Relative Theory of Money v2.718

rev. 1.3.7

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Contents

CHAPTER 1

Introduction to Version 2.718

The reader of RTM 1.0 and 2.0 with some mathematical knowledge on exponential functions have noticed that the version numbering tends toward the number “e”.

This 2.718 version of the RTM brings an improvement on the form and on the signification of demonstrations without changing the meaning nor the quantitative result. This improvement brings a better theoretical definition that can make sense by analogy with other domains than economy registering a deep link with space-time analysis in its temporal and quantitative dimensions.

Most importantly, the limited life span of the observed objects and of the observers appears to us as a fundamental element which is not taken into account sufficiently not only in economy but also in many other areas of analysis.

This improvement on the theoretical part leads also to some general remarks on the form.

The historical part is also augmented with the introduction in the storyline of a lineage of economic thinkers consisting of John Locke, Thomas Paine, Clifford Hugh Douglas and Yoland Bresson.

> “Those who have quitted the world, and those who have not yet arrived at it, are as remote from each other as the utmost stretch of mortal imagination can conceive.
>
> Quelle règle ou quel principe peut-on poser pour que de deux êtres imaginaires dont l’un a cessé d’être et l’autre n’existe pas encore, et qui ne peuvent jamais se rencontrer dans ce monde, l’un soit autorisé à maîtriser l’autre jusqu’à la consommation des siècles ? »
>
> — “The Rights of Man” 1791 Thomas Paine (1737 – 1809)

CHAPTER 2

Preface of Version 1.0 by Yoland Bresson

The Relative Theory of the Money written by Stéphane Laborde is in line with the great French tradition of economic science works produced by engineers like Dupuit, Cournot... until our only Nobel price winner in the discipline: Maurice Allais.

But every science builds a specific language for itself and I fear that economists, as well as the Honest Man of this century, won't grasp all the interest of this theoretical contribution without a "translation".

The "Universal Dividend system" proposed by the author is a monetary system in which money is uniformly distributed between all the actors, individuals of all age or sex, any one of them receiving an equal part of it.

Nearly all of us have already used such a system ... when playing Monopoly™. Indeed, at the beginning each player receive the same amount of money, and at each turn by passing through the start square, they earn some money, each one receiving the same amount. One turn is the base period, theoretically identical for all, except that because of chance, dice throws... the turn passes faster or slower and money gains then get different between players. Note that the equality of the monetary donations does not prevent the appearance of winners and losers according to their individual choices and the opportunities of chance.

Nowadays, in our reality, the distribution of the money supply does not correspond to such a system. It is created and distributed under the form of debt through the banking system, which answers the money demand from the citizens by lending them far more money than the banks themselves detain, at an interest rate greater than the one they have to pay for when supplying themselves from the Central Bank, the one and only true emitter. So the country has at its disposal this monetary supply called M3.

One should clearly distinguish the money supply - which is an available stock of money, all the time present, fixed except for additional monetary creation - from the income flows in money that individuals capture through economic activities and exchange: the money supply generates the flow of the revenue, which when summed up for a year, is traditionally evaluated as the GDP. This link which seems trivial is in reality very subtle, as we shall see later.

So the author seeks to answer to the following question: which rule should we adopt for monetary creation, and at which rhythm should the money supply grow, in order to institute a system with Universal Dividend, where the money supply's density, meaning its distribution among individuals, would be uniform in space and time ?

He assumes a stable population in number with a given life span. That is, he admits a zero demographic

growth: there are as many births as deaths and no migrations. In this case, the life span corresponds to the duration at the end of which there is no individual from the old generation left. The population is totally renewed since the setup of the new rule ; the density is now uniform for everyone, whatever the density prevailed at the origin. The Universal Dividend system, the one in which each individual receives an equal part of the money supply, is completely realized.

The answer is what the author calls "the Optimal Universal Dividend": the money supply must grow annually according to a "c" factor, which of course is inversely proportional to the life span – meaning the duration of the population's renewal rate, or the time to put the system in place completely – and that money surplus must be equally and unconditionally distributed among all population members. This "c" factor is roughly equal to 5% for a life span of 80 years.

How can we deduce from this the unconditional amount to assign not in money supply, but in monthly income flow, an "existence income",here totally consistent with its definition: an income distributed because one exists, as a member of the community, and not in order to exist ?

If we compute, as the author does, for Europe, 5% of the M3 euro mass divided by 330 millions Europeans citizen, we obtain 1515€ per person. What does that mean ? We must create 5% of additional money this year and distribute it on the next 1st of January by giving 1515€ to each European citizen and not create any more money during the whole year 2011.

Do it again on the 1st of January 2012, 5% more ... and so on each year so that in 80 years everyone would possess an equal part of M3 at that time. This method would only be applicable if: only one money emitter exists, the ECB for example, creating the additional euros whether in notes, whether by crediting the accounts of all individuals and by imposing the exclusive usage of "100% money", as Maurice Allais wanted, so the banks could not lend more than the amount they hold in their deposits.

Such a setting would correspond to an institutional Big Bang. A monthly attribution of income, an existence income, seems to be a less traumatizing implementation for our institutions.

How to Go from Money Supply to Income?

If we simply divide the 1515€ in 12 months, we implicitly suppose that money supply takes exactly one year to generate a total flow of revenue equal to itself. By the way, it is the way I defined the "economical Unit of Time", the single norm in which the switch from the mass to flow can be expressed everywhere without distortion. Indeed, depending on the country or the times or circumstances, expansion, recession, a particular monetary supply circulates faster or slower, supporting more or less frequent exchanges, together with higher or lower monetary values. In one civil year the sum of the flows can be worth three times the monetary supply. The Economic Unit of Time does not correspond to the real time unit. With a GDP that would be equal to $3 \times M3$, the economic unit of time would be roughly equal to one quarter and one semester if the GDP equals $2 \times M3$.

In reality, the GDP varies between two and three times M3. So the 1515€ should be divided by between 4 and 6 months to give the monthly income. For Europe, we obtain approximatively 300€ per month and per person of Universal Dividend or rather Existence Income to be in conformity with the economic language: a dividend is given one time, in principle, extracted from a stock, the money supply in this case, whereas an income is a regular flow coming from monetary exchanges.

It is remarkable that Stéphane Laborde's theory meets the one of Time-Value up to its very measurement, since its universal dividend for Europe closely matches the existence income computed from Time-Value which is evaluated today at around 350€ for France.

These two theories, “Relative Theory of Money” and “Time-Value” converge to build the foundation of a new paradigm, a new vision of economy. Based on them, the architecture of a new social organization – more respectful of the equality we must imagine – could be elevated. I have personally attempted to propose one, establishing consequences of an existence income or a system with a universal dividend, to follow the author, by publishing “Une Clémente Économie” (in French). But this essay is neither exclusive nor definitive. The “Relative Theory of Money” which is offered to the Libre Community of cybernauts is an invitation addressed to it, in a total sharing of creative ideas, to imagine, then to materialize another world.

CHAPTER 3

Introduction to Version 1.0

My experience of economic activities over the last 20 years, ranging from volunteering to entrepreneurship including earning wages, in a system ridden with crisis, which reached its climax in 2007, pushed me to take an interest in money. Until then, it had not stricken me that these social and economic issues could be linked to the very nature of the code which yet governs all exchange activities.

The models applied throughout the financial world are based upon prejudices about the nature of value, and in 2010 are highly influenced by the theoretical developments of quantum mechanics, not for the structure of money, but rather to estimate the risks associated with investment.

Yet, and this is undoubtedly the main contribution of the Relative Theory of Money, we must take into account the challenges of globalization which bring billions of people into developing monetized exchanges, as well as the historical imbalances within intercontinental trades.

However, for this global scale, such ideas should be linked not to Quantum Mechanics, but rather to Relativity, which are the most relevant to get to understand what doesn't work and to try to bring about the necessary mutations.

An analysis based on the direct economic experience, coupled with a study of the mechanisms of the current monetary system, made me understand that the latter relied on pre-relativist concepts and upon a deep asymmetry, in which centers of monetary issuance are anomalies that are sources of bias.

This book's aim is not to define the monetary system as it exists, but rather to define what would be an fair currency within space-time, as well as what I call "Relative Money" in that it can only be defined relatively to every independent measurement frame of reference within the system: the element which is linked to every individual citizen within the concerned economic zone.

We will see that it is the fundamental notion of an expanding field of value that allows the comprehension of the economic evolution viewed from a global angle, and which forces us to define a currency, not only by encompassing the economy as it is in the here and now, but also as it will be for future generations. Such an undertaking not only implies redefining the monetary system in accordance with the principle of Relativity (which is a principle of symmetry), but also allowing for an interpretation of the historical economic phenomenon from a new point of view, with new concepts, and therefore a new causal interpretation.

I will finish this introduction by stating the great inner surprise I felt when I discovered the Universal Dividend as the central paradigm of relativist money. I wasn't really prepared for this conclusion at the inception

of this reflection.

At the same time, and I will come back to this, my astonishment was even greater when I discovered Yoland Bresson's "Time Value" works. Even if the differential equations he proposes differ in their form from those which I established to describe the same notion of value field, we found exactly the same relations between global and local measures. I consequently did not have any problem to translate them into my own theoretical reference in order to understand them.

Whilst Yoland Bresson's process derived from a theorization of economical exchanges, and mine from a theory of a relativist money, the fact that both approaches lead to a similar result have merely consolidated my conviction of the great relevance of this result, and that is why I asked him towrite the preface of the Relative Theory of Money.

I wished to synthesize the essential conclusions to which I was led, these are moreover profusely illustrated on the website http://www.creationmonetaire.info.

I wish that the Relative Money Theory helps in establishing the most equitable economy possible, and which would be truly beneficial to all its players; present and future.

CHAPTER 4

Reading Advice for Version 2.718

As a 2.718 version comes from feedback from version 2.0, I specify that theoreticians who are comfortable with general theoretical formalization notions, as well as mathematics (at least differential and integral notions), economy and money can without difficulty start reading in the established order.

But for others, it could be more fruitful to start with the history part which starts at the chapter “Zooms on money history” (see the table of contents at the end of the book), and then read the theoretical part. The reason is that this part is without doubt more pleasant to read for the neophyte and additionally it will give you an appreciation of the order of magnitude of the phenomena treated here.

We talk here about Space and Time, and the phenomena that occur in the areas of economy and currency. We must realize that the scale which serves as a landmark to all things we are dealing with here exceeds a human life span, although it has direct consequences on everyone’s life. And without measuring the extent of this scale, there is a risk that one may not grasp entirely the importance of small accumulated changes over a long period of time.

CHAPTER 5

Definitions

We can not validly study economy without relying upon both a landmark and an exchange reference measure, in the same way that in all science, the considered landmark and measure units should be defined before any study.

As a reference and time units as well as length units are necessary to the establishment of the laws of physics, no advanced study can be conducted without previously defining the economic reference frame and the associated measure unit.

5.1 Reference: Monetary Zone

An economic zone or a monetary zone is the base frame of the economic study. What characterizes it?

- The space where the monetary agreement is manifest
- Time, that is to say, the average life span of individuals who live and die in it.
- Individual or collective (entrepreneurial) production of goods and services
- The exchange of goods and services between individuals or groups of individuals.

Individuals or groups of individuals are inevitably brought to exchange, even if it is only information, education, or even more generally bonds. What therefore fundamentally characterizes the economic zone is all the individuals who compose it. The economy exists everywhere and at all times as soon as individuals produce and exchange goods and services, and that regardless of the nature of these goods and services. On the other hand, we cannot define an economic zone empty of individuals. Therefore it is indeed the individual who constitutes the only common and fundamental value of any valid economic frame.

But to go further, this set of individuals evolves in time with births and deaths, immigration and emigration. Therefore the economic zone can be seen as a discretized space-time in constant creation/destruction where each temporary point represents an individual with a limited life span.

Thus it is a spatiotemporal model in continuous, non-static, discreet transformation, where each space-time point is created at a determined date (birth of an individual) and has a limited duration which, on average, matches the life span which we will denote “ls” in the considered economic zone.

Furthermore and this is the fundamental definition of Relativity in economics, any individual has a personal and unique vision of the value of all things and no individual or groups of individuals from an economic zone is able to impose onto others a particular vision of what is value or what is not.

5.2 Pseudo-isolated economic zone

An economic zone is said to be pseudo-isolated when, for a given time duration, we can consider that it lives independently or quasi-independently from its exterior. It could be the case of economies on islands that are still autonomous, where the livelihoods of individuals is ensured by a sufficient food production (which is also quite relative, see for example the case study of some ascetics), but also the case of a topologically complex group of individuals in a non-connected, transnational, even transcontinental space. As long as it shows autonomy, we can consider it as a pseudo-isolated economic zone, able to self-manage its flow of production and exchanges, at least on a small period of time.

5.3 Value measurement: monetized exchanges

When there is exchange of goods and/or services, we talk about value exchange. X exchanges with Y a value Vx = Vy = Px × Cx = Py × Cy, where "Px" represents the price in the common measure unit (called the common currency) of X's production "Cx".

This definition of value is perfectly relative to the observer who measures it, so if X considers that Vx = Vy, it is possible that Y considers Vy >> Vx, and be perfectly fine. Furthermore, Z who observed this exchange may very well judge according to his own referential that neither Vx nor Vy have any value at all.

Let's remember here how much men have fundamentally not agreed throughout their history on respective values of their goods. Therefore equality of exchange values is not an economic criterion that is independent of the observer, which is also seen through actions of donations or taxation without anything in return, and which are therefore non-symmetrical, where equality of exchange values is not respected according to the point of view.

The need to measure value universally pushes individuals to agree on a common measure of exchange, which they call money. A defined money give thus a common measure of value to all things in the same unit, for a given observation landmark, which allows easier comparisons.

Money thus acts not only as an exchange tool between individuals of the economic zone, but it also becomes the only value that is independent from the observation landmark.

This being said, many different definitions of money exist historically and locally, which are based on radically different types of exchanges, and which are often not known by those who accept to use it.

Those cases of ignorance of the nature of the money that is used most of the time under pressure, are a violation of the basic contractual law in economy, which supposes the acceptance of involved parties of the proposed exchange type.

We can without hesitation declare that imposing the use of a non contractual money (not subject to a voluntary acceptance) is an act opposite to the Human Rights to manage one's life on an economic part as well as

a violation of the constitutional principles of liberty and equality.

And thus at a minimum in a real democracy, the official money can really be acceptable only if it is subject to a democratic elaboration of its definition, as in its validation, its acceptation, its modification and it abandonment.

CHAPTER 6

Formalization

6.1 Relativity principle

The principle of relativity as defined by Albert Einstein postulates that *"the laws of physics are identically expressed (have the same form) in all and every referential"* (inertial frames of reference or not). We call it also "principle of symmetry" or "covariance". The principle does not mean that the observers measure the same thing, but that the laws of physics that are established must, following their transformation from one to another frame of reference, have the same general form. So the measures are very different from one observer to the other, the only invariable one is the speed of light.

As for economy, I have extended this principle to the notion of money, *"money, as a universal code that rules economic exchanges, must work identically in any frame of reference"* and of value *"any individual is free to estimate what is value and what is not"*.

In economy, any couple observer/frame of reference is an individual within his monetary zone, and principles must be valid and have the same form, in whichever space-time position is considered. It is about applying the 1 st article of the Declaration of Human Rights regarding the equality of rights between individuals, applying it not only to the code that rules the common currency, but also to the relative measure of all value, which is also the understanding of individual's freedom of choice regarding value, at the level of its production as well as its exchange.

In other words *"no individual must be privileged regarding judgment and measure of value"*.

6.2 Liberty, Value, Money, Coordinate system

We cannot either establish a coherent theoretical overview without having specified the fundamental liberties it refers to. Those liberties are missing from the classical theories for the wrong reason: they ignore them.

6.2.1 a) Freedom

Freedom is defined as a symmetrical principle: no nuisance to oneself and to others.

6.2.2 b) Value

We refer to "value" as any economic good that is physical or non-physical, energetic, spacial or temporal. For example, we can attribute a value to a fruit, electricity, a software, a terrain or a teaching. The principle of relativity denies any absolute measurement of value. Any value fluctuates relatively to the individual that uses it, produces it or exchanges it, and thus fluctuates in the considered space-time.

6.2.3 c) Money

Money is a common accounting and exchange tool to all citizens of the same economic zone (by extension we could say "universal" as long as we are aware that it is within the scope of the considered monetary union).

6.2.4 d) Currency union

One monetary union (or economic zone) is defined as a sovereign space with its present and future citizens. It is thus a local space-time.

6.3 Axiomatic

The principle of freedom must comply with any present and future individual and allows to define the three fundamental economic freedoms in form of the following fundamental axioms:

6.3.1 a) Freedom to access resources

Any citizen is free to access resources.

6.3.2 b) Freedom of production

Any citizen is free to produce value.

6.3.3 c) Freedom to exchange "in the money"

Any citizen is free to exchange with others "in the currency"

As freedom is defined as non-nuisance, we must not fall into the basic and logical error which would consist in interpreting the economic freedoms as the freedom to violate others' property or to produce or exchange outside what is permitted by Law.

So how can we interpret the "resources access freedom"? We must interpret this under the angle of non-nuisance as in the "Lockean proviso":

"When someone appropriates an object, there must be enough of it in common left for the others and in similar quality".

For example, one does not have the right to seize the only source of water of a desert, without ensuring that a minimal access to water is guaranteed for everyone.

6.4 Open (Libre) Code and Free Monetary System

An open code as defined by the free software world consists of an open-source code of a computer program, modifiable by its users. This principle of "freedom of code" is fundamentally compatible with the principle of Relativity, because if the Laws are independent of the frame of reference, it means that they are neither hidden, nor inaccessible via experimentation wherever we are.

But money is actually a hidden proprietary code, in the sense that money is controlled by rules not democratically modifiable (essentially the rules of Basel I, II and soon III, which are established in no way through a democratic process), and the operations made through the Banking system concerning the emission of asymmetrical credits are not transparent. The historic crisis of the "Subprime lending" with its peak in 2008 is the latest illustration of it.

According to the consequences of the "digital perspective" revealed by Olivier Auber, the choice of a system implies the choice of the code that rules it, and that is not neutral. We have then to question the transparency and the legitimacy of the code.

It implies that the freedom of the code which rules the system (here money, which is the code of all economic exchanges), is a prior concept to the choice, if not there is simply no choice, therefore no freedom. According to that criteria defended by the inventor of "free software" Richard Stallman, if you accept to use a system where the code is not free, you deprive yourself of fundamental freedoms.

The consequence of a monetary system with a hidden code is the emergence of an economy where the value field is an auto-reproductive and unstable pyramidal structure. On the other side the consequence of the usage of a free monetary system is the emergence of an economy where the field of value is a spherical structure in space-time expansion, compatible with the renewal of generations.

However, we will make a difference between the software freedoms as defined by the Free Software Foundation (FSF), which are four in number, and those linked to the freedoms of a communication or exchange protocol such as money, which cannot be modified individually without cutting oneself out of the community that uses it. So for the free software, the freedoms defined by the FSF are:

- Freedom of use
- Freedom to access and to read the source code
- Freedom to modify the source code
- Freedom to copy and distribute

Which are different from the four freedoms that have to be associated to an open monetary system:

- Freedom of democratic modification
- Freedom to access resources

- Freedom to produce value
- Freedom to exchange “in the money”

Examples: In 2011, the Euro cannot be considered as a money of a free monetary system because its code (the treaties on the monetary code) are not modified by a democratic process.

We can speak about the Euro as a currency depriving of freedoms, or as a proprietary monetary system, *at least* in the sense of the first freedom, and even more according to the fourth freedom as we shall see later.

Another example: gold. We can talk about gold as a *monetary candidate* which does not respect *at least* the third economic freedom to exchange *“in the money”*, for the simple reason - that we will develop later - that it is not universally accessible within an economic zone. Such a “currency” that forces one back to barter where it is not present, cannot have the characteristic of freedom “to exchange in the money”.

And this is why the RTM makes the difference between a specific value and the money as *“measure and medium of universal exchange”* inside the monetary union.

It is quite the same role that the speed of light plays in Relativist physics. Light is not a physical object like any other objects. Its speed, data of space/time (a distance divided by a time) is the same in any referential. And it is because observers agree on this point, that they deduce the relativity of the other measurements to establish a relativist theory compatible among them, giving different measurements following different frames of reference, but having the “same form”.

6.5 Summary

We now have the following foundations:

- Principle of Relativity
- Freedom of democratic modification
- Freedom to access resources
- Freedom of production
- Freedom to exchange “in the money”

CHAPTER 7

The "Three Producers Problem"

The necessity to define a common currency being given inside the community of individuals, despite their fundamental disagreements regarding what constitutes value or not, a fundamental problem remains for the definition of this currency. It can be reduced to solving the following time-space "Three Producers Problem":

- X, Y and Z respectively produce Vx, Vy and Vz values.
- X wants to acquire Vy, Y wants Vz, and Z wants Vx.

We can see that the exchanges cannot be bilateral, but must be circular. Furthermore as it is perfectly possible that X grants no value to Vz, Y to Vx, and Z to Vy (relativity principle), none of the produced goods and services can be used as a common metric. This is the fundamental argument that implies that the currency must be defined on a basis that is independent of the produced values by each individual.

The problem also exists in time, where the individuals, productions, services and needs will evolve in nature and will progressively be replaced or disappear. It is not less necessary for individuals to be able, at all times, to trade appropriately each other's production in order to satisfy their respective changing needs.

So, not only *"in space"* (for a short time of evolution "dt") values are not commonly recognized by producers and are the object of circular exchanges, but *"in time"* the individuals and the produced values change radically.

Nevertheless, for a time that is short enough, we observe some stability. So, there is a continuous evolution of economical parameters, including the currency we want to define, which allows the present producers at any moment, and at least for this short period of time, to agree on the stability of their circular exchange tool.

Also, as we shall demonstrate in what follows, and to be coherent with our fundamentals, only a purely mathematical quantification of exchanges, independent of all references, goods and services, is acceptable for our actors in the "Three Producers Problem".

This result doesn't reduce the value of the money because its total quantity, although purely mathematics, is limited in all instant. The purchasing potential of this money is limited by the prices beyond which the producers would not be able to exchange their productions because of a lack of money.

The problem being posed, we are going now to browse and analyze the solutions that we considered, before addressing the actual relativist solution.

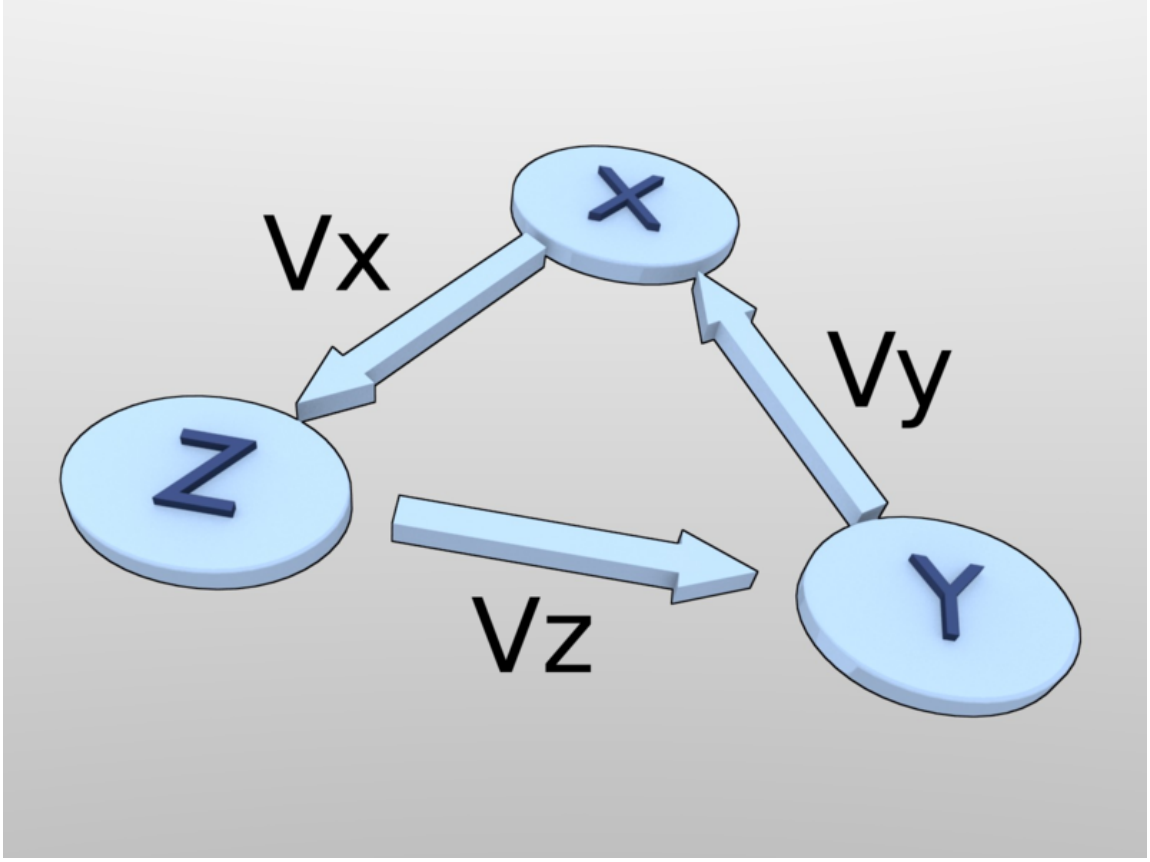


Fig. 7.1: *For a small "dt" time unit, individuals X, Y and Z coexist, produce and exchange stable values. (Luc Fievet RTM 2.0)*

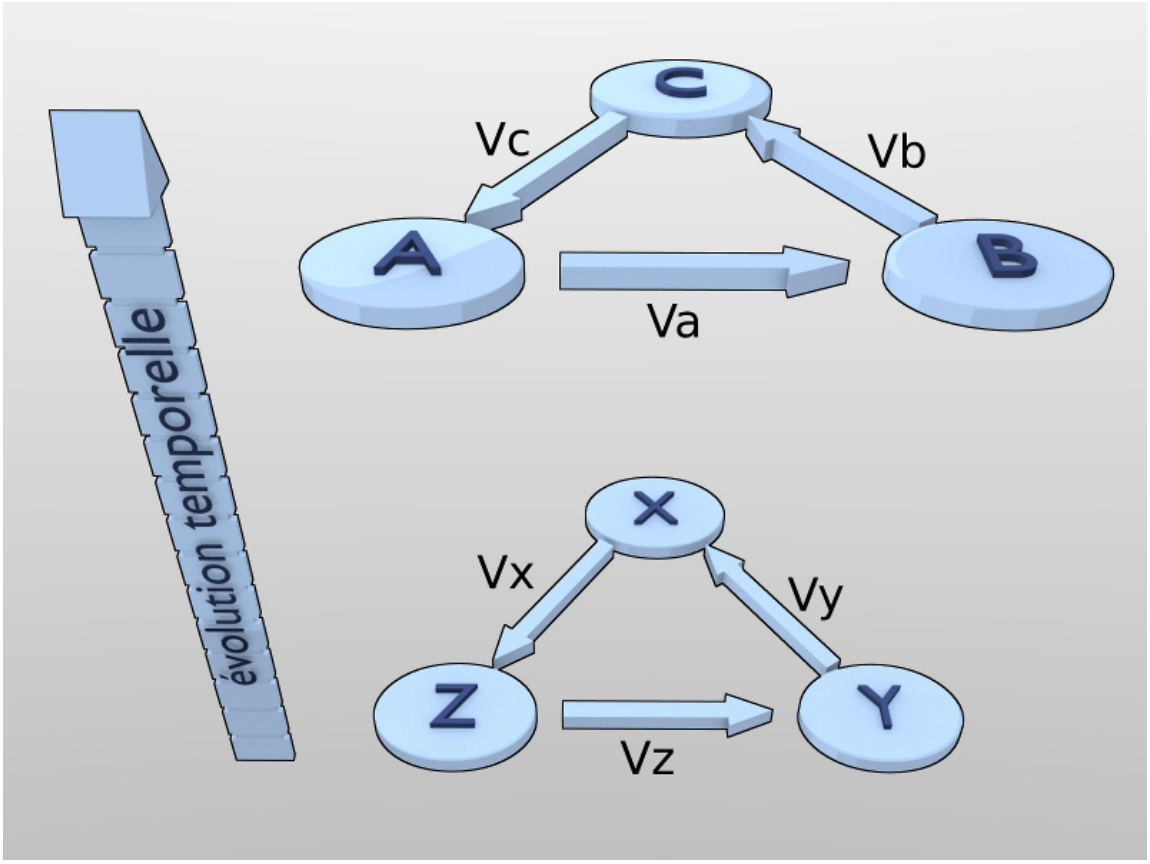


Fig. 7.2: *The "Three Producers Problem" gets more complicated when after some time, they die and they are replaced. (Luc Fievet TRM 2.0)*

CHAPTER 8

Reference Value Problem

The reference value is an old economic problem at the basis of many important crisis, due essentially to the misunderstanding of the "Three producers Problem".

The reference value consisted in imposing to the actors a currency whose production was controlled by the producers of a specified property, for example rare metals, which obviously gave them a considerable advantage since they new how much money supply would be available for the future, as well as its control, at the expense of other actors who didn't have this information, and then suffered the arbitrary shortage or overproduction of that type of money for their economic exchanges.

If on the other hand, and it is in majority the case, that reference value has no real utility in a pseudo-isolated economic zone, it has no other fundamental role than to quantify the exchanges, and can therefore be very advantageously swapped with a pure mathematical measure.

Some tenants of reference value object that at least with that value it is difficult to cheat regarding monetary creation, since one must add material value. This is false as history showed that even though it was based on a reference value, money has gone through inflationary or deflationary pushes, has caused bankruptcies and economic crisis because material "proof" has not been respected. It is not a matter of guarantee but a problem of transparency, trust, as well as ethical and equity respect, that are at the core of trust in a common money.

Also the reference value is not producible everywhere and at all times depending in its scarcity and exhaustion, which implies periods of monetary influx or scarcity, a phenomenon that doesn't fulfill the temporal symmetry condition of monetary creation toward future generations. The generation that decides to adopt a currency of such nature does it at the expense of next generations, which will be imposed a money that has become rare and essentially possessed by the first entrants or their direct inheritors. It is a factor that blows away the freedom of the future humans by blocking their possibility to access resources to produce and exchange "in the money".

Numerous direct proofs exist showing that economic values are not judged the same between successive generations.

Let's take a specific example: in 2010, information technologies and telecommunication networks have taken a tremendous part of the globally exchanged value in the economy without common measure to what existed in 1980. But it would be a mistake to think we should today arbitrarily create more money insured with that

value, since the value that will prevail in 2030 might be more fundamentally different after the judgment of the generation present at that moment. It would be simply like taking a decision in their place, although they are for the most already among us and manifest in their way their will to transform the economy from their own point of view.

