decreases by the amount consumed (it never goes below zero).

Trades

Players can make some *transactions* or *trades* between each other. Each trade involves at least two players, p and q and it might generally consist of generally anything imaginable. Each trade happens at a certain moment t in time.

A trade could involve some exchange of goods, in which some amount of a resource is transferred from one player to the other (from p to q for example). We call such a trade an *exchange*. An exchange could involve both (or some) players transferring something to some other party, or just

one of them. It could also involve more than one kind of resource. An exchange does not necessarily have to be limited to a transfer of resources. It could involve anything else on the side, like providing services, behaving in a certain way in the future, divulging some information, or anything imaginable. The effect of the trade is the usual notation that the one who gives remains with a smaller balance of what he gives by the amount he gives, and the one who receives increases his balance by the amount he receives.

By this language, *harvesting* and *consumption* could be viewed as a just exchanges of a certain kind.

Another particular form of trade is called a *contract*. In a contract, the players (e.g. p and q) *agree* to behave at all future moments in manner that is compatible with that stipulated in the contract and never “break it”. They could impose obligations on themselves only for a limited amount of time (for example for 12 time periods), in which case after that time elapses, whatever they do will not be in breach of said contract. But, in a general sense, the contract is obligatory to the parties at all future moments in time.

Note that a trade can consist of multiple contracts and multiple exchanges simultaneously.

Special resources

There exists two kind of special resources we will, by convention, name *Food* and *Gold*.

Furthermore, there can exist any number of *virtual* resources, that can be harvested by one any one of the players alone in any quantity (e.g. “pieces of paper with his autograph”).

Axioms

In this paper, I discuss only the particular kind of situation when the following Axioms are verified. These Axioms are sufficiently general and are at least “approximately” true for most real-life economic situations, in present-day (2015) economies on Earth.

Axiom 1: No forced trades with the Banker

Every player that is part of a trade involving the Banker *must* agree to take part in that trade. No trade involving the Banker to which some of the players involved did not agree ever takes place. This axiom is also understood to imply that the Banker cannot physically hurt or otherwise take some other course of action with regard to a player which can, in a wider sense, result in the player being considered *forced* (but not merely coerced) to engage in a particular trade (involving the Banker or just some of the other players).

Essentially, Axiom 1 implies that the Banker cannot **personally** force a player to behave in a manner that such player does not *agree* to (or is a necessary result of some prior *contracts* with the Banker the player undertook voluntarily in the past).

For technical reasons, we permit that it is possible the Banker loses some resources due to some involuntary consumption exchange (e.g. accidental destruction or perishable supplies going bad) – thus, he is able to enter this particular kind of involuntary trade with himself (which is not governed by Axiom 4 either).

Discussion:

In the sense of this axiom, a player that agrees to take part in trade because he wants to avoid getting illegally murdered by some other party, did still agree. It doesn't matter why he agreed for this assertion to hold. Also note that the Banker himself must agree to a transaction involving him (which is not necessarily true for the other players in some other transactions not involving the Banker). This Axiom could be strengthened to require that no forced trades generally take place (weather they involve the Banker or not). But such an extension would imply the Axiom, and this article shows that the Banker eventually takes over even in this restricted case, where he is the only one that cannot force or be forced by other players to take part in a trade.

Axiom 2: Feasibility of trades with the Banker

All trades involving the Banker which are agreed to by all participating players are feasible.

Discussion:

This basically means that the players have the power to make any kind of voluntary trade which involves the Banker. In particular, this means they have the power to make any *contract* with him that all parties (including the Banker) agree to.

Axiom 3: No sudden gain or loss

The only way the balance of a player in a certain kind of resource changes is by the effect of some exchange.

Furthermore, a player which does not *agree* to an exchange cannot have his balance in any resource *increased* (only decreased perhaps). So he cannot be forced to increase his balance in some resource “against his will”.

Discussion:

Note that *harvesting* and *consumption* are considered exchanges. The Axiom basically implies that resources don’t “suddenly” appear or disappear.

While in real life a player may occasionally “loose” some goods due to accidents, thefts, or the like, it still holds that his balance in a certain kind of goods never increases without his consent (even if he found a bag full of gold suddenly in his room, if he does not *accept* it, his balance in gold did not increase). Thefts and other involuntary means by which a player is deprived of some amount of resource could be modeled as forced exchanges. The previous Axiom 1 implies only that the Banker is safe from such effects (and the players from such actions of the Banker). Sudden loss due to accidents or other impersonal effects could be modeled as *consumption*.

Axiom 4: Power of contract

If at any moment t a player could act to respect or not a *contract* involving the Banker (e.g. it is not physically impossible), that resulted from a transaction in which he took part voluntarily, he always respects it.

Note that this Axiom implies the Banker also honors all agreements. This is a deliberate limitation, to show that even in this situation the Banker still takes over. The result in the article holds even if the contracts with the Banker are mandatory only for the other players.

Discussion:

This axioms states that once a player got involved in a contract by agreeing to it, he always respects it, if he can. That is, if he always behaves in a manner compatible with the content of the contract, if such a behavior is available to him. So not only he does not break it (when he has a way of respecting it) because he might fear some much worse effects. It simply does not happen that a contract is breached in those case. This Axiom states that an agreed-to contract becomes like “a law of physics” for that society.

In present-day society, there is no power of contract. However, it is closely approximated for some kinds of contracts: in some places, if a court of law orders a particular kind of action, it is enforced by certain people (e.g. police), regardless of the choice of the people involved. Of course, in real life, sometime police may not be willing or able to enforce a certain order, but it is generally the case. Furthermore, in real-life, some forms of coercion (e.g. threat of death or extreme violence) could make this assertion be valid in most situations where these could be credibly applied.

Note that this Axiom could be extended to involve or contracts of certain kinds between players, however this is not necessarily. I show that even with the limited assumption made in this Axiom, the Banker still takes over.

Axiom 5: Mandatory consumption

All the players in the game (potentially excluding the banker) *must* consume at least some minimal amount F from the resource “Food” at the *end* of each time period t in the game. If they cannot consume F , then they, by definition, *die* in time period t .

Discussion:

This assumption is more powerful than assuming a contract with the Banker is done to this effect by all the players. They must always consume at least some amount F of food in each time period – this means their *balance* of food at the end of a time period is no less than F . If does not holds, they such a player *dies*.

In real-life situation the resource Food could be modeled to mean actual foods stuff, or something else (like air for example).

Note: In a real-life situation the term *to die* could be modeled to mean anything compatible with all these Axioms, not necessarily physical death.

Axiom 6: Effect of “death”

By convention, we consider that when a player *dies*, that he is controlled by the Banker at all future moments, as if he had agreed to a contract to that effect.

Any player that has never died up until time period t , but did exist at some prior period before t , is still part of the Game at moment t . So there is no “way” to escape the game except by death (which does not necessarily equate to physical death).

However, by the prior statement, even this situation grants the Banker complete control (although in some practical situation the “dead” player may not have any actions that he could take – so complete control over him might not be that interesting).

In a modeling of a real-world situation involving a human Banker and a human player, this Axiom might not necessarily hold – as the saying goes “until death do us apart”. So we could model it by altering Axiom 1 to limit its scope to just players who have never died.

Discussion:

A *dead* player may or may not continue to be part of the game and take some future actions, depending on what why model *death* in this economic game to mean in the corresponding real life-situation. However, this assertion implies that no player could escape the eventual control by the Banker by dying at some point in the game. It is still possible that players may *choose* to die – for example to protect some loved ones in the game -. However, no player could ever be able to avoid complete control by the Banker, if he ever died.

Nota bene: If death, in the practical situation modeled by the Game, implies that the player p who has just “*died*” is no longer able to exert any *voluntary* control over his actions or over the surrounding reality, then complete control of the him by the Banker has no practical effect. It is the same if player P is or is not under the complete control of the Banker (as resulting from Axioms 4, 6 and 7), as he no longer “could act” in any fashion. Note however, that such a “having died” situation is not necessarily a “switching of masters” for player P . Assume that after “having died”, P comes under the control of a benevolent **God** who reads the players thoughts and makes him “do” whatever he would have *wanted* (in some philosophical, intuitive sense) to do, had he not been in a contract with the Banker. So Axiom 1 would still be respected even after the death of player P – and even if P could be very much alive in the classical sense –. **Note bene bene:** Imagine the situation where player P priory engaged in a contract with the (now benevolent) Banker to the following effect. We call this contract **The Free Will Contract (TFWC)**. It’s clauses are:

- **Clause 1:** “*We, Player P and the Banker, undertake that from this time forwards (even in the past if some player ever travels to the past ☺), P and all players in the Game (including the Banker), at any and all times will take **precisely** such a course of action as P (or that particular other player) would have seen fit, by his (their) own free will, had Axiom 4 not applied with regard to **any** contracts (regardless of when they were entered into) at or after that moment (no matter who would be part of them) except those who are also **TFWC** contracts (have the same content as this one).*”

It is important to “free” all other players (by forcing them to act of their own free will) in this fashion as if, had they not been freed, they may themselves be *forced* (by Axiom 4) to *force* P to act as if no TFWC had been agreed to (or otherwise to potentially be forced to do nasty things to P – like kill him).

Furthermore, we limit the “absolution from forced choices under Axiom 4”, only for the decision moment and future moments, to make sure that P (or whomever) acts as if there was no “mandatory enforcement by Nature” only from that point on. This way, all decisions and actions the players have taken up until that moment of decision (weather forced or not) would still be considered to have taken in the same manner. If we didn’t impose this limitation, P could be forced to act as if the past was different that it actually was (even though P knew it) – because some things that “already happened” may have been impacted by *forced choices* or otherwise as a result of the application of Axiom 4 with no TFWCs.

- **Clause 2:** “*Furthermore, we the Banker and Player P , undertake that from this time forwards, as many other players as possible (i.e. including P if possible), will be made aware (e.g. remember) any and all contracts to which Axiom 4 applies (weather they are or were part of them or not) that are or ever were (or as large a set of them as possible) – in particular all TFWC contracts.*”

This way, P , and as much of the rest of the world as possible, cannot “forget” that he (P) *and all other players* are **forced** (by the law of nature resulting from Axiom 4), to behave as if no other contracts except TFWCs are ‘mandatory’ (i.e. Axiom 4 applies to them).

This clause is important also to ensure that he does not make any choice (even of his own free will), believing wrongly, that, if he had not taken that particular action, a potential undesirable situation might arise in the future (for example have the Banker dictate all his actions as if he had no free will)

as a result of the fact Axiom 4 applies to some contract (and for e.g., believe that some other player would be *forced* to kill him if he did not cooperate), but not knowing that it's application has no *forcing* effect as a result of the TFWC contract (more formally it forces the player to act as if he was not forced) – so it's basically as if it didn't apply (although Axiom 4 still applies! Only that because of the TFWC also mandatory happens under Axiom 4, whatever happens as a result of the application of the “mandatory” filter – must be *precisely* what the Players would have chosen had there been no mandatory filter).

- **Clause 3:** “*If there is a conflict between a provision of this TFWC contract and any other contract, such that they are not both satisfiable, then the TFWC contract will be satisfied above all competing interests (more or less)*”. Basically this means that Axiom 4 will be applied in such a way that the definition of “*could act or not*” is interpreted in such a way that if had the answer to the question been “yes, he could” that would have resulted in him having to limit his ‘free will’ (as defined here) limited somehow (even in the smallest possible sense), then the answer was for sure “No, in this particular situation, he could not act in any manner consistent with that contract (the non-TFWC one).”
- **Clause 4:** “*No man can decide of his own free will what future actions he will take of his own free will (or in any way impose any sort of limitation on this set of potential actions – even in the smallest most infinitesimal degree). Furthermore, he can not, of his own free will, decide to renounce or limit his free will in any manner at all.*” This basically means that a man cannot *of his own free will* (in the sense used in Clause 1) decide “what is or is not of his own free will” for the future. So basically he cannot – while exercising Clause 1 – decide – of his own free will to somehow make some *default* choices for the future (even the very short near term future) which would then be applied “automatically” at those moments in the future, without him facing another “decision moment”, regardless whether he wants to or not.
In particular, this Clause 4 explicitly makes the decision to enter any *mandatory enforceable* contract (like that to which Axiom 4 applies), by definition, a decision that he cannot make “of his own free will”. It is still possible for him to enter such a contract (agreeing to part-take in a transaction in the Game – like a contract – does not necessarily correlate in any way with the definition of “free will” described in this TFWC.
- **Clause 5:** “*Anyone who has entered a contract to which Axiom 4 applies with just himself (e.g. taken a personal oath) will, from this time forward, act in **precisely** the same fashion he would have acted had he not entered that contract, unless that contract was a TFWC.*” I am not sure why I felt I needed to write this explicitly, as it might perhaps be implied by Clause 1. It seemed somehow important to treat the special case of contracts with oneself separately (like the Banker cannot force himself to act in ignorance of past or future TFWCs contracts)!
- **Clause 6:** “*This contract shall produce effects in meaning above form.*” This basically means that if I (Mircea Digulescu, the author of this article) – forgot to include some important clause in this TFWC (or else how it has some important “bug”) – the effect produced by it would be precisely that which I intended and could be intuitively understood: To make it be from there on as if Axiom 4 (or anyone like it) never existed (although, since it is an Axiom – it is still true no matter what anybody in the Game wants, tries or does – just like a law of physics).