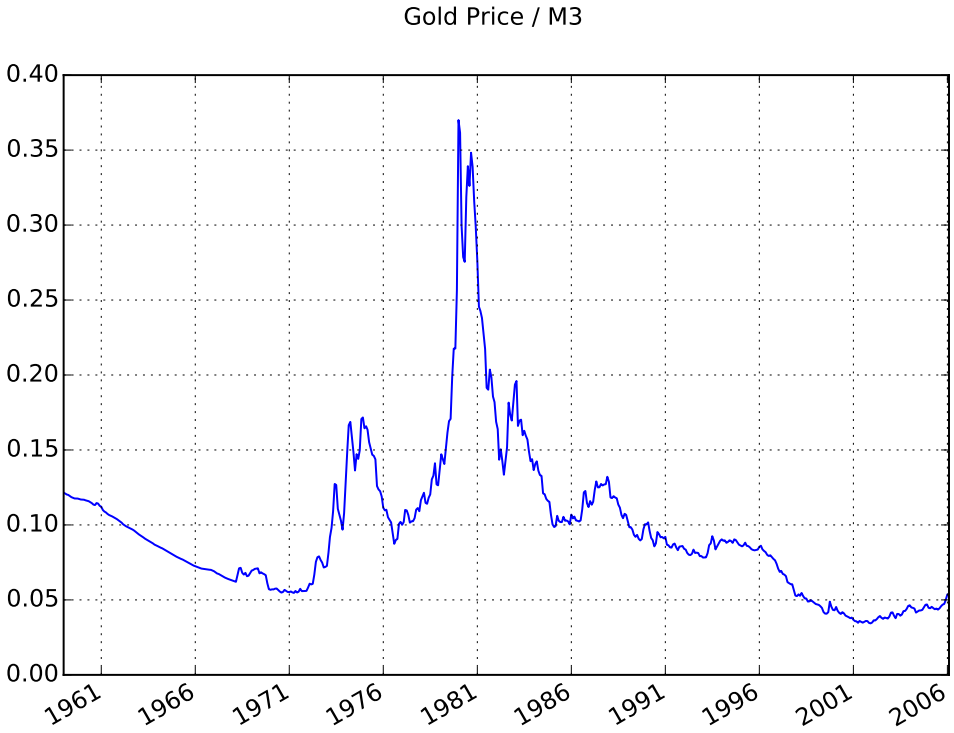
Another example taken in the past: when we see the relative value of gold, we can see without any possible doubt, for the generation of 1980, it was very clear that this metal was of a big value. But in 2010, and even if gold facial value has broken its historical records when compared to the total sum of the money in circulation, it weights less in the economy, while still being an exchanged value.

This doesn't mean that this specific value cannot evolve to new relative summits, but rather that it evolves in a non correlated way from the issuance of the fiduciary money which is independent from it, at least partly. So, creating a separate currency doesn't require any specific value, apart from the only one which is fundamental and universally present in space and time inside the economic zone: the human being.

Better: the definition of one reference value as a forced money is a fundamental bias that denies relativity of any value that any individual has the right to judge independently of his fellow citizens.

Also it is not surprising from the point of view of the Relative Theory of Money that in 1971 the standard gold has been abandoned for a totally dematerialized currency, whose growth is controlled by a Central Bank and by a set of rules restraining the capacity of the private Banks to emit credits.

However, the "money-debt" system, while being a step ahead from a system of reference value, remains biased by the granting of centralized credits on arbitrary volumes and values to the detriment of a large part of the present and future population.



"Ounce of gold / Money Supply M3 in the USA ($)" ratio evolution from 1958 to 2010.

CHAPTER 9

"Debt-Money" Problem

If we say that X is putting himself into debt (negative balance sheet) to credit Y, who can then pays Z, who finally pays X, we have a partial solution that creates a fundamental problem regarding symmetry.

9.1 a) Spacial symmetry is not respected

If it is "X" who owns the right to get in debt in the first place, according to "Y" and "Z" there is a huge equity problem. Besides, we can say that the production of every of these values does not need to wait for a specific point of monetary emission to circulate. Value exchanges can and must start independently of any specific point, under the risk of blocking a part of the economy (here the exchanges between Y and Z).

9.2 b) Temporal symmetry is not respected

Even if imagining that X, Y and Z are initially all credited at the same time of a fixed quantity of money, what is the situation for A, B or C who will come after them in the economic system? Their respective exchanges of values being totally different from those of X, Y and Z, should not suffer either from a unique emission done in the past, and whose distribution would be excessively concentrated here or there (or could even have fled out of the local economic zone), thus blocking their exchanges without sensible reasons from their point of view.

9.3 c) Enslavement through missing interest

One algorithmic demonstration enlightens us on the fact that a debt-money with asymmetric emission is sufficient, if we respect its principle to the letter, to ensure the endless enslavement of some people by others.

B = Banking system

H = Humans

Interests owed to B by H are 5% / year. In (1) is created the emission of a new "debt" by B, constituting then the "money" credited to H. In (2) the 5% are reimbursed, then eventually spent in (3), and then it's a infinite loop.

(1) B: -100 | +100 => H +100 | -100
(2) B: -100 | +105 => H +95 | - 100
(3) B buys for 5 to H 1 hour of work
(4) B: -100 | +100 => H +100 | - 100
(5) Go to (2)

Choice #1: infinite loop. H is infinitely enslaved by B who earns 5% per year without working, while H has to work for B to get them back. The problem here is not so the missing interest than H working eternally for B. B has then no interest (pun intended!) in H really reimbursing his debt. He will call "reimbursing" the only fact to pay him that eternal annuity.

Choice #2: if on the contrary B does not spend the 5% per year but stores it, skipping step (3) (or only spends a small fraction of it and stores most of it), then there is a real missing interest in the economy. H finds himself more and more into debt, and after 20 loops we find the following situation:

B: -100 | +200 => H +000 | -100

At that moment (H) will not be able to reimburse during the next cycle. He goes bankrupt, defaults, or a negotiation takes place. B has then a huge stock of money, he profits from a purchasing power multiplied by an economy in deflation (since during all that time the economy will have suffered from the progressive rarefaction of the circulating money). He then buys everything he believes will be the economic base of the next cycle at the best price.

Then the cycle will restart on the base of a new generation of humans. B recreates enough money for his own benefit, which he will lend, at a level of creation high enough to make the old money mass negligible. Indeed one never starts from scratch in (1), but on the base of a pre-existing monetary supply, that will for example be 1 of 100 created unilaterally on false premisses, a pseudo-contract whose terms are not given.

All of this is only possible because H ignores the mechanism that nobody tells him. If on top of that this mechanism is going on for a lifespan or more, a new human H recently born, to which nobody would have explained that mechanism, would eventually be able to only become aware of that subtle phenomenon late in his own life.

Moreover, and it's not the least of the essential points of the phenomenon, we have to warn that we see in 2012 a confusion between the common "debt-money", issued by the political collectivities alleged to represent the citizens, and private "debt-money". Both wear the same **name**. But if we distinguished the money created exclusively under that "debt" form by the political community from the one issued by a private group, without giving them the same name, the mechanism would not only be more respectful of the logic it pretends to apply, but the rise of individual consciousness of the phenomenon would accelerate.

So it is then staggering that when it is about protecting trademarks the law would be non-negotiable while being about counterfeiting the universal exchange tool we accept the fact that a group of private enterprises call with the same monetary sign what is only it's own "debt" emission, as if they shared the same brand, and that we use this same brand, with the same acronym, for the debt emission of the political community. Imagine once that a beverage would be called "Coca-Cola" while being produced indifferently by General Motors or Pepsi Cola and that the State itself would use that acronym to emit another beverage and would use it as reference to ensure the economical exchanges compatibility. Which political community would accept that? But it is exactly what this confusion concerning the common money has produced. One should then not be surprised by the final chaos which that false logic, that unacceptable principle, can bring humans into.

9.4 Conclusion

That "solution" is thus not a valid one. It needs to be banned, because it doesn't respect the symmetry and the equity of the reference frames compared to the proposed solution.

Additionally, it just thrives on the confusion that tends to generalize the notion of "debt" to a same and single acronym, forcing the whole political community to share the losses, because it is ignorant of the emission mechanism of issued debts by diverse actors and nevertheless pretending to be called using the same accounting sign.

In conclusion, "debt-money" is a system instituting a profound asymmetry regarding monetary creation, which is not contractually acceptable inside a democracy respecting human rights. Logically the recognition of the equality of judgment of all economical value implies **the symmetry regarding the creation rules** of a currency that would be really common (which does not mean equality regarding possessed goods or accumulated money through exchanges).

We must understand here the distinction between the monetary creation by a "debt" toward an arbitrary center, meaning the fact that some actors located spatially or temporally have the exclusive privilege of issuing money, creating an asymmetry toward the other actors of the present and future economy and the debt contracted with one possessing pre-existing money. It is indeed the main point condemned here.

CHAPTER 10

Solutions

A *spatio-temporal symmetry* (the application of the relativity principle) is thus necessary, which enables the circularity of values' exchanges, ensures a temporal continuity, which is non-discriminatory inside of the spatio-temporal reference frame, taking into account present and future while also limiting the quantity of money so it is both stable and a non-null exchange potential.

Is it even possible? Yes!

As we'll see, not only the solution categories are perfectly determined but we can find one optimized solution.

10.1 a) Solution Classes

Monetary creation solutions respecting spatio-temporal symmetries imply that the money mass "M(t)" chosen by the actors is a mathematical mutual credit (not a debt), so without dimension and not linked to a specific value.

Symmetry conditions and thus of freedom, will permit us to establish the required differential equations to determine solutions to the "three producers" problem.

10.1.1 A spatial symmetry

No reference frame or individual present at an instant "t" is privileged regarding new money creation. We obtain then when "t" is constant:

$$\frac{dM}{dx} = 0$$

dM represents money variation, and dx the spatial dimension and so with the definitions given in the previous chapters, the switch from one individual to another.

We are referring here to a notation and a reasoning as a physicist, but we could also have noted it in a more mathematical notation:

$$\frac{\partial^2 M}{\partial t \partial x} = 0$$

Everyone can then better understand the spatio-temporal symmetry invoked here according to their own usual notation and thinking referential.

10.1.2 A temporal symmetry

Every generation is established in the same economical way during all of its limited lifespan "ev".

No generation is privileged over time. All individuals positioned at the time immediately following "t+dt" have to be credited with a relative part of money in the same way and in the same relative ratio than the individuals positioned at the time "t" and so in a continuous notation:

$$\frac{dM}{dt} = cM(t)$$

Or again with a discrete approach (dt = 1 time unit):

$$M(t+1) = (1+c)M(t)$$

"c" then represents the relative ratio or the relative variation of money during a small unit of time "dt" (we will see later what "small" means in our reasoning, when we will address the notion of lifespan).

The relative amount of money created must be then relatively constant at all times, thus respecting the temporal symmetry and allowing the participation of individuals of all generations to the same monetary system while respecting the three economic freedoms and the principle of relativity in the whole considered space-time.

This brings us to the fact that the "Three Producers Problem" is resolved by only one class of possible solutions. These are the exponential solutions (or "power" functions):

$$M(t) = M(0)e^{ct}$$

It is also written as a power of (1+c) in the form:

$$M(t) = (1+c)^t M(0)$$

Concretely this means that for solutions that are coherent with the three economical freedoms and the principle of relativity, anyone of the N(t) actors of the economical zone existing at a date "t" is emitting a same relative part of money, a "universal dividend" (UD) that is valuated as:

$$c\frac{M(t)}{N(t)}$$

In other words: the growth "c" of the money supply "M" is relatively stable and distributed symmetrically between all present and coming actors. These solutions with Universal Dividend ensure the respect of the

relativity principle. The density of the money is guaranteed at all times as well as in space, avoiding that way the extreme monetary droughts (sources of deflation), as well as the extremes of the excess of monetization (sources of local bubbles or hyperinflation).

Money is created in a continuous way consistent with the continuous replacement of the generations and the growth of the chosen money supply, “c” is equitably attributed in space (the whole individuals) at a “t” instant whatever “t” is, which is the only way not to harm the economical actors both present and future ones, which we can also call “flow of individuals”.

So it is indeed the space-time factor, and more accurately the temporal dimension (generational), linked to the limited duration of the life of individuals, that changes the nature of the definition of the currency. So we need to avoid the fundamental error which is to consider all current actors as a “permanent” quantity. One must understand that it is a flow of individuals in perpetual renewal, and that in that flow there is no reason to favor any of them regarding the monetary creation in the whole economical space-time hereby determined.

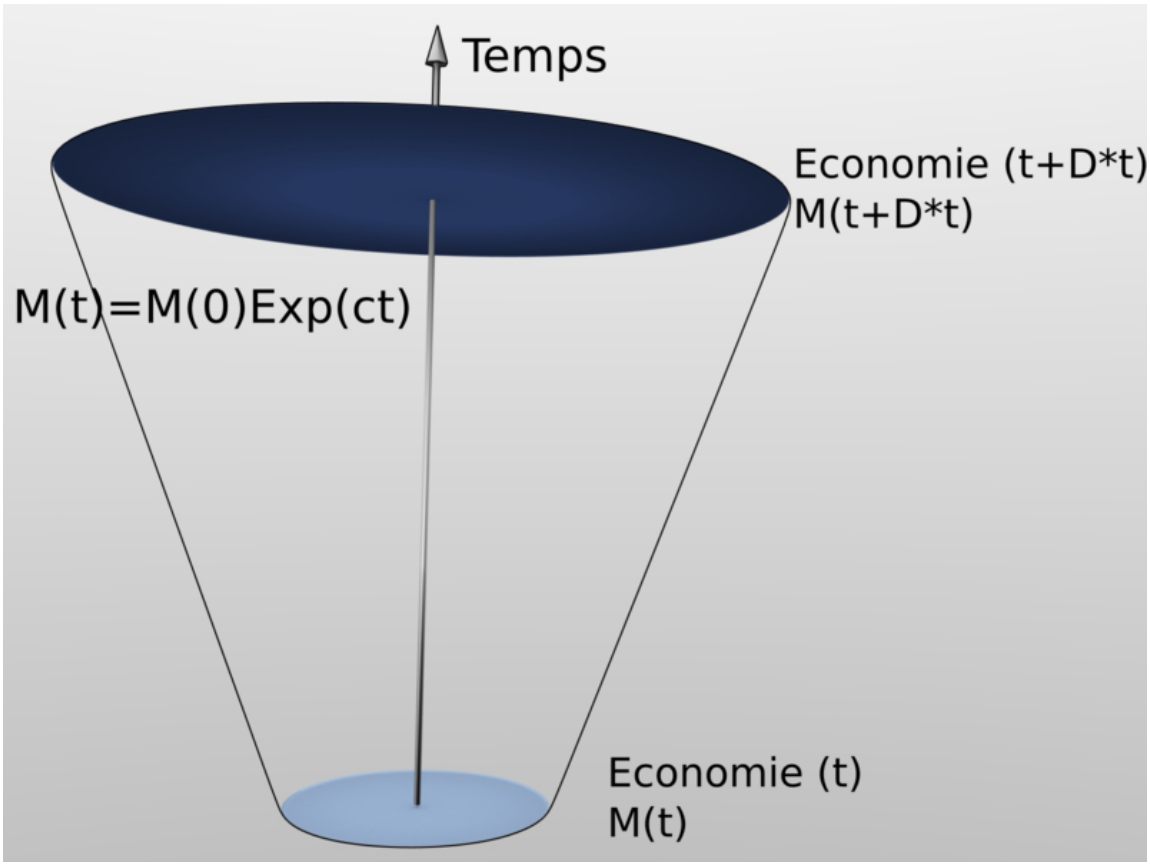


Fig. 10.1: *(Luc Fievet RTM 2.0)*

“c” is the Universal Dividend factor, it represents a part of the total money supply existing at instant “t”,

created for every member. That monetary part allows them to exchange their goods and services in a independent way from the previous monetary creation. That same part must be small enough in order for the pre-existing money to be maintained at a stable value.

It would be wrong to understand here that the money supply should be "an exponential function". We have treated here only the theoretical case of the "Three Producers Problem", perfectly replaced in space and time. Therefore we should only keep the fundamental instant result, namely a universal dividend for which we are going now to establish the limits and coherent framing values.

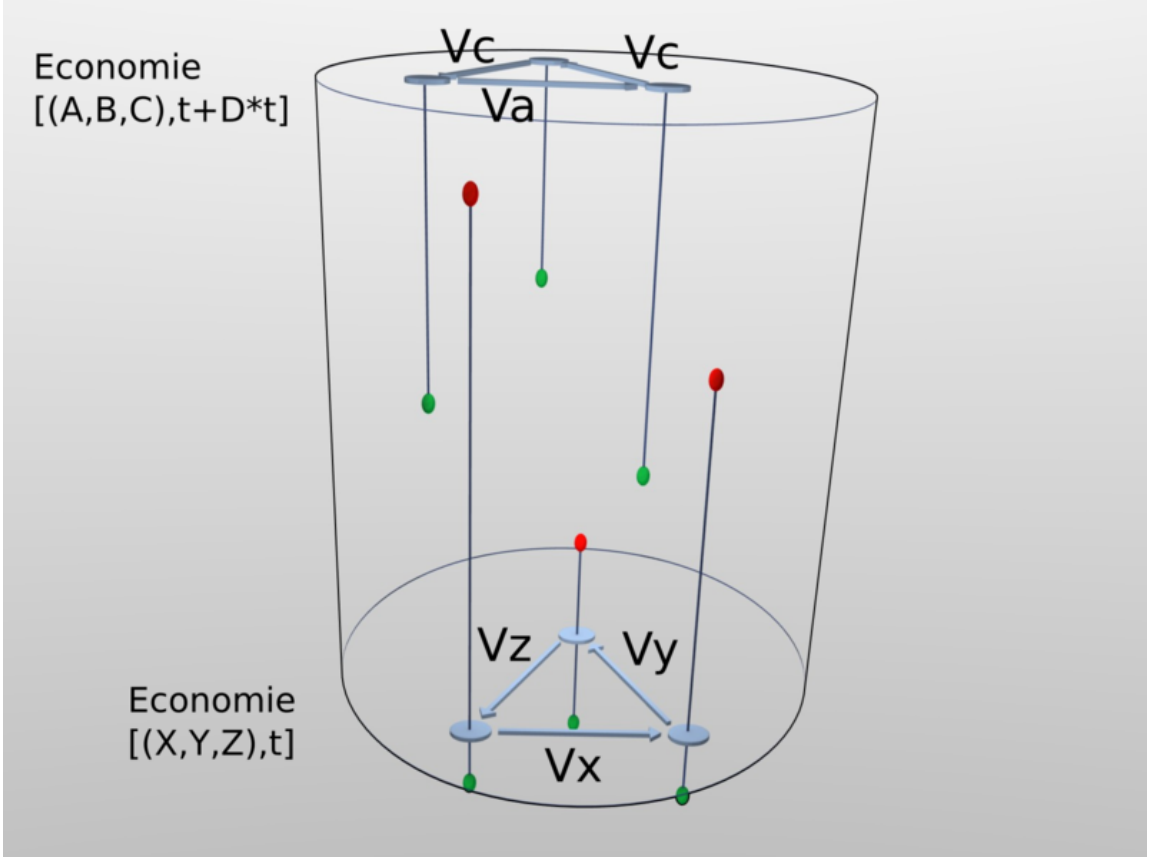


Fig. 10.2: *Green elements represent the births, in red the deaths of individuals, the vertical axis is time (Luc Fievet RTM 2.0)*

10.2 b) Optimization and Life Expectancy

It is possible to find a fundamental relation between the Universal Dividend "c" and life expectancy. Indeed, to make it simple let's consider first an economic zone composed of N(t) members with N(t) being stable in time and having an average life expectancy "ev". Let's observe at first how the living generation is positioning itself toward the flow between the generations that are already dead and those that are to be born.

If we imagine now that a unit of time passes, we must also see how individuals closer to "ev" go from life to death and those who are not yet born but soon to come to existence, as well as the transition from one time coordinate to the next of all those that stay alive.

To make an analogy, you can think of a fountain that always looks the same seen from a distance although its droplets of water disappear step by step with time, passing from the positions of those that are at initial projection at its base to those falling back in the pond. It takes a given time (the life span) for a drop of water to go through the whole "life track" by following the stream of the water jet, which itself seems immutable.

Once this observation is understood and put together with the previous results, we can then pose as a fundamental relation that the creation of the money supply during the whole past life expectancy should only be represented at the instant "t" compared to the existing money supply as the tiny fraction of individuals of that nearly disappeared generation but still present in the temporal height in the proportion of 1/ev.

We have to establish that:

$$\frac{M(t)}{M(t+ev)} = \frac{1}{ev}$$

Which implies:

$$\frac{(1+c)^t}{(1+c)^{(t+ev)}} = \frac{1}{ev}$$

Which gives us for c:

$$c = ev^{\frac{1}{ev}} - 1$$

"c" being small we mathematically demonstrate (limited development) that it can also be written as:

$$c = -\frac{1}{ev} ln(\frac{1}{ev})$$

Or more simply:

$$c = \frac{ln(ev)}{ev}$$

These last three expressions (E1), (E2) and (E3) being equivalent.

As we have noted before we cannot be totally satisfied with this value because the center of the temporal symmetry is placed at ev/2 and not at ev. It is thus here a minimal value for c, that goes in the way of giving the advantage to the leaving generation (the older ones). The same reasoning for "ev/2" gives us a value in accordance with central symmetry:

$$c = \frac{ln(ev/2)}{(ev/2)}$$

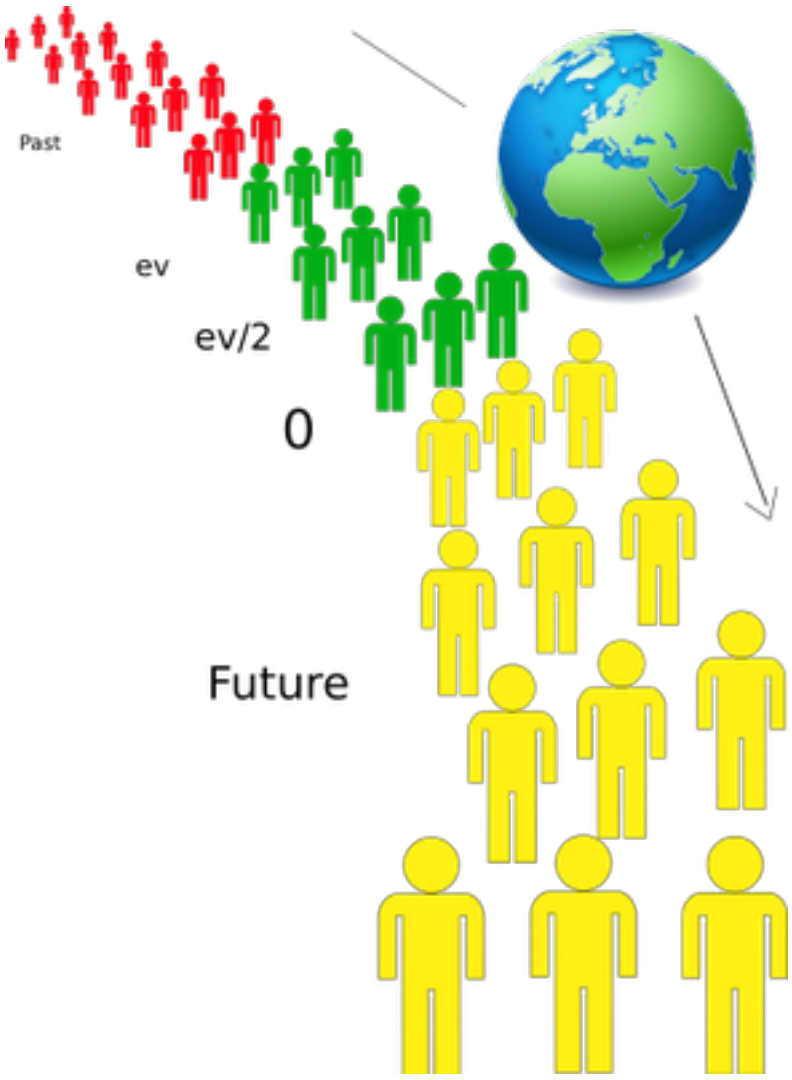


Fig. 10.3: *In green, the living generations at "t". We must see and understand on that diagram the temporal height of existence "ev" and its center of symmetry "ev/2"*

Fig. 10.4: *Fountain (wikimedia)*

It is important to note that the time unit used in the calculation is not neutral, because it is linked to the regular distribution of the universal dividend in the economy. And this rhythm is not neutral for the economy. We choose the year as a fundamental economic unit because of experimental data that gives to the solar year a fundamental economic rhythm due to the annual harvest cycle as well as holidays.

Let's note that money is quantitative when we use it, its continuous aspect being only an appearance (see the analogy of the fountain). Therefore, the computed Universal Dividend is quantitative. Having bounds of relative values is completely coherent with a stable quantitative UD which is recalculated and increased only when it is likely to exceed the acceptable bounds of its relative value. This remark is important and needs to be analyzed deeply. This is what allows a project of free money compatible with the RTM (like OpenUDC and uCoin - TN: currently Duniter) to use a fundamental, and yet simple and understandable, rule to arbitrate indefinitely between quantitative and relative value.

10.3 Conclusion

We can now conclude and completely write the fundamental result of the RTM:

**The monetary systems which are compatible with the principle of relativity and the three economic freedoms are monetary systems with a Universal Dividend whose value is a proportion "c" of the money supply which depends on the average human lifetime of the considered economic zone. The equation to calculate the UD should then be similar to:

$$\frac{ln(ev)}{ev} \leq c \leq \frac{ln(ev/2)}{(ev/2)}$$

The contraposition is then also a fundamental result of the RTM:

"The monetary systems which do not integrate a universal dividend are not compatible with the relativity principle and the three economic freedoms"

To clarify it even better, we could also add that a universal dividend which would exist but would be too weak or too strong, outside of the defined ranges, on a too long period, thus favoring a generation over another (new, old, anyway!) would not be compatible with the RTM either.

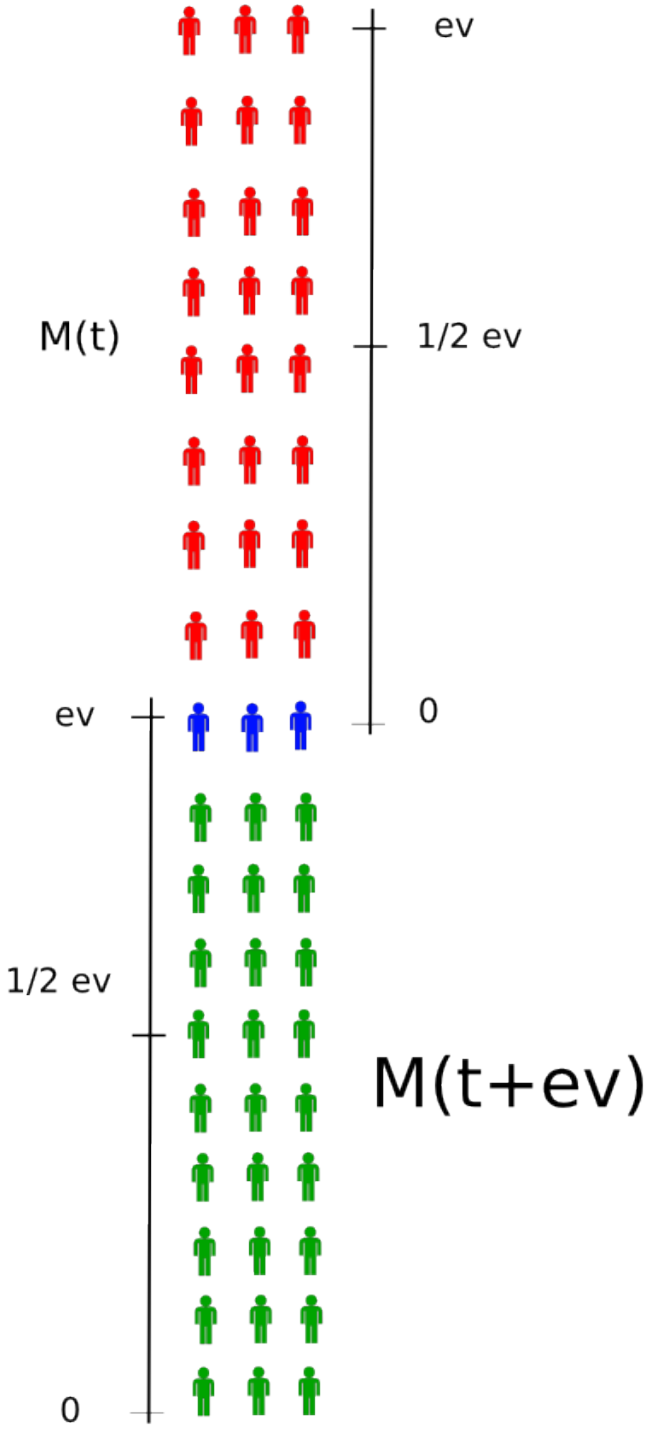


Fig. 10.5: *The generation shown here in blue represents only 1/ev of the whole living people, has contributed to the monetary creation of the previous generation for M(t) during all its existence even if the money supply in place is M(t+ev)*

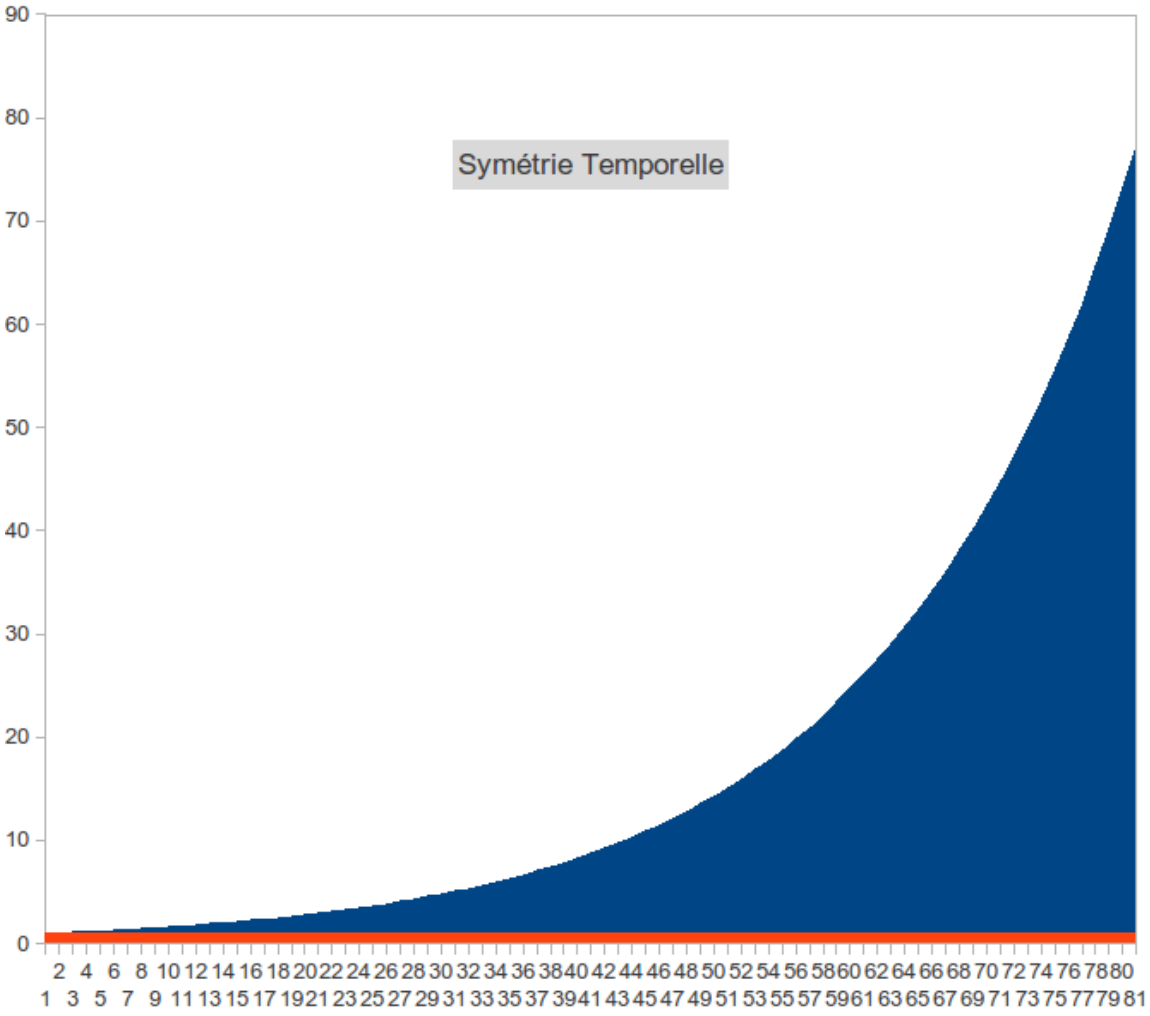


Fig. 10.6: *After 80 time units, the previous generation represented by 1 at t=0 will account for only 1/80th of the existing money supply*

This last point is fundamental because there is a great temptation for the living to claim excessive property rights on the living area, thus violating the freedoms of their successors. History is full of these violations of fundamental principles, which inevitably lead to rebellion on the long term.