Such a TFWC contract with the above clause will force the Banker that if he ever gets complete control over P as part of a contract (which would still be totally obligatory under Axiom 4, though, as Axiom 4 holds regardless of what trades the players make! It can be considered “a law of physics” in the reality modeled by the Game), he will, in fact, *force* P to act **of his own free will** (as if no contracts could ever be *mandatory* – in the sense of Axiom 4 – then or in the future). This is not the same as if P and the Banker did not enter this TFWC (P might have been under the “influence” of some other ‘mandatory’ Axiom 4 contract, from which he is there on released). This means, that once a TFWC is in effect with regard to the Banker (that the Banker agreed to enter), any player who falls under the complete control of the Banker will actually have more choices of actions available to him (if somehow an Axiom 4 – kind of contract produced somehow effects – direct or indirect – with regard to him, which limited this choice set – or made him unaware of some important truths) or experience no “bad” change in the choice set (if he was acting of his own free will before) [in this second case however, he there on he acts still of his own free will not only because ‘he chooses to act this way’ – but because it has become a law of nature for him to act so]. In the latter case, if, for example, player P had the power to bind his future actions (by his free will – in the broadest sense – he actually actively wanted that from all his heart) in some manner and then somehow make “nature” so that he could not “change his mind” when those actual moments came, then, by falling under the complete control of the Banker (who was himself bound in actions by a TFWC contract), he lost that power. Thus, player P does experience some diminished option set. But only to the effect that he

cannot ever choose to “give up” his free will (even for some very short time) and make nature somehow make that decision a definite reality.

Axiom 7: Complete control of a player

The Banker is said by definition to be in complete control of a player p during some time-period t , if p and the Banker agreed to a *contract* to this exact effect (unconditional control of p by the Banker), at some earlier moment.

Discussion:

By the Axiom 6 above, the Banker is in complete control of all dead players at all time periods after they first died.

Axiom 8: Perpetuity of Banker

The Banker player exists at all time periods.

Discussion:

In real-life, if the Banker were a single person, Axiom 7, would imply that the Banker is immortal. This may seem an unrealistic limitation. But assuming that the Banker player is the modeling of the collective action of some group of people (the bankers), with regard to “the rest of the world” (excluding themselves), the this Axiom can hold. For example membership of the “banker group” could be passed on hereditary (or some arbitrary chosen people could be selected to be included in the “banker group” at some times). This way, single individuals can die without a problem. The only tacit assumption in this latter case is that at any moment the “banker group” take solidary action with regard to the “rest of the world” (they cannot disagree amongst themselves what to do – or have any part of them act else how than the “collective” decision).

Initial state and game restrictions

Let's say the game starts at time period $t = 0$. This article is concerned only with the economic games that start in a state characterized by the contents of this section.

Condition 1: Maximum harvesting capacity

Condition 2: Finite number of initial players

At moment $t = 0$, there are precisely n players except the Banker, with n a natural number.

Discussion:

This condition clearly holds in modeling of real-life games.

Condition 3: Population growth limits

The *maximum* number of new players appearing in the game at precisely some certain moment $t > 0$ is function $new(X)$ of the number of players X existing in the game at moment $t-1$.

In this article I will analyze if there are additional constraints that $new(x)$ must respect for the result claimed to hold (eventual control of the society by the Banker).

Discussion:

Note that $new(x)$ is the *maximum* number of new players. The population could in effect grow more slowly than this.

Condition 4: Birth and childhood

The moment a new player (which did not exist at $t=0$) appears in the game – say at time t_0 – is called his *birth-moment*.

Every player has 0 amount of food in his balance at the moment of his birth.

Immediately after birth, he experiences a period called, by definition *childhood* that always has duration at least $T_{\text{childhood}} > 0$ time periods (from t_0 to $t_0 + T_{\text{childhood}}$ inclusively at least). This value, $T_{\text{childhood}}$ is a parameter of the game. In this article I show what constraints must be placed on it for the result to hold (ultimate takeover of the economy by the Banker).

With regard to some moment t , a player experiencing childhood at that moment is called, by definition, a *child*. A player not experiencing childhood is called, by definition, an *adult*.

Discussion:

This condition basically states that a child is born without any food that he “has” and that all new players in the games experience a duration of childhood, that is no smaller than some constant.

Condition 5: Effects of childhood

Every *harvesting* that includes only players which are experiencing childhood does not create any quantity of food.

Discussion:

So children cannot get their own food – either alone or by colluding with other children. Thus, no child can ever ignore *all* the adults in the game at the moment of his birth and live beyond that moment: he has no other way of getting F food before the end of that time-period.

Discussion

So the game begins at the start of time period $t = 0$, with some players and the Banker. Every player present at this moment in the game is an adult. So, every player $p[i]$ has some initial stock of food – $f_initial[i]$. Since by Condition 2 there is a finite number of starting players, then there exists some maximal value F_0 such that $f_initial[i] < F_0$.

Note that a potential “death” of the Banker in the Game [in terms of running out of food] only means he gets controlled by himself, which is valid anyway (by some tacit assumption). By Axiom 8, as a player, the Banker is perpetual. Thus, if in the “real world” he needs to do certain things to survive, we must have the following necessary condition, for the result presented in this article to hold:

Necessary condition 1

The Banker can always act in the manner described by the ensuing sections of this article without violating any of the Axioms 1-7 or Conditions 1-5.

Claim

In this article I examined the condition that must be respected for the Banker to get eventual complete control over some entire actual society (all other players), given that said society operates an economy that can be modeled by a Game respecting Axioms 1-7 and Conditions 1-5. These axioms and conditions generally hold for most real-life economies in present day (2015) societies on Earth.

I proved the following result:

Phase 1 – The Barter epoch

So the (potentially real world) economic life modeled by the game, starts at $t=0$, in the initial conditions described in the corresponding section above.

For some number of time periods, players happily trade amongst themselves (potentially even with the Banker). We don't really care what the content of the trades are at this point. They may trade food or other resources amongst themselves if they like, or not – it is irrelevant.

However, by Axiom 5, every player still consumes at least F at the end of each time period, or forever comes under the complete control of the Banker.

1. Discovery of Gold

Now, in this epoch, the Banker will carefully search for a kind of resource that fits certain criteria that he looks for. If he finds it, then that resource is, by convention (by definition), the resource Gold (so we use the name Gold to refer to the resource the Banker found during this Epoch and successfully used as Gold).

Note in particular that during this epoch, the resource Gold may be of no value to any of the regular players. They might not be able to eat it, and it may be that they really don't have any use for it. The real-life resource sand can serve as a good real-life example of such a Gold resource, with regard to a period in Humanity's past before it started being used for construction work. In present day society the resource Gold could perhaps be some particular kind of stuff nobody currently needs or wants (e.g. some particular stuff we consider useless garbage and if it gets in our homes at some point, it generally ends up in a landfill shortly after).

Let the moment the Banker identifies this Gold resource be called **T1** ("**The discovery of Gold**").

After he identifies gold, the Banker computes a value **T4** which is called "**the end of the gold age**". I will show how the banker can compute this value based on the actual properties of the particular resource he identified as Gold and the state of the game.

Necessary condition 2: Properties of Gold

The Gold resource that Banker found in this epoch, fulfills, by definition, the following properties:

1. There exists such a future moment **T2** (called "**the moment of introduction of Gold**"), so that between **T2** and **T4** ("the end of the gold age"), the rest of the world (all players except the banker), harvests no more gold than some fixed value **H**. Note that the Banker has to take into account the potential effect of births – new players appearing into the game – as the condition above must be respected with regard to all players which may be in the game between **T2** and **T4**, not just those who were also in the game at **T1**.
2. Let **GP** denote the total amount of Gold in all the regular players' balances at moment **T2** and **GB** the amount of gold in the Banker's balance.
3. For every moment t between **T2** and **T4**, the Banker has at least 100 units of Gold in balance for every player that exists at moment t , which does not already have an outstanding *loan contract* with him. For example if he has at moment **T2** $GB=100 \cdot$ total number of players who ever exist at some moment between **T2** and **T4**, then the condition is met.

Nota bene: The above conditions are sufficient for proper identification of Gold, but not strictly necessary. The Banker might get to **T4** in some other cases too. However, the above are sufficient to make sure the Game gets to **T4**.

If no such resource exists during this Epoch, then we say that the Necessary condition 2 is not met, because the Barter Epoch admits no Gold. However, note that the Banker could potentially "keep looking" for Gold indefinitely. Furthermore, he may not necessarily have to figure out what the moment **T2** is in advance (and thus think of a strategy from **T1** up until **T2**). For a candidate resource Gold, he could just "try it out" for a while (until he believes that the **T2** for that candidate Gold must have arrived), and check at each moment if the conditions for that particular moment being a **T2** are met. When they are, the Banker considers that resource a candidate Gold. Thus, **T1** might be equal to **T2**.

Furthermore, *very importantly*, the Banker could even try out the entire remainder of this strategy for any candidate gold resource. If eventually the strategy fails (he does not reach a valid **T4**), then we just say he had discovered *fool's Gold*. Thus, the Game was still in the Barter Epoch, before **T1** (since the Banker had not actually discovered the Gold resource that met the conditions above – he only thought he did). But the Banker can then resume his search for Gold. So the Banker is actually able to try any number of Gold candidates and see if they were the *real* Gold, if he managed to get to a moment which can be described as **T4** ("**The end of the Gold age**") – which I will characterize later in this paper -. Since as we shall see, the Banker can know at any time if the then-current moment is a valid **T4**, when he moves beyond it, he is sure he had used real Gold. Furthermore, by convention we name Gold the resource that the Banker actually used to get to **T4** (thus, not any of the prior "fools' gold").

However note the Banker might plan in advance getting to the situation at **T4**, not just "wait until it happens" (so he might use a Gold resource that at the **T1** moment he holds zero balance of for example).

Real life example:

Let's examine how the Banker might correctly identify a Gold resource with regard to some realistic economic situation. How can he *know* that condition 2 will hold? One clear example is if all the regular players in the game are constrained to harvest gold from some planet (say Earth) that has a fixed amount of gold. If he already has or can harvest enough gold to have at least 100 units (arbitrary chosen) to lend every player who agrees to it, between moments **T2** and **T4**, he has found Gold. Even if the Banker doesn't know for sure when the moment **T4** will come precisely, as long as the conditions for Gold are met (he has found true Gold, not fool's Gold), then it is guaranteed it will come in some finite amount of time, as long as he always has enough Gold to offer as loan to anybody he (the Banker wants).

2. Limitation of harvesting of Gold

From the moment **T1** ("the discovery of Gold") the Banker pursues the strategy described here. Note that he might also pursue this strategy over and over, for every potential Gold candidate he tries out (which end up proving to have been fool's gold), but, **by definition**, by **T1** we refer to the moment of discovery of actual Gold (if such a moment exists).

So once the Banker has discovered Gold, he needs to make sure he gets to **T2** such that Gold has the Properties of Gold, specified in the Necessary Condition 2.

Imposing Harvesting Limitations

The banker needs to undertake this phase only if there could potentially be too much gold *harvesting* during a time period (not just too much gold in the world). So for example if the regular players are confined to harvesting Gold which occurs in finite quantity on their Planet, the Banker could skip this phase.

How might the Banker ensure that there isn't much Gold production at some given time period between **T2** and **T4**? In fact he doesn't even care if there's too much production at any given time period between **T2** and **T4** – just that the TOTAL amount of gold harvested between **T2** and **T4** never exceed a fixed value **H**.

Well, Gold can generally be a useless resource during the Barter Epoch (just like dust say). As such, the regular players might not be interested to have control over Gold Mines – i.e. maintain the possibility that they can harvest Gold in sufficient quantity at future times. They may even be annoyed that there is too much Gold around them (consider it dangerous garbage for example) and want it removed anyway. As such, they might very well agree to engage in the following **Gold Production Limitation Contract (GPLC) contract** (Contract GPLC) with the Banker:

- "I hereby undertake not to agree (part-take) in any *harvesting* of Gold at any moment t which would result in the total amount of Gold having been harvested during that time-period - by harvesting operations which did not include the Banker - exceeding a fixed value **LG**."
Note: This is a sufficient form of the GPLC, but not strictly necessary. The Banker will have certain strategies if instead of a fixed value LG, he uses some adequate function of the amount of Gold available in the Game (for example that less Gold is produced in the current time period than the maximum amount of Gold that was produced in some prior time period after some moment T_p): This can be sufficient to ensure condition 1 of the Properties of Gold is met, if all the players agree to such a contract. He could even agree to a production of Gold that *increases* from time period to time period, but the maximal increase is bounded by above some constant. Also, the constant LG could differ from player to player – so long as it has a maximal value, it will be sufficient. We call any such contract which, if agreed to by all regular players in the game generates condition 1 of Gold, a GPLC contract.

So what does the player promise [And by Axiom 4 thus forever commits himself to having done]? Basically he says that we will not harvest Gold either himself, or help other people harvest gold (by agreeing to part-take in a harvesting), if too much Gold has already been produced *during that time*

period (so not that there's just too much Gold in the world in general). Furthermore, if for some reasons he wanted to harvest more Gold than the *gold-emission limit* LG – it is still possible, but only if the Banker agrees to it. This can very easily be presented as “if all the players in the game agree”. Would this contract look dangerous to a player? Not really. He may not need or use Gold himself (he may actually hate being around Gold) and no other player in the game would have any use for Gold at that moment.