We could remember that the Universal Dividend is almost inversely proportional to the life expectancy of the considered economic zone (ln being a function which varies very little).

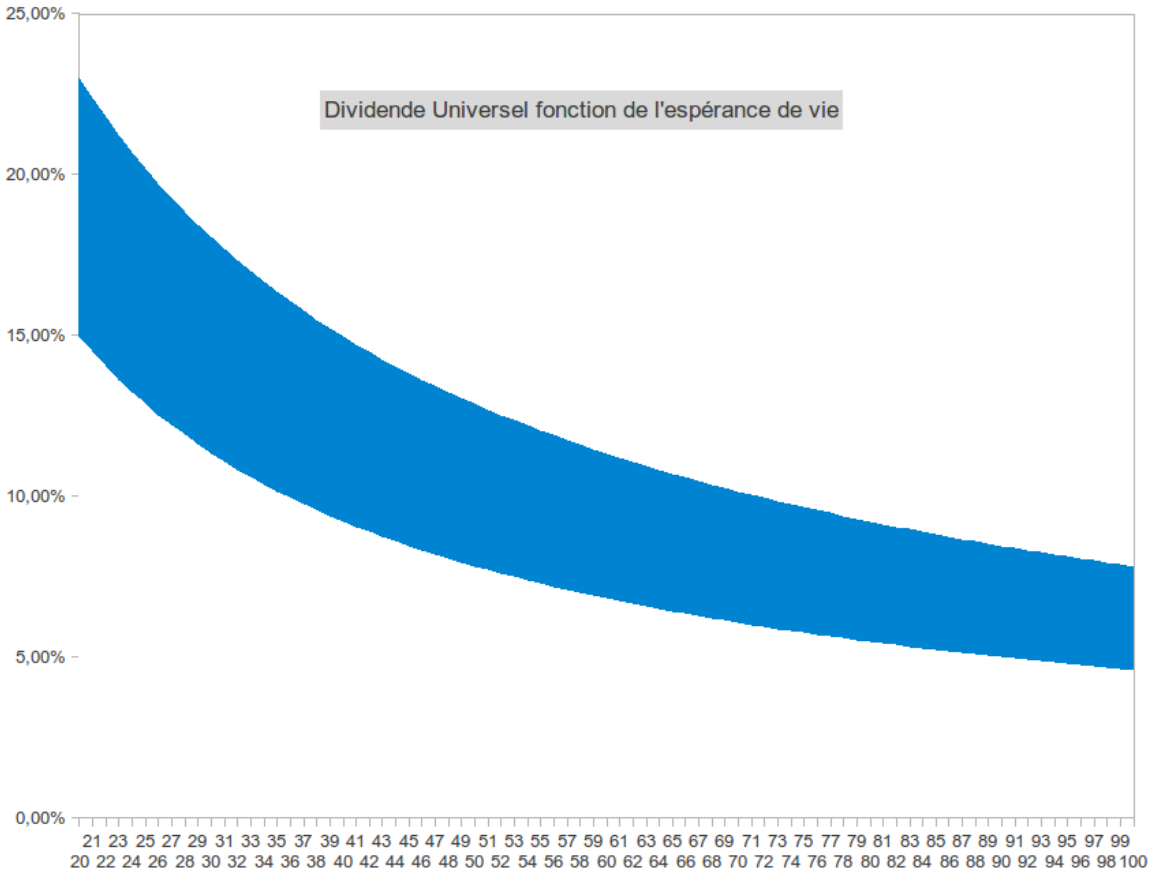


Fig. 10.7: *Acceptable values (in blue) of the % of universal dividend depending on the life expectancy. At the bottom of the colored area a too weak dividend will have a tendency to favor outgoings, whereas at the top a too high dividend will have a tendency to favor newcomers*

These results conclude our main theoretical development.

CHAPTER 11

General Considerations

11.1 Some Orders of Magnitude

An economic zone like the Euro one has an average life span of eighty years in 2012, we obtain:

$$5,48\,\%\,/\,an \;\leq\; c \;\leq\; 9,22\,\%\,/\,an$$

To already give an idea of orders of magnitude, we can make a comparison with real data from 2010. Take the example of the Euro Zone with 10,000 billions of Euros and 330 millions of citizens, the optimized Universal Dividend would be included between:

$$DU = \frac{10000000/3305,48\%}{12} = 138/mois/citoyen$$

and

$$DU = \frac{10000000/3309,22\%}{12} = 232/mois/citoyen$$

Which means between 552€ and 928€ per month for a family of four individuals.

Reality shows huge disparities within the zone regarding the existence of a minimum individual income since in France or in Germany we conditionally reach 450€ per month per individual (condition of age, of resource, etc.), compared to countries like Romania or Bulgaria, where there is a minimal salary of 130€ per month per individual, and without money allocated individually.

We are, in Europe, in a case of high spatial asymmetry which results in the creation of high disparities and a transfer of economic activities from countries with high individual monetary allocation (which are discouraged to produce goods and monetized services), to the countries with almost no individual monetary allocation. This essentially implies that equality between individuals is not recognized within a common economic zone.

If the ins and outs of monetary creation had been presented to the individuals of this community, and thus their own approval had been required to organize this common currency, they would have realized the encountered difficulties regarding ethics, fairness and symmetry of monetary creation, and they would surely not have accepted it in such conditions.

In the USA, the optimal universal dividend is calculated for about $ 15,000 billion in circulation and 310 millions of residents for a 80 years life span. It would be between:

$$DU = \frac{15000000/3105,48\%}{12} \approx 221\$/mois/citoyen$$
$$DU = \frac{15000000/3109,22\%}{12} \approx 357\$/mois/citoyen$$

With these remarks, we will see later that the installation of an Universal Dividend can be progressive and does not have to be fixed to a given monetary state to be organized. The given numbers here aim to explain the mechanism, and to give orders of magnitude at the moment the calculation is done. One must not forget that the money supply is not a fixed quantity, it evolves in space and time, and any measure must only be understood as a local and instantaneous snapshot.

NB: In addition, Yoland Bresson points out that the GDP is between two and three times the money supply at various stages, and we may consider that an unconditional basic income could be based on two to three times the Universal Dividend, that is in 2010 approximately 400€ per month per citizen in Europe, or $600 per month per citizen in the United States. We then make the difference between the Universal Dividend as an individual monetary creation and the Basic Income, which includes the Universal Dividend and a share of redistribution. We can also apply the temporal symmetry principle not only to the immaterial circulating currency but also to the property rights of the prime matter in a more global way, which leads to at least double the transmitted value in time if we consider that money reflects the existing value. But this consideration is beyond the frame of the RTM itself.

These remarks associated to a range of possible values for "c", give a range of acceptable values in 2012 for a Basic Income (and not only a Universal Dividend) between 200€ and 800€ per month per Citizen for Europe and $300 to $1200 per month per Citizen in the United States. This data from 2010/2012 is obviously to be calculated again depending on population, life expectancy and money mass variations.

11.2 About Value

The argument that the money supply's inflation would be unethical, because it would depreciate what individuals own doesn't hold when confronted to both a global and a local analysis.

First of all, the consideration of life expectancy and fair monetary creation toward all generations discards the argument from a temporal point of view before our descendants who shouldn't be excluded from the process for our benefit.

Then, even from a local point of view the argument is flawed before a subtle analysis.

Let's consider an individual or an individual collective "X" among the N of the economic zone who owns a fraction f of the entire money supply. X receives therefore a fraction of the dividend c / N which means that his ratio of personal monetary "gain" is:

$$G = \frac{NouvelleMonnaie - AncienneMonnaie}{Anciennemonnaie}$$

So:

$$G = \frac{(f + \frac{c}{N}) - f}{f}$$

And thus:

$$G = \frac{1}{N}\frac{c}{f}$$

That means that his ratio of personal gain G will be greater than c if he owns less than M/N of money, it will be equal to c if he owns exactly M/N money, and less than c if he owns more than 1/N of money.

It therefore depends on the currently owned quantity of money that one can estimate to benefit or not in monetary terms.

Numeric example: A owns 50, B owns 200, there are other individuals in this monetary community and the money supply is 1000, for a community of ten members. Let us assume a life expectancy such that the UD is 5% per year.

The Annual Universal Dividend allocated to anyone will be 5% × 1000 / 10 = 5. A will have then 55, and B 205. Locally, A has benefited of 5/50 = 10% of additional money, instead of 50 / 1000 = 5% and B owns 205 / 1050 = 19.52% of the money supply compared to 200 / 1000 = 20% before the distribution. B has seen his share of money reduced because he owned before the distribution more than 1000 / 10 = 100 of money, whereas for A, under the average, the opposite happens.

However, if X owns more than M/N of money, which is more than the average, the money supply that he doesn't own will be, on average, per individual, mechanically less than M/N, so the prices adjusted downward due to local deflation.

Thus, although his quantity of relative money won't grow as fast as the global mass, he can benefit from lower prices. In addition, if he owns less than M/N of money, the prices could have a tendency to increase for the opposite reason, and what was won relatively to the money will be lost relatively to the values.

In relative theory where analysis includes the relation between parts and the whole, Local + Non-Local = Global. This means that everything chosen individually has an opposite effect on the rest of the economy. If the money is hoarded, it is a force that tends to lower prices where the money becomes scarce, and if the money flows, it has an effect which tends to raise them (at constant levels of production, excluding innovation. Innovation prevents the comparison in time, cf. the principle of relativity).

Finally, value is obviously not money. The value for which X can aim for, includes the goods he owns, which includes admittedly the money, but also the goods he could buy with his money, as well as the money he could get by selling his goods.

Thus, the arbitration that X can make could depend only on his personal choices about the quantity of money he wants to include in his goods or not, the good he wants to hold, sell, or buy, and certainly not only the quantity of money he owns. Moreover, in an innovative economy where the members are encouraged to create new goods and services, what will be value tomorrow is to a large extent totally unpredictable.

Also there is no certainty possible about what should be done in order to "protect" one's capital, which is also here a purely relative value ("Le Douanier Rousseau" - TN: a French painter who died in poverty but whose paintings are now worth a fortune - would be surprised to know the estimation of his capital carried

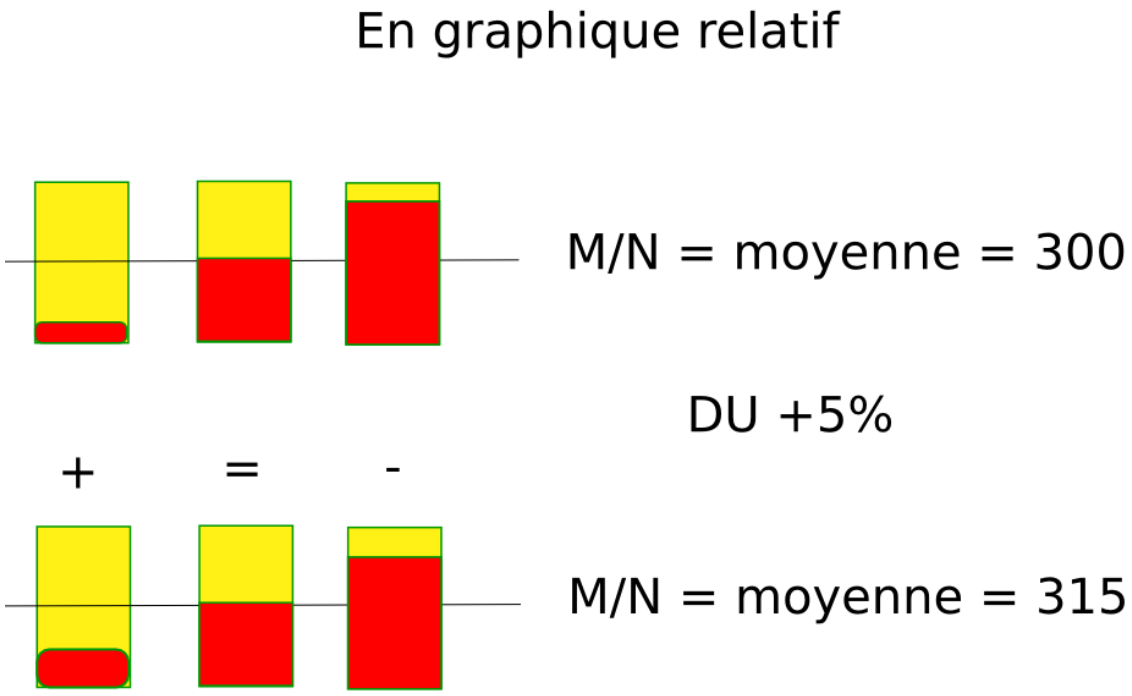


Fig. 11.1: *Graphical example with three individuals, having a monetary distribution of 300, before Universal Dividend, then after. The evolution of their relative situation is different depending on the relative share of money owned by each of them.*

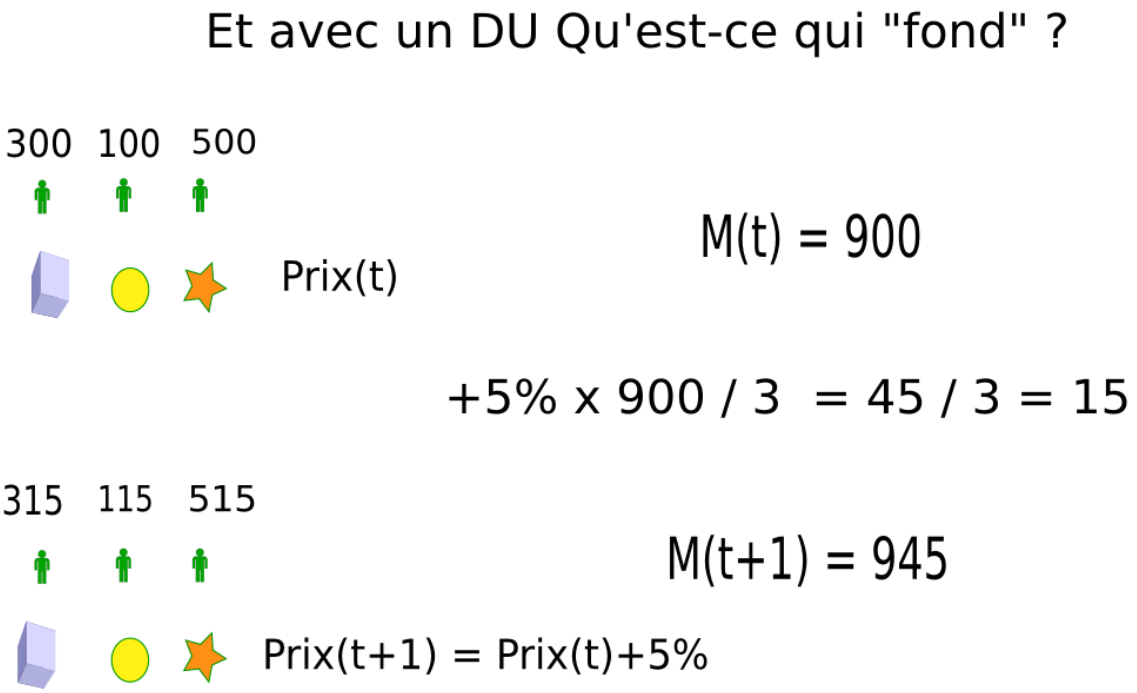


Fig. 11.2: *But furthermore, before and after the distribution of a Universal Dividend, prices of the non-monetary goods can evolve too. There is, thus, no possible, simple and generalizable conclusions about the monetary distribution, if only that it is not favorable nor unfavorable for all, all the time, but its beneficial effect or not depends on the concerned individual and how the monetary surplus will be distributed on one hand, and used by the individuals on the other hand.*

out in 2010, and Maxwell even more if he still owned "intellectual property rights" on his fabulous theory on electromagnetism).

Moreover the Universal Dividend is without absolutely no prejudice, in terms of personal gains or loss, regarding "value". It is the individual choices which determine the impact of the money supply's increase on the individual basket of values.

11.3 About the symmetry of the value brought by individuals

One should really understand the symmetry argument in its entirety. Members of an existing monetary system have benefited from the initial monetary creation, but are not necessarily "rich" of this particular money. They are most of all rich of the goods, the skills, the fundamental nature of the human being able to trade with his siblings and to have a unique opinion about what is value or not. Yet the value which exists inside this community of individuals has no reason to take priority over the value estimated by the future newcomers.

This is true both spatially and temporally. That is to say that when two communities decide to integrate with one another, and so to merge their money, one should not take precedence over the other in terms of monetary creation per individual, and when a generation replaces another, one should not suppose that values realized by the next generation would be less legit than the previous.

That is why it is a relative theory of money. There is no individual referential privileged regarding the measure of value, each individual constitutes an acceptable reference to get a measure, and only the money, contractually admitted by the members of the economic zone is a common measure of value.

It is the same as in relativistic physics, we have between two relative references only one common measurement standard which is the speed of light, from which observers agree, and transform their view of the phenomenon (time, space, etc.) in relation to the chosen reference. Yet this measure, although common, is not "absolute" as a result of the expansion of the Universe. The speed of light in relation to the volume of the Universe decreases over time.

It is the same for the money coming with a growing economy in space-time. The succession of human generations built upon each other, creates higher or different values in a process of quantitative and/or qualitative improvement (which can also manifest itself by a reduction of some streams due to the optimization of their use).

Even in the case of stagnation or regression (we can think of the case of the North American Amish who refused to integrate technical "progress" in their community), the community enriches itself in terms of knowledge, lived experience, which in the long term will constitute without any doubt a value related to the experimental knowledge acquired in this way whatever the interpretation. No doubt that the evaluation of economic value for the Amish differs significantly from one of another community.

Fig. 11.3: *Amish farmer fertilizing his field (Wikimedia)*

CHAPTER 12

Money Supply and Relativity

12.1 Money Density

Studying the money supply of an economic zone as a global figure is not enough to certify that the money is correctly created or not.

Indeed, if we can in some circumstances note that a certain money supply grows at a steady and constant pace, its non symmetric creation density in such or such economic sub-part would violate the ethics of the set of solutions of the "Three Producers Problem" when expanded to N citizens of the economic zone.

Non-symmetric monetary creation density issues are essentially due to the hoarding by a subset of citizens of the monetary creation through a biased application of creating value, and is being done at the expense of all present and future actors, in terms of both "first choice" and "value judgment".

Global monetary information publication should therefore be completed, for an efficient citizen control of monetary ethics, by information relative to the spacial density of the creation of that money, knowing that this density should be well balanced.

Therefore in France, it is because the monetary creation is essentially concentrated around Paris that the economy is ostensibly the most flourishing, and that the population flows are condensed there. The same reverse monetary creation realized in another city during the same period of 50 years would produce without doubt a similar result (always at the expense of other cities).

12.2 Growth

Let "c" be the measured growth of the money supply. Besides, what is called "economic growth", within the meaning usually given to GDP, fundamentally depends on "c". But it is the uncertainty about "c" in the economies falsified by arbitrarily created "debt" money, which generally destroys growth by disorientating the individuals regarding the efficiency of their currency.

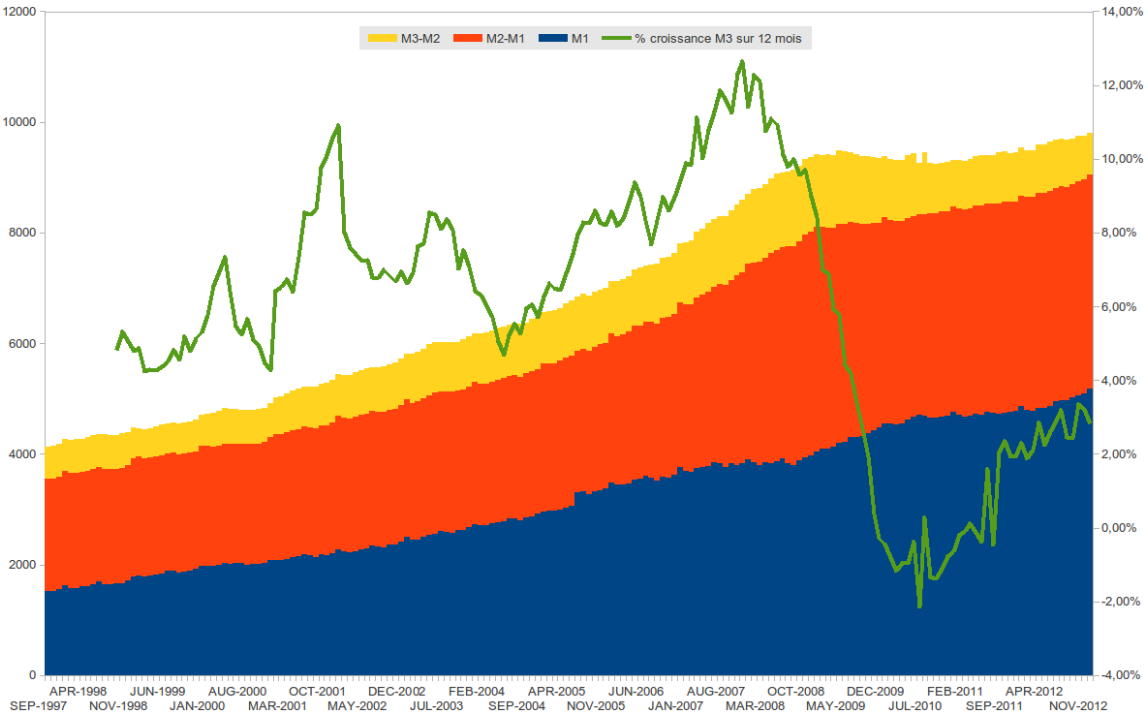
It is a fundamental error to estimate the "growth" using the GDP, which measures exchanges of values. In fact, growing the money supply, if it is dense enough at all in the economy, will have as effect, considering

a constant production, to mechanically rise prices, without any effect on the quantity of exchanges, the costs being generally impacted and following the rising prices, but not at the same time, so this will rise the GDP, even if the exact same goods and services would be produced and consumed from one year to another.

It is also possible to see GDP rising at lower production and lower exchange levels, if money is created in a sufficient and significant proportion to compensate.

"Growth" from the "GDP" point of view is therefore an absolutely biased notion, whereas the growth of the money supply represents a perfectly sure, known, and verifiable information and *does not depend on the chosen frame of reference to measure it* unlike all other estimations.

The following graph shows the whole money supply M3 consisting of M1, (M2 - M1) and (M3 - M2) of the Euro Zone from 1997 to October 2012 in quantity as well as in growth on 12 months (ordered by % on the right). The growth in Euros from 1997 to 2007 has reached on average 8% per year, with a distribution within the 330 millions of citizens in the economic zone, of the excess of common money that was not published and certainly not uniform.



This monetary creation essentially benefits States and big companies even if they produce obsolete values and without interest for 90% of the population with production processes that are most of the time outdated and extremely expensive. This system only favors some privileged individuals, and encourages incestuous speculation between Banks. The winner hoards his earnings, and the loser goes bankrupt, establishing thus at the end of the operation a central and unbalanced monetary creation.

While money is an immaterial and a common tool to exchange productions in an economic zone, it is used to hold a power linked to the capacity of depriving the sovereign citizens from the exchange tool while forcing

them to use it (particularly to pay under duress taxes and interests from credits in a currency whose emission is otherwise controlled).

And yet, it is obvious that the only decision to stop allocating additional credits to a pseudo-isolated economic zone, brings it to the mechanical incapacity (and not fundamentally productive) to repay capital and interests "in the currency". How do we make sure we will be able to pay with something that we don't produce ourselves? The asymmetric money producer is taking the easy way out by defining and producing itself exclusively and therefore at the expense of others which acts as measuring value!

"Growth" measured relative to GDP can be a total lure. The only growth is that of the money supply, which accompanies with a delay effect the growth in monetary terms of monetized economic exchanges, regardless of their relative form in space and time.

There is then an unacceptable scientific bias to perform measures thanks to a tool for which the experimenter chooses the settings according to his goodwill, and without considering his modifications in his results other than its subjective choices.

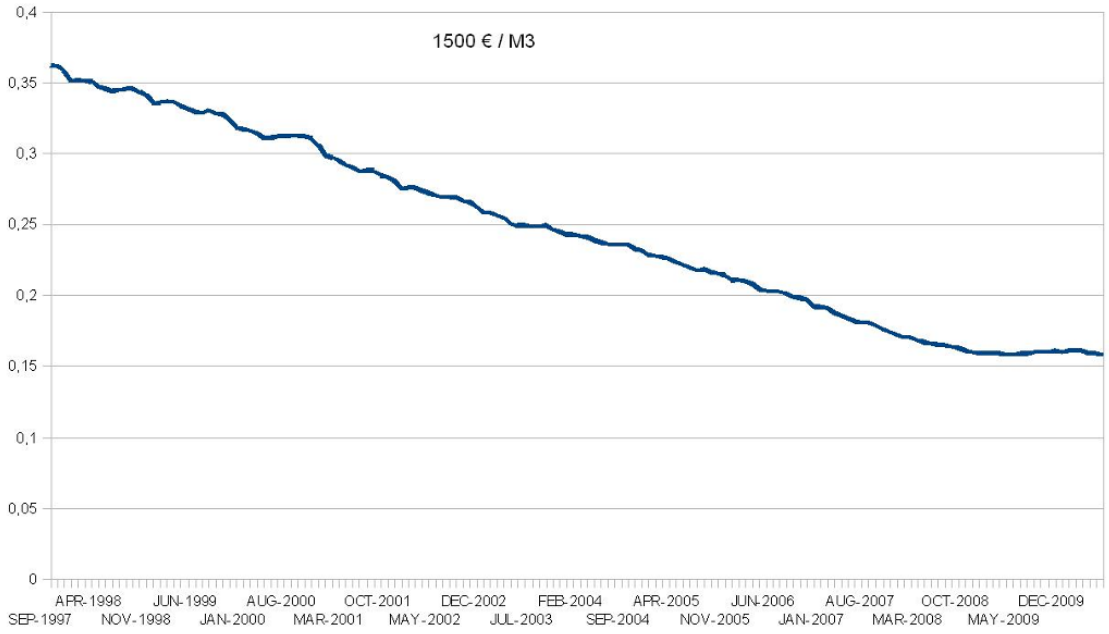
12.3 Purchasing Power

Si l'on tient compte de la croissance de la masse monétaire, on ne parlera plus de pouvoir d'achat d'une quantité donnée de monnaie sans la mettre en rapport avec cette même masse. On parlera donc de potentiel d'achat. Le biais qui consiste à définir le prix d'un « panier de biens » arbitrairement défini comme mesure du « pouvoir d'achat », revient à définir un pouvoir d'achat intemporel dans lequel en toute honnêteté on retrouverait alors en 2010 des quantités de « poules au pot Henri IV », « Fiacres 1900 », « formation à l'art subtil d'alchimiste » ou autre « livre produit par les moines copistes ».

Du point de vue de la Théorie Relative de la Monnaie, on ne peut que refuser d'accepter une telle méthode, basée sur des valeurs « absolues » quand bien même elles seraient revues et actualisées, car elles seront toujours sujettes à des choix arbitraires.

The following graph represents a 1500€ "fixed" salary evolution relative to the money supply of the Euro (expressed in billions of euros) from 2000 to 2010, and therefore to the purchasing power.

Purchasing power of a fixed salary has fallen more than 50% between 2000 and 2010. In other words, it is likely that the prices of a majority of goods whose demands are "relatively stable" between these two dates has risen more than 100% on the same period. It is rather surprising to see how the lies about measures that are verifiable can be spread within democracies where the media power is expected to represent the guarantee of transparency.



The Relative Theory of Money does not say that a “salary” should follow money supply inflation, that is in fact impossible, the highest salaries would be favored and would participate to an increase of the money supply greater than the balance rate! Moreover, nothing ensures that a given production will be exchangeable against anything tomorrow, this depends on individual and collective choices which change over time.

The Relative Theory of Money says that this is the Universal Dividend, and only that, which is indexed on the money supply, and which ensures that monetary basis is symmetrically distributed, and therefore compatible with the three fundamental economic freedoms.

It also says that we should correctly measure economic scales with relative data, taking into account the quantity of the existing money supply per citizen within the economic zone, so that the economic actors could make their choices wittingly and according to their individual point of view.

CHAPTER 13

Value Field

13.1 Fundamental Equation of the Value Field

Considering what has been previously established, we have on every point "x" of the economic space and at a time "t", a production Cx, associated to a price Px, as well as a flow of incoming or outgoing production (positive or negative) Cfx associated to a price Pfx, together with a created money on X dMx and a flow of incoming or outgoing money (positive or negative) dMfx.

In the case where the money represents exactly the produced or exchanged value we have:

$$dMx - PxdCx + dMfx - PfxCfx = 0$$

But as otherwise this equality is true only exceptionally during immediate exchanges or productions, we call J the field which is generally different from zero, defined on every point "x" of the economic space-time, by:

$$dJx = dMx - PxdCx + dMfx - PfxCfx$$

dMx represents the Universal Dividend, Px × dCx the potential of individual value (the economic innovation share of each individual), while dMfx represents the local flow of the pre-existent money supply, and Pfx × Cfx the local flow of exchanges (positive if it increases, negative if it decreases).

The differential value field is dynamic, evolves in time, and measures thus at each point of the economic space, the differential of created money and of the value created by the individual "x", added to the part of money and the global circulating value to the "x" point.

The resulting field of its integration "J(t)" will show positive bumps where we will find surplus of money compared to the local potential worth of the effective production of goods and services. On the other hand, it will be hollow where the local potential worth of production exceeds the quantity of money present. This quantity can be negative if there is emission of debt.

Example of field for an economic zone including an area of monetary excess shown by a bump, and a zone where there is a production of value associated with a monetary scarcity represented by a hollow, the rest of the area being balanced.

Economic value is relative to the observer who is measuring it (to the actors who are exchanging it), so we should talk about "local potential worth of production" rather than "absolute value" that would be recognized by all the actors of the economy, which doesn't make any sense in the "Relative Theory of Money".

If these two are are slightly isolated within the economic zone, and produce the same goods and services, there will be high prices in one and low prices in the other, only because of this distribution of monetary density inside this economic zone.