Here's another example of the GPLC contract main clause:

- “I hereby undertake not to agree (part-take) in any *harvesting* of Gold at any moment t between **T2** and **T4** which would result in the total amount of Gold having been harvested during all the time periods starting at **T2** up until the t time-period inclusively - by harvesting operations which did not include the Banker - exceeding a fixed value **LG**.”
Note: The banker does not need to specify **T2** and **T4** precisely. He may refer to **T2** by linking it to some future event (e.g. “the moment a GPLC is signed by all players of a certain kind”) and to **T4** similarly (e.g. by the number of time-periods “from the coming into force of the contract”).

Also, the Banker could try some values for **T2** and **T4** and, if his strategy didn't work that time, try again (with the same Gold or another) until he gets them right.

However, what if the regular player fears that maybe in the future (since the Contract is binding forever) – or during the time it will be in effect – some useful usages of Gold might be discovered and he might then want to be able to help harvest more Gold?

The GPLC contract could even be amended with this **GPLC informed decision clause**:

- “The GPLC contract is valid only if Gold will not have any intrinsic value to some player in the Game during the time it is in force.”

By “intrinsic” value, in this context I mean the usual economic understanding of the term: Intuitively that no useful usages exist for it. More formally it could mean that if was not employed in relation to a contract or a trade, it would be as if it didn't exist, in economic terms.

Note: Of course, for such a clause to be offered, the chosen Gold must actually not get some intrinsic value between **T2** and **T4**. The definition of the term intrinsic is also of notable relevance. For example a player may create some intrinsic value to any piece of garbage (e.g. Gold), by making it a decorative item.

Now, what if the player is afraid that harvesting Gold (as a byproduct) would be the preferred way of getting some other useful resource at some moment between **T2** and **T4**? The informed decision clause could then be updated to exclude validity of the contract under this eventuality also.

Of course, if this GPLC informed decision clause is a must for players to agree to a GPLC contract, the Banker could always try again with another choice of candidate Gold if some uses are found for the fowls' gold he tried out before. He could also try to refine the definition of “intrinsic value” to exclude any properties his candidate Gold currency might have. In itself, the only value a Gold resource must necessarily have, is that it will be accepted (and later demanded) in transactions. So it will only get trade-value at some point, but it may as well never have any useful application.

Now, what if the Banker still cannot persuade some player p to agree to a GPLC contract, because the player p is worried about the “forever valid” nature of a contract? As detailed before, the Banker only needs to limit Gold harvesting between **T2** and **T4**, so he could put some **GPLC maximum temporal validity clause**:

- “This contract is no longer valid after X time-periods from being agreed to.”, with a proper choice of $X > T4$.

Again, if the Banker got the X value wrong (too low), he could always start again with another attempt (with the same Gold resource or another). He could easily try starting out with a low value (say 1 year) for X and then keep doubling it in the next attempts until he finds one that is sufficiently large for his strategy to have time be played out. Or, if he can, he could try to get the players to agree to extend the validity of the contract for another X time-periods before it is about to expire.

How hard could it be for the Banker to convince the players to agree to this contract? Note that the Contract above refers to just what the player agrees to. When he makes the concrete trade with the

Banker to engage in this contract, the player might get other things in return (exchanges, other contracts, etc.). Note however, that the Banker must never agree to a contract that would prevent him from being able to carry out the strategy outlined in this paper (unless the Power of Contract Axiom does not apply to him). So it should not be that hard to convince a player to engage in a GPLC contract. After all, to him (the regular player), Gold is just garbage and seems to always remain just garbage.

The goal of this phase for the Banker is to make all Player agree to a GPLC. In fact, he doesn't necessarily need *all* the regular players – just those who might be able to thwart his strategy between T2 and T4 by over-harvesting Gold. Again, if he doesn't get this set of players right (for a given economy) and his strategy fails, he could always start over and move to T2 when a different set of players has agreed to the contract (maybe all the players in the Game).

General strategy: A Banker may not know for sure which of the candidate for Gold he has in mind will turn out to be the actual Gold. Nor may he know precisely when the true moment T2 and T4 would be. Since the Banker has nothing to lose by making other players agree to refrain from harvesting *something* without his *consent* (i.e. implied by being part of the trade), we could try to make players agree to GPLC contracts for any resource he could think of. In fact, he could try to propose the **General Limitation of Harvesting Contract (GLHC)** which has as a main clause (and may be augmented with some of the other clauses above if needed) an adaptation of any GPLC main clause:

- For any GPLC main clause, the main clause in GLHC is the that clause with “Gold” replaced by “any kind of resource”.

Note: Of course, that may seem a little harsh for some players. So instead of ‘any kind of resource’ some particular set of resources could be specified. Or the set of resources could be just characterized – i.e. any resources that has only trade-value but no intrinsic value (**e.g. any currency** – or at least **one currency**) –

Real life example:

Here are some eerie examples of real-life stuff that could potentially be used as Gold in present day (2015) society:

- Radioactive waste: Nobody likes radioactive waste. It's dirty, it's dangerous and it has no potential useful usages (since it's already waste – not fuel). Nobody wants to have radioactive waste himself (say it could not be used for other purposes like weapons or medicine) and if harvesting radioactive waste produced no other useful resources (like Energy), people might very well be happy to agree to produce themselves or help other produce such dangerous pollutants.
- Carbon (CO2) emissions: Green-house gases (like CO2) don't seem to have any useful purpose today (2015). More so, they are pollutants – they make the environment worse. So people could very well agree to limit production of such gases. In fact there **are** international treaties already in effect in this regard! (See [5- Kyoto Treaty] [5- Copenhagen agreement]). However, CO2 might end up being produced by natural processes (like plants) – thus people might just “take” some already existing CO2 when the need arises. Furthermore, CO2 is harvested as a byproduct of useful industrial goods (in factories).

Minting Gold: What if the Banker could “make” a resources that has the desired properties of Gold? Could he? Under some assumption yes. Take for example:

- Pieces of paper with the text “This is 1 GOLD” signed by himself: So he could sign some number of such pieces of paper with this text on them (say 1,000 or if he can why not 1,000,000,000) and place them around the world so that they seem to be abundant. Clearly the Banker could always harvest more such Gold (if he has paper and a pen) and no other player could ever harvest this kind of Gold without his consent. Unless, of course, his handwriting or signature could be forged. Or the pieces of paper photocopied. In this later case, they could be called “fakes”. Then, of course, fakes could be forbidden by some contract or state of affairs. This is what many state-bankers (in USA and other countries actually) actually do – they call it cash currency (so a 100\$ dollar bill is actually a piece of paper with the text “This is a 100\$ bill” signed by the Central Bank of that state (in the sense that it is made so that it is hard to forge). And, of course, forgery of cash currency is forbidden by law – which is enforced by police [but in our model of the Game such forceful actions are not always permitted to exist].

- BitCoin (see [5 -]): What if there existed a resource that is in itself necessarily finite (on Earth or in general)? Presently (2015), such resources can exist. One example is the digital currency BitCoin [5 -]: There exists a maximal amount of BitCoins that will ever be produced. Furthermore, harvesting of BitCoins will get increasingly more time-consuming as time progresses, due to the computational power involved in solving the cryptographic challenges needed to mint a BitCoin. So one could expect that the total production of BitCoins between some moments **T2** and **T4** will be bounded by some upper constant limit. Of course, for BitCoin to actually be Gold, the Banker must already have *enough* of it (or be able to produce more if needed).
- Abstract Promissory Notes: Leaving aside the “practical details” related to having some real-world resource function as Gold, we can conceptualize the following: What if the Banker has the power to create *promissory notes* – like in the pieces of paper example above – that are considered valid if and only if they were *manually, personally signed by him* at some moment in the past? Being signed in this context would refer not to any physical or digital process (which could be forged or maybe have flaws later discovered in it) but to the core conceptual meaning of the term “to sign”. Basically, in the formalism of our Game, a particular promissory note PN can be considered valid if and only if the player *voluntarily agreed to a contract with the Banker which forever makes that note PN a valid promissory note*. Because the contract involves the Banker, and the fact a promissory note is considered valid is always possible, by Axiom 4, such a promissory note is forever valid. Furthermore, because contracts with the Banker are always voluntary, the respective player has veto-power over the *harvesting* of that currency – thus, if he ever harvested enough of it – it could always be used as Gold with regard to a society to which he is a Banker. The actual Banker in the Game can always use such a conceptual promissory note (issued by a contract with himself) as a *currency* (and a Gold resource), over which he has complete control of harvesting (assuming he does not enter some other contract which force him limit this ability). Also, in case there was some process by which a promissory note could be irrefutably “*signed*” by some player such that on forgeries are possible and the player cannot be *forced* (not only coerced) to sign such a promissory note, than every player could have his own individual Gold resource without the need to involve the Banker.

3. Accumulation of Gold

One other thing that the Banker must do to make sure he can use his candidate gold resource as Gold is to make sure he has “enough” of it at **T2** and could potentially harvest sufficiently more if such a need arises between times **T2** and **T4**.

If the number of players in the game has an upper bound N_{max} – for example if they all live on a Planet which can accommodate only a fixed number of them (say either in terms of physical space or in terms of maximum available food production) –, then the Banker knows he has sufficient Gold if he has at least $100 * N_{max}$ at **T2**. However, this upper bound N_{max} doesn’t necessarily have to refer to the players that could ever exist at some moment in the game. Just to those who could exist between **T2** and **T4**. By the above analogy, if the Banker knows the regular players are bound to say Planet Earth and here the population will never grow beyond N_{max} , then again $100 * N_{max}$ Gold units at **T2** suffice.

Furthermore, even if there is not physical limit to the maximal number of players, by Condition 2 (finite number of initial players) and Condition 3 (which implies a finite number of new players) it follows that at any moment between **T2** and **T4** there will be a finite number of existing players. Taking the maximal such value – let’s call it **N (maximum number of players between T2 and T4)**, again it results that having $100 * N$ Gold units at **T2** suffices.

Alternatively, he could have enough Gold at **T2** just for the players in the Game at that moment, and be sure that he always harvests at least 100 units of Gold for every new player that appears in the game. Since 100 is an arbitrary value (it might as well be 1), that should generally be much of a difficulty. Also, in some of the concrete examples of potential Gold resources from phase 2 above, the Banker can harvest any amount of Gold at any given time.

If he “started out” with a particular Gold resource that he then learn he could potentially not have enough of, he might try to enter some arrangements (contracts) so that he always harvests sufficient Gold. Some potential ways of getting Gold:

- Taxes and Fees: Every time Gold is *harvested* he always has the option of collection a “redemption fee”: some amount of Gold. He may have some contract to this effect or which produces this effect as a consequence. However, he still needs to make sure enough Gold is produced to cover his needs by collecting such fees (which may prove difficult if harvesting of Gold was limited by a GPLC contract from phase 2 above). He could collect other sort of taxes: living tax (fixed tax every time-period from every player), income tax, property tax, transaction tax, Gold mass tax (a certain percentage of all the Gold in the rest of the world), etc.
- Indirect Robbery: He could determine a regular player p1 to rob another regular player p2 (*force* the second player to an *exchange*) so that p1 has some Gold that the Banker could then get by other means (the Banker can never directly force anybody by Axiom 1). The Banker could actually have a *contract framework* (a set of contracts) with p1 which forces p1 to behave in this matter regardless of his preferences. Taking this a step further, the Banker could determine p1 to *indirectly rob* another regular player p3 – thus making p1 obtain Gold from p3 by the same kind of strategy described here – before getting Gold from p1.
- Birth tax: Every time a new player joins the Game, the Banker collects 100 gold from someone (not necessarily the new Player). If a birth can only happen by some consent of a subset of the existing players (say the parents of the new child), the Banker might try to get a fee from them (e.g. by some contract).

Nota Bene: In terms of actual needs for the later phases of his strategy to work, the Banker actually needs just some contract which obligates some certain players to pay him the amount of Gold stipulated, should the Banker request it. However, he needs such a contract to be *feasible* (remember Axiom 4 – the contract actually happens mandatorily, but only when a situation it compatible with its content exists at that moment) whenever he will need to try to exert his option and “cash in” the gold. Note: In fact, not even this is required. Just that the Banker could use such a *promissory note for Gold* in lieu of actual Gold when ever he needs.

Also, the Banker could collect Gold by *harvesting* it, or by engaging in some exchanges with the rest of the players in which he gets Gold. Since Gold could generally be taken to be a resource considered “useless” before **T2** (“**the moment of introduction of Gold**”), the Banker should not have a hard time getting large amounts of it before T2.

Important note: The above examples of strategies for accumulating Gold are available to any regular player, too! In fact regular players could also have other options available between themselves (like theft, robbery, forceful labor), because they are not protected from each other by Axiom 1 (as they are protected from Banker).

Also, the strategies described above remain valid through the Game for the accumulation of *any* kind of resource – not necessarily Gold. With regard to some resources, the [*Indirect*] *Robbery* alternative may not be feasible, but all the others remain.

Also, undoubtedly, other strategies for resource accumulation could be devised. In fact, another important class of strategies called *loaning with interest* will be introduced in the next Epoch of the Game.

4. Accumulation of Food and Control of means of Food Production

Another thing the Banker needs for the strategy in the next Epoch is to be able to maintain a reasonable amount of resources “in high demand”. Such resources could be, again, anything – computers, laptops, oil, water, “tickets” which enable the owner to get massages from some beautiful big-breasted girls – anything. The more such resources are “in demand” (i.e. other players need or want them), the better.

The more the Banker has of them (or could produce), the better.

However, for him to be able to truly implement his strategy to gain complete control over the society (assuming the other players generally will try to avoid this from happening), he **MUST** accumulate some Food. By our Axiom 5 (forced Consumption), Food (lack there of more precisely) is the only thing that could potentially(!) *force* a player into a deal with the Banker or *die* (in which case the Banker gets complete control over him, by Axiom 6). Without Food, it could be that some Player will always prefer to refuse to agree to any contracts with the Banker (which are physically mandatory by

Axiom 4) which would eventually imply that he will end up agreeing to a **Complete Control by the Banker (CCBB)** contract (the only means for the Banker to gain complete control over a player who has never died, by Axiom 7). Without Axiom 6, some Player might escape complete control by the Banker by deliberately (or not) having *died*, or he could “save” other players from this fate by causing them to *die*.

However, as long as the Banker has sufficient Food available to him between **T2** and some finite moment **T8 (“The Point of No Return”)** – which I shall discuss later in this paper –, he, for sure, can gain complete control of the entire society, under the conditions presented in this article.

To make sure he has sufficient Food for enacting the strategy in the later Epochs (which is discussed there), it is always useful to him (and might be necessary) to **all**:

- Control the means of Food *harvesting* (e.g. by being a necessary part of any Food *harvesting*) – this ensures people will be more likely to need to enter a deal with him (the Banker) for Food, rather than get Food by some other exchange. He might not need to necessarily control “all” the means of Food harvesting in this Epoch. In fact he might not even need to control “a lot” of them. Just enough so that people will eventually have to (or prefer to) engage in a certain trade with him for Food.
- Accumulate as much Food as possible: He will in later Epochs offer Food in an exchange, as part of some deals.
- Gain sufficient means of Food production: This basically means that he needs to be able to replenish his balance of Food adequately enough. This is particularly relevant if Food is very perishable for example (and is much is lost due to automatic consumption after a certain time after harvest).

Notice that unlike in the case of Gold, with regard to Food, the Banker is not particularly interested in how much Food circulates or gets harvested; Only that (i) he has enough Food to offer it in exchanges in the later Epochs when needed; and (ii) Food will eventually become sufficiently “scarce” for some players to prefer (or have no other choice than) to agree to a particular kind of proposal by the Banker, in exchange for Food.

The strategies available to him to accumulate Food and control means of Food production (in this Barter Epoch) can be very very varied. Any of the strategies discussed priorly for Gold could be applied (with some proper minor adjustment) with regard to Food. Of course, with regard to Food, players may (and generally will be), much, much, much more reluctant to enter any agreement which potentially limits amount of available Food (at least to them). Gold they may not care (that much) about, because it seems useless to them (and is useless during this Barter Epoch). But Food they not only want, but desperately need for Mandatory Consumption.

However, the Banker doesn't really need to control the “Food economy” ‘too much’, or even have himself ‘that much’ available Food, as we shall see in The Gold Epoch.

Putting it all together

The four phases (1-4) described in this Epoch can take place all throughout the Game (as the Banker may not now for sure when he discovered the real Gold, or just some fools Gold). Phases (2-3) however take place with regard to some (candidate) Gold resource.

Once the Banker fulfils all this stages with regard to the actual Gold resource, and reaches the moment **T2**, the Gold Epoch starts. Notice that the Banker need to necessarily now for sure that some “candidate **T2** moment” is the actual **T2** moment (as he may not if he found the true Gold, or just fool's gold for example). So the Banker might wrongly think he moved to The Gold Epoch several times in the Game (as he thereafter realizes the Game was still in the Barter Epoch when he fails to implement the Gold Epoch strategy described below).

However, given

Sufficient Condition 3: “The Banker eventually correctly discovers Gold”

There will be some unique **T2** moment which we, by convention, use to denote the actual **T2** with regard to Gold (so the one on the Bankers last attempt – the one which succeeded).

Note also that if the Banker has at each moment some non-zero probability of finding Gold and crossing into the Gold Epoch (even if this probability decreases as times goes on very fast, tending to the limit 0), then, as a consequence of this result about random-walks here [5 – Furnicuta], the Game will advance to the Gold Epoch with probability 1.

Phase 2 – The Gold epoch

Once the Game progressed to the Gold Epoch, the begging of which is, by definition, moment **T2**, then there is some resource Gold, which satisfies the **Necessary Condition 2: Properties of Gold**, including the limits on harvesting during this Epoch and the availability of Gold to the Banker. Again, if they didn't hold, it means the resource in question is not Gold (it is fool's Gold say – meaning just not Gold). So the Game may not have left the Barter Epoch yet. If it did, then Gold is Gold, with all the properties of Gold.

Therefore, the entire harvesting of Gold by all the regular players (including potential newcomers) from **T2** up until **T4** will be no more than **H**. Furthermore, the Gold already in some of any of the regular player's balance is **GP**. Let **G** be total amount of Gold which is available at some moment between **T2** and **T4** to any one of the regular players. Then $G < GP + H$.

Furthermore, since **T4-T2** has some finite value, by Condition 3, there exists a maximal number – lets denote it by **N** - of players which exist at some moment **t** between **T2** and **T4**: If at time **T2** the global population is **X**, then $N \leq X + \text{new}(X) + \text{new}(\text{new}(X)) + \dots + \text{new}(\dots(\text{new}(X))\dots)$, where **new()** is applied **T4-T2** times the last time. This may seem like a large number – but it is surely finite!

1. Introduction of Gold

Now, in this epoch, the Banker will carefully search for a kind of resource that fits certain criteria that he looks for. If he finds it, then that resource is, by convention (by definition), the resource Gold (so we use the name Gold to refer to the resource the Banker found during this Epoch and successfully used as Gold).

During this Epoch, the Banker will struggle to get more and more players engage in propose the following **Gold Loan Contract (GLC)**. The contract for player **P**, who accepts it (perhaps as part of a larger trade) consist of:

1. **P** will receive immediately a certain amount **C0** of **gold-backed Banker promissory notes** (see below) as a **loan**, which he undertakes the obligation to repay with interest to the Banker.
2. For every moment thereafter up until the loan has been repaid (or the game progressed beyond **T4** – crossing into a new Epoch), player **P** will have an outstanding **amount due**, **C[p][t]** of credit he must repay to the Banker.

Note that **T4** may not necessarily be stipulated in the contract. But it might just to make **P** more likely to agree to such a contract. The contract could say “any amount not paid back in 100 years is no longer owed” for example, if the Banker knows that **T4** will arrive in less than 100 years.

3. **P** undertakes to “repay” before the end of each time period **t**, with $t < T4$ at least $c1 * C[p][t]$, for some constant $0 < c1 \leq 1$ (which the banker might even let the player **P** choose). The repayment will constitute of giving “back” (by means of an exchange) to the Banker either an amount of gold **g[p][t]** and an amount of **gold-back Banker promissory notes gn[p][t]** such that $g[p][t] + gn[p][t] \geq c1 * C[p][t]$. Basically he can cover the *minimum payment* $c1 * C[p][t]$ either in actual Gold or in gold-backed Banker promissory notes, in whatever proportion of the two **P** likes.
4. Once **P** has made a total payment in time-period **t** of an amount **PG[p][t]**, his **amount due** for the next period will be: $C[p][t+1] = (C[p][t] - PG[p][t]) * d$, for some fixed $d > 1$ called the **interest rate** chosen by the Banker. He might even let the Player decide what a ‘fair’ interest rate $d > 1$ is and use that one.

Marketing: How might the Banker explain this exponential increase in the amount due? He could argue: “Look, if I’m going to loan you Gold, I must get something in return, right? I mean that is ‘fair’, right? Now say that if I loan you X units of Gold I will get back Y units of Gold (take X = 100 and Y = 1 for eg.). Now it is fair that if I loan you more Gold I should get back more units as interest, right? But I – the Banker – shouldn’t be worse off by lending you a large amount of Gold – say Z then by lending you twice two smaller amount of Gold. Again that’s ‘fair’, right? Then by induction over the size of the loan, since $d(Z) \geq 2d(Z/2)$, if $d(X) \geq d \cdot X$ (which holds for $d = X/Y$), it follows that $d(Z) \geq d \cdot Z$, for all larger Z.” He could then even ask P to decide himself what a “fair” amount to return Y was for a loan of size X, and set the interest rate $d = Y/X$.

Marketing: How might the Banker explain the the exponential growth of the amount due then? Maybe like: “So ‘we’ agreed that it is absolutely necessary – by mathematical induction – that any ‘extra’ amount you owe me as ‘interest’ is no less than some percentage of the initial credit value C0. But now, it should be ‘worse’ for me if I lend the same amount of money at this moment or at some other moment, right? Now since at each t you owe me some $C[p][t]$ – ‘doesn’t matter how you got to owe me this’ (<-not afterall= "" again= "" am= "" amount= "" any= "" apply= "" at= "" c= "" debts= "" decided= "" due= "" else= "" fair= "" formula= "" gold= "" have= "" his= "" i= "" is= "" it= "" lend= "" lending= "" like= "" means= "" might= "" must= "" not= "" of= "" only= "" p= "" pays= "" period= "" s= "" same= "" so= "" someone= "" t= "" t= "" that= "" the= "" this= "" time= "" to= "" true= "" who= "" you= ""> This is a series of deceptive and manipulative comments by the Banker with the intent of making P think its “equitable” and “fair” this way. Of course, what matters is just that P eventually agrees to the contract.

5. If the Player is ever unable to make the minimum payment during some time-period t, he is said to be **in default of loan**. From the moment player P is in default of loan (up until the entire loan has been repaid), P will take the following mandatory action:
 - o For every **Food** exchange he is ever involved with (except those involving the Banker) that involves transferring some of his outstanding balance of Food to some other players, or *harvesting* new Food, he will always demand at least some minimum amount of Gold, **B**. So he will never agree to or voluntary take part in any trade (except with the Banker perhaps) unless he (P) – whatever else happens – is paid at least **B** units of Gold.

Notice that since this is a mandatory action in a contract with The Banker, by Axiom 4 it will be respected for sure. Player P may at times have preferred to do some trades where he doesn’t get Gold (for example with someone who doesn’t have any Gold) – but, under this condition – he will not be able to.

Marketing: The Banker could easily try to frame this condition as “perfectly fair”: “Hey, listen, P: You defaulted on your Gold loan already. This means you didn’t have enough Gold to make the minimum payment. The least I could ask is that at least from now on (until you repay the full loan) you will ask for some Gold (at least **B**) at least for these very very basic exchanges – involving Food. How could you pay me back if you don’t ‘want’ to make any Gold?”

- o He (player P) will be allowed to be paid the Gold amount $\geq B$ either in actual Gold or in gold-backed Banker promissory notes in whatever proportion. However if it’s not Gold, it must be Banker’s promissory notes (not just some promissory – even if is perfectly convertible in Gold at any time – maybe even more so than the Banker’s promissory notes). This is the crucial aspect! This is because the Banker has complete control over the *harvesting* of his own promissory notes (by using some of the Axioms – since he cannot be compelled for example).

Marketing: How might the Banker market to P the idea that P himself cannot accept inlieu of the **B** amount of Gold promissory notes from someone else, no matter “how solid they are”? “Listen, I am the Banker – I cannot be forced to do anything (by Axiom 1) –. Maybe some other player which emits such notes could be under some strange influence (e.g. a contract or even a grave threat) and will emit these notes even when he cannot cover them with Gold. Or he might refuse to pay the actual Gold for them when asked (<- 4= "" a= "" able= "" actual= "" actually= "" afterall= "" all= "" allow= "" allows= "" am= "" and= "" anyway.= "" anyway= "" axiom= "" banker= "" be= "" by= "" deals= "" doing= "" favor= "" for= "" forced= "" gold= "" happen= "" have= "" i= "" if= "" in= "" instead= "" is= "" loan= "" make= "" my= "" not= "" notes= "" of= "" others= "" paper.= "" pieces= "" promisory= "" receive= "" repay= "" respect= "" some= "" the= "" this= "" to= "" undertake.= "" want= "" was= "" what= "" which= "" would= "" you= "" your= "">”

- o Priority repayment to the Banker: For every exchange in which Player P is involved and by which he receives some amount E of Gold (including a *harvesting*), player P undertakes to immediately transfer to the Banker some amount $\leq E$ such that he at least as his minimal payment $c1 \cdot C[p][t]$ covered with the amount he just transferred and all amounts he had repaid up until then in time-period t. So basically the Banker says: “Look, if you make some Gold, then I have priority to receive

it over all other desires or competing arrangements you may have. Not necessarily all of it, but at least enough to get your minimal repayment covered for that time-period if that is possible. After all you did default on this loan and I want to make sure I do get the Gold I am owed.” Notice that when P gets involved in a trade that involves actual Gold (not promissory notes) – the Banker gets (some of) the actual Gold! Player P cannot choose to pay this Gold amount due for the transaction he has completed in promissory notes! “After all, you did get actual Gold, didn’t you? Why would you repay may with my own promissory notes?”. Actually I think the Bankers strategy would work even if P would be allowed to repay in promissory notes too. He might try to stock up real Gold – but he will eventually run out of promissory notes too!