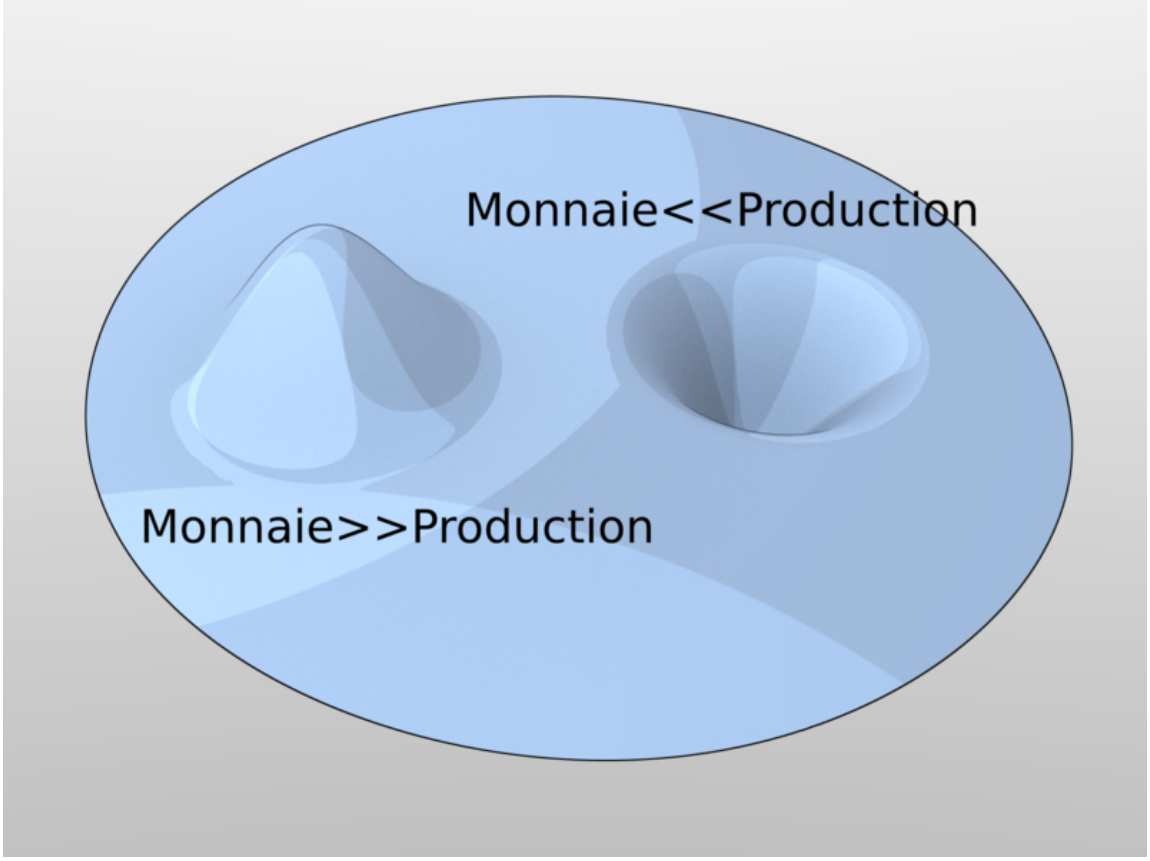


Fig. 13.1: *Spatial variations of the value field (Luc Fievet RTM 2.0)*

NB: Yoland Bresson defines the value field like

$$dJ = dx/K + dM/M - dp/P - dc/C$$

where K represents the time standard (the Universal Dividend), M the money supply, P the production and C the economic exchanges. The value field is then without any dimension. Both definitions are very close, because they are based on the same values, and both taking into account the local and global measure inside a differential equation. I distinguish, in order to be more precise, the production from the money created locally and the one exchanged.

13.2 The Value Field of Debt Money

This definition of the value field helps us to picture the evolution of economies based on the debt money system. The banking emitting center creates some debt money that will, then, diffuse little by little inside the economic zone till its edges.

The initial issue of debt is profitable to a first circle of economic actors such as banks, states (big consumers of debt money), and big companies. These actors consume most of this unilateral creation of credit. This sudden and centralized money issue will slowly depreciate the existing money available in the rest of the economic zone while it diffuses into it.

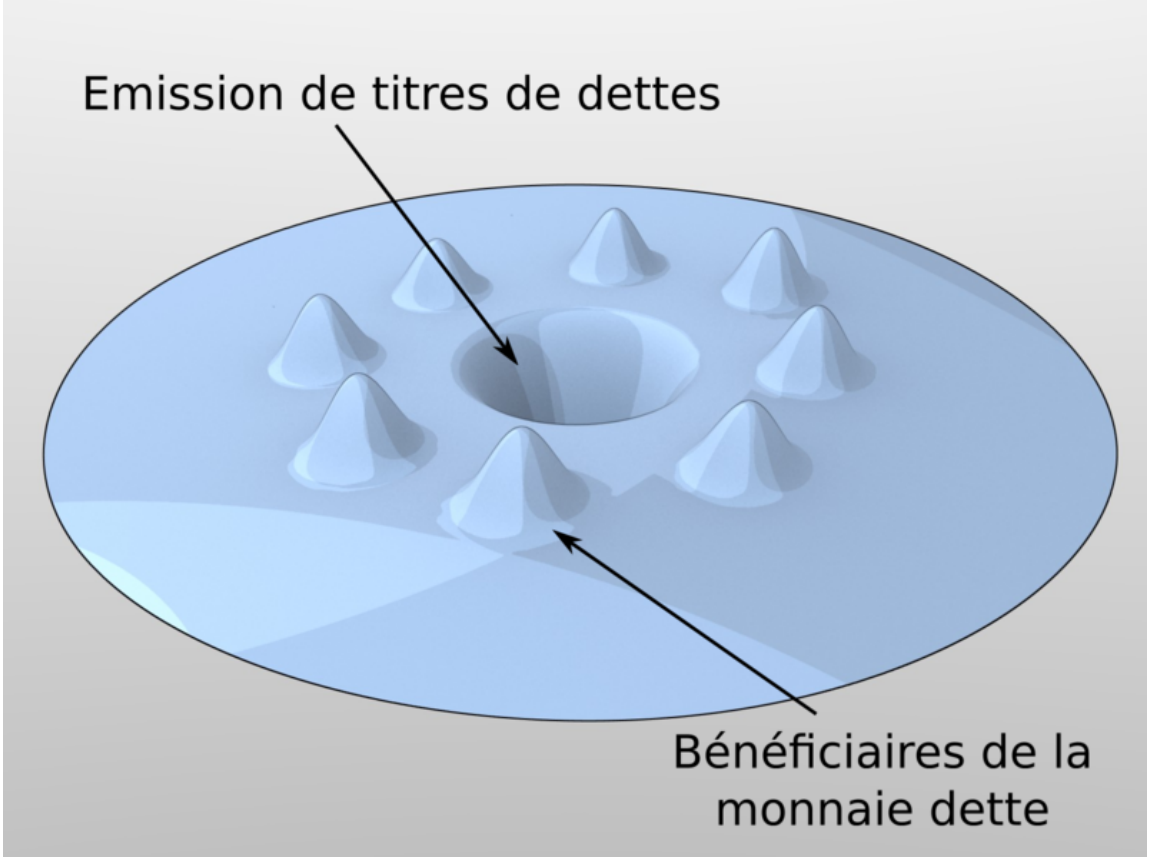


Fig. 13.2: *(Luc Fievet RTM 2.0)*

The name "money debt" is not enough to understand the mechanism because the debt issued is indeed never paid back. Only interest are generally paid which secure a perpetual annuity to the monopolistic issuer.

This centralized and asymmetric monetary system owes its perpetuation to its monopoly, and to the grant

to more and more debts at a sufficient pace to pay the interests, but only for the first circle. The rest of the economy is being served in money but only in exchange of real production (from which the first issuing circle is abstaining), and thus is subjected to the monetary power.

13.3 The value field of a local exchange trading system "LETS"

LETS (Local Exchange Trading System) are developing during cyclic monetary crisis, because of the lack of money, which blocks the economy and the exchanges which are far from the emission center of debt money. Communities having a pseudo-autonomy on generally limited fields of activity, develop then a complementary symmetrical currency, partially freeing them from the central currency.

LETS are creating most of the time a symmetrical model of mutual credit and do not create any distortion regarding the money created inside the economic community. Being created on the basis of a complementary money, their trades are not officially recorded in the official economy, and that is a substantial part of the GDP which escapes from the evaluation of the economy, because of the non-density of currencies with asymmetrical issuance.

13.4 The value field of non monetized production

Non monetized production, because of the total lack of central or local money, appears in the field of value as a hollow: (money = 0) - value < 0. It is the case for all production that is traded, given, produced without merchant exchange, which includes most of free softwares, free of rights works, and any voluntary service, which substantially benefits monetized economy.

One may wonder why producers would be giving away their production without any monetary return. The reason is that some values are especially important as they disseminate fast, widely and freely, enabling the establishment of usages, norms, and recruitment of new producers bringing their modifications to the community.

The total value of this type of production exceeds by scales of magnitude the value of the listed companies in this sector, when we estimate the equivalent development cost that would be needed to produce the same thing. One should simply think that in 2010 all the Internet is running essentially on free layers, in terms of protocols, servers, databases...

Even Science is most often the subject of free of rights discoveries. Scientists inventors are most of the time lead to publish their discoveries to get peer reviews, and it is a collaborative work both in time (scientists from the present are benefiting from past discoveries) and space (discoveries being most often the result of a common work). One can wonder for example how much Einstein could have benefited from rights on "intellectual property" on the Theory of Relativity. It would be interesting to estimate, to know what the guy created in "usual" economic terms...

It seems that software and artists producing free software and free works did not yet bother to integrate the monetary tool within their community, and that remains a mystery, even if the revelation of the mystery of money is not straightforward, it is typically similar to algorithms and games, which are domains mastered

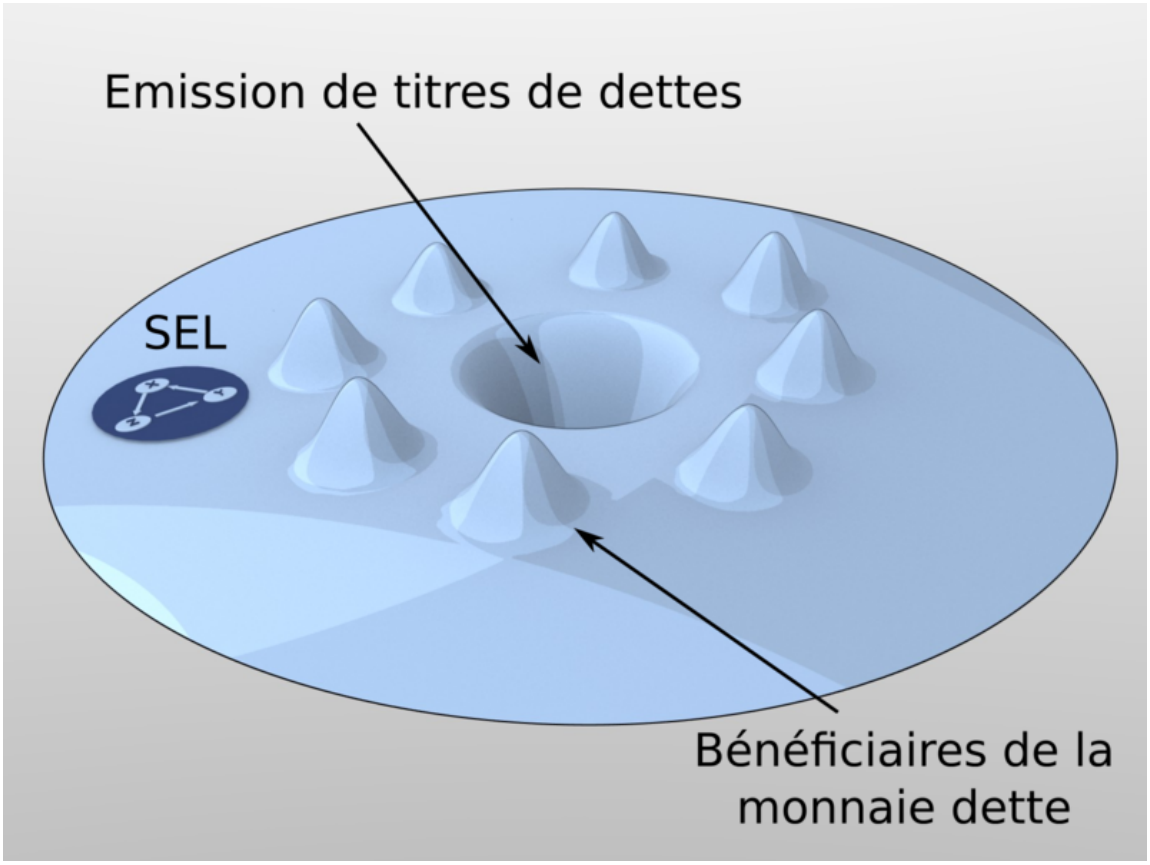


Fig. 13.3: *The LETS is "flat" initially, its money creation density is spatially balanced, but not temporally if it is using a fixed mutual credit created only once at the origin of its axis of economic time (Luc Fievet TRM 2.0)*

by this community. Though, software letting a community establish its money already exist, and they can be deployed fast.

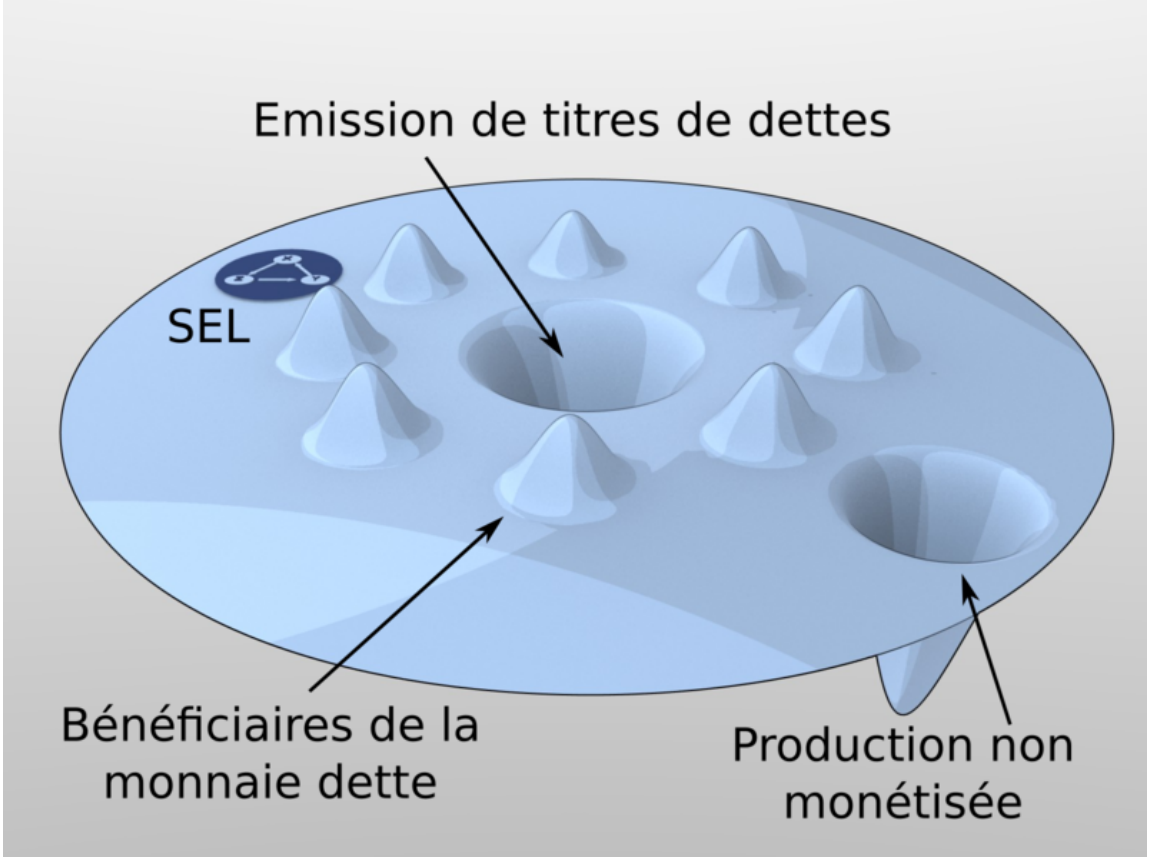


Fig. 13.4: *Non-monetized production can totally be huge in terms of value and is arbitrary ignored from an arbitrary center of "debt money" issuance which only monetizes what it knows, therefore denying the second economic freedom. (Luc Fievet RTM 2.0)*

However, to balance this sad observation, which is probably temporary, we can remark that big communities created around playful activities like Second Life or even more without any doubt World of Warcraft, have created a powerful monetary approach. Here, the internal money of the persistent world of WoW, is not created properly, but is still accessible via normal actions in the game, they are subject to external transactions, including in official currency. This shows without doubt that as soon as a currency is created within a community, its value is revealed, and not the opposite.

Therefore, because there is no circulating money inside these communities creating free values, the value of these works is not defined. While in the meantime the monetary creation inside a gaming community spontaneously reveals a measurable value. Thus, money is not only a trading tool but a common measure tool

as well. We can not measure economic value in an area without money. Such big misunderstanding of this mechanism leads economic policies to rely on data like the PDB, which only measures what is monetarily irrigated, creating bubble and resonance effects, and financing only the past from debt obligations on the future, and never the future on the basis of a Dividend on the past.

The huge non-monetized value has a role to bring big monetary creation forward, which exceeds by far the sum of old values on which already existing money circulates. This is the productive basis of big historical inflationary bursts: the violent creation of debt money whose purpose is for the issuers to fraudulently monopolize the new economic replacement value.

13.5 The Value Field of a Universal Dividend Economy

A Universal Dividend economy equalizes monetary creation. It does not stop hollows and bumps from appearing, but it makes them possible everywhere, without any central point, and most importantly bringing a money circulation in all the economic area by its intrinsically dense structure, which limits the points and the accumulation duration, as much monetary as productive.

In this type of economy there is no central point of monetary issuance, which makes every project, every production, and every autonomous economic circuit directly exchanged for money everywhere and at all time.

In a monetary field of debt money, far from the issuance center, we will find these type of structures, but at a scale too weak compared to central distortions, which makes it appear as flat (negligible distortion) seen from the center. The problem is that the force of attraction of the false central debt (and real asymmetrical and fraudulent monetary issuance) which provokes unstoppable fights to free oneself from it.

13.6 The Forces in Place

The value field has a tendency to oscillate around its equilibrium point. Also a hollow will have a tendency to rise until it attracts existing money, and if it is not enough, to provoke money issuance (until it causes the creation of a local complementary currency). In the same way, money will have a tendency to accumulate until it causes the purchase of non-monetary values. Hollows and bumps are then two masses attracting each other. This phenomenon can be seen at any measure scale, from the individual to the whole economic area, and the process of filling hollows with bumps is unavoidable, be it discrete or continuous, fast or slow, peaceful or violent.

In a central system of debt money, centralized accumulation of money or production is done until a break point is reached where the attraction force of the excessive surplus of money compared to the excessive surplus of non-monetized production triggers a brutal movement. Thus in general hyperinflation of prices where production was under-monetized for too long, which develops with the influx of money freed from the center, or movements such as the shutdown of production because of the lack of money or any form of compensation for too long, which can lead to historical social crisis, revolutions or wars.

The chosen (or forced) monetary creation system defines the type of economic development that follows, as well as the space-time form of the value field: a continuous fluctuation without interruption for a Uni-

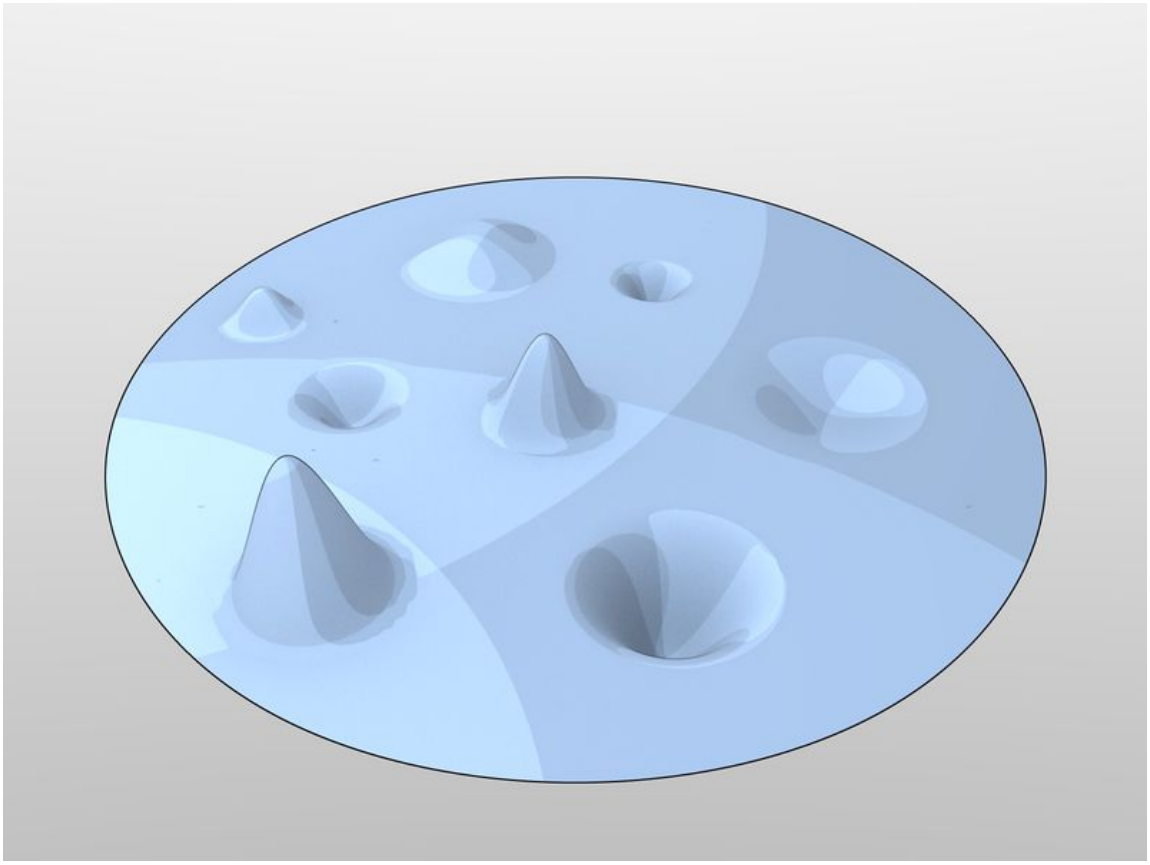


Fig. 13.5: *Value Fields fluctuating, without any central point (Luc Fievet RTM 2.0)*

versal Dividend system, or pyramids of central money with cyclic crushes (monetary bubbles, also called speculative bubbles) for asymmetrical issuance systems.

CHAPTER 14

On the Quantitative Money Theory

The general definition of the value field allows to find common economic results at the limits. Thus, let the equation of the value field be:

$$dJx = dMx - PxdCx + dMfx - PfxCfx$$

In the case of a balanced pseudo-isolated economy of null local creation of money, we have then:

$$0 = dMfx - PfxCfx$$

Or also:

$$dMfx = PfxCfx$$

Along a circular line of exchange, we have then by doing a complete turn, during a time "t":

$$\int_0^t \sum_{k=1}^{n} dMfk = \int_0^t \sum_{k=1}^{n} PfxCfx$$

Which, if the production remains unchanged, and with stable prices, and for a time short enough during which the production stays similar, and where producers are not replaced by the next generation, gives us the result of the quantitative theory of money:

$$M \times V = P \times C$$

Where V = t = number of complete cycles of monetized exchanges.

Which is then an equality concerning only global and integrable quantities. This result does not consider the local fluctuations of the space-time reference frame, and is only valid within a pseudo-isolated economy, for a short time when changes - be they productive, individual or monetary - are negligible.

The bias of an only global vision is the non-relativity of measure of value. Because globally we find here or there an "exchange of values" we will decide that value is "here". Yet this measure only concerns its actors, and is not stable neither in time, nor in space (from other individuals' point of view).

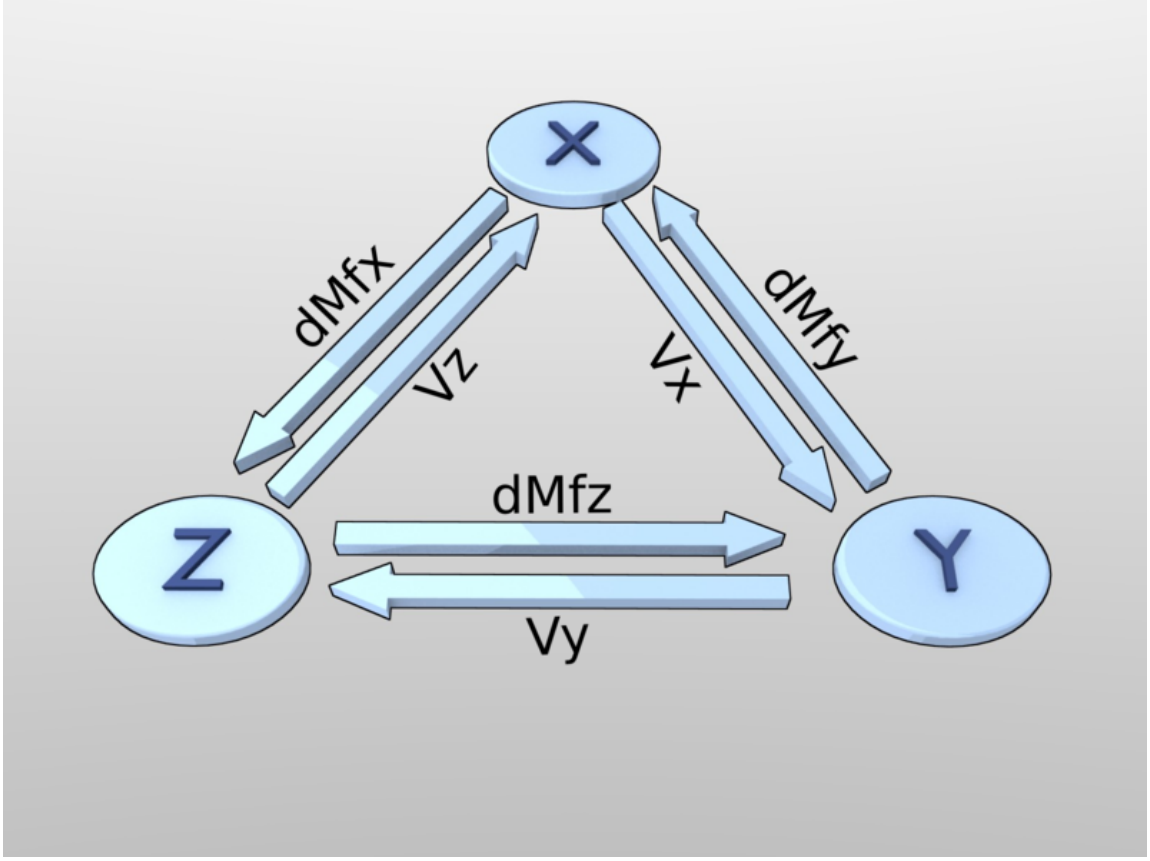


Fig. 14.1: *Circular lines of exchanges of value and money (Luc Fievet RTM 2.0)*

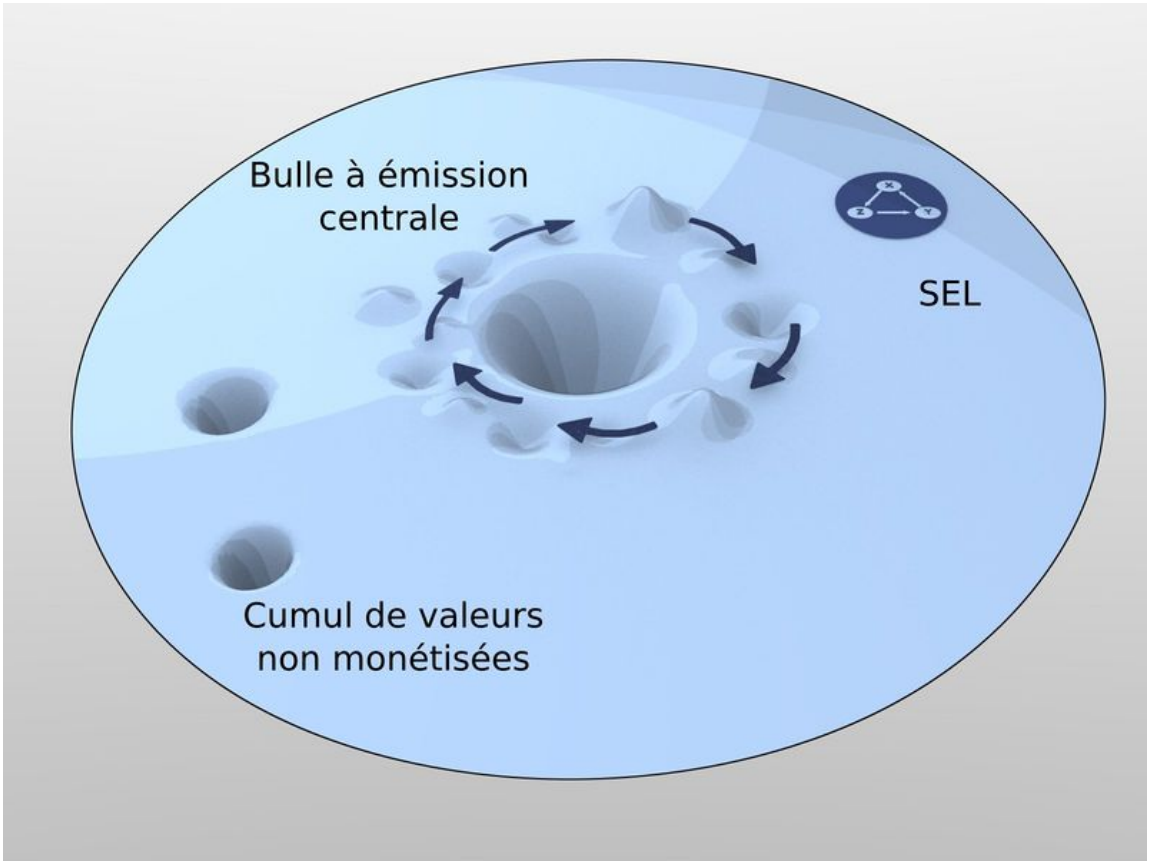


Fig. 14.2: *LETS and non-monetized values in the central "debt" money (Luc Fievet RTM 2.0)*

That is if money is created asymmetrically, not dense, the value is stored or exchanged very heavily in another part of the economy without being monetized (if hollow), or the creation of a new local currency becomes necessary (creation of LETS).

As this is a phenomenon of accumulation, coming out from this deadlock can be achieved either via the hyperinflation of sub-monetized values, which can be done by violently issuing remedial money or by the gradual process of Universal Dividend, which monetizes the economy gradually and in a sustainable manner.

As we noted in the calculation of the optimal Universal Dividend, one can get out of distortions by setting the desired rate of Universal Dividend. It is obviously a strong need to conceive a fully transparent and stable configuration in time, otherwise it is not surprising to see a surge of violent economic behaviors, anticipating choices which are subject to suspicion regarding their subsequent changes.