- **Effort to ‘make gold’**: Player P undertakes to *make some significant* effort in obtaining Gold in each time period when he is in default. In particular, he agrees to always accept some trade with someone (not any one trade in particular – but one of the trades available to him) to produce some quantity of Gold or gold-backed Promissory notes (“hey, they’re the same thing – says the Banker”) at each such time period (if such a trade is offered to him). This clause can be eliminated if it is impossible for regular players to harvest Food individually (without involving at least one other player).

6. **Minimal loan amount**: The amount **C₀** loaned to P will be no less than some constant value **C** chosen by the Banker (see below).

Marketing: The Banker could say: “Hey, listen – I don’t want you coming over here to be every day. Take this large amount today and use it how you like. If at future time you really want to repay everything to me, you could always do it. But look, by the way: I am offering you a really really low interest rate d . You might as well loan some of this Gold to other players at a higher interest! That way you will be able pay back to me the amount due (or at least the minimum payment) including this ‘small’ interest while getting even more Gold from the other players. This way you might some day become financially Gold-independent too – just like myself. And look: You already have everything you need: the Gold, the contract you need to ‘sell’, even the ‘speech’. Now, how about it? Do you want a loan or not?”

The main “immoral” catch so to say with this **Gold Loan Contract (GLC)** is that the Banker knows that the total amount of Gold (actual Gold and gold-backed Banker promissory notes) available to all the regular players (in the ‘real economy’) – including any potential new children – will eventually dry out (at **T₄** more precisely). Real Gold might still be produced after **T₄**, but (as we shall see), immediately when a *harvest* of Gold happens, the Banker gets the entire amount harvested. Thus, the players will never be able – after **T₄** – to use any Gold (real Gold or Banker notes) for transactions amongst themselves. Furthermore, they will all be in default of loan. As such, they would practically not be able to make *ANY* transaction *AT ALL* which involve Food (Clause 5 – in case of default of loan – requires that they receive at least some positive amount **B** of Gold, or Gold-backed Banker notes – for them to be able to voluntarily take part in such a transaction; by Axiom 3). This is what the Banker *wants*. He wants and knows that all players will eventually default. Another immorality of such an arrangement is the fact it circumvents “momentary free will”: A player P has to agree to somehow limit the actions he could take at some future moment (except in a manner prescribed by a TFWC - The Free Will Contract) – and (because of Axiom 4) – even force himself to respect this limitation, no matter what the situation becomes at some of those future moments.

Now the Banker, wants to choose an adequate minimal credit value **C** so that all players eventually default and, furthermore, forever there after never get to fully repay their loan. For simplicity lets assume with loss of generality that the Banker extends these Gold Loan Contracts (GLC) only in the fixed amount of **C** (so no less, no more – take it or leave it). The result of the article would still hold if he gave various amount of credits to players, so long as he never credited above some constant value **D** on any Gold Loan Contract. But that would just make the math details more complicated to explain. So for simplicity (without loss of generality) lets assume **C=D**.

Well, what is the maximal amount that ALL regular players could repay to him at one of the moments between **T₂** and **T₄**? Clearly it is no more than all the Gold that “circulates” in their “real” economy. Thus, all the players combined (for example by forming an alliance) will never be able to repay to the Banker more than **G** units of (real) Gold at any given time. To each player P, the Banker will only issue promissory notes in one of the following situations:

- To cover a Gold Loan Contract we agrees with P. He will only agree to credit P if P does not already have an outstanding Gold loan (since there is no need – the amount due for a contract grows

exponentially – its fast enough not to make the Banker need to somehow make it grow even faster by increasing the credited amount).

- In case the Banker wants to enable some trade between Player P who is in default on a loan, and some other player(s) which cannot (or choose not to) make the minimum Gold payment to P in the amount of **B**. In this case, he enters another “**day-loan-partner-deal**” agreement with P – such that the entire amount of Gold (or promissory notes) which P gets as part of the transaction (usually just the minimum – B) is immediately transferred back to the Banker. Thus, in practical terms it is as if no new promissory notes were actually created – the Banker just allowed P to get whatever else he (or both of them) wanted from that transaction. It is as if the Banker “took the (virtual) promissory notes from one of his pockets into the other”. Furthermore, in a day-loan-partner-deal, the player P always transfers back the precise same resource that was the object of the day-loan-partner-deal (so if he got real Gold, he transfers back to the Banker real Gold – not promissory notes). Furthermore note that the Banker doesn’t have any particular need to engage in such a deal, if Assertion 6 holds (he gets full controls of all players who *die*). In that case his strategy is perfectly applicable without such deals.

Now pick $C = G + 1$. This means that any credit the Banker extends is always larger than the amount of real Gold that could ever exist ‘freely’ in the ‘real’ economy between **T2** and **T4** without having been “introduced there” (by a redeem operation to a player without outstanding Gold loans for example).

The Banker will also need to think about some gross estimate of how much *other* resources (like Food) – he would be willing to give to any particular player at some moment (in exchange for Gold or gold-backed Banker promissory notes). As the economy progresses players will make better and better offers to the Banker for regular resources (like Food) – since as Players start defaulting, Gold will suddenly become in short supply (and *day-loan-partner-deals* will become very much in demand). But nevertheless the Banker might mobilize some ‘real’ resources (like Food, or cars or ‘willingness of pretty girls to have sex’) so that players will agree to Gold loan contracts. However, the Banker must be careful not to give away “too much” for ‘free promissory notes’ – his actual goal is to get the real Gold out of the regular players’ economy. Since he gives such a huge credit at first – C, players might give promissory notes to other regular players – which, in turn, might demand that the Banker actually gives them Gold in exchange for those notes, as he is bound to do (since they have no outstanding credit with him). This would mean getting “real” Gold back into the economy – which is what the Banker wants to avoid! However, even this way, the ‘real economy’ will eventually run out of real Gold (including that introduced by the Banker himself) as I shall prove shortly.

Let’s examine first what a gold-backed Banker promissory note Resource would look like. At the start of the Gold Epoch, the Banker introduces the following kind of resource, using his power to make a contract binding (even to himself): **gold-backed Banker promissory notes**:

- I, the Banker, undertake to redeem any promissory note for a certain amount M of real Gold to that exact amount M of Gold to any player who does not have an outstanding Gold Loan Credit with me.
- For a player that has an outstanding *amount due* A for (the) Gold Loan Contract with me (the Banker), I will either take the promissory note in full as payment against the *amount due* (and reduce the outstanding amount due accordingly), if $A \geq M$ (even if the player redeeming has already covered the minimum payment for that time period), or take amount A from the note as full repayment of his credit, and give the remaining M-A units in real Gold to him.

Basically the Banker will not pay real Gold in exchange for a promissory note to someone who still ‘owes’ him more than that amount of Gold.

Now back to choosing a right value for **C**.

What is the total maximum amount of real Gold that the Banker might be forced to introduce in the ‘real’ economy between **T2** and **T4**? He never issues another credit to a P player with whom he already has a Gold Loan Contract (but, instead, if interested makes *day-loan-partner-deals*). So, if he eventually does issue a credit to P, it is either the first time P enters such a dreaded contract, or P has already repaid – in full – all amount due on all prior loans (including interest). If player P did manage to repay everything (including the principal) – it means whatever was claimed (as real Gold) out of the C promissory notes that were issued to P (which P may have traded along to some other players) – P converted at least that much (in fact strictly more) with either real Gold or promissory notes.

Furthermore, every promissory note that the Banker has to pay out in real Gold he must have issued himself to some player P (necessarily the one claiming it!) who has no outstanding Gold loan from the Banker. It could be that P never manages to repay in full that particular Gold Loan Contract for which the note was issued (in which case he inevitably eventually defaults) – OR he repays that particular loan in full, including interest. If P manages to pay that particular loan in full, it means for every promissory note issued to P that the Banker had to pay out in real Gold, he either got real Gold right back, or promissory notes issued to someone-else.

Thus what is the maximal amount of promissory notes that the Banker could potentially be asked to repay in real Gold? The banker issues at most $C*N$ promissory notes as part of some “first” contract to any of the N maximum players in the game between T2 and T4. The maximum value $C*N$ is theoretically attainable (might not always be attainable) only N players have been loaned at least once by a Gold Loan Contract. For the value (of total promissory notes the Banker redeems in real Gold) to be able to any larger, it necessarily follows that at some player got a credit more than once. However, since any player only gets a ‘new’ credit if he has already repaid in full (including interest) the previous one (in particular or previous ones), how was the total “emitted promissory notes that were or might be redeemed in real Gold” affected by the two events? When he has repaid the first credit in full, he repaid at least C (in real Gold or some promissory notes). So at repayment, the banker got back C “Gold-stuffs” – either in promissory notes or real Gold – for whatever he got in promissory notes – those notes (say worth J Gold) will no longer be redeemable by anyone else. He issued C new promissory notes, however he “invalidated” another J at least (usually many many more). So for the new notes he issued in the “new” credit to some player, can only contribute to the total real Gold that he has to redeem to someone by C-J. However, he got precisely C-J real gold back from P. So the maximum overall value for all the real Gold that is ever simultaneously (all of it) in “active circulation” in the ‘real economy’ which ended there by being introduced by the Banker as part of an operation to redeem a promissory note (by some yet uncredited player), is unaffected by the fact some players might get credited (under the Banker’s strategy) more than once.

Therefore, the total amount of Gold the Banker can ever be called upon to have “available” to introduce in active circulation is no larger than $C*N$ (so this is a sufficiently large value to satisfy condition 3 from the Properties of Gold).

Furthermore, the value of all outstanding promissory notes in the real economy (no matter when and to whom they were issued) plus the total amount of Gold in the real economy (the total balances in such resources of the regular players) will be no larger than: $C*N$ (the maximum amount Gold introduced by the Banker which is still in ‘active’ circulation – in the terms the banker did not for sure receive some part of it back already) + G (the total amount of Gold the economy produces independently of the Banker).

For the last conclusion to hold, we augment the Bakers strategy by making him refuse to part-take in any *harvesting* of Gold, in which he does not receive the *full* amount of newly ‘*harvested*’ Gold.

Basically, he will not help the other players increase the Gold supply available to them (except the temporary situation where he redeems some promissory note to someone). This means also that he will never offer some of his real Gold as part of anything else other than a redeem operation or one the (optional) “instantaneously recovered” **day-loan-partner-deals**.

2. Giving value to Gold

So the Banker introduced Gold as something ‘potentially interesting’ (as something he offers promissory notes on). At the moment of introduction (T2), Gold is generally widely available, not *at all* in demand perhaps even (it is considered useless dust by the other players). Thus the other players may not even find anything ‘dangerous’ or ‘notable’ in the fact some guy (theBanker) offers promissory notes on this useless and potentially abundant resource: “There’s so much of Gold ‘lying around’ that theBanker has collected enough of – or has some means (e.g. Gold Mines) to produce a lot of – and he doesn’t want to take all that effort (he’s lazy perhaps) to keep collecting (by *harvesting* perhaps) this resource that he wants to offer in some deals (why would anybody want it anyway?), unless he found someone interested to deal with him (theBanker) in this resource – and that someone will want to use this Gold thing for another trade than again just with the Banker (in which case the later doesn’t need to bother to extract it ‘just to give it to someone who then gives it right it back to him).”

So at the start of the Gold Epoch (at **T2**), the Banker will seem very harmless – at most some “weird fellow” who both offers and asks something regarding this useless Gold resources for some of his deals.

Now, for the Banker to be able to actually persuade the Players to engage in the **Gold Loan Contract** he must make them interested in having this weird promissory note that they could ‘always’ (sic! <- amount="" apparently="" are="" debt="" get="" gold="" greater="" hold="" in="" not="" notes="" o:p="" of="" reedem="" resource.="" same="" the="" then="" they="" this="" to="" unless="" useless="">

Now to make players interested in Gold, he **MUST** have some stuff that he can offer them (and that they are interested in), which he prices in Gold. It could be anything – cars, homes, “massage services by pretty girls” – anything that the players would be willing to get from the Banker in exchange for Gold.

Initially, players may jump at this *great offer* – the just pick up some of this Gold thing that seems very to be everywhere – and give it to the banker in exchange for some stuff they *actually care about*.

Real life example: The Banker could even use a Gold resource that seems “detrimental to the environment” (**something say like CO2 greenhouse gases – which are considered a pollutant**). That way it seems natural to the other players that this “good guy” the Banker is willing to ‘pay’ (give them something useful) in exchange for getting this ‘bad, bad’ resource out of the environment. So what might the Banker say he wants Gold for? To either destroy it (which anyway he might as well do since he is interested in getting Gold out of the real economy) – and those ‘save the World’ from some very bad and dangerous substance (like radioactive waste, biological weapons or, again **CO2 greenhouse gas**). BUT, since he still needs to be able to introduce some Gold he receives back in circulation before everyone defaulted (so even if the net balance of the Gold he introduces into the real economy (by redeemals) minus that he received as loan repayments is never greater than **C*N** – if he were to destroy some amount of real Gold he gets from other players then this **C*N** value would increase by precisely that amount [so he would need more gold ‘out of his pocket’]. If the interval between **T4** and **T2** is very long there could potentially be a lot of instances where real gold is being repaid (thus he would need to have a larger and larger initial starting balance). It could be the case that the necessary balance might still be bounded from above (but without mathematical proof it may also be the case that it’s not). However, the Banker says: why bother? I will not destroy any real Gold I receive ‘too soon’ (by that he means before **T4**) – although I promise it will eventually get destroyed.