This is a complete reversal of the current paradigm in 2010! Instead of Central Banks that are trying to maintain arbitrarily end of life values with hidden and suspicious monetary emissions that promote a caste of initiated leaders in place, and therefore the artificial and unhelpful upholding of monopolies on old values, we need a currency with a stable, dense and transparent issuance, in which the values fluctuate, and the individual economic positions change with respect to the freedom of each individual, by strongly encouraging individual creativity.

So if we take the axioms of the Quantitative Theory of Money, which defines the money as:

- Accounting unit
- Medium of Exchange
- Store of Value

The paradigm of the RTM which defines it as the four freedoms of democratic change of the code, access to resources, production and trade, invalidates the consistency of these axioms. “Store of Value” is inconsistent with the medium of exchange. The currency cannot be compatible with these two concepts at the same time. Only a short period of time allows to consider a stable value of the money, like any other economic good or service. Its universality as a medium of exchange in space and time can be ensured with this pseudo-steady value only via a stable issuance.

This is the historical experimental evidence that validates the RTM against the QTM. No money has been maintained as it was turning into a store of value at the expense of its trading function.

CHAPTER 15

Psychological Resonance Principle. Bubbles are only a consequence of the asymmetrical monetary issuance

The issuer of asymmetrical money has his own view of value, which is potentially not compatible with the ones of the other members of the economic area.

By doing so, he will have a tendency to privilege what he thinks is an absolute value, and thus to issue credits about the production and the sale of this specific value. He supplies only the benefit to himself (thanks to the interests) and for the producer by resonance effect (benefit by overrating and sale), the losers being the last buyers of the value before its ineluctable drop.

We are here in the frame of asymmetrical monetary issuance on a fundamental *principle of psychological resonance* which can be summarized by:

"The economy is waiting for visibility on the monetary policy, which waits for visibility on the economy"

This principle is the base for the bubbles phenomenon and systemic crisis by construction, within monetary systems which do not understand the relativity principle.

15.1 Theoretical Development

Let's suppose a specific value dVs = Pf × dCf is growing (dVs > 0). The issuer of credits will supply the production and the purchase of this value with new credits dMf to get benefits out of it, proportionally to this value, and so, for this specific value:

$$dJx = dMx - PxdCx > 0$$

This "growth" reaches a maximum, which is limited either by the authorities controlling the global monetary expansion, either by market saturation. At this time, the value begins to stabilize globally, if not to drop. The drop will be related to the excess of money invested in this sector, which will have produced an excess of unsolvable production.

A problem then arises to refund the credits allocated to the issuer, which, as it can not be done, will have to be the subject of a renewal of the credit that was allocated in excess, which ultimately constitutes a lasting

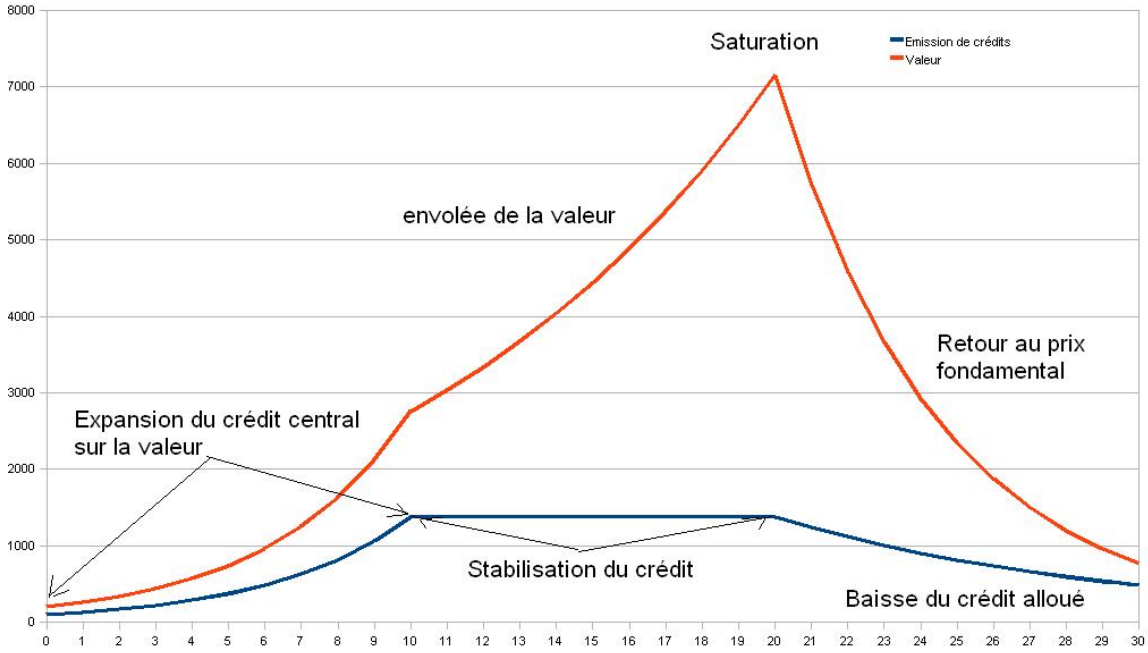


Fig. 15.1: *The evolution over time of pseudo "values" by arbitrary issuance of "debt money"*

monetary creation in time. It is a monstrously asymmetrical advantage of the producer of this specific value compared to other economic actors who, even if they identified the right values to produce and trade, are deprived unilaterally from their part of the necessary monetary tool.

One should really understand in the field of value the debt owed by the "last buyers", following the explosion of the bubble, which is due to the asymmetrical and arbitrary creation of credits. It is not allocated to solvethe "Three Producers Problem" or the circularity of the trade of value within the economy, but only on the basis of "expanding values", creating then an inherent resonance. Let's see the evolution of the bubble in the field of value with an example.

a) A monetized value is identified by the arbitrary credits issuer having equities

b) The arbitrary credits issuer allocates then credit lines to the producer of this value, and to the purchasers, by doing so he creates a field distortion in his favor, credits and interests being "due". Initially the value "increases" suddenly because of the local injection of credits.

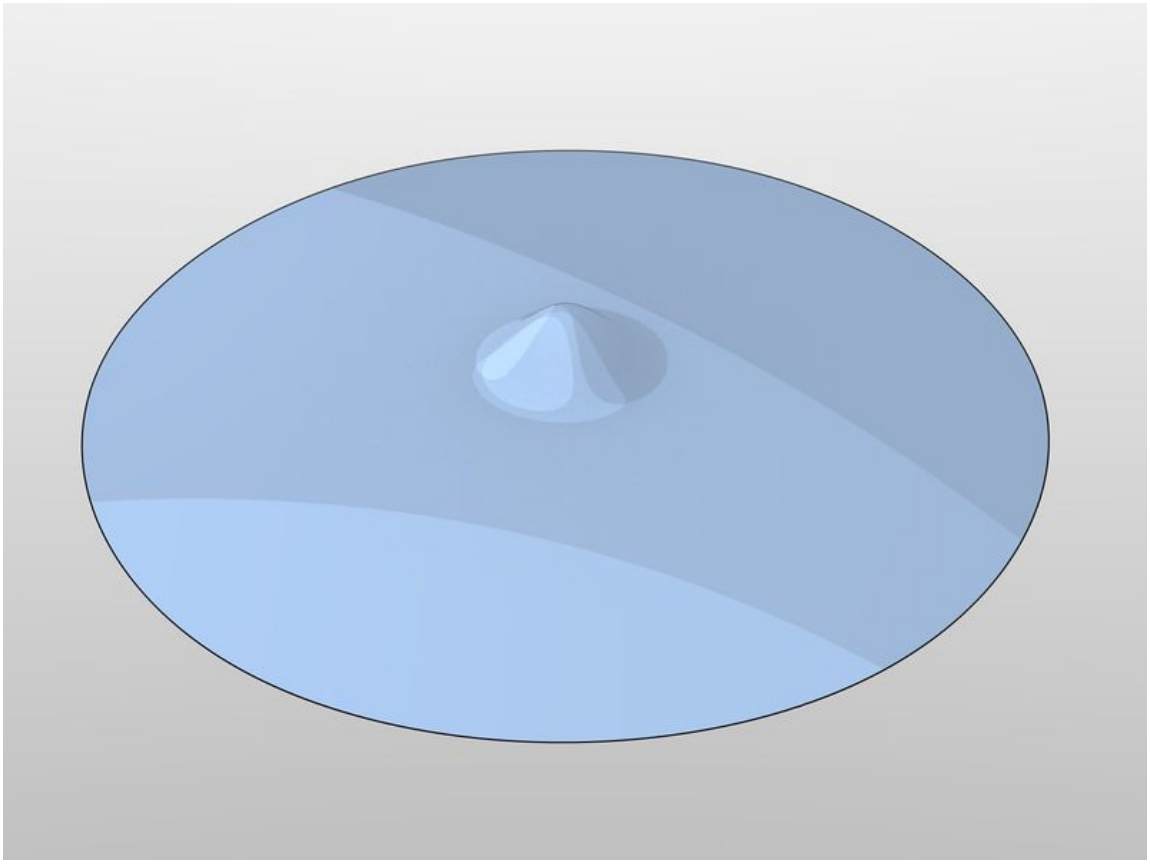


Fig. 15.2: *a) Initial capital equity (Luc Fievet RTM 2.0)*

c) The issuer of arbitrary credits stops his injection, either because he credits another value he chooses, or either because he gets to the maximum credits issuance possible (he reached his maximum permitted leverage) which is the case of the big systemic crisis (the leverage effect is globally reached by the whole system, and one can not create more money anymore legally with this advantage). At this time, the force of interests and credits refund makes "the bubble burst" which can not feed itself of the injection of new credits.

d) At the end of the "cycle", an arbitrary credits issuer remains who "sucked" most of the preexisting money because of the payment of the interests, and so has realized a benefit, and a sector of production of value where not only the last purchasers are with a superior debt to the value they bought, but also where the producer is charged with a mechanically produced debt by a due total refund (capital + interests) superior to the local growth of the money.

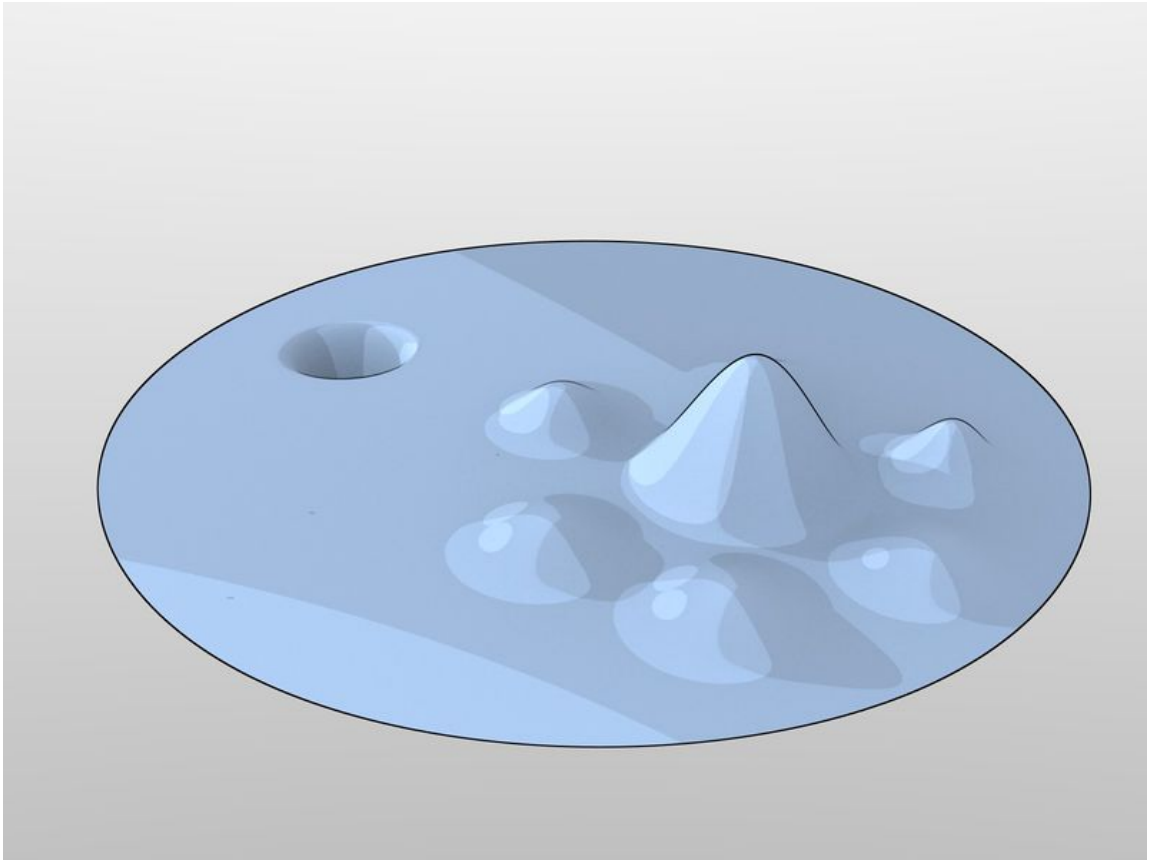


Fig. 15.3: *b) The issuer of credits by leverage creates additional money which feeds a producer selected arbitrarily. (Luc Fievet RTM 2.0)*

This local phenomenon is obviously exactly the same at a global level, the end of a cycle being at this level

the moment when the whole banking sector has emitted all possible credit reaching its maximum leverage, and even if they identify some new values to vampirize they are not legally allowed to do it. At that moment, the whole economic area is trapped by a refund power superior to the global growth rate of the money.

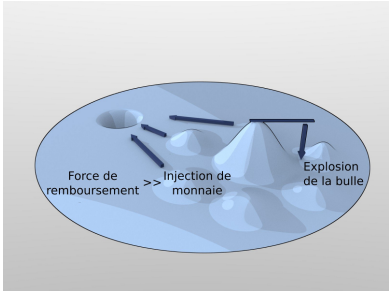


Fig. 15.4: *c) Refund power of arbitrary emitted and allocated credit (Luc Fievet RTM 2.0)*

Thus whatever the value created in the economy of a centralized monetary system, the benefit always goes to the asymmetrical credit issuers with a null risk, because even if the producers go bankrupt, and the credits are not refunded, the system has to bail out the credit issuers if it does not want to see the whole economy get totally paralyzed.

This asymmetrical model is a system where, at a minimum risk, the money creator gets the maximum benefits, and at a maximum risk one only gets the minimum benefits (and most often a forced bankruptcy) for the producers

This is fundamentally different from investment with money accumulated beforehand, which is also an influx of money in a determined sector, but without insurance of fixed interests, without playing with the monetary mass, so without being achieved to the detriment of the rest of the economy, and with a true risk of loss without globally harming the economy (money accumulated and invested is debt to no one).

15.2 Experimental Verification

The theoretical reasoning can be verified by studying global bubbles for which there are measures of global monetary mass controlled by the issuing center comprised of the Private Banks (leverage) and the Central Banks. In this asymmetrical monetary system, periods where a beginning of concentration of monetary flux is found are over-fed by a creation of resonance money.

To see this effect on experimental data, we are going to calculate the standard deviation on an average of 12 months, of the growth of monetary masses M3 in Europe and United-States. The standard deviation in statistical mathematics represents the effects of deviation from the average, which is a very good way to visualize a resonance effect.

$$E = \sqrt{\frac{1}{n}\sum_{k=1}^{n}[M(k) - Moyenne]^2}$$

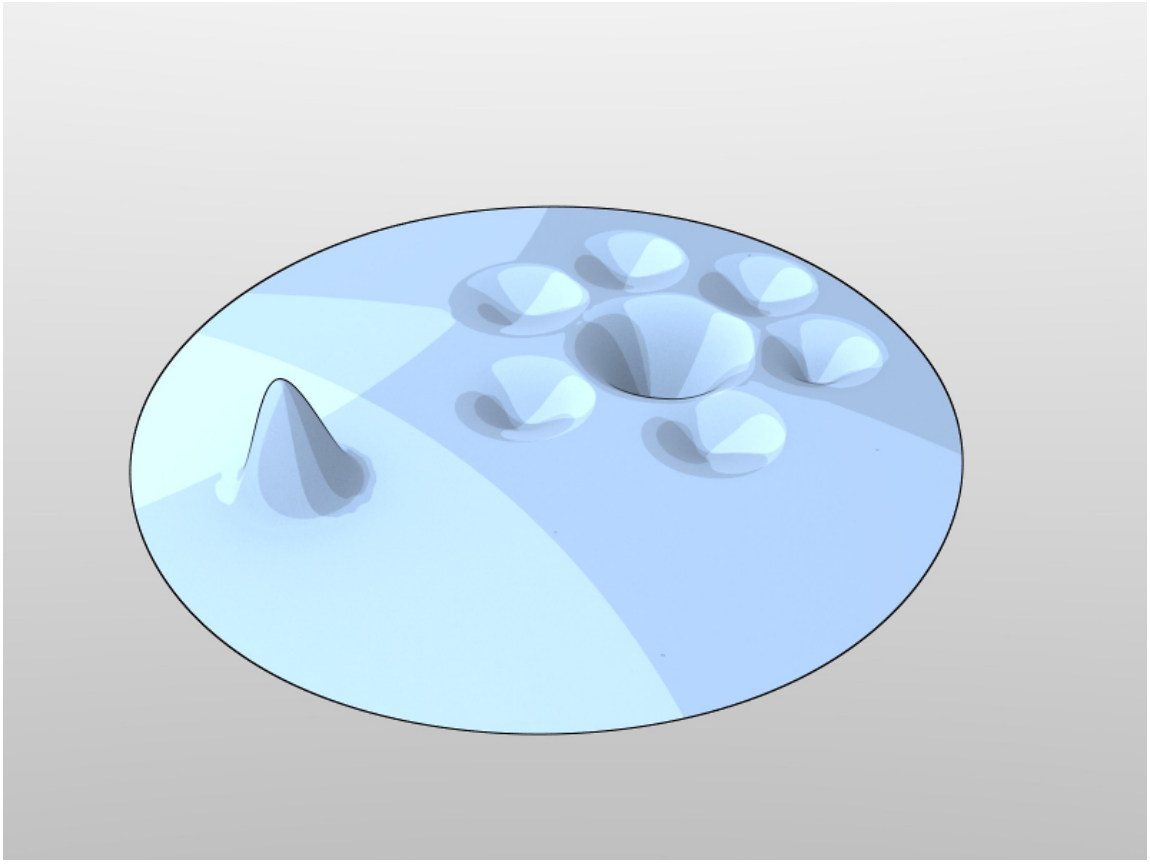


Fig. 15.5: *Forced bankruptcy by progressive money dry-up, and capture of any value by the issuing center (Luc Fievet RTM 2.0)*

We perceived here very clearly that expansions and crisis are pure effects of monetary resonance, M3 € did go through pushes of monetary creation very far above its average during the 2000 and 2008 crisis.

As for M3 US$, on a period even longer, we obtain indications on longer periods where we see the resonance of monetary expansions with the big "economic" crisis, which are only the effect of the principle of psychological resonance in a system of asymmetrical money creation.

For M3 € we get the following:

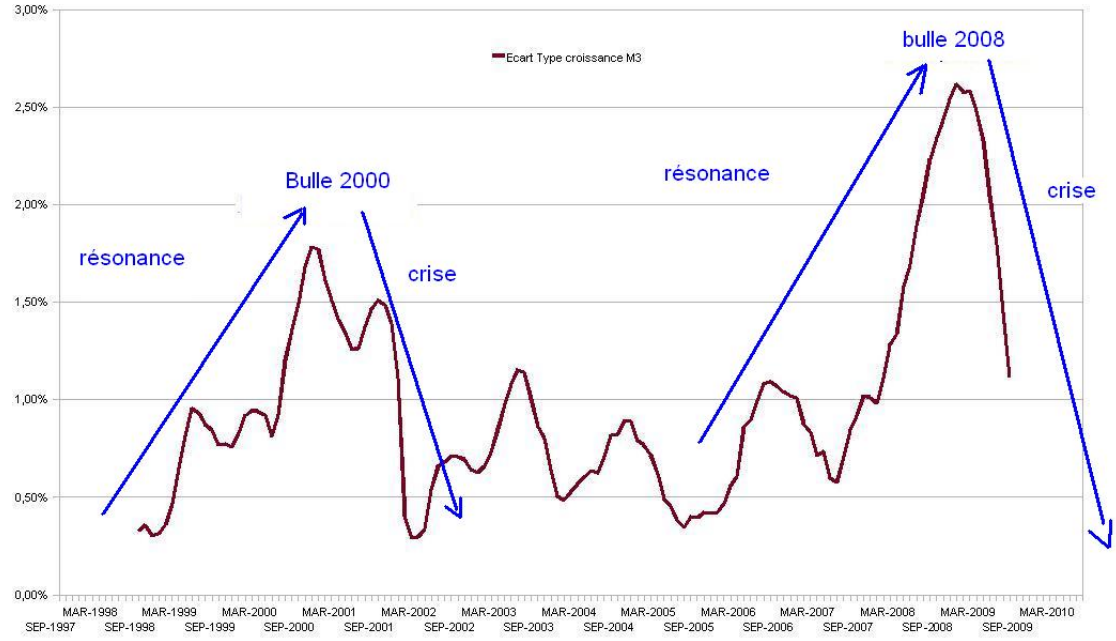


Fig. 15.6: *Standard deviation on 12 months of the growth of M3 € 1998 - 2010*

There is a capture of the money created arbitrarily on monetary flux identified by actors of these resonance expansions, at the expense of the rest of the economy.

Not only the rest of the economy is excluded from this monetary creation by resonance, but it will go through a devaluation of its share of money by delayed effect, when this influx of new money will go back to the economic circuits. Thus the actors of the monetary center will share the money issued recently, then benefit from the advantages of the first purchaser at the lowest price. When they take possession of lasting economic value, inflation of prices follows this influx of money, and the other economic actors get cheated twice, first by the creation a central money from which they are excluded, and then twice by the inflation provoked by the progressive purchase of economic goods with this money.

The issuing center plays, thus, by construction, against the interest of the sum of the other economic actors.

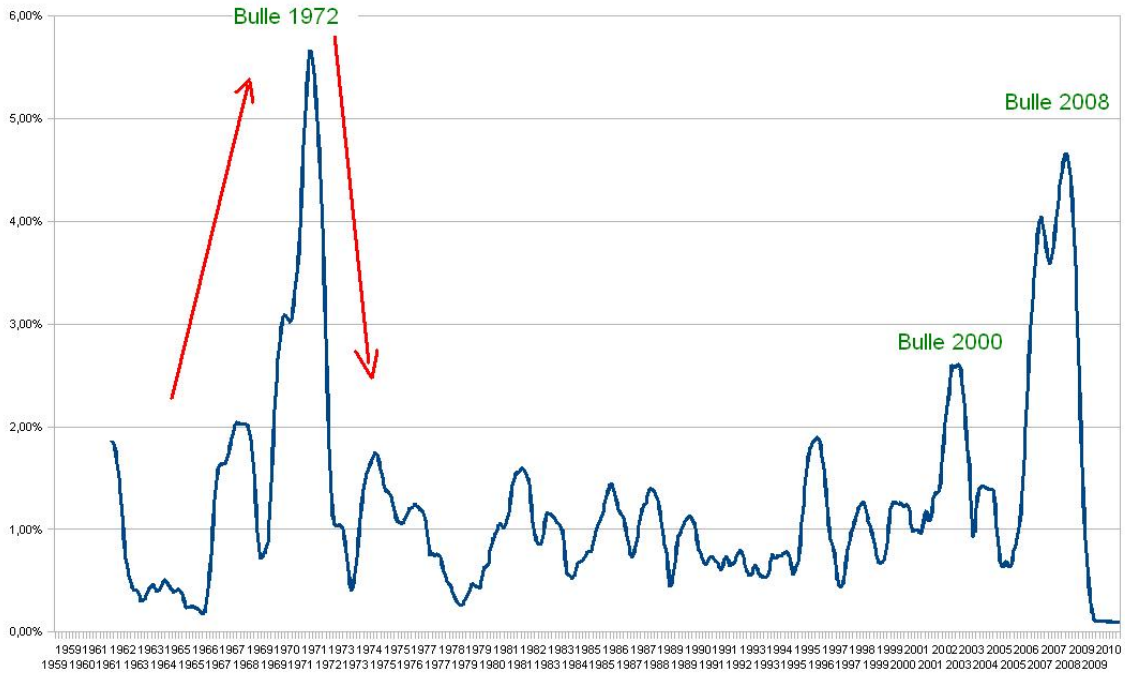


Fig. 15.7: *Standard deviation over 12 months of the growth of M3 $ 1958 - 2010*

CHAPTER 16

How to compare two economic zones?

The definitions we have just seen concerning the money supply, its growth, the link it should have with the Universal Dividend and the value field, allow us to compare two economic zones that use two different currencies.

Let's consider two economic zones A and B each credited with a money supply defined in space and time, Ma(x,t) and Mb(x,t) and a number of respective citizens Na and Nb having access to the common money.

The application of the principle of relativity invites us to define the instant common measure of individual value Ua and Ub at a given time on the basis of the average monetary density of each of these zones.

For A:

$$Ua = \frac{M_a}{N_a}$$

and for B:

$$Ub = \frac{M_b}{N_b}$$

The instant exchange rate T(a/b) of the currencies, which represents the ratio of exchange of a quantity of money in the area A Qa to a quantity of money Qb of the area B is such as:

$$Q_a T(a/b) = Q_b$$

It has within the principle of relativity a fundamental value, which is:

$$T(a/b) = \frac{U_b}{U_a} = \frac{N_a}{N_b}\frac{M_b}{M_a}$$

This fundamental result differs from common tools with which we measure the relationships between the "prices"... Yet the values being fundamentally judged as different from one individual to another, and so from one economic area to another, this reference is completely distorted by the arbitrary choice of values used to define these prices. Whereas the density of common money does not suffer any kind of arbitrary, and is perfectly measurable.

16.1 Numerical application:

$$Ua(\text{États-Unis}) = 15000/0,31 = 48387\$/citoyen$$

$$Ub(Europe) = 10000/0,330 = 30303/citoyen$$

Relative exchange rate **T (€ / $) = 1.60 $/€**

Between 2008 and 2010, the exchange rate found on the markets oscillated between **1.30 $/€ and 1.60 $/€**.

But even if the result found is near a fundamental theoretical value applicable in the Relative Theory of Money, there are two factors which should be taken into account. First of all the amount of money released by the Central Banks is questionable because the American Fed does not communicate officially M3, and these are unofficial websites which give estimations.

Furthermore, and this is not the least important point, we are not in these economic zones within Universal Dividend zones, where individuals are equals before monetary creation. Money is created in a centralized way on arbitrary values, and in a non symmetrical way from both sides, which creates strong temporary distortions (and an economic loss on the long term according to the importance of these distortions).

Moreover, we can see the role the population is playing about the exchange rates measured by the ratio "Na/Nb". Thus, one can better approach the currency policy based on the importance of the economic space considered. It is obvious that, from this angle, an under-monetized economic area will have to extend sooner or later the expansion of its money supply to all its space, therefore to have strong growth rate due to spatial catch-up.

We understand here the Chinese problem in 2010. Since a small part of the 1,400 millions inhabitants can benefit from monetized exchanges, the money supply must grow strongly in all other areas of the economy to monetize it as a whole. It is for hundreds of millions of human beings to have access to the monetary tool to develop their exchanges, which will play on the value of Na which represents the number of monetized citizen.

However because of the ratio Na/Nb which will be, at the end of the complete monetization of its population, really big compared to Europe or the United States, the Chinese money supply "Ma" could grow at the same pace as Na (number of monetized citizens), without it having an impact of the fundamental exchange value of its money.

The evolution of the exchange rate for Europe and the United States, which are for their part already strongly monetized in space (Nb will not grow much), will not depend then on China monetary growth if this one is only spatial, but on their own monetary growth policy in time, to play with the ratio Mb/Ma.

We are facing here two growth policies to catch-up with the necessary balance, in two complementary dimensions: spatial on the Chinese side (one should not forget that the also under-monetized 1,200 millions Indians face a similar problem), and temporally for the United States and Europe. Yet the temporally catch-up in Europe and in the United States requires a Universal Dividend to adjust the density height of the money supply.