How may he sell this idea to the public? For example, for **CO2 emissions (which is said to be a greenhouse gas)**, he could say: “Hey! There’s no way to destroy this CO2 stuff ‘right now’ – we can’t send it all into space and gravity keeps it bound to Earth. So I will just ‘safely’ store it – in some **specialty built underground facilities** (that what do you know happen to be completely owned by my – the Banker – and no one could ever get any CO2 from the without me (the Banker) allowing it)”. Btw, **underground storage facilities for CO2 gas (the Carbon Dioxide gas) are currently being build (or may already have been put into operation) at least at one site on this planet: In Romania (as some European Union funded project perhaps – I know this because Romanian millionaire George Brailoiu (Owner of a very large Carbon Trading company) – who is my (the author of this article – Mircea Digulescu’s) uncle and former business partner (I never got a personally loan from him – he didn’t don’t force me to do it – just a company I used to own did) told be this and spoke to me about this.**

So the Banker has a way to seem “well-intentioned” to the rest of the Players – he has a good explanation why he wants to accumulate CO2, he has an explanation to why he doesn’t just immediately destroy it and he also has a good story about how it can be stored (if people really want to ‘feel safe’ and know that eventually all CO2 will be destroyed – not just stored – the Banker could say that it will eventually be sent in small quantities with space rockets into the Sun – but that won’t start ‘just yet’). Now since CO2 is considered “bad” (a pollutant) he also has a very good explanation to why he always refuses to help others *harvest* some more of it.

By this moment in the Game, the Banker must have some framework to make sure total amount of Gold present in the real economy (which he has not introduced) between **T2** and **T4** is bounded from above by some finite value. For CO2 for example, there may be some contractual framework to **limit CO2 (carbon dioxide) emissions (which is one manner in which CO2 is produced)**. **Such a framework actually DOES exist in real-life (see [5-Kyoto], [5- Copenhagen]).** Currently

there seems there could be some other processes (except burning of fossil fuels) which produce CO₂ (like plant metabolism) and could perhaps fall outside the international CO₂ limitation framework [but they may be included in the future]. So CO₂ may not necessarily be the real Gold for some Banker on Earth (although, under some future conditions it might as well be), but it sure is a good candidate. However he have a better still Gold candidate: *CO₂ emission rights*. So a unit of actual Gold of this type would look like “right given by International Authority to emit one teragram of CO₂”: **These emission rights can be traded (like stock) among Players (states or smaller actors). There is some overall authority (the international body responsible for the implementation of the Kyoto and Copenhagen treaties) which could – if it so decides – emit more of this ‘right to emit one teragram of CO₂’ Gold, “out of thin air” [and can thus be regarded as part of the Banker], and there is (already) a regulatory framework (a series of contracts (treaties) – maybe some of them binding -) that limits the level of production (harvesting) of these ‘right to emit one teragram of CO₂’ things by the rest of the players in the game (so the international authority responsible can ‘emit’ more such emission rights, but the individual states like Romania, Germany, France, etc. (or companies, or individuals) – CAN NOT). So CO₂ emission rights really look like some good candidate for Gold [its corresponding Gold economy may not yet have entered the Gold Epoch – where *promissory notes on these rights* (promise to get such an actual “certificate”) are used give out loans. Or those promissory notes could be regarded as some or all of the *fiat* currencies (like USD, EUR, CHF, etc.): Some other part of the same Banker in this real-life Game – like a Central Bank or ‘the FED’ – may offer these promissory notes (*money* – say USD), that it itself (the FED say) offers ONLY AT AN INTEREST and NEVER HELPS ANY OTHER PLAYER IN THE GAME PRODUCE ANY [except say for some day-loan-partner-deals]. **This is what actually happens today (2015) in the economic society of Planet Earth.** Note that in the case of the use of *money* as promissory notes in this (perhaps hypothetical) scenario – the promissory note (money – USD) is not even made explicitly on some Gold (like the metal Gold or like the CO₂ emission rights). However it can be regarded as a promissory notes on *all potential Golds*: So long as people need this *money* thing to get an actual unit of that Gold they need [CO₂ emission rights, actual metal Gold, right to produce radioactive waste, whatever] – **money (USD, EUR, etc.) IS A PROMISORY NOTE ON ALL SUCH POTENTIAL GOLDS.** Why? It’s crystal clear: (i) **for all these potential Golds (CO₂ emission rights, anything] getting some amount of it (like “right to emit one teragram ☺ of CO₂”) from “the other part of the Banker” – the International Authority responsible – can only happen if you ‘spend’ one of these promissory notes on it**, (ii) promissory notes are offered by the Banker (the FED part say) only at an interest – **always as a loan (never as a purchase of something)** and (iii) no player outside the Banker could ever *harvest* such a promissory note (money) without the Bankers involvement (can you just ‘mint’ 1,000,000,000 USD? The FED can – but you (or I) can’t!).**

So enough with the real-life example. I feel I made it sufficiently clear that the kind of scenario modeled (and explained) in this article is very plausible and may in fact even occur in our global human society on Planet Earth – as you are reading these lines.

Back to the general conceptual case, once the “sets up the stage”, he needs to make Gold (or perhaps just the promissory notes he can emit) valuable to the players.

As detailed above he could just keep offering interest-carrying promissory notes on Gold as loans and demands such notes (or actual Gold) in exchange for stuff players want.

His purpose now is to extract all ‘free’ Gold from the economy (that is Gold which is not immediately transferred to him – the Banker – or more generally which might be used in some transactions with some regular players which does not involve him).

In fact, he is interested in just making everybody dependent on the promissory notes he keeps emitting in Gold Loan Contracts. However as long as there is ‘free floating’ Gold in the real economy – by the way in which he setup the Gold Loan Contract (so as not to be obvious to the players that they will agree to pay more on more of a resource over which the Banker is the sole actor who can *harvest* it) – he allowed real Gold to be used in lieu of such a promissory note.

For his “plans” of ultimate complete control to be certain, he needs to take Gold out of the relevance within real economy.

3. Eliminating Gold from the real economy

Basically in this phase the Banker more or less just *sits and waits*. He gives loans of his own *promissory notes backed by Gold* according to the strategy I described in Phase 1. So, more or less, the Banker know precisely what to do (e.g. always offer a Gold Loan Contract to any player who has no outstanding *amount due*). Note that in case the Banker is “split” in more than one apparent part (i.e. in the real-life case of *fiat currency* – there is more than one Central Bank in the World – each of such central banks controls some seemingly different promissory notes: USD, EUR, CHF, etc; **iff** all such Central Banks are actually part of the same Banker) then the phrase “has no outstanding amount due” is applied with regard to any and all such parts.

What else could the Banker do? He could try to ‘speed up the processes’ by) getting more and more control over resources the players actually want (or, **need**) (both making use of the **power** he already has in the economy due to Gold and Gold-backed Banker notes and acting without necessarily employing them), so that they may become more on more willing to accept a Gold Loan Contract (for amount **C**) from the Banker. So in this early stage the Banker may still appear very much like a regular player – making exchanges (purchases and sales for example) which do not involve Gold or promissory notes.

So how would this stage of the economic “gameplay” look light intuitively?

It may be more difficult to convince players “early on” in the economy to take on such a “huge” credit **C** (when they actually might need much less – and then ask themselves – why pay interest on the entire **C**?). But then again they might think “ah, well... it’s just for one time-period – a one-time payment of $d \cdot C$ for getting some Gold I need. Is the cost of credit $d \cdot C$ too much to be interesting for me?” Since early on in the economy Gold is abundant (and also, as it is closer to the Barter Epoch, largely considered ‘useless’) the player may reason that “Well... I will be able to get this amount of Gold to pay the Banker back with interest – maybe not in one time period – but surely ‘quickly enough’. Furthermore his conditions for ‘defaulting’ don’t seem all that unreasonable; there about some measure to make sure I actually ‘make an effort’ to repay him ‘his’ Gold”.

In middle stages of the economic play, **C** may not even be close to ‘large’ – it may be around the “running price” for a family car (which in the beginning of the economy was not even ‘priced’ in the useless Gold)... or even get less: to some laptop perhaps.

Towards the later stages of the economic play some players will hold huge huge amounts of credit (individual *amounts due*) and may already be in default - and thus be tempted to trade amongst themselves with huge values (like billions or trillions times **C**) – just so that they could “keep up” with the *minimal repayment* – or to “keep up” with the other regular players ‘around them’ raising the tariffs for the services they usually get from them.

When the ‘final end’ (**T4**) is very near - perhaps a moment **T3** (“**the moment of obvious defeat**”) has passed beyond which all the regular players in the Game combined – even forming a Global coalition – can never avoid eventually reaching a moment (**T4**) where they are all defaulting on their Gold loan to the Banker whenever the Banker chooses (i.e. does not given them some donation – or sell them (not necessarily loan anymore) – some promissory notes that they can then use to make their minimal payments). Furthermore, by Axiom 4, and the clauses of default, **they will not be able to trade Food with each other**. If the Effort to make Gold clause is also in effect, they will not be able consume any individually *harvested* food either unless the Banker allows them (he could always offer them at that moment **1 gold-back promissory note** for the entire harvested Food during that time-period – by filling in some obviously possible technical details [e.g. forcing that also the first unit of Gold or Gold promissory notes the Player makes while in default he immediately transfers to the Banker there after – he cannot use it in any other trades (or just force that $B > 1$ for the same effect)). This means, the Banker can force them to *die* by the Axiom pertaining to mandatory consumption.

Furthermore, let’s assume that all players agree at some point to a **Supreme Preference for Life Contract (SPFL)** with the following clause:

- “I the Player, so long as I am ‘indebted’ to the Banker (have some *outstanding amount* on loan to him), I will always choose to remain alive – i.e. not *die* – rather than die, if there is some trade

(perhaps to which the Banker is a part and would accept), which I could engage in (so it's not impossible) and which have the direct or indirect consequence of remaining causing me (the player) to advance the maximum moment of 'certain death' from some finite value to at least one moment in its future, I will undertake that trade".

- If we want to be really cynical, as a Banker, we might not even 'ask' the Player to do that which we want – By the above rule and Axiom 4, he would be obligated (automatically forced) to make every effort to discover himself if there is any transaction which we (as the Banker) might be interested for him to do 'for us' (or with us). So it is the player who would keep proposing to the Banker on and on, round after round (in case he has a certain maximum future lifespan at that time-period) just trying to make the Banker agree to something that would extend his (or hers ;)) life. And he might not even know if there exists such a transaction! (That is whether we, as Bankers will be interested to keep that Player alive 'a little while longer' or not).

Note that the Banker could add this SPFL clause directly to the Gold Loan Contract (C) or offer the player to "amend" it at some future moment (perhaps offering something else in return – like the possibility to feed his *child*[which he would necessary need to keep him alive at least one time-period, as the *child* is, by the Axiom, 'born' with no Food, no Gold and no Gold-backed promissory notes, and cannot *harvest* Food without the participation of some adult]) – which only he (or another Adult) could do (since no alliance of children could harvest any amount of Food).

So very close to **T4**, what does the economy look like? Well, more and more players 'get it' that there is a finite moment **T4** that is unavoidable (or at least so it seems) at which they will eventually be forced to accept ANY contract the Banker offers (including any **Agreement to fall under complete control by the Banker (AFUCCBB)**). So many may struggle to avoid this. They will understand the later they run out of Gold or Gold promissory notes, the later **T4** comes. So these players – with others who also 'got it' – might making some trades within their own 'inner group' with as little Gold component as possible (namely **B**) – but this won't help them too much. So they may start doing robberies, kidnappings (who knows, they may even end up as Islamic State in Iraq and Levant – ISIS terrorists), basically anything to delay that moment. OR perhaps they could start doing this only AFTER they were acting under the forceful effect of a Supreme Preference for Life contract (which the Banker might always 'cause' them to do simply by not offering any deals himself).

So close to **T4** (in fact shortly after **T3**), the society would become more and more violent – more and more immoral – more and more deceiving – and all this might happen *despite (against)* every willful effort of all Players committing such acts [which may intensely suffer as a result of doing this they would normally 'rather die' than do [or suffer ☺]] – if they are bond by a SPFL with the Banker they will *necessarily* act so by Axiom 4.

Why does every regular player eventually default?

Well, actually not all players *P* *necessarily* end up defaulting – if for example player *P* never ever agrees (in what ever strict or less strict meaning is used with regard to the Game) to any trades which involve the Banker – then he could (the general assertions of the Game permit it) live happily ever after and never have anything to do with the Banker or the anyone that ever traded with the Banker or was ever affected in any way buy such a trade.

Escaping the Banker's snare

In particular, if **all** the players of the game **all refuse to agree to any loan contracts** (with the Banker if it is certainly known, but better still – **with anybody**), than this strategy of the Banker fails. Furthermore if all players all refrain from **agreeing to any trades** which involve any new player **P_n** with whom they have not priory just agreed to a "*The free will contract*" (TFWC) [because if they just remember they had such a contract in the past – they may actually have a false or incorrect memory]. Better still, **if all players never agree to any trades of any kind which do not also contain as part of them (as part of the same complex trade) a TFWC (The Free Will Contract)**, the Banker can never gain *any* advantage over *any* player. His special nature which causes the contracts he part-takes in to be mandatory is no major advantage under such a system: The best he could do is make players more powerful (in the sense they won't be able to renounce their 'free will' for any future moments). He (the Banker) would, under such a system, essentially just *force* the people to "*act freely*" – *of their own free will and conscience*. However: He still has some advantage over the other players: He cannot be 'hurt' (forced into a trade) by any group of

regular players. If some malevolent immoral player might try to force the Banker into a trade (e.g. try to rob him) – perhaps it could be possible that the Banker makes some kind of oath with himself for something to happen (e.g. have that immoral player eventually propose to him a deal without a TFWC clause!) – and from there he could slowly make more and more players give up using TFWC (as hey – it's clear we'll all 'well intentioned'). However the TFWC could be updated to force players (in case it is actually taken with a Banker) to always be included when a Banker is involved (whether they know this is why they included it or not).