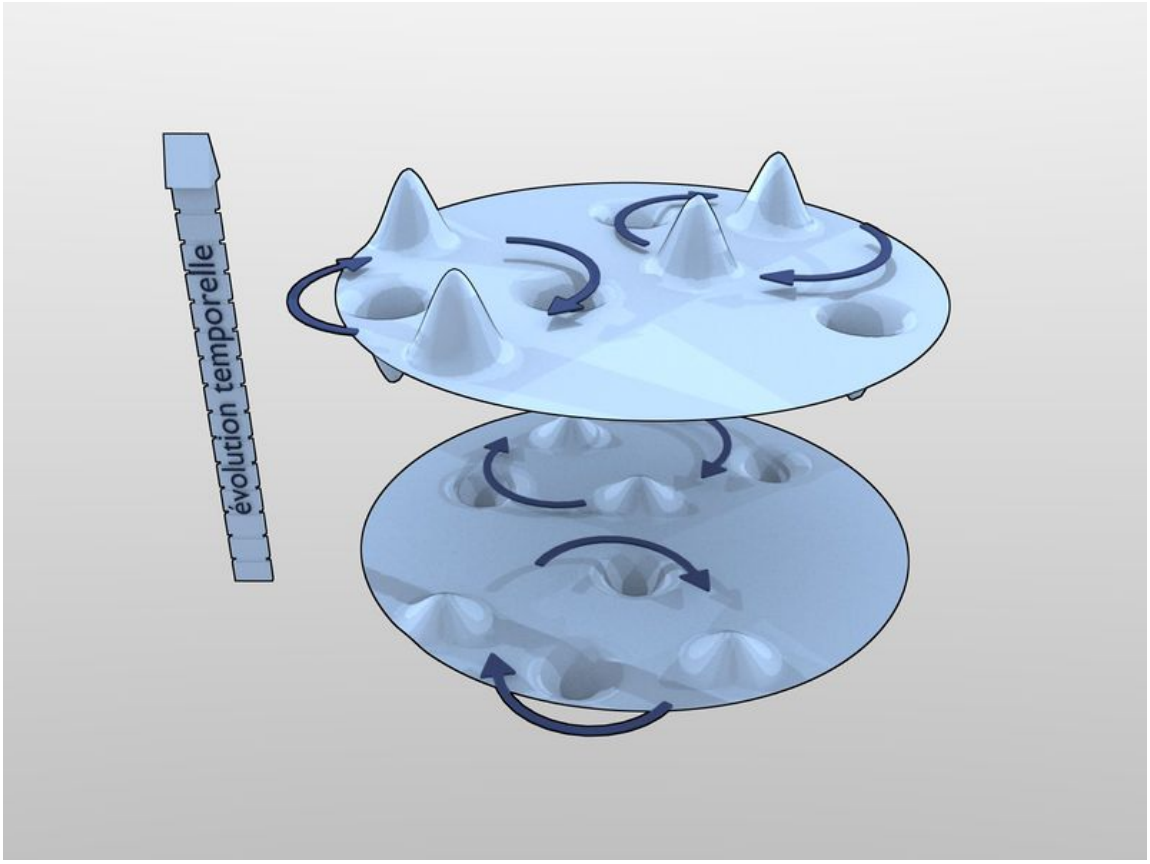


Fig. 16.1: *Evolution according to a constant ratio Mb/Ma through the temporal monetization. Only the monetary quantity of the exchanges grows and keeps the speed of circulation stable (Luc Fievet RTM 2.0)*

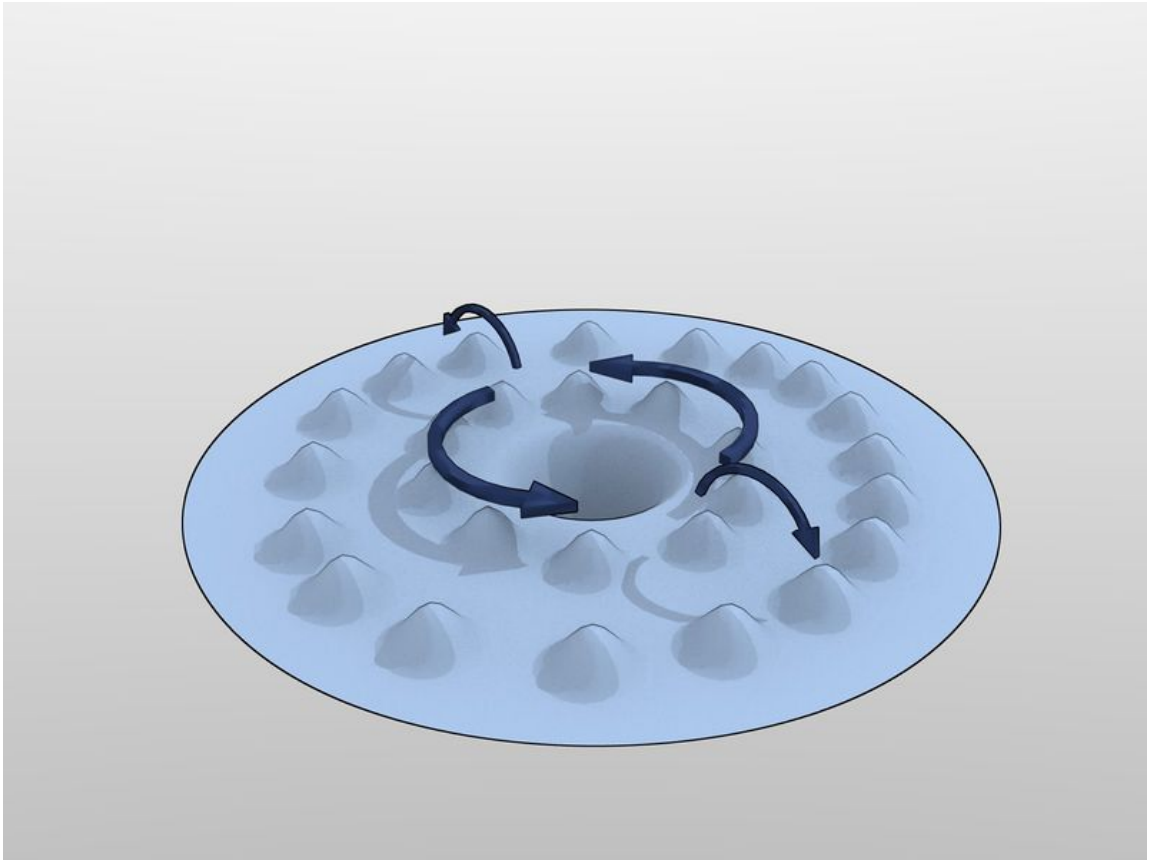


Fig. 16.2: *Evolution according to a constant ratio Ma/Na using the spacial monetization. The monetary quantity per monetized citizen (new monetized citizens = second circle) remains stable (Luc Fievet RTM 2.0)*

CHAPTER 17

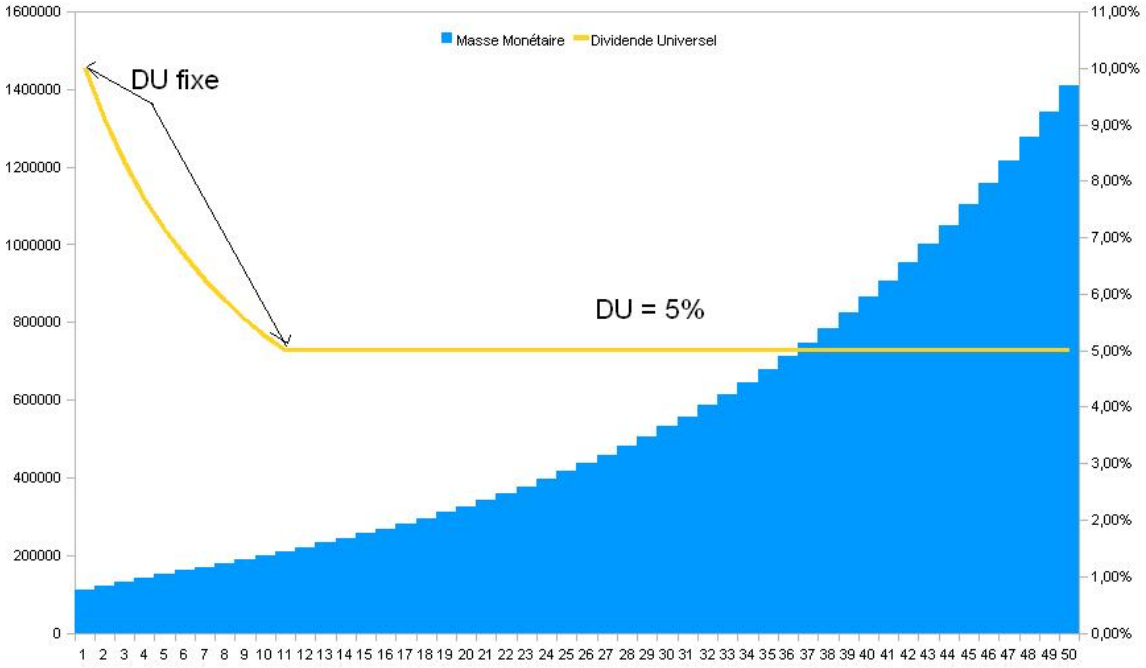
How to set-up a currency based on a Universal Dividend?

A Universal Dividend based currency can be set up based on a new currency or on an existing one following two approaches, simple or progressive.

17.1 Simple approach

The first approach consist in setting up an initial Universal Dividend superior to the “c” rate target that we will leave unchanged until the monetary mass growth rate reaches “c”. From now on, we regularly increase the Universal Dividend by following the “c” rate. This approach is particularly suitable in the case of a preexisting currency that mutates to the Universal Dividend.

For instance, in the Euro Zone, this approach could be performed based on the existing minimum allowances, grouping all social help within a unique and simplified counter, and integrating in the preexisting salary the mention of the Universal Dividend in the gross wage. It could be a “motionless revolution” which would essentially consist in raising the awareness of the Basic Income as the base for all free economical activity based on the sovereign individual, taking all his full part in the monetary system.



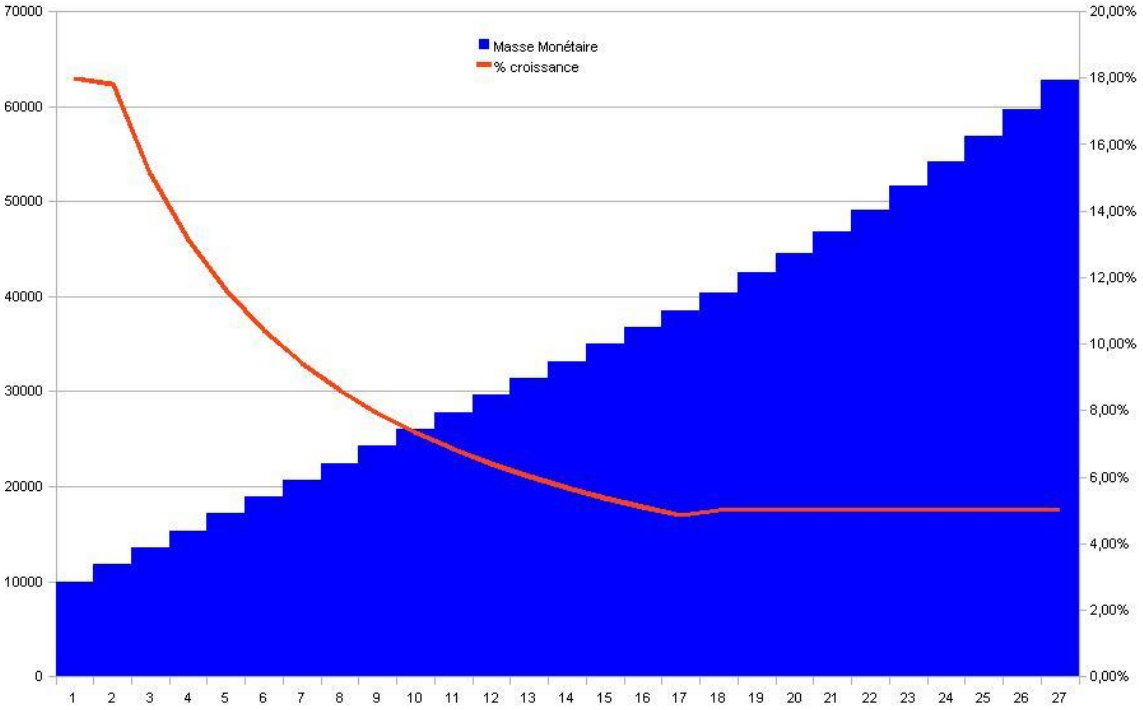
17.2 Progressive approach, the European case

The second approach consists is allocating to each new member a fixed initial credit associated to an optimal Universal Dividend from the very beginning. This solution is particularly suitable to create a new currency within a LETS.

Europe give us an very interesting case about a truncated Universal Dividend. It is truncated because a big part of the Euro Zone does not enjoy a minimal income, and that another part benefits from a conditional minimal income (hence not universal) and furthermore which is very high. We thus have individuals working for others with the simple application of an asymmetric monetary politic. Furthermore, conditions to get those minimal incomes are extremely complex, and require so much energy from individuals to ask for their part to different counters, that once it is obtained, it very strongly discourages monetized economic activity, which most of the time essentially results in the risk of coming out of the obtaining conditions.

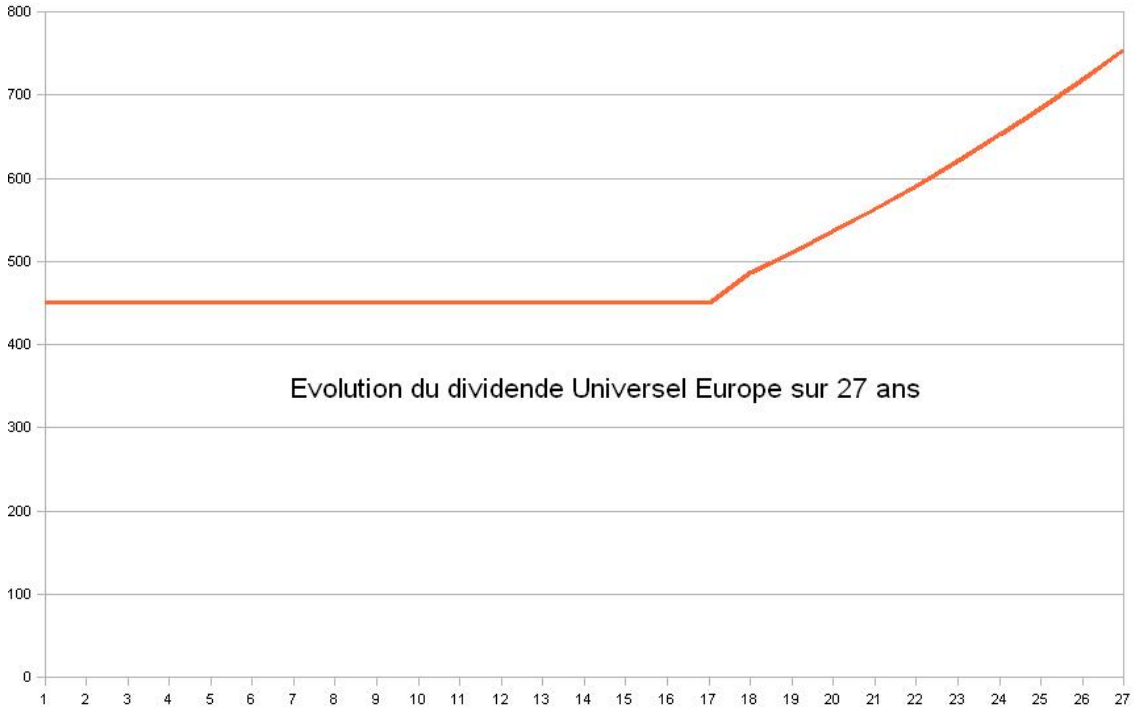
The observed minimum income in France or in Germany is on average around 450€ / month (sometimes much more with others helps, but also much less if besides that the individual ventures to monetize a declared activity).

If the Euro Zone brutally declared this Universal Dividend level for 330 million citizens, this would be



at a 18% rate of the monetary mass, which, to fix universal dividend, could reach the optimal growth rate of 5% of monetary mass in 15 years.

The Universal dividend itself would follow this evolution:



We could object that this evolution would be sudden, creating violent and sudden economical distortions, countries which are currently deprived in the zone of Universal Dividend being entitled to a new and high Universal Dividend could be quickly disorganized economically.

We can then imagine another more flexible strategy of convergence, starting from a Universal Dividend calculated from the 2010 monetary mass, of 130 € per month per individual for individuals deprived of a minimum income, to make it converge toward a target of 450 € per month per individual in the whole zone.

Basing ourselves on an asymmetric and strong growth of the Euro monetary mass observed at 8% per year from 2000 to 2007 (Law question: why did we allow a few to benefit exclusively from the monetary mass growth of common money to the detriment of other individuals?), we would reach this goal very quickly because:

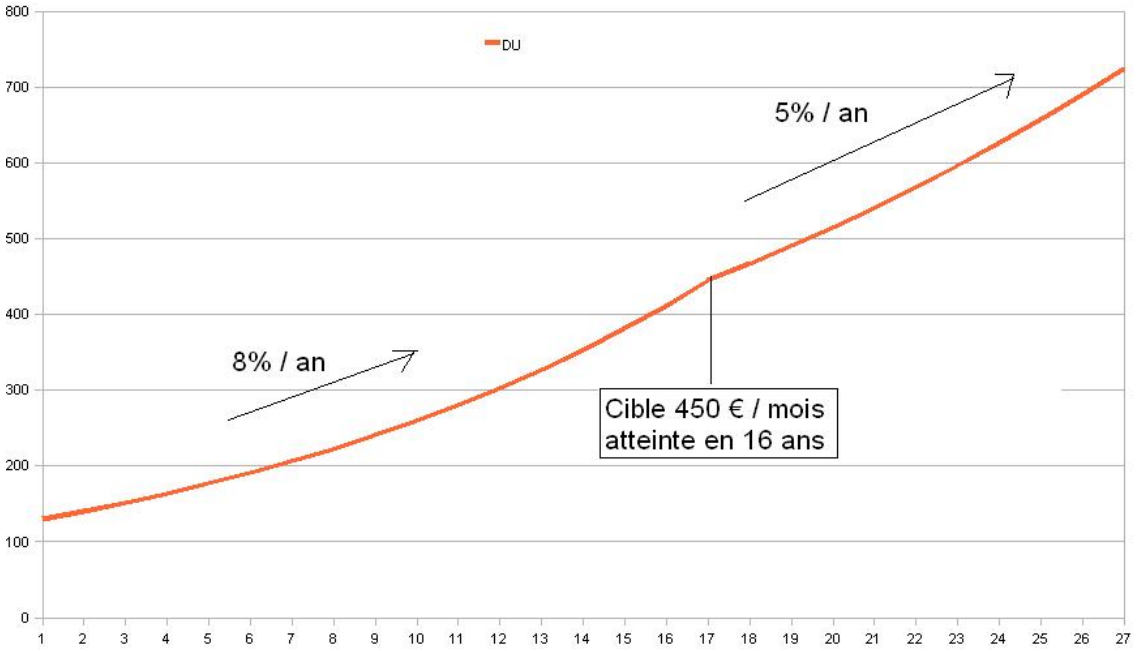
$$130(1,08)^n = 450$$

equals to

$$n = \frac{ln(450/130)}{ln(1,08)} = 16ans$$

The same duration as in the first strategy! (but creating less money, and so in a more progressive way).

The possibilities of progressive establishment exist, it is a simple question of fixing a defined spatio-temporal goal, associated to the recognition of equality between individuals of the same monetary zone before the measure of all value, and thus before monetary creation.



17.3 Reflection on loans with interests

Regardless of the monetary system used, it is right to think carefully about the problem of loaning with interest. If this interest exceeds the money mass growth rate, we are in a case in which we must recover more money than is created, what can prove mechanically impossible to realize, independently of all production and exchange levels.

If an autonomous but not insulated economical zone, whose local money was fed through an initial loan with interest, and then sees itself arbitrarily deprived of the associated money creation, then the creditor's demand is to give back more money than there locally exists. Those cases are conditions of forced bankruptcy.

For instance in France in 2010, thought the monetary mass increased by 8% per year from 2000 to 2007, (7% between 2000 and 2010 due to the contraction 2007 – 2010), the 22% interest rate is a legal rate, furthermore applied to individuals who are the most remote from the money creation, so the less susceptible to be able to pay back. This is a sufficient condition to cause personal bankruptcy.

But let's also take the case of a global monetary growth rate of 7% per year, with this additional money which is not symmetrically allocated within a zone, but only benefiting to central transmitters and their affiliates in the center of the global Ponzi pyramid. A local interest rate of 5%, although lower than the global growth rate, will be, in this remote place of from the emission, superior to the local money growth which will be for instance of 1%. Then it is at the moment of acceptance of this loan, a case of local decrease of monetary mass 5% - 1% = 4% per year, leading to local deflation and so to forced bankruptcies, independently from the notion of all production and exchange of values.

We might think that whoever accepts the loan should evaluate the ins and outs, and it is his responsibility

to evaluate his "risk", except that he is behind a Banking system which has access to all his accounts, and to global financial data. So, there is an asymmetric access to information, which allows one to take the advantage over the other. In fact the advantage of the money transmitter is immeasurable compared to the borrower. The first has all the information and all power to change it, the second has neither one nor the other.

With a transparent Universal Dividend, the long-term growth of the money supply being known and dense in the economy, the fixed interest rate of a money credit (of a previously accumulated money by the lender) should not legally exceed the Universal Dividend rate in order to have the insurance that the general conditions used to pay principal and interest are met. If the "risk" proves excessive for the lender, the solution is to not increase interest rate beyond the required maximal conditions, but to loan less or not at all.

At the very least this should also be the case in every monetary system. The interest rate of a loan can not legally exceed monetary mass growth rate. Without this, it is sure that conditions are not filled to be certain that it is possible to refund a loan at a superior rate, and such contracts must be logically declared inadmissible.

It is logically absurd that Law does not prohibit the emission of credits at an interest rate superior to the monetary mass growth rate.

17.4 Reflection on tax

The same reasoning than the one on the interest loan, implies that tax can NOT globally exceed the monetary mass growth rate, except if one wishes to give the State an unbearable prerogative over individual initiatives.

This means that in an Universal Dividend economy, community representatives, to finance collective projects with taxes must compute their estimates based on the number of managed individuals, and knowing the monetary growth "c" factor takes at most the lowest possible global fraction "f × c". As for the rest, the State must finance itself by selling the goods and services it produces, and must not get into unreasonable debt given the normal influx of revenues it can obtain.

CHAPTER 18

Focus on History of money

In this chapter, historical and consecutive monetary periods are analysed according to the relative viewpoint of the RMT. It does not pretend to be an “absolute” viewpoint.

18.1 The Neolithic currencies, first dense currencies with uncontrolled inflation

From the Neolithic, we find equivalents of exchanges accounting by material barter based on diverse reference values. In Britain for instance, we found in the tumulus built at these times, important stocks of axes made of jade, which number and dissemination resemble strongly to monetary stocks, allowing trades based on a value of reference.

With this type of accounting, yet the possibility of a monetary inflation were existed, due to those who has access to stocks of this value of reference. This explains undoubtedly that such important stocks remains until our era.

18.2 Metallic currencies, first currencies limiting inflation

Barter being insufficient to allow exchanges, and the first currencies based on potentially and strongly inflationary productions because easy produced by anybody, it became necessary to use a money value more stable. To do so, rare metals were going to take the central monetary role advantageously.

This is how gold, silver, bronze and copper are going to be used as almost exclusive value of reference during the empires developments from Antiquity, and this until the 18th century, beside the strong development of paper currencies.

Fig. 18.1: *Jade axes from Neolithic (Wikimedia)*

18.3 Roman Empire

No empire without monetary expansion! The universality of the use of currency gives to the one who controls the production and the definition a great power of illegitimate monopole when the respect for ethics toward the emission is not at the core of the fundamental values.

Roman Empire comes with monetary expansion, regularly "devalued" for the benefit of one central issuer: Rome.

Denier, Sesterium, Aureus, Antoninien, Valerian, Argenteus, Solidus, follow one another. Made of bronze, copper, silver and gold according to the conquests by force, and to their gains, or via the slavery in auriferous zones, as the famous region of "Las Medulas" in Spain, where - according to the narratives of Pliny the Elder - we can consider that between 26 BC and the 3th century, Romans extracted approximately 1 500 tons of gold.

Each of these currencies is emitted while an expansion of the Empire occurs, and during the appropriation of metallic resources, replacing the former, then it's slowly devalued by the central issuer which puts less and less noble metal in the coins, obviously due to not having access to infinite resources.

The solidus, based on a fixed gold quantity is not abandoned by loss of value, but by rarity. It's not its value that makes it lose its status of currency, (it still has value nowadays!), but its universality as intermediary of exchange which cannot be assured.

Yet, we can think to the fact that although monetary unity devalues itself - according to the reference material which is represented during its first emission in time - it doesn't impede the economic expansion and the global quantity that can be exchanged by the whole monetary mass - which is increasing in time. There is no contraction between the unitary contraction of money and its global expansion which comes with the

Fig. 18.2: *Solidus, AD 327 (Wikimedia)*

economic evolution.

We can sum up this by the fact that 1 is way smaller compared to 1000 than compared to 100, while 1000 is way bigger than 100. If doing so, our monetary unity loose 10% of its exchange capacity in relation to a given value, and at the mean time, the monetary mass gains globally 15% of exchange capacity - due to the economic expansion that comes with its transformation - then, what is "lost" in unit, is "gained" globally. Remains to know where the noticed surplus comes from.

18.4 Golden and silver Spanish bubble

Despite their limited nature, gold and silver didn't avoid inflation, mostly during the Spanish Empire time (from the 15th century). The discovery of Americas by Christoph Columbus (1492) turned upside down the monetary streams in Europe.

According to Wikipedia "Economic relations between the Spanish America and Europe" (in French only):

" The two big battlefield loot done during the Aztec Empire and mostly in the Inca Empire, brought back important sums of money to the spanish crown and to the conquistadores. The Inca emperor Atahualpa's ransom represents, according to Pierre Chaunu, half a century of precious metals in europe.

Mines bring back even more spoils of war : first of all, thanks to few sources of gold in Cuba at the beginning of the 15th century, then thanks to the big silver mines from Peru in the 17th century (mine from the Potosi), and more in the north, Mexican mines dominate the production from the 18th century with the gold mines from Portuguese Brazil (Minas Gerais).

Fig. 18.3: Auriferous region of Las Medulas exploited by Rome from the 1st to the AD 3th century (Wikimedia)

Fig. 18.4: *Sesterce from Trajan AD 105 (Wikimedia)*

It's during the 17th and the 18th centuries that precious metals' production and arrival in Europe have been the most important."

But what do we notice? Precious metals loose their value all along centuries: according to the historian Earl Hamilton and his "Price History", the stock of 600 millions pesos in 1500, allows to buy as much wheat as the stock of 3 billions in 1800.

Addition of money in economy decreases the value of money. What is true for a gain of any product's productivity (fall of its monetary value regarding a constant money) is also true for money, even though it's about a good of reference: the quantity of merchandise that can be exchanged with a certain quantity of money, depends on the total quantity of currency in circulation. Therefore, it's not one or another but both. The productivity's growth of production of wheat would've decreased the price of the currency, here in gold or silver metal all along the 3 centuries. However, the constant addition of an important quantity of money which has been spread into the economy (estimated here according to Hamilton to 5 times more), would've increased by 5 the price at constant production and consumption.

Supposing a relative stability of goods and services production between these two dates, we would have the right to pretend that the cost of the wheat production decreased by 5, meanwhile the injection of 5 times more of money stabilized the facial price.

This short-cut doesn't reckon with the changes of economic behaviour, with the growth of the numbers of individuals (which reduce the part on currency/person), with the new goods and services requiring their part of the monetary stream, etc... But it allows to understand well the mechanism occurring within the money system : the local price relies strongly on the global monetary variation, as well as its density of distribution. The density has to be understand as so : if the surplus of money was stayed in Americas, the price of the wheat in Europe, according to the same reasoning, would have fell from factor 5, essentially due to the gains

Fig. 18.5: *Conquistador Francisco Pizarro (Wikimedia)*

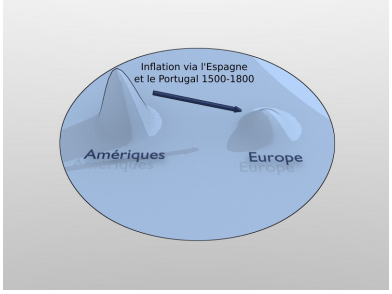


Fig. 18.6: *Gold and silver inflation following the Spanish conquest (Luc Fievet RMT 2.0)*

of productivity made, and any other things alike..

This historical note allows to understand that not only gold and silver don't escape to the fundamental relative monetary rules, but it's not require to use them to manage the common monetary mass. Thus, it's not the nature of a determined good which makes it a currency, but the agreement of any mode of circular exchange and also purely mathematical. So how this currency will be managed? It's the trust regarding the ethic of the tool of exchange which will ensure the membership of Citizens to the proposed currency.

Fig. 18.7: *Reales in silver (Wikimedia)*

18.5 The collapse to avoid : hoarding and deflation

Considering their growing monetary role, golden and silver metal were going to push to the seek and control of deposits, as well as hoarding. Lending currencies at fixed interest rate, creditors involve borrowers to give back more than what it exists in circulation, in a global movement of hoarding. The limited nature of this type of currency makes impossible technically this type of flow of funding over the longer term.

We have to understand that the phenomenon of lending is already in itself a hoarding phenomenon, the lender await to gain more money than what he owns, and it has nothing to see with the role of the currency as an immediate mean of universal exchange of goods and services. It's not a problem as long as the lending and the hoarding remain limited, but what happens if the currency is excessively hoarded or leaks aren't progressively bailed out, as we have to add energy in an isolated system in order for it to keep moving?

We have a phenomenon of dissipation of the currency. Not only the hoarding creates a deflationary cycle when the money creation does not compensate the loss, but the idea which says that saving is good because it presupposes an upcoming investment, is insufficient to explain or to stem the mechanism, for two reasons:

1. If the savings accumulated is re-injected in the forms of loans, the deflationary cycle will go trough a temporary counter-tendency, and the accumulated savings, if the borrowers continue to refund correctly increase, increasing the deflation rate to levels of price decline so insupportable that the

bankruptcy of the exchange circuit is reached. The lender who has an initial monetary advantage, and gets some fun by only injecting money in the form of loans, and not in the form of circulating goods, takes mechanically possession of the whole economic circuit.

2. if the accumulated savings is invested in another autonomous trading circuit (in space or in time), this is really good for this new circuit without any doubt, but it will do nothing on the problem of the initial circuit, which does not necessary have the goal or the means to sell its production outside, for example where this money would have been invested. Here again we perceive the fine analysis enabled by the field of value, which removes inconsistency of global theories by focusing on the density of money and the differential field of value.

Still this local deflationary mechanism is all the more dampened in a money of rare reference value which, by construction, not only is not dense everywhere, but also of which the growth depends on external parameters and specific investments to produce, which lacks of relevance with what the free producers want to produce and trade regarding the measure of any value.

Low growth money but dense encourage investment and plays then its fundamental role : money usage for trades inside production circuits. Moreover it can be used to restore progressively monetary density everywhere, by repairing slowly but progressively and without bumps, unavoidable leaks due to excess of hoarding or external investments of the corresponding economic area.

Finally, paralleling with the physics is not without interest. We know since energetics theories that the perpetual movement is impossible. The perpetual movement consist in a system which would turn on itself, with a initial input f energy finished. Yet these systems violate the first and second principles of the thermodynamic. To be clear, there is always energy loss, and it is necessary, one way or the other, to inject supplementary energy to keep the system moving.

To bring an interesting historical footnote, Albert Einstein declared that he when he was working on his Special Theory of Relativity (from 1902 to 1905), he was working for the patent office of Berne, this work was "handy" for him. Indeed, besides the fact that it was giving him the necessary livelihood to pursue his scientific researches, this work was not wasting too much of his energy, and consisted most of the time to declare as inadmissible the patents which pretended to realize perpetual movement machines.

To think that a fixed quantity of money would be a guarantee of stability of the "value" of this money, is to not understand the Relativity of the individual measure of value, and not to take into account neither the simple experimental fact, which demonstrate all along money history for 10 000 years, that forced or conciously accepted the expansion of monetary masses is unavoidable. By understanding this phenomenon we will transform the cyclic changes of catch-up brutally experienced, mostly sources of war or revolutions, in simple adjusting periods, acceptable because well understood by anyone, based on a systemic ethic clearly defined, hardly questionable, and always ensuring the economic freedoms.

18.6 John Locke 1632 - 1704

John Locke, philosopher precursor of the age of the enlightenment puts limits and tempere property rights by the "lockean proviso" which declares that one can only claim legitimately the ownership of original resources where there is enough, and as good, left in common for others.

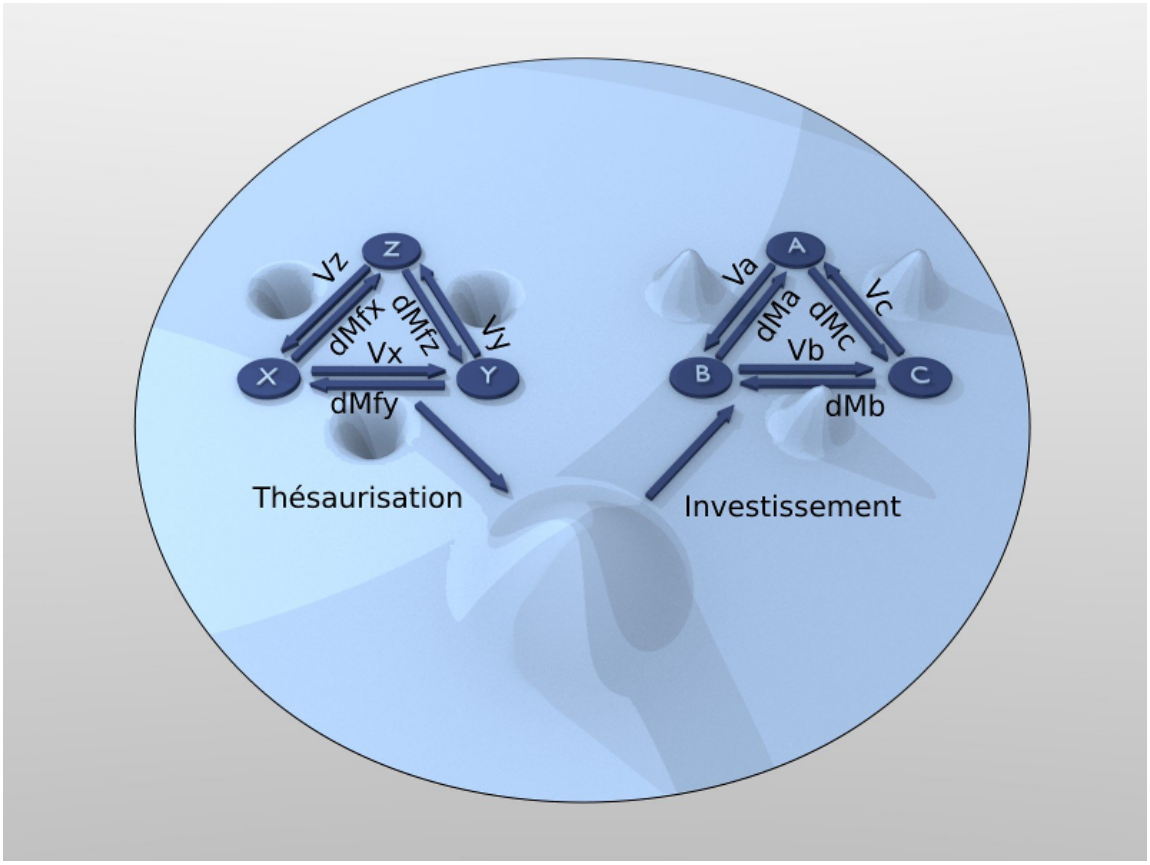


Fig. 18.8: *An example of hoarding and investment with leak (Luc Fievet RTM 2.0)*

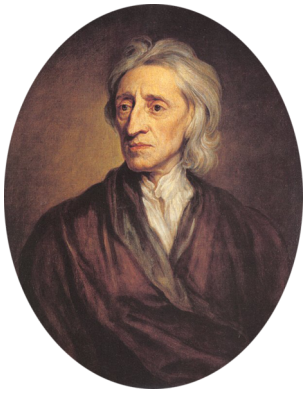


Fig. 18.9: *John Locke (wikimedia)*

18.7 Fiat currencies, first expansionist currencies

Fig. 18.10: *Caricature of the Law's system (Wikimedia)*

In the 18th century, the "Law's system" - from the Scottish "John Law" - is officially implemented within a central proto-bank in France. Law observed the monetary fiduciaries mechanisms which were already working in Italy. Then France was overwhelmed by debts and Louis 15 gave his agreement for the implementation of this system.

Fiduciary money engenders a currency which evolves toward a loss with the referent value, to go toward a dematerialization in the form of pure trust. This very first version of money paper represents a part of the referent value (gold or silver) payable by the issuing Bank.

18.8 First fiat pyramids of centralized creation

The first banks issuing fiat money base the trust on the reference value. But the temptation to print more banknotes than the Bank owns in metal as a guarantee, enabling more and more actors to monetized their production, and thus to create value exchanges cycles. The economic development is fastening as money becomes more dense in the economy.

However, two fundamental causes provoke the collapse of these expansionist pyramids.

First of all one can not indefinably guarantee fixedly a finished value of reference by emitting more and more money. It would need to announce clearly the growth rate of the money emitted by the Bank, would allow getting a opposite rate of value of reference in time. For example, banknotes are emitted at a speed of "c", guaranteeing a value of reference owned by the issuer, and it is announced that the banknote at the time of issuing, the banknote is exchangeable to a quantity of value of reference, then this banknote should be noted that at time "t" the exchangeable value of reference will be :

$$Q(t) = Q(0)(1-c)^t$$

For example for a displayed growth of banknotes issued of 5% / year, it should be noted on the banknotes issued at the date "d" that the quantity of value of reference guaranteed by this banknote for the current year "a" is :

$$Q(t) = Q(0)(95\%)^{a-d}$$

The quantity of exchangeable value of reference would halve in this precise situation every 15 years after the issuing date of a banknote. This system would be complex, and would ask to do the calculation of the value of reference for every banknote depending on its issuing date, but it would be exact.

The second cause is the loss of trust in the fixed guarantee. Existing banknotes being guaranteed by a fix value, with a very big trust of its users, the guarantee is almost never claimed by the beneficiaries. The Banker starts to feel exhilarated, and issue more money, then more again, until the day where the trust drops.

Actors of economy are surprised to find so much guarantees of the referent value in their trades, increasing so the price in the emitted fiduciary currency, until the day where the trust in the issuer ceases, which constitutes the rupture and the crisis. Requesting for their guarantees, beneficiaries find out the truth : the equal quantity of the referent value, according to the the sum of the emitted wages, doesn't exist in the bank, customers are swindled and it's bankruptcy.

This is the principle of the Ponzi pyramid which is described here and where it's the last participants who are the most hardly affected. It's due to the fact that an economical expansion can't be done upon the wage of a fixed referent value. This phenomenon, which seems obvious, will take 3 centuries to find a partial improvement, when fiduciary money will take place more and more in the economy as itself and not as a guarantee.

The phenomenon of Ponzi pyramid - consisting in making the last participants pay to remunerate the first ones - in the monetary mirror of the value, means spoiling goods or making the last participants work for the benefit of the central issuers of money.

18.9 Thomas Paine 1737 – 1809

Thomas Paine, revolutionary American, then French, declared in the "Human rights" published in 1792 the following assertion:

"Those who have quitted the world, and those who have not yet arrived at it, are as remote from each other as the utmost stretch of mortal imagination can conceive. What possible obligation, then, can exist between them- what rule or principle can be laid down that of two nonentities, the one out of existence and the other not in, and who never can meet in this world, the one should control the other to the end of time?"

In 1785 three years after "Human rights" Thomas Pain, then French deputy, publish "Agrarian Justice" in which he declares that no citizen without revenue can be and as any citizen has to be represented, he must benefit of a universal basic income allowing him a political existence.

18.10 Invention of regulated Leverage

Despite repeated failures of the first Central Banks, the idea of an expansionist fiduciary money was never abandoned. Why ? Because such a money is easier to transport, easier to exchange, is a nice business model for issuing Banks, but most of all it lead the economy to fast expansionist periods. A system where failure were avoided had to be found while saving the positive aspects of this system.

A solution has been found: the limited banking leverage. The banker has a limit of fiduciary money emission in the limited of a regulated ratio. This system would allow customers to find back the referent value in a sufficiently high proportion, in order to not undermine the trust. Historically, it's about factor 10% of reserve which has been chosen. This reserve ratio, a sufficient numbers of customers could get back their referent value and the trust remained valid in the system.. Only for a longer time!

Fig. 18.11: *Thomas Paine (wikimedia)*

This system still asymmetric does not impede the loss of trust and only postpones the term on a larger period. The limited leverage effect is finally blocked while it reaches the "long-term assets", when the 10% of reserve are reached, the banking system is forced to stop emitting new credits, and it's bankruptcy for the last borrowers who can't expect any more stream of the new currency which allows to pay the debts and the interests.

The referent value guaranteed by money can't be respected by the issuer who wants to allocate more credits to reinforce an economic expansion. Beside, without monetary expansion, it's not possible to reinforce the investment, the hoarding without associated value creation, sufficient to acquire a growing buying power. The intrinsically melting value of an expansionist currency encourage its circulation, allows to pay debts + interest: it is the necessary condition for a supple expansion in time.

Playing on these both complementary aspects which are expansion and credits contraction, the centralized system with leverage effect, give to the banks, the control of the artificial "economic cycles", which are only monetary cycles, allowing not only to control the whole economy but also to ensure - whatever the created value - a perpetual income. It's a fact: issuers of asymmetric money are among the oldest economic centres of activities with the States, which take the successive "crisis" in stride.

Producers remote from the monetary emission centre - misunderstanding how money is emitted - realize belatedly the effects of the politics of credits emission over the fluctuation of the common money value, and they measure too late the impact of this phenomenon on their own activity.

When they realize it, and all wish at the same time to recover the "reference value" there is not as much stocks for answer to all demands (insuring 10% of reserves remains in any case a fraud, it is impossible for the whole owners of money to recover this "value", and the first to get it are doing it at the expense of the others before general bankruptcy), and the bankruptcies from Banks to Banks destabilize then all the rest of the economy which collapses and leads to social and political disorders of historical scale. 1929 was the last crisis at an international scale based on a value of fixed reference.

Fig. 18.12: *Charles Ponzi, inventor of the pyramid named after him (Wikimedia)*

18.11 Clifford Hugh Douglas 1879 – 1952

Clifford Hugh Douglas, British engineer published in 1924 “social credit” , where we see for the first time the perspective of a “monetary dividend ” which is demonstrated as essential to ensure the balance of the money and the correction of the bias of interests related to debts.

Fig. 18.13: *Clifford Hugh Douglas (wikimedia)*

18.12 The instability of the reference value

From 1946 to 1971, the gold standard continues to be used, but it is not really guaranteed by the transmitter other than through façade prices. As long as the demand for the reference value was low, the price could be displayed as fixed, but even before 1971, evolutions of the displayed price became necessary facing an excessive demand supported by the monetary expansion, as shown in this graph of the price in dollars of the gold standard, which was no longer one.

Fig. 18.14: *Evolution of the price of gold in dollars until 1971*

This is as well as since 1967, gold's price started to letting go. Impossibility to provide baseline value to fix price within a money in expansion appear when at equal demand quantity of money growth. This is a purely mechanically phenomenon.

Similarly seen in 2010, a growth of 7% / year over 10 years of the money supply in euro, and then hear that "monetary policy" is to maintain a "2% inflation" is so absurd that we should not be surprised to see coming

sooner or later a violent catching, either by blows on the most requested values, or gradually, but it would be mechanically impossible on the long term to get two totally contradictory figures.

18.13 Complete abandonment of the gold standard, the fractional reserves

Recognising the futility and the impossibility of holding a standard through a reference value, 1971 sees the emergence of fractional reserves, a control system of the money supply by Central Banks, which allows to control interest rates and the amount of funds allocated by the Banks. The price of gold then underwent various changes, through a historical bubble that saw a peak in 1980.

The system of fractional reserves still does not solve the problem of ethics as to the currency, a two-headed emission centre, Banks and States, in arrogating to a monopoly of exclusive emission to the detriment of producers away from the centre.

There is always, in this system, a leverage which takes advantage of the asymmetrical issuer of the currency that creates money by arbitrary credit «pledged», in case of bankruptcy of the borrower, with a rate such as 8% of reserve.. made of.. the same currency! This change is a windfall for the financial sector, since this type of reserve is being manipulated easily, one can always, in case of crises, find solutions, which can be ethically very questionable, but allow to avoid sudden failures and thus avoid a part of previous disorders.

We can compare the monetary system still active in 2010 to the old French computers network of the Minitel, a centralized network, where the creation of services required a review of the monopolistic owner and the sharing of revenues from the activity. While an issue system of symmetrical currencies in the space-time such as Universal Dividend is comparable to a neutral Internet where every citizen of the economic zone is considered as equal to money creation, and therefore capable of exchanging in “peer to peer”, from person to person, without special permission of a central authority.

How does this fractional reserve system work in terms of the economy ? This system creates artificial cycles for the benefit of asymmetric issuers :

Step 1 : The financial system is being consolidated, and on the basis of his “own founds” will be able to issue a debt **“€”** via interests which comes “irrigate the economy” by a “leverage”. Step which can be long and sprawls overs 10 or 20 years, the Central Bank ensuring a control of this “regulatory spoliation”, at a low enough rate to be sustainable.

Step 2 : the financial system “is paid” by the interest **“I”** of the issued debt (public and private). The interests, and possibly the nominal debts, fueling the “hole” thus formed. Except that the issued debt has no reason to “return” to the issuer, as having duly paid this or that, it is very largely hoarded by investors, or is found circulating in autonomous microsystems which use rightly medium of exchange. This step can also last for 10 to 20 years ...

Step 3 : due to the impossibility of return issued debt with interests, the financial system, on the basis of caused bankruptcies, end up with a totally unstable balance, and in a bankruptcy itself (it is still expected to balance its balance sheet). He collapses on itself. There is then a massive issuance of new debt “to rebuild it”, to irrigate again an economy that moves away (inflation of real wealth) but lacking sorely of money (crisis due to the scarcity artificially maintained of the currency). It then finds the end of the cycle and a new

cycle may restart, 1) 2) and 3), except that considered economic space is much larger and "richer" than in the previous cycle (in monetized value which does not mean an "absolute" value, which does not exist).

The result for the producers, is that, regardless of the created and exchanged value, the acceptance of such "common" currency is the assurance that this value will inevitably vampirized by the asymmetrical issuer, assuring him a "business model "absolute and infallible, valid at any point in space-time.

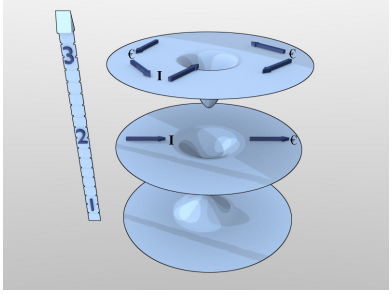


Fig. 18.15: *Three steps of emission of the "debt money" (Luc Fievet RTM 2.0)*

18.14 Yoland Bresson, born in 1942

In the "post-wage-labour" published in 1984, the french economist Yoland Bresson states :

"The community needs, through the State, to periodically allocate to any economic citizen, no other considerations than its existence, the monetary equivalent of the value of the unit of time".

Yoland Bresson demonstrates a relationship between time of existence and value, and calculates, on considerations relating to GDP, a relative value of a basic income (named "revenu d'existence") whose quantity is surprisingly close to that deduced by the purely monetary and relativistic approach to the RTM.

18.15 2010 and after : Bâle III, or symmetrical currencies ?

The cycle being long, the capturing value is being made on a sufficiently low rate to not be excessive, the process is hardly discernible. In the same way, who is able to see the difference between building a network centered, such as the Minitel, and building an acentric, symmetrical and neutral network, such as Internet, except for system administrators and telecommunication protocols specialists ?

We are therefore in the exploitation of ignorance as to the construction of the monetary system. An informed citizen of a proposal for the use of a common currency allowing it to trade fairly with similar production present and future, should not accept such an architecture, but opt for a choice that is open, transparent, and equitable among all members of the respective currency union.

2007 – 2010 representes the end of the last cycle of monetary expansion 1971 – 2010, which has seen successively private rules prevail both in the USA and in Europe, decided within an "expert" group, named "Bâle I" then "Bâle II" and "Bâle III" under negotiation, expected "regulate the Banks ".

Fig. 18.16: *Yoland Bresson in 2012 (wikimedia)*

This would be like trying to transform the Minitel while the Internet is being increasingly adopted.

But what's happening in 2010 ? An explosion of complementary currencies ever seen in the history of currency crises. If the local currencies explode, attempting several types of monetary systems, based on a fixed mutual credit, with an Universal Dividend, it is mainly on Internet that are deployed interesting attempts, which the most technically accomplished is probably the Open Source project "BitCoin" which allows to manage a monetary system P2P "peer to peer", where the currency can develop itself in a fully decentralized way, through peer-to-peer relationships and where all transactions are stored and encrypted on the entire network.

The project Bitcoin is however sealed by a non-fundamental compatibility with RTM. Indeed the total mass of Bitcoins is technically limited to a maximum. So that although the spatial symmetry is respected in part because it seems not to advantage anyone, the temporal symmetry is not, and once past the generation of the maximum money supply, the last new adopters won't have access.

In addition there still is a spatial bias. The symmetry is not based on individuals adopting the system, but on the machine ability to generate computing. This is not consistent with economic freedoms. Bitcoin therefore doesn't respect the first freedom of a monetary system, as it is an open system.

Therefore it can be expected that the "temporal pyramid of Bitcoins" collapses sooner or later.

What remains from the gold rush, except ghost towns ? Whereas after a harvest, a wheat field does not provide over and over again abundant crops ?

18.16 Historic graph

18.17 The Universal Dividend implemented

The Universal Dividend has already been implemented recently under different forms, and under different names as "unconditional basic income", "basic income guarantee", "universal basic income" etc...

There are examples of implementation in Alaska, in a local experience in Namibia, within SEL as SCEC in Italy, or in Brazil. There are groups that promote a symmetric and individual income as the International Association of BIEN (Basic Income Exchange Network), as well as the AIRE (Association pour l'Instauration d'un Revenu d'Existence) in France was chaired by the economist Yoland Bresson.

Best of all, Europe is already virtually installed in a system where an Universal Dividend grew since 20 years, in parallel with a system of arbitrary credits. In France, in 2010, the RSA is 450€/month, but it decreases gradually as assured people gain additional revenues, on a large ditch, so that for example, among citizens earning an equal hourly income, some touching the RSA by working only half-time, when others are full-time. A totally unfair system that can be called "great divide" and whose main consequence is to encourage citizens with little income, not to monetize their productions, or not to declare the exchanges (or both).

This is actually all OECD countries that offers a minimum income, which remains conditional in most cases, usually associated with an age requirement, various constraints such as to demonstrate the search of a "job", and thus ultimately they do not consider individuals as unconditional associated with the nation.

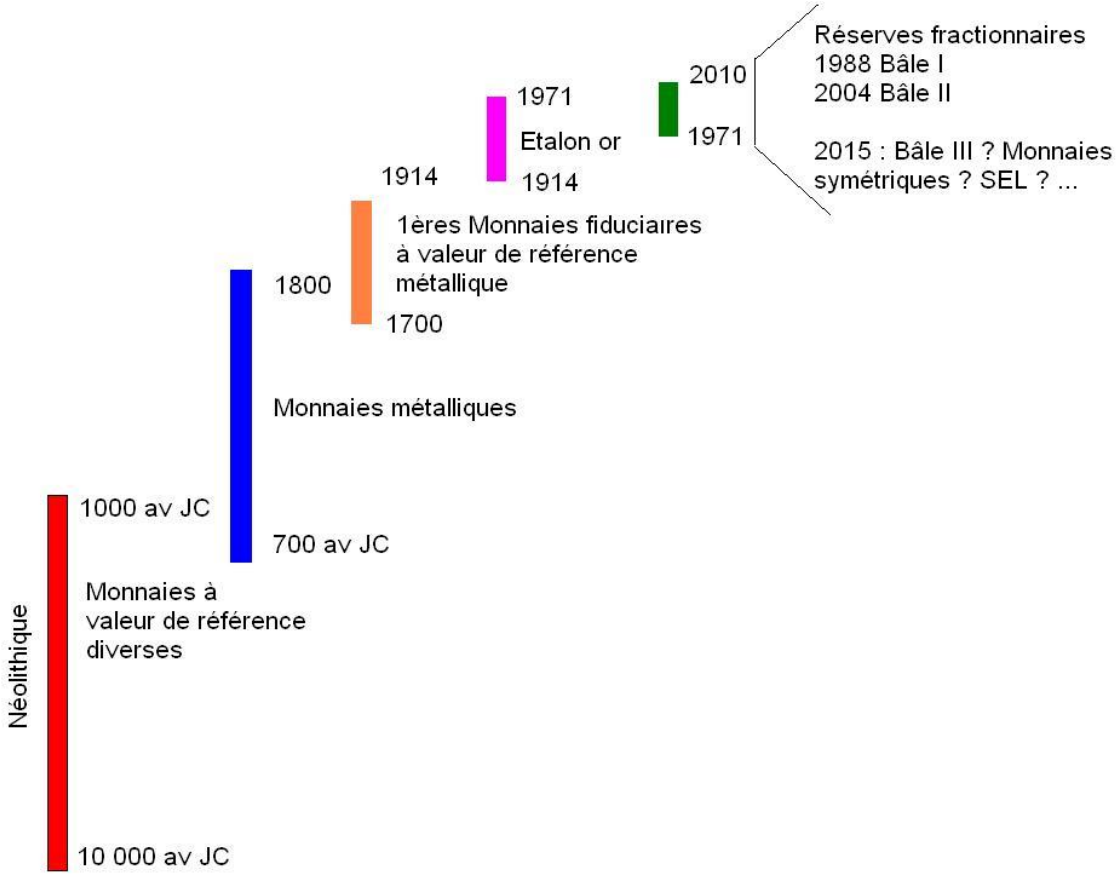


Fig. 18.17: *The different monetary forms since 12,000 years*

The main problem of the euro zone is the strong disparity of the minimum income. Where France, Germany and Spain offer more or less comparable amount of 450€/month, the citizens of other countries recently associated with the common currency don't have, and sometimes have minimum wages below this amount.

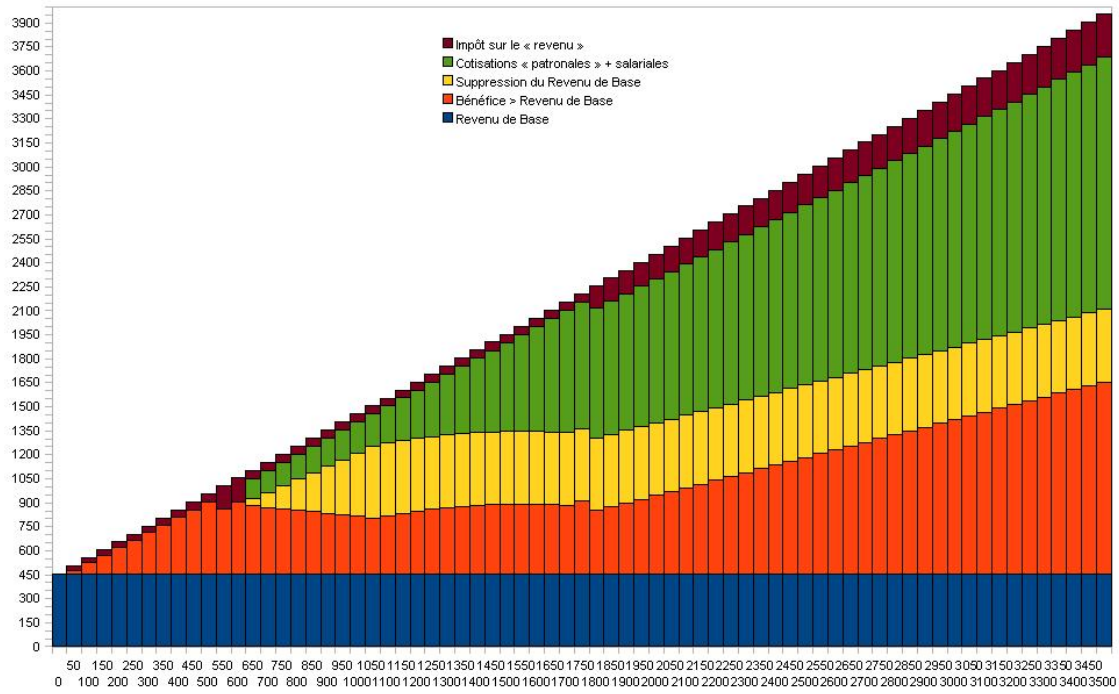


Fig. 18.18: *Evolution in France in 2011, of the net revenue received (blue areas + orange = RSA + net complement. The yellow areas, green and red are the taxes) According of total individual turnover or full salary (abscissa = full salary). Between 600€ and 2200€ / month of turnover, The Citizen earns always the same amount, about 1050€ / month. (http://www.creationmonetaire.info "The basic income in France")*

Under these conditions, the production leaves the countries offering high minimum income to reach out to those where it is much lower or non-existent, creating a strong distortion of competition between individuals, in total contradiction with the stated objective of a free market and undistorted .

A common currency is only compatible with human rights if its mode of creation respect the equality of men before the judgment of any value, and thus their equal right to the money creation. The implementation of an economic zone based on a common currency, without a convergence of individual minimum incomes, is a violation of law. It comes to an implementation of a currency that doesn't respect the four freedoms (the freedom of the democratic change in the code, and the three economic freedoms which are the access to resources, the production, and the exchange "in the currency").

18.18 The open project Open-UDC

The project Open-UDC (as “Universal Dividend Currency”) is a development project of an open computer system (licensed under GPL), of free currencies based on Universal Dividend.

Initiated in 2011, it is accessible on http://www.open-udc.org , and it consists to develop a set of tools allowing the individual and collective management of monetary exchange within of a digital money supply associated with rules and open and democratic control processes.

Besides an initial democratic basis, the project has reduced the calculation of the Universal Dividend on a monthly basis from very simple rules, it may be useful to remind here for the creators of local money wanting to follow the RTM :

- UD (0) = 100 UDC
- UD (n+1) = MAX { UD(n) ; Pud × M(n)/N(n) }

Where “n” is the previous month. UD(n) is the Universal Dividend of the last month, Pud is the constant percentage of the preset minimum Universal Dividend, M(n) is the money supply of the last month, and N(n) is the number of members of the monetary community.

The Universal Dividend in monetary units and thus fixed, never fall, and is recovered if the growth of the money supply for each member (M(n)/N(n)) becomes lower to the minimum “Pud”.

CHAPTER 19

Other bases of the Universal Dividend

Even if the logical and mathematical approach is enough to reach the result of a Universal Dividend money, it is still possible to develop complementary and more practical points of views, which tend to the same fundamental result.

19.1 The Citizen condominium of the Currency Union

The economic zone associated to a common money is fundamentally a Citizen construction. Any Citizen in its respective State is a co-owner of the Zone (which can be reduced to only one State). In a democracy, we are regularly invited to elect our representatives directly or indirectly. Therefore it is an act of common life, where the money is the economical cement commonly accepted and created to allow exchanges in space but also in time in a balanced way.

Yet any owner of a company whatever it is, receives, proportionally of its capital holding an annual Dividend. The Euro area is economically valuable proportionally to its monetary mass circulating (or even the PDB, but PDB and Monetary Mass are interdependent).

The Universal Dividend corresponds then simply to the recognition of the co-ownership of the economic zone by each Citizen (present and to come, and no generation has any privileged right from this point of view). The citizenship of the economic zone is inseparable to the fundamental right of a comparable share of the common money issuance between every citizen.

19.2 Monetization of free value, voluntary, non-directly mercantile

Art, free software, free rights writings, non-mercantile work made thanks to associative or individual actions etc... provided by each citizen from the Euro zone, are values, which benefit to the mercantile sector directly or indirectly, immediately or delayed in time. For example, Internet works with a layer of free software that have been developed and distributed for the most part, without any monetary recognition.

These types of productions are hardly traded for money directly, because what makes them value, is the adoption by the majority, even more fast that one does not ask for a mandatory payment to get it. This creates norms fast, information exchange protocols, and usages. Yet, this substrate of value develops mercantile values which give value to their rare products or artificially scarce, by asking for a mandatory payment.

The Universal Dividend is a valuation of this free layer and not directly mercantile to the society, which is a fair compensation of the rights of use of this multi-value layer for mercantile activities.

One can not oppose the free creation of value an intellectual property rights as a mean to be paid. Because the choice to give the freedom of use and of transformation of its creation is a mean to disseminate without obstacles, without brakes, fast, to the benefits of the most. This is generally the case of scientists discoveries. Still, authors of these creations do not say that they should not be paid for what they brought, but they do not want to sell it directly. They do not ask for proportional gains to their contribution, but a minimum monetary recognition.

The Universal Dividend answers to this expectation.

The creator who wish a proportional remuneration to his contribution has to go for a proprietary approach. The two approaches do not oppose, they complement each, and can totally exist not only between different actors, but also for one actor who, as the case may be, can choose to do a free or a proprietary contribution. One would not “classify” a free citizen, master of his own fate, in any “box” where he would be constrained to stay to pretend to benefit any social “window” , which would constitute an obvious economic setback, limiting creativity and individual production to really specific domains, by definition not innovative !

19.3 Neutrality of money

Monetary Issuance by leverage is an asymmetry which emphasized capitalistic gap without any reason. Because X, Y or Z have an capitalistic asset at the beginning, one will let them to overrate this asset by monetary issuance leverage, which devalue existing money to their asset, and let them buy or copy any innovation at any time by creating temporary false money.

The Universal Dividend is a neutral money issuance and symmetrical in space and time, which let the money its original sense : *a Mutual Credit between Citizens*, given not only once, but progressively, lifelong, and relatively to the measurable wealth (Proportionally to the monetary mass / citizen), without harming any individual present or to come, whatever how old is he.

Universal Dividend then does not only have a neutral role to the investment via the monetary mass growth allocated between every citizen, but also an economic buffer in case of evaporation of the money in any zone pseudo-isolated inside a monetary area. If we imagine that “X”, after doing a big monetary gain decide to leave the autonomous area to invest somewhere else (or simply save money), the Universal Dividend makes sure that the monetary exchanges are not totally stuck, and can start again progressively.

Money has not as a goal to be a tool of hostage taking where the one who, having made the choice to monetized his production, could profit of the accumulation of money to block the exchanges of other producers, and impose his views.

This argument resume the fundamental principal stated by Richard Stallman about the usage of any information system : the code must be transparent and editable. To accept a money any citizen should at least accept

the running code, and be able to change by democratic choices. Yet it is obvious in 2011 that these two minimum conditions are not filled by "official" moneys with hidden codes, imposed, of which the development of the working code is not submitted to any democratic choice (Bâle I, II et III, are monetary principle not submitted to the approbation of the users).

The "digital horizon", highlighted by Olivier Auber should awake us about the dimension of this choice of monetary code attached to economic freedom following high criterion like the legitimacy, ethic, or neutrality.

19.4 Fundamental value of any economy

Fundamental condition of any measure is the individual. Indeed, outside of the individual no measure of value can exist. This is the minimum and sufficient point for any measure of value.

Human is the observer of the economy, as much as its fundamental actor. His service and his freedom of creation is its primary objective. Thus, he is the only real point of valuation possible for any money who wants to be anywhere and anytime universally usable where the economic trade is possible.

Outside any specific value, there is an economy. But emptied of its individuals, no economy remain, there is obviously nothing left measurable.

By developing the money on a continous micro-investment, all along the life of any citizen, it is the whole economy which invests in each of its fundamental economic component, the "risk" being distributed in the multitude and in the time.

Furthermore, there is no way Humans of a given generation would claim the right to judge in their siblings, from who comes the value future generation will use. Proceeding like this, past generations, blind to reality of uncertainty to what is value or not, have let fall in misery several of their creators of value considered today among the most important.

The existence or lack of Universal Dividend is a measure of humility or arrogance of present men before the men to come.

19.5 Other arguments

Internet websites and blogs have used or cited ideas of the RTM and bring other compatible interpretations and really relevant of Universal Dividend :

- http://revenudebase.info/
- http://www.tetedequenelle.fr
- http://blog.rom1v.com
- http://aymericpontier.blogspot.com
- http://blog.tcrouzet.com
- http://changaco.net/

Furthermore the wikipedia article about “Basic Income” is full of information, including about experiences (all successful) of economic area who adopted a monetary system near the Universal Dividend.

CHAPTER 20

License and Versionning

The Relative Theory of Money ("RTM") is edited as a software under free license GPL v3, because considered as a possible and modifiable base of a software system of free money. All theoretical conception can be considered as a source code.

You are free to copy, distribute, quote, modify, sell this text, as well as create alternatives versions. You should report that liberty for RTM's parts you recovery and published.