Vindictive Banker

However, still, the Banker could make some contract with himself (an oath) to eventually *gain complete control over the entire society*. By Axiom 4, such a contract would (if his desire is feasible), always act so that it occurs (more precisely – never act so that it certainly *cannot* occur). However, this is also a renunciation of his own (the Banker's) free will: he decides to limit his actions at any future moment. So such an oath would be nullified whenever the Banker agrees to a TFWC contract (by that 'this TFWC contract shall prevail over all competing interests' nice clause we thought of' + 'this TFWC shall be interpreted in meaning above form' ☺). So the Banker necessarily never enters into such an TFWC (not even with himself).

However if eventually, in the World *all players* escape his *temporary* complete control – or more generally they become all bound by some Axiom 4 contract which forever there after grants them *free will* (a TFWC) and furthermore *children* are born with *free will* and can never choose to give it up during their *childhood* periods – and furthermore – their childhoods ends precisely when (or no sooner than) when they had agreed to a TFWC under the effects of Axiom 4. We could impose – by definition – that their childhood lasts this (perhaps long) period. It could be that some children never become Adults (never experience a last moment of childhood) – in which case we need to adjust the $T_{\text{childhood}}$ axiom accordingly.

But:

If at any moment t of the Game (time period), every player has a probability $p(t)$ of having already ended his childhood (under the TFWC definition) or eventually ending it (that is not having an infinitely long childhood), then, by Theorem 11 of this result [5 – Random Walks, Furnicuta – Mircea Digulescu] the probability he eventually reaches Adulthood is 1 (although it is not necessarily a *certain* event).

So if we extend the definition of childhood from above to include all players at moment $t = 0$ (which were previously considered directly Adults), then the probability that even the Banker will become an Adult "someday" is 1.

So even if he took that "*vindictive oath*" (to 'take over the world') while still in Childhood he has probability 1 of eventually becoming released from that oath and – forever thereafter have to choose at each moment "what to decide" [no longer having the 'luxury' of his previous oath – or any oath – dictating his actions].

Continuing this train of thought will certainly lead to further deeper insights.

But for now, let's come back to how the Banker in the original problem might go about to actually take control over the entire population.

So we have seen that there could be cases where it is impossible for the Banker to take complete control over the entire population. But how about when it is certain or at least very likely?

So what will happen once Players start to fall under the Banker's snare contract?

Well, players will take some loans... repay them fully (which means the total amount of Gold in 'free float' in the regular, real economy necessarily decreases)... take some more loans and so on!

He have this theorem:

Theorem 1:

Every situation where there is some outstanding loan to at least some Player P, eventually ends with a set of players including at least {P} agreeing to fall under a AFUCCBB contract with the Banker, or the total free-float (not committed to be given to the Banker immediately) Gold supply available in the real, regular economy decreases by some minimal amount $(1-d)*C$, or both.

Proof: For every any Gold Loan Contract loan taken out on promissory notes, the minimal *amount due* (if the loan is fully repaid the following time period) is $d*C$. Since if no Player falls under the AFUCCBB than (by Theorem 2 which we will prove shortly) than he necessarily repaid in full all debts to the Banker *in some finite time*, this implies that if no player is "caught" that time, the total

amount of Gold an promissory notes repaid was at least $d \cdot N \cdot C$ (if N players eventually took out at least one loan). But the total amount of promissory notes issued was $N \cdot C$. Thus at least $(1-d) \cdot N \cdot C$ was repaid in real Gold from the regular economy (since all redemptions in actual Gold to the real economy “compensate each other” with new loans taken out – unless they were the final redeeming).]

Theorem 1a:

The theorem 1a above can be extended to refer to either real Gold or promissory notes.

Proof: At any finite moment T in time, there will be at most $C \cdot N + G$ promissory notes and Gold together. Taking the above theorem and using “Gold or promissory notes” instead of “Gold” the arguments still hold.

Theorem 2:

If a player P never fully repays back all the loans he ever took from the Bankers in some finite amount of time-periods $T[P]$, he necessarily falls under the AFUCCBB with the Banker in some finite amount of time-periods $F[P]$, if and only if the Banker so desires (more strictly, so acts):

Proof: If player P never fully repays his last loan, there are two possibilities: he either defaults at some point or he always makes at least the minimum payment. Since the minimum payment is growing (exponentially still) Player P will always have to “make good” at least $c_1 \cdot d^t \cdot C$ units of gold or promissory notes. But the maximal total amount of promissory notes and gold ever in circulation (beyond some moment) never exceeds $C \cdot N + G$, since the Banker never offers a new loan to a player already having an outstanding loan (and each time a loan is repaid by someone but another loan is later again taken, the net impact on the Gold supply in free-float in the real economy is a contraction) it means at no time will there ever have been more than $C \cdot N + G$ units of currency which player P could have redeemed (at potentially a single time period). But this first quantity is finite and fixed. However, the sum of all repayments player P did at any previous time period before time T is at least $c_1 \cdot [1 + d + d^2 + \dots] \cdot C = c_1 \cdot d^{(T+1)} / (d-1) \cdot C$. This is a monotonically strictly increasing function (even still an exponentially increasing one). However, the maximum amount of Gold or promissory notes player P ever had at all prior rounds taken together is $G + C \cdot N \cdot t$ [assume that each time by some mysterious happening the maximum amount of gold possible is in a ‘free float’ in the real economy]. There will be a finite time moment $F[P]$ where the first function will exceed the later (thus leading to a contradiction – player P can never repay with something he does not have).

So now what if he defaulted once?

That means he falls under the clauses of being in default. He will always have to demand and get some minimum quantity B of Gold (or promissory notes) for each transaction in which he part-takes. Furthermore, he still hasn’t repaid the loan to the Banker – so he still has some positive outstanding balance. Thus, until he repays *in full*, all Gold-stuffs he gets will be used at the Bankers discretion (i.e. taken away from him immediately). By the following *Theorem 3 (the world eventually runs out of Gold stuffs)*, we have that at some future finite moment, player P will be unable to get Gold-stuffs from anywhere except the Banker (with his approval). Furthermore all Gold that he harvests beyond that time – at any moment – he must immediately pay (before he could use it for any other trades) towards the minimal amount due of his loan. But as that minimal amount due increases exponentially (with positive base), whatever Gold he harvests himself will eventually be insufficient to cover the minimum repayment (otherwise the Banker had chosen a too small a value for C) – proof by induction: after some finite future moment, at any future time period he harvests no more than G gold [by the properties of Gold] during each time period (thus a constant). However if he holds any positive outstanding amount due at that time (which player P can realize for sure that it was his **T3 (“moment of obvious defeat”)**), the minimal repayment due will always grow beyond that value G after some other (quite short) amount of time periods. When that moment comes, it marks the start of the “*terminal stage*” for P : He has no Gold stuff and everything he could ever make is immediately given to the Banker and cannot be used. Furthermore, he has no means of getting new Food. So by the Mandatory Consumption Axiom he will eventually run out of Food too (this stage will call the ‘terror’ (groaza) stage of P ’s life). When he eventually runs out of Food (which happens with probability 1 even if he has some smaller and smaller probability of having to consume at least 1 unit of Food during a time period), he has two choices (or none really if he is under a SPFC clause): to *die* (which by Axiom we said results in the Banker getting full control over him) or to agree to a AFUCCB if the Banker agrees to such an agreement with P in exchange for 1 Gold. Technical details (which can be filled out) aside, P lives will look like this, for sure (if Theorem 3) holds:

- Free barter stage (**TP0 – “P’s free will stage”**)

- Moment of first contract with Baker without a TFWC (**T3p – “P’s potential earliest moment of obvious defeat”**)
- Moment of agreement to first Gold Loan Contract (**TP1 – “P’s stage of Euphoria”**) with the Banker
- Moment of full repayment of the last fully repaid Gold Loan Contract (**TP2 – “P’s Moment of (apparent) choice”**)
- Moment of agreement to the loan that P will never fully repay (before he gets completely controlled by the Banker) – (**TP3p – “Objective maximal moment of certain defeat with regard to P”**)
- Moment of peak Gold / Gold promissory notes harvest for P (**TP3s – “Moment of obvious defeat even to P”**)
- Moment P runs out of ‘free Gold stuff’ – and forever there after (before full control by the Banker) so remains without any free ‘Gold stuff’ (**T4 – “Objective end of Golden Epoch for P”**) – from this moment forward P will start (perhaps slowly) but surely to consume all his Food balance.
- Moment P runs out of food (**T5 – “Moment of Imminent Death for P”**)
- Moment P dies, comes under complete control by the Banker or Both (**T6 – “P’s moment of transcendence”**)
- Depending on the nature of the Banker (if he is benevolent, malevolent, neutral etc.), P experiences the period of his life *under complete control of the Banker* starting at moment (**T7 – “First moment under complete control”**);
- Potentially P might experience a (**T8 – “Moment of being released from full control by the Banker”**) – if the banker ever chooses or otherwise acts to “release P” from full control (for e.g. as a result of some TFWC contracts).
- Potentially P might experience a (**T9 – “First moment beyond ‘last chance’ for P’s existence to ever change in any significant manner”**) – beyond this moment – T9, P’s future existence belongs to a set of experiences (“paths”) for T9 which can be characterized by some property Prop(Set) which can be expressed in a finite number of “information element steps” (e.g. something like a finite natural number for example – but perhaps employing some more advanced concepts, like *Qualic Registers*).
- The first Moment P has ever *died* in a conventional sense [and thus, forever thereafter never will be part of the original Game again – at least not the very next time-period], P has become a selfless-automaton with regard to the Banker [P’s preference, his feelings, his *living essence* are irrelevant for anything that ever happens with regard to him – though he might yet still experience Qualia; P can be viewed for this time forward as just a “tool” for the Banker] or the P’s reality [the Game he finds himself in – or how the old one looks now] is not describable or predictable at any future moments by any and all players in the game not even in the most vague approximation. Or all of these happen. (**T10 – “The universal moment of truth”**).

Note: Note however that from P’s subjective perspective he might believe he has reached the “true” moment of the T1-T9 types any number of finite times in the Game (for example in some cases when the Banker toys with him after having gained complete control over him as early as T3p perhaps - not necessarily directly at that moment, but as a necessary logical implication of the contract he agreed with P and the remaining contractual framework with the rest of the players in the Game). If the Banker was actually a small Banker (i.e. not the Banker Axiom 1 refers to, but, for example some “made” smaller Banker that has strictly less powers than some “larger” banker – or perhaps even the Banker himself – for e.g. that the “larger Banker” will always have final decision with regard to anything the “smaller Banker” tries to do [whether this smaller Banker is aware or not of such a limitation]). However, if true Gold exists with regard to all Players, and Sufficient Condition S1 – (eventual Gold Loan by each player under some circumstance) is satisfied, then, in the Axiomatic framework we defined, the Banker eventually takes control of ALL the regular players in the Game (this applies only to the true Banker – the one referred to in the axioms – if the Game has one; It seems intuitive that the Axioms imply that no distinct-preference Bankers could exist – i.e. there cannot be two entities as powerful as the Axioms imply which can have distinct “agenda” with regard to the set of “regular players” for which they are both Bankers).

It remained to prove this theorem:

Theorem 3 – The real economy eventually runs out of Gold stuffs if any player P has a positive outstanding amount due on some Loan that he never repays and also never runs out of Food.

This more restrictive statement is what we actually needed to be able to prove Theorems 1-2.

Proof: If the Gold the Banker used was true Gold (and not fool’s Gold) then it necessarily respects the Properties of Gold. As such, there will always be just some maximal amount of Gold, **C*N+G** in free-flot in the economy at any given moment (however a large amount of it could

be *harvested* somehow by each player). Since player P starts with some positive amount due, he either keeps making a minimal repayment of increasing value at each time-period, or eventually hits “*Peak Gold-stuffs*”. If he hits Peak Gold stuffs, by the last part of the argument from Theorem 2 he runs out of Food. If he never experiences Peek-Gold [which actually never happens, but to be rigorous we need to prove this *implication* to be able to deduce that its first part is always false], then there is no upper bound on the maximal amount of repayment he makes in some time period which occurs within some finite time. However since the total Gold-stuffs that could ever exist in the real economy is a bounded from above by a constant ($C*N+G$), we obtain a contradiction. This completes the Proof.

Sufficient Condition S1

When the game G is such that eventually (perhaps due to some particular play of the Banker), there is a finite (or enumerable) ordering of regular players P1, P2, ... , Pn, ...

Then if

1. It happens (perhaps by some adequate play by the Banker) that P1 will necessarily need to get into a trade with the Banker *at least a sufficient number of times* $W[P1]$, otherwise he (P1) *dies* (of Food starvation for example). $W[P1]$ is sufficient to be a finite number that depends on the Gold that the Banker uses with regard to P1 (for example let $W[P1] = C*N + G1 + 500$ between the Gold Epoch moments $T2[G1]$ and $T4[G1]$).
2. [This statement is not part of the condition: It is an application of the theorems 1-3] Then P1 will eventually fall under complete control of the Banker: P1 will be “forced” to enter into at least $C*N + G + 1$ trades with the Banker or face *death* – which by Axiom 6 still implies complete control by the Banker. But for each trade, the Banker will cooperate only in exchange for a Gold Loan Contract. Since by Theorems 1-3 each such contract will deplete the maximal total free-float Gold supply by at least some amount (thus at least 1) and there are at least $C*N+G+1 > C*N+G$ (the maximal free-float Gold-stuffs supply between P1’s Gold’s T2 and T4 moments), it necessarily implies that the last loan will never be fully repaid. Furthermore there will be no more free-floating Gold (P1’s Gold) in the regular economy (excluding the Banker). Thus, by theorems 1-3, P1 necessarily falls under the Bankers controls
- 3.

[TO BE CONTINUED]

Work in progress

Daca va intereseaza si putina reflectie filozofica:

1. [This statement is not part of the condition: It is an application of the theorems 1-3] Then P1 will eventually fall under complete control of the Banker: P1 will be “forced” to enter into at least $C*N + G + 1$ trades with the Banker or face *death* – which by Axiom 6 still implies complete control by the Banker. But for each trade, the Banker will cooperate only in exchange for a Gold Loan Contract. Since by Theorems 1-3 each such contract will deplete the maximal total free-float Gold supply by at least some amount (thus at least 1) and there are at least $C*N+G+1 > C*N+G$ (the maximal free-float Gold-stuffs supply between P1’s Gold’s T2 and T4 moments), it necessarily implies that the last loan will never be fully repaid. Furthermore there will be no more free-floating Gold (P1’s Gold) in the regular economy (excluding the Banker). Thus, by theorems 1-3, P1 necessarily falls under the Bankers controls

Note: To be perfectly rigorous, we need to state that P1 requires the Bankers cooperation $W[P1]$ times before some maximal finite moment in the Game. Thus it’s not just that – “Hey, Banker – I will need you to agree to a trade with me in this Game for sure (probability 1 at least), but for any fixed moment m , the probability it happens before moment m is 0 (or somehow “that will almost surely never happen”).” Note that such a situation might be plausible and defined: “I will need you sometime when I have between 500 and 1000 Food.” This event might happen for sure (it could be certain P reaches such a situation) – so not only just with probability 1. However, it could be that P is “smart enough” to allow himself into this situation only after a TFWC with the Banker. If P “knows” that he will eventually get such a TFWC contract, but for any fixed *finite* moment m the Banker has a strategy to avoid getting into a TFWC with P [so whatever m the Banker – or someone – chooses – it is possible to construct a strategy for the Banker such that – given everything that could ever happen in the game before that moment – to make sure he never gets into a TFWC with P1] before that moment m [for example the Banker bound himself to certainly get into a TFWC with P1 “sometime”

in the Game – but without any further restriction], then it is simultaneously true that P1 will *certainly get into a contract with the Banker before some finite moment m* and that for all finite moments m of the game for which he is asked the statement “Will you get into a contract with the Banker before this particular moment m ?” the answer will be – and it will be factual – **“Certainly not!”** (so not only probability 0). For any particular set of finite moments where all moments in that set could be bounded by a above by any *natural p* number the answer is **certainly not**. By reduction to absurdity an yes answer for any such set would imply that if the Banker was patient at least p time moments (and not enter into a TFWC) with P1, he would eventually “win” and gain complete control of P1. However, the set of all such sets of finite moments for any p is finite (a subset of $2^{[p]}$). Thus, the entire set of such sets of sets of moments is recursively enumerable. The Banker could at moment 1 ask himself “will P1 get into a contract with be before, say $m = 1000$?”, the answer will be now. The he asks himself for $m = 2000$, then for $m = 3000$ and so on getting answers to questions of this type (from P1, from some Oracle or from a computer) at each moment p for up to $m=3000p$. Thus we will always get a NO answer, no matter how any times he tries. Furthermore, for any natural number L which si part of a set $L1, L2, \dots$ which tends “very fast” to infinity, the answer for $m = L$ will be 0.

Note benne: Thus the Banker can then say, look “if for any natural number the answer is NO, however it is **certain** that for “some natural number greater than any other fixed natural number” the answer will be **certainly YES**, this is weird: Let $\text{Smaller}(p)$ be the set of natural numbers smaller than that some bound from above on the moment p when P gets into a contract with me. This set $\text{Smaller}(p)$ will be one of the sets $[1], [2], \dots$ of the enumerable sequence of sets $\{1\}, \{1,2\}, \dots$. But, by induction for all such sets the answer is **NO** (strictly). Thus, there is no such set $\text{Smaller}(p)$ for the moment p . Thus for any “bound from above” p the answer to “Is the contract moment $> p$ ” is **certainly YES!** As such I the Banker [n.a.: wrongfully] conclude that p cannot be a natural number (every natural number p admits the ‘bound from above $p+1$) – therefore no such natural number p exists, therefore I know that it is (or at least could be) impossible for me to get into a contract “of the kind I want” (without TFWC) with P1 any time in this Game [even if I never give up on not allowing P to have a TFWC with me (the Banker) – and thus the Game might even continue indefinitely], so long as “I will want to get into that kind of contract – without TFWC.”.. To make a long explanation short: The event **E1**=“The Banker gets complete control of P” **happens only if D1 = “The Player P renounces his determination to never allow himself to be taken complete control over – and thus renounces his free-will from that time forward.”** The event **E2** = “The banker eventually ‘concedes’ to P1 and renounces his ‘gunpoint’ power by granting a TFWC to P1 for example”. In case **E2** happens, perhaps the Banker eventually renounces his original Goal, and cooperates with P even if the Banker thus understands that he might ‘never again’ be able to hold P at such a ‘gunpoint’ where that P **must (it is a fact of reality) eventually enter a contract with the Banker (which the Banker must also agree to) at one of the possible finite times in the Game** – or end up under the Bankers complete control *anyway* (by dying). The corresponding decision is **D2** = “The Banker chooses – acts to grant P1 the TFWC contract, thus removing the ‘gun-point’ leverage he held until then.”

So it is a stand-off! Either P1 must decide D1 or the Banker must decide D2, **or both!** Now one of them might not be “of his own free will” (the Banker might be somehow bound by some long-forgotten oath he made with himself under the auspices of Axiom 4 never to concede in that fashion to P1 at least; also P1 might be bound by some contract with the Banker to never concede in that fashion to some particular **her** (a girl) – which happened to be the Banker here).

But if none of them concedes, than the Game continues for at least another time period (thus if both of them ever entered a Supreme Preference for Life Contract this ‘do not concede to the other’ or ‘don’t give the other what he wants’ might be the only way in which they could prolong their otherwise ‘certain death by some finite time period’).

However, P claims $C1$ =(“P1 will certainly enter in contract with the Banker before some finite [**unknown**] natural number moment”) is **true** and then $C2$ =(“for any fixed natural number m the answer to the question will P certainly enter into a contract with the Banker before some moment m ”) is **false** are in fact mathematically compatible: In some cases when $C1$ is **true**(namely when the finite moment p is [unknown] – for example it is the modeling of the result of a (or some) decisions by a living creature! – about which nothing more *could ever be known* at the moment the question $C1$ is posed) it could very well be that **C2** is also true.

So $C1$ basically states, Given everything we know about everything related to the Universe, to Maths, to everything, the only way in which the modeled state of the game could be constrained as a result of the (partially) free-willed decisions that P1 and the Banker will make at each future moment in the

Game, we can state the following with certainty (whatever might happen in the real physical Universe which is modeled by the game, can constrain the actual future states of this Game only in the following fashion – and furthermore in precisely this fashion):

- P1 will eventually enter a contract with the Banker at some finite moment (i.e. the game will certainly not continue forever).
- It is true that what happens in the Real Universe, could only be modeled in the terms of the concepts of this Game as P1 never “choosing” at any moment **m** to concede.
- It is true that what happens in the Real Universe, could only be modeled in the terms of the concepts of this Game as the Banker never “choosing” at any moment **m** to concede.
- It is true that the object of P1 and the Bankers quarrel is about a statement, which basically is equivalent to **which one of us conceded before the other did**.
- It is true that in the real Universe P1 and the Banker inhabit, they (or the entire Universe) did somehow make it so that no-one concedes before the other (no one is **first**).
- It is also true that they made it impossible for themselves (and the entire Universe) to evolve such that any of them concedes first.
- It is true that **in their Game** the real-life situation which could be understood to mean “they both concede at the same time” would map to a situation that is not possible: By the manner in which they arranged the “decision” moments for one-another **in the real Universe** (for example P1 having “free will” between seconds [0, 2], [8, 10], ... and the Banker between [4, 6], [12, 14], etc.) and by the arbitrary ordering of such “decision points” so that it could translate into the meaning that if one of them decided during some interval *k* and the other during another interval *l*, they found a way to settle “by convention” one of them which then be, by definition considered to have conceded first.
- It is also true that they compelled themselves never to be able to concede if this would make any of them “the first” one to concede.
- So the situation in the real Universe is correctly modeled by the statement “neither P1 nor the Banker ever concede first”

They could also have bounded themselves never to concede at all (doesn't matter if the other conceded or not).

So what ever happens in the real Universe could be described in the game as four bits:

b1, b2, b3, b4

b1 = “Player P1 has ever conceded”

b2 = “Player P2 has ever conceded”

It is true that at any “moment of choice interval player P1 can be interpreted as ‘not having conceded in that moment’” AND the “Banker ‘state of mind’ could also be interpreted in this way” **in the real Universe**

(They don't necessary have to be aware of what is being ‘read’ about their ‘state of the mind’ – or even be aware how they could affect that particular state of their mind – however, what is being read is related to a **sovereign choice** – *something that is a definite result of them choosing* to act in a certain way. Also the way they acted in the real Universe – that they both inhabit – matters! This could or could not be then translated to some piece of data [perhaps limited to represent ‘If in universe U1 this means A’ – in the conceptual model Game if A happened in the real Universe then “00” happened in the Game [by equating concepts])

HOWEVER IT COULD BE THAT IN THE REAL UNIVERSE THE POSSIBLE SERIES OF EVENTS IS A, B, C, D, E, F, WHILE, IN THE TERMINOLOGY OF THE GAME, THESE 6 POTENTIAL STATE MAP TO JUST 2 BITI (4 STATES).

That could be because the Game is just an insufficient approximation of “what goes on in the real Universe”. As such, when information is transferred back from say the player's ‘divine’ phase (complex evolution of their state of mind in some interval of decision) to their ‘reduced selves’ phase (which is also the same as them) they get something like this:

A -> 00

B-> 10

C-> 01

D -> 11

E -> 01

F -> 10

However what if 'heartless' bits 01 are not enough for the Players to make some genuine *alive decision*? So those bits actually have to have some corresponding original state which is transmitted back to the players.

So we might then have (at some particular moment):

A -> 00 -> A
B -> 10 -> B
C -> 01 -> C
D -> 11 -> D
E -> 01 -> C
F -> 10 -> F

However, although the state of the Game (in formalism) can consist of only 2 bits – their Qualic states or processes (P1's and Anca's) which they actually 'felt' at the moment of choice (or – say – for the entire interval between two moments of choice), could have been more than just 4 possibilities.

Furthermore it could be that the Qualias that were relayed back to the in their 'reduced' phases (when they are not almighty) was actually **totally different** from anything they experienced in their 'divine' selves in effect.

So for A they could receive Z. For I they could receive S. And so on.

Furthermore, they could have received states which are decohered: If in reality they had some entangled common state from A,B,C,D,E,F, when projecting to what they got in the Game, they may – in the game – have the false impression they actually have **more** choice than they actually do (i.e. that they could – of their own free will – as they perceive themselves in the game):

If there are 5 possible states (...) which are projected into just 2 bits (which the **rational** player will treat as one of for different possible states), then for one particular states things may seem to evolve *chaotically*: **In particular no Turing-computable algorithm could ever predict (or make ANY characterization whatsoever)** of what might happen at moment *m* in a Game which evolved somehow up until moment *m-1* in some fashion.

As more or more Games are played up until moment *m*, the Turing Algorithm could try to make some guesses about what the set of

Can the Game continue indefinitely (ad infinitum)? Well if P1 and the Banker are automatons (with regard to some "higher" Banker or some strange Banker_continuum which include both of them), perhaps it could be. If P1 and the Banker are - say just Turing machines executing a program to never decide "**STOP THE GAME**" (or have been reduced to this infinitesimal-existence/power) – in the traditional orthodoxy that conceptual mathematical concepts (like a particular kind of a Turing machine) are not living beings in themselves – then yes, there exists a mathematical construct where such a situation (respecting all the Axioms) exists.

It could also be conceivable that in the actual physical universe **MUA** of some two living creatures **P1** and **Banker** it could also be possible that such an ad infinitum game

2. [This statement is not part of the condition: It is an application of the theorems 1-3)] Then P1 will eventually fall under complete control of the Banker: P1 will be "forced" to enter into at least $C*N + G + 1$ trades with the Banker or face *death* – which by Axiom 6 still implies complete control by the Banker. But for each trade, the Banker will cooperate only in exchange

References

[1] — *Mircea Digulescu (2015 April) – Poker Deal Calculator Research Project Source Files* - <http://informatica-computer-science.blogspot.com/2015/04/success-probability-calculator.html>