You could find more information about GNU GPL license on Wikipedia to the address

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This version is the 2.718. I wanted suggest an edition under that form to permit RMT improvements and completion, including through a collaborative process. You can contribute to futures versions by suggesting updates of present data, additions of complementary points, graphics or other kinds of contribution on

http://wiki.creationmonetaire.info

If you wish donate to author, or do numerical purchase, paper or other, you will get those possibilities on the same web site.

CHAPTER 21

Sources

Theory : Blog “Monetary Creation”
http://www.creationmonetaire.info

History, data : The free encyclopedia Wikipedia
http://www.wikipedia.org

Euro Data : European Central Bank
http://www.ecb.int

Monetary data from the United States
http://www.shadowstats.com

Yoland Bresson, economist and founder of AIRE
http://www.revenudexistence.org

Olivier Auber and the “digital perspective”
http://perspective-numerique.net

Images in the RTM are all from Luc Frievet (free) from Wikimedia (Creative Common) or directly from the author (Creative Common).

CHAPTER 22

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Luc Fievet's graphics are accessible on http://wiki.creationmonetaire.info

Fig. 22.1: *RTM 1.0 cover reviewed by Luc Fievet*

CHAPTER 23

Previous editions

- RTM 1.0: november 2010
- RTM 2.0: june 2011
- RTM 2.718: november 2012

CHAPTER 24

Appendix 1 : Comments about the four economic freedoms

The Relative Theory of Money (RTM) is based upon four economic freedoms to which it gives meaning. Through these comments, I wish to deepen an understanding of them; for anyone who wishes to model their economic and monetary reasoning upon them

General remarks :

I have noticed since the first release of the RTM in 2010, statements to this effect : *"The RTM proposes a monetary system of Universal Dividend"*. This is false and stems from a misunderstanding of the nature of a particular paradigm. I shall explain this.

RTM defines 4 economic freedoms in space-time comprised of individuals with an average life expectancy noted "ev". On this basis, and only through coherent reasoning on this basis, the RTM results in Universal Dividend monetary systems being the only compatible monetary systems within this framework, the model demonstrates results of a relative value for this dividend as being equivalent to ln(ev/2)/(ev/2); the distance of a monetary system from this demonstrated (and not "proposed") central value. This is the qualifier of relative distance toward a free money.

This is therefore absolutely not a "proposal", but a coherent demonstration with foundations. This is crucial to understand, because a theorem would imply the converse. Which is without any doubt the result of the most important of the RTM. That monetary systems non-conforming to these results are not coherent with the four economic freedoms within human space-time.

By highlighting this perspective, the RTM provides an understanding of the nature of the causes which are the roots of the negation of these freedoms, enabling an understanding of a specific causality which results in misfortunate interruptions such as wars, revolutions, or insurrections.

Whilst those who would study the RTM do not acheive an effective understanding of these crucial points of understanding about causality, they cannot estimate to have truly understood the the results and conclusions which derive from its nature.

Freedom : Freedom is established as everything an individual can enact in accordance with the non-harm by oneself to others, living or future. This non-harm can be defined at a precise point (x, y, z, t) in space-time and has no lesser properties than of evolution or revolution.

One should not understand in this instance freedom as being asserted absolutely, which would not have any

logical sense in terms of coherence. Neither should one understand the opposite excess, which would be that freedom would be undefined, the contrary of what is previously asserted.

Finally, freedoms relating to a monetary system, although being expressed differently, have the same fundamental nature as the freedoms related to free softwares. One should really understand here that it is the user who must be free. Whilst we say "free" software or money by convention, we could equally say "enabling users to practice their freedoms", and so "free" relative to the human who is manipulating the object. It is essential to understand this point, because when written this way we could have a tendency to think that it's a property inherent to the object as it is, rather than understanding that it is what the human can do, which is really different.

Freedom 0 : *The individual is free to choose their monetary system.*

One can only declare but the three following economic freedoms when within the rationale of a relativist monetary system, because the monetary system is already defined. A relativist can indifferently reference the four economic freedoms or simply three freedoms depending on their circumstance. Thus, the specific number 0 is coupled primordially toward this primary freedom.

This choice is herein extendable to the possibility of modification. This signifies that not only the individual can choose to use and adopt an independent monetary system, and thus refer themselves to the principles declared by this other monetary system, but they can equally act in order to evolve the monetary system they use, in accordance with such rules or general principles which could enable this evolution.

There is therefore a double possibility in terms of modification; maintenance of the existing, or toward changing. This is analogous to the life of a software code, which evolves from version to version, or which "forks", meaning it is copied and modified by others in a different direction, or even to adopt a totally different software model, it having evolved independently since its conception.

This essential freedom is present in several verified experimental forms, for example the Swiss WIR, the German Chiemgauer, the Local Exchange Trading System "JEU" in Canada, all built following very different rules. Also visible in time, the change from one monetary system on the basis of a physical reference (gold standard) to it being on the basis of an immaterial reference (fractional reserve banking).

Freedom 1 : *The individual is free to use the resources.*

Usage of resources must conform to the non-harm toward another's freedom. This indicates, concerning individuals use of some resources (whatever their nature) there must remain a substantive quality of this resource which remains available. This should be of quantity and quality sufficient for use by other individuals, or with the existence of a compensation attributed to the usage of these resources (whatever they should be) for the loss endured to other individuals who could not use them.

Obviously we are not talking here of cases which represent de facto the order of harm (so by definition the order of non-freedom) concerning the use of resources already identified as harmful.

A historical example among the most commonly understood for this principle is the excess or absolute ownership of land, limited by nature, which leads to an economic spaces and periods where not only the new born individuals can not mechanically become landowners; because this one resource is not available for them under the same conditions as for their predecessors. This is a situation wherein compensation, for this excess of ownership for one infringing the living environment of another, does not exist.

This is typically the case of latifundios, feudal societies, absolute monarchies or near-absolutes, or also communists regimes or near-communities where it is the one State which plays the privative role of the first

economic freedom, or also corporative regimes where it is private interests groups or State-private alliances who play together this role of freedom privation, to the individuals who are not part of these groups.

The mechanic which leads to the negation of the freedom 1 can totally not be seen at a time, excess of resource appropriation can be the limit of a slow differential process, able to accumulate during half a human lifetime, a lifetime, or even several generations. The economic space considered, coming about this limit, one can find experimentally that irrepressible forces are triggered under the forms of wars, insurrections or revolution, as if we compressed gas until it burst the containing recipient.

Freedom 2 : *The individual is free to produce any value.*

This freedom is probably the most fundamental of the RTM, because it includes implicitly in its statement the principle of relativity. In the RTM the relativity principle is not only detached from the second freedom only to ease the read and the understanding of these reasonings, for individuals having advanced scientific knowledges, doing an implicit reference to equivalent principles in physics.

For "value" to be, it is necessary that an individual identifies the object by coupling it with this characteristic. This let for sure other individuals absolutely free to not couple it with this characteristic for this one object, or to couple it with a different degree, or also depending on other parameters inexpressible for the others.

Furthermore the object can not exists at all, outside individual spirit. We will talk, a longtime after the production of this one value, of innovation. But to pretend that an innovation could be recognized by other individuals outside the spirit of the one who conceived it as having every characteristics of a value, is not to understand the second freedom twice : at time and relatively to future humans.

This observation is about the freedom of human spirit to express any conceptual model reflection of its own experimental reality. We will have a similar phenomenon in science about mathematics models or physics, which do not have the same qualities nor the same predictive precisions or descriptives, depending on the experimental frame.

Nuisance would be here to think it would be legit for individuals agreeing conceptually between them, to impose their models on other individuals, while nor history, nor the number, are in any way valid standards before the freedom to conceptualize.

It appears, backward this nuisance of a proselyte type, that when a conceptualization of reality enables a better understanding, a better agreement with experimental reality lived by individuals, it has no need to extend by any force or excessive proselytism to be adopted by other individuals.

Living individuals, or new entrant in life space, compare conceptualization with past reasoning and new, and adopt the ones who seems to be the most conform to their understanding, or to their goals, or also to many other modalities which one should not judge.

This is without prejudice to the end of this process of concepts transformation. Neither it is without prejudice to a relevance a priori more precise or less precise between these models concepts. This is not due to the experience and individual choice, which is verified in the whole space-time of past lives. Neither there is here any judgment of value, a priori by default to characterize this freedom.

Economically, about the possibility of a fair money, this principle results to the fact that no basis other than the ones individuals can be coherent with this freedom, or relativity principle.

This money in lieu of account, symmetrical mutual credit is defined on the basis of the ones individuals is the class of general solutions. In this class of general solutions, the individual in space-time is being taken into

account, meaning its average life expectancy "ev" allows to established the symmetrical common monetary contract in space-time between all the individuals, resulting thus in under classes of compatible solutions which are the universal dividend monetary systems to which the relative growths are near ln(ev/2)/ (ev/2).

Freedom 3: *The individual is free to exchange "in the money".*

Freedom 0 being exerted, the individual can count, estimate, calculate, display, in the monetary unit he chose. Then if these individuals use force on others to do these actions in another units, this freedom does not exist. Or also if the individuals force others to any intermediary exchange before the exchange in the chosen monetary unit, yet again this freedom does not exist.

Also, if individuals pretend to adopt a money, and do not display, do not count, do not estimate, or do not calculate in their own chosen monetary unit, they do not exert this freedom. However one should not that the freedom 3 could exist, the choice of individuals to not exert it is still possible, the situation would be different from the case where this freedom would be violated by forces of coercion.

It is not really difficult in reality to exert the third freedom. Let it be prices, accounts, calculations, display in the given monetary unit, it is very simple, knowing the price of the chosen money in the displayed monetary unit (the exchange rate, which a price like any other), to do the transformation.

Then an individual who would want to display, count, calculate all the price of anything, displayed anywhere, in his own money freely chosen, can apply such a transformation really easily, with the help of a software doing this job if needed.

I should note about it that the relativist money is often badly understood because of the non-understanding of this freedom, yet essential. I was able to hear for example "the relativist monetary mass grows indefinitely", it is true from a quantitative point of view, but it is false from a relativist point of view. From a relativist point of view the money is perfectly finite. I will explain this point so that it is very clear in the reader's mind.

The relativity principle implies that there is no absolute measure. To begin with, let's use the example about the speed of an object in Physics. The speed V_0 of an object will be perceived differently depending on the observer 1 which will have a relative speed V_1 or the observer 2 which will have a relative speed V_2 compared to the object. Anyone can easily understand when they experience it that he sees the train motionless when he is within, or moving when he is on the dock, or also with another speed if he is in another train.

The frame of reference decides on every measure. And we have the fourth freedom, so we can choose the suitable frame of reference.

If we count in "number of Universal Dividends" and not anymore in the simple "quantitative numbers", we chose a relativist money unit, conform to the chosen monetary system. And this "number of Universal Dividend" is perfectly finished, depending only on the number of individuals (which is conform to the basis). So even if in the quantitative frame of reference (view of the train from the dock) the expansion seems an indisputable fact, if the observer chose the UD himself as the monetary unit (he is then in the train) the monetary mass does not move at all.

A global dividend being for example of 5% of the monetary mass, it is obvious that he can only have at a time "t" a global limit of 20 dividends in the one monetary mass (20 x 5% = 100%). If we reference the N individuals of the monetary area, we will count a universal dividend of 5 % / N and thus a limit of only 20 x N individual dividends in the whole monetary mass, thus a fixed number of units for a stable population constantly renewed.

Then any price, count, calculation, can be realized in UD, it becomes very clear that the idea of expansion or non-expansion is total non-sense and is only the object of a pure convention depending on the strict arbitrary choice of the chosen frame of reference, and thus on the fourth economic freedom. The same applies to the false ideas of "melt" or "non-melt" of the money, which does not exist in a well understood relativist reasoning for the same reason.

One could record briefly this last point, already explained several times in details, that an individual seeing his saved quantitative money units "melt" by monetary expansion, sees also being added to his account his own individual share of new issued money, this simple observation should immediately cause reasoning for the reader who will see really fast by himself that there is a balance sheets to do with what "melted" and what is "added", and not at all any random assertion on this phenomenon.

A similar reasoning will refute the false assertions about "the inflation" (of which the resolution is the equivalent of the theme, also topped from the "melt"). Because the number of UD is limited and the prices being all transformable in UD, this simple choice of frame of reference will make immediately understand to the layman that no source of inflation is possible. However, there are ignorance sources because of the attachment to the quantitative. This ignorance consist of not seeing that in unfair moneys, it is the unsymmetrical monetary creation between men which causes a real problem to the one who do not see the new money issued being added to their account relatively to the one who see the new monetary issuance being integrally added to their own accounts.

The relativist reasoning always come back to its basis which is the coherence with the four economic freedoms. It does absolutely not care of wrong quantitative notions that he knows how to refute easily. His whole attention is focused on the question *"this or this monetary system is coherent with the four economic freedoms, relatively to the humans who use it and will use it ?"*.

The non-understanding of this point is then only about ignorance of this relativist reasoning modes.

Appendix 2: A mathematical summary of the RTM

$$TRM \sum_{k=1}^{7} \frac{1}{k!}$$

25.1 The 4 economic freedoms

According to RTM the definition of freedom is "what can be achieved without harming oneself and others." It is not therefore the result of creative thinking but can be demonstrated publically.

RTM defines four economic freedoms, which form the basis of his general approach and are:

1. The freedom of choice of one's monetary system
2. The freedom to access resources
3. The freedom to evaluate and produce any economic value
4. Freedom to exchange and determine prices

Freedom 3 including establishes the principle of relativity as the essence of its approach.

25.2 Principle of economic relativity

The RTM is based on the principle of economic relativity, which states that every human being defines a legitimate frame of reference to estimate and produce any type of economic value, known or unknown by others.

In other words there is no absolute economic value, no human being who is legitimately able to define what is value or non-value for other human beings, nor in space (between present human beings) neither in time (between remote people over time).

25.3 Space-Time

The economic space-time is characterized mainly by humans who are part of a particular economic zone.

The following thought experiment helps to understand this point: if we remove from a given economic zone exceptional specific economic value, there will always be an economic zone. Conversely, if we remove humans, then there remains nor observer neither actor in this economic zone.

Therefore, human is the only invariant foundation of any economy.

However, humans are not absolute also, since they have an limited average lifetime "ev" (average life span), and renew in time, new-borns replacing deeds.

This dimension is a finite data of economic space-time considered by the RTM where, for all considered time t, all humans are renewed at time t+ev.

We call later "space" the whole individuals for a specific date "t", and "time" the phenomenon of replacement succession of these individuals over time. The space-time must here be understood in relation to this definition.

25.4 Free Money

A money is a reference economic value that establishes a common metric for a given time and a given monetary area, allowing to measure in the same unit some values and trades, and to facilitate the flow of the economy between different actors.

Note that even though people do not agree on economic values neither in space nor in time, they still use the same unit of individual valuation, in relation to a reference value, which is named "the money".

A monetary zone is defined by the set depending on time E(t) consisting of individuals I(x,t) that have adopted this same money (a monetary area may also include several moneys).

A money is then said to be "free" if it is a valid reference value for a metric that respects the principle of relativity of all economic value, as well as human space-time defined above, not establishing any arbitrary control (meaning the laws to be of the same form for all) of each other, mainly regarding the recognition and production of any economic value.

To be qualified as free a money cannot be based on an arbitrary decision about what is value or non-value, nor preferentially occurs for some human in space or in time.

It must be the accounting unit because it is the reference of the metric (as in relativistic physics, speeds are in proportion to the speed of light).

It must be an economic value anyway (just as light is a physical object), because we must have an economic metric. But to be independent from other values, its production cost should be minimal (the mass of the light is zero, that is precisely what gives it its invariance).

Therefore it should reconcile invariance and finiteness for the value, and minimal production. Human beings are the only invariant basis, it can be only a purely numerical value co-produced by humans, whose value is expressed relatively to its own sum.

We call $\left(\frac{M}{N}\right)(t)$ the money M average for the N life-limited humans taking part in this economy at time "t".

Humans must all be co-producers of this same economic value, though they replace in time, so we must define a production of our reference value M, with same form for individuals, in space and time.

We then establish an economic metric whose reference value is generated in an invariant way by a frame of reference change (change of individual, regardless of the time in which he is born, lives and dies).

For each of N individuals I(x, t) of the currency area so established, under quasi-stability condition (especially of N), the instant relative production (differential) of a free currency, can only be the same in space (spatial symmetry) as well as the same in time (temporal symmetry).

In other words, it can not be production of free money that is not the same for every individual participant in this money for a given instant "t", and this relative production is independent from time.

$$\frac{d^2\left(\frac{M}{N}\right)}{dt\,dx} = 0 \quad ainsi\,que \quad \frac{d\left(\frac{M}{N}\right)}{\left(\frac{M}{N}\right)} = c\,dt \tag{25.1}$$

For the rest, and for conciseness reasons, we will omit the differential time "dt", especially as dt = 1 when transforming into discrete calculations.

We deduce, placing us under assumption of continuity and differentiability, (see the chapter "Variations of N and calculation of UD"):

$$\left(\frac{M}{N}\right)(t) = \left(\frac{M}{N}\right)(t_0)\,e^{ct} \tag{25.2}$$

Moreover individuals with limited life "ev", instantaneous production (derived) being established as invariant, individual relative sum produced during a life should not be either dependent on time.

The currency of those who go must give way to the currency of those who will replace them at the end of that period. Which is equivalent to saying that $\left(\frac{ev}{2}\right)$ years later, the living must have co-produced their own relative full share of currency:

$$\frac{\left(\frac{M}{N}\right)(t)}{\left(\frac{M}{N}\right)(t+\frac{ev}{2})} = e^{-c\left(\frac{ev}{2}\right)} \tag{25.3}$$

This symmetrical principle between those who are leaving and those arriving establishes a convergence centre of symmetry at the point $\left(\frac{ev}{2}\right)$, where those who arrive at this point represent a proportion of $\frac{1\,an}{\left(\frac{ev}{2}\right)}$ of those who go to see another expression, see also (25.14):

$$\frac{\left(\frac{M}{N}\right)(t)}{\left(\frac{M}{N}\right)(t+\frac{ev}{2})} = \frac{1\,an}{\left(\frac{ev}{2}\right)} \tag{25.4}$$

Hence it comes from (25.1) and (25.4) that we obtain a symmetric rate where the average $\left(\frac{M}{N}\right)$ is reached for any individual, at approximately $\frac{1\,an}{\left(\frac{ev}{2}\right)}$, at point $\frac{1\,an}{\left(\frac{ev}{2}\right)}$ of his participation in the free currency so established, whatever the considered period of time.

$$c_{sym} = \frac{\ln\left(\frac{ev}{2}\right)}{\left(\frac{ev}{2}\right)} \tag{25.5}$$

The rates "c" below c_{sym} establish a metric favouring older individuals, while higher rates will reward younger people.

This convergence rate has a low limit c_{min} obtained for a convergence reached in the end of average life expectancy:

$$c_{min} = \frac{\ln(ev)}{ev} \tag{25.6}$$

Numerical application for France with a life span "ev" of 80 years in 2014:

$$c_{sym} = \frac{\ln(40)}{40} = 9,22\%/an \quad et \quad c_{min} = \frac{\ln(80)}{80} = 5,48\%/an \tag{25.7}$$

25.5 Quantitative

We call Universal Dividend differential invariant quantity at the time "t", which we can describe either as continuous or discrete form (which will be useful to establish approximations of practical implementation):

$$DU(t) = d\left(\frac{M}{N}\right)(t) = c\left(\frac{M}{N}\right)(t_0)\, e^{ct}$$

Or:

$$DU(t+dt) = DU(t) + dDU(t) = (1+c)DU(t)$$

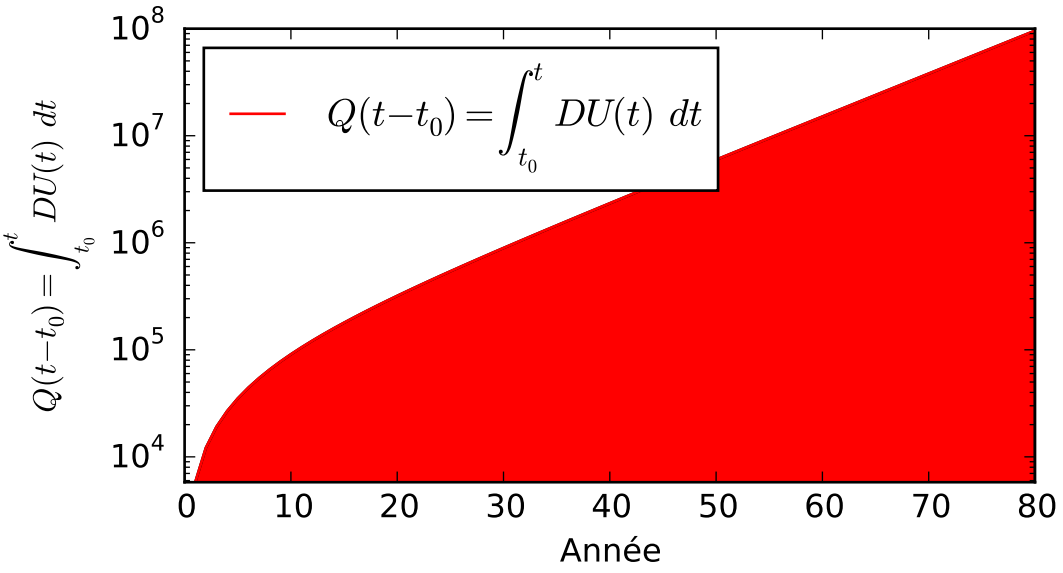
Corresponding to monetary units co-created by individuals for the annual unit time "t", which will be of the form:

$$DU = c\left(\frac{M}{N}\right) \tag{25.8}$$

And Q(t) the sum of monetary units co-produced by an individual between the times t_0 original date of participation to the metric and t:

$$Q(t-t_0) = \int_{t_0}^{t} DU(t)\, dt = \left(\frac{M}{N}\right)(t_0)\, e^{ct}\left(1 - e^{-c(t-t_0)}\right) \tag{25.9}$$

This gives us graphically:



25.6 Relative

Given the above we also have the relative expression of the reference money of the global economic metric under the immutable form in the space-time:

$$\frac{M}{N} = \frac{1}{c} DU \tag{25.10}$$

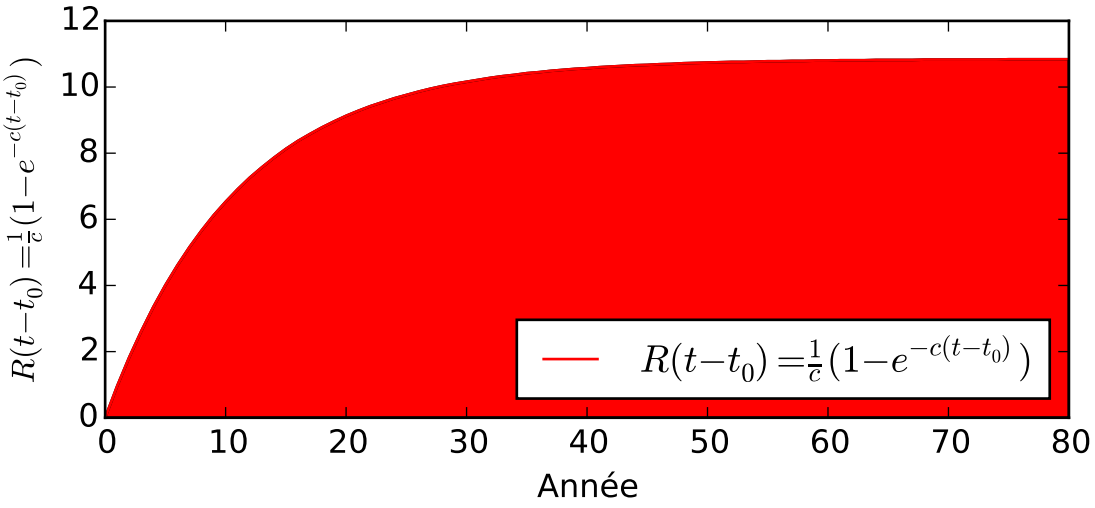
and

$$DU(t) = d\left(\frac{M}{N}\right)(t) = c\left(\frac{M}{N}\right)(t_0)\, e^{ct}$$

So we can also transform our metric in relative based on the established relative unit "UD" so established. Now let's call $R = \frac{Q}{DU}$ the number of co-produced units by an individual between t_0 and t:

$$R(t-t_0) = \frac{\int_{t_0}^{t} DU(t)\, dt}{DU(t)} = \frac{1}{c}(1 - e^{-c(t-t_0)}) \tag{25.11}$$

This gives us graphically:



In the relative frame of reference, the part of co-produced money by any individual participant of this metric converges asymptotically and consistently (in space-time) to:

$$\lim_{t \to +\infty} R(t - t_0) = \frac{1}{c} \tag{25.12}$$

And in particular for $t = t_0 + \frac{ev}{2}$ with $c = \frac{\ln\left(\frac{ev}{2}\right)}{\left(\frac{ev}{2}\right)}$:

$$R\left(\frac{ev}{2}\right) = \frac{1}{c}\left(1 - e^{-c\frac{ev}{2}}\right) = \frac{1}{c}\left(1 - \frac{1}{\left(\frac{ev}{2}\right)}\right) \tag{25.13}$$

Given (25.10), (25.11) and (25.13) , we can express the fundamental condition (25.4) in the form:

$$\frac{\int_{t_0}^{t_0+\frac{ev}{2}} DU(t)\,dt}{\left(\frac{M}{N}\right)\left(t_0 + \frac{ev}{2}\right)} = \left(1 - \frac{1}{\left(\frac{ev}{2}\right)}\right) \tag{25.14}$$

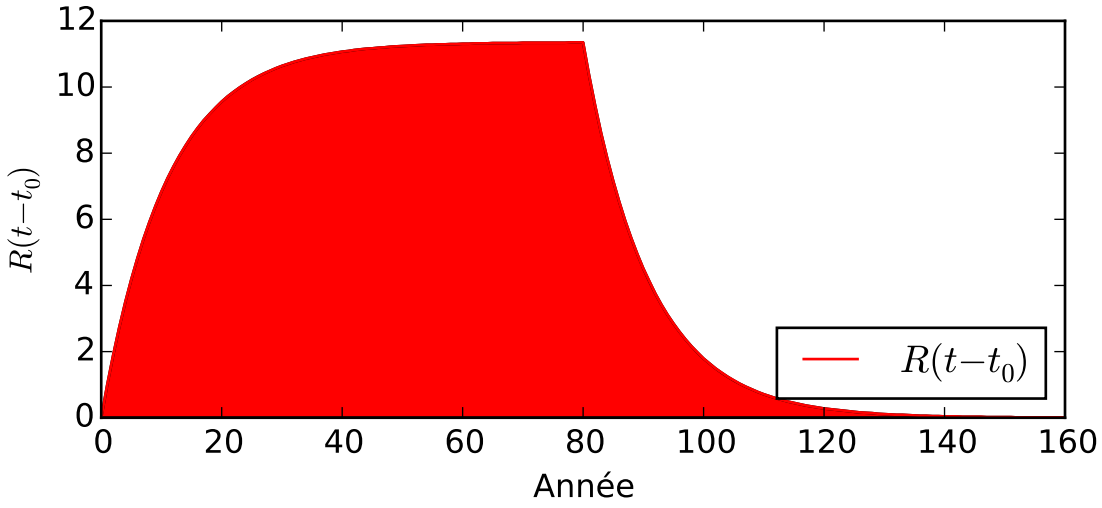
So we can express according to (25.14):

"The sum of UD produced by an individual participant in a free currency during $\left(\frac{ev}{2}\right)$ converges to the average monetary mass to $\frac{1\,an}{\left(\frac{ev}{2}\right)}$ near, whatever the individual and whatever the considered time."

Or according to (25.13):

"The sum of the relative UD produced by an individual participant in a free currency during $\left(\frac{ev}{2}\right)$ converges to $\frac{1}{c}$ with $\frac{1\,an}{\left(\frac{ev}{2}\right)}$ near, whatever the individual and whatever the considered time."

Relative graph of monetary part generated by an individual during and after his departure:



25.7 Initial asymmetries

Consider the special case of an individual starting its presence in the metric with an initial share of currency (gift, inheritance or any economic exchange) $Q_s(t_0)$ and having balanced exchanges with the outside (the financial purchases being always equal to the monetary sales). This individual, we call pseudo-self, will see its share of currency $Q_s(t)$ evolve as follows:

In quantitative:

$$Q_s(t) = Q_s(t_0) + \int_{t_0}^{t} DU(t)\,dt = Q_s(t_0) + \left(\frac{M}{N}\right)(t_0)\,e^{ct}\left(1 - e^{-c(t-t_0)}\right)$$

In relative we call $R_s(t)$ the evolution of its money share:

$$R_s(t) = \frac{Q_s(t_0) + \int_{t_0}^{t} DU(t)\,dt}{DU(t)} = \frac{Q_s(t_0)}{DU(t)} + \frac{1}{c}(1 - e^{-c(t-t_0)})$$

And we have:

$$DU(t) = DU(t_0)\,e^{c(t-t_0)} \;\; ainsi\,que \;\; R_s(t_0) = \frac{Q_s(t_0)}{DU(t_0)}$$

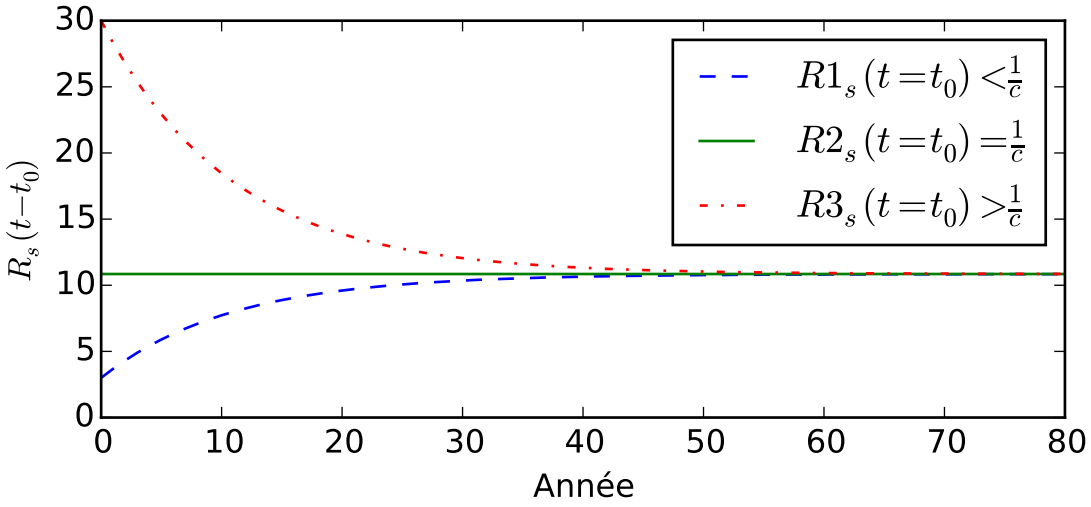
So we finally get by factoring the relative form:

$$R_s(t) = \frac{1}{c}\left[1 - e^{-c(t-t_0)}\,(1 - cR_s(t_0))\right] \tag{25.15}$$

Where we see directly that if $R_s(t_0) = \frac{1}{c}$ which is equivalent to $Q_s(t_0) = \left(\frac{M}{N}\right)(t_0)$, then for all "t" we have the equality

$$R_s(t) = \frac{1}{c}$$

Now according to the three cases, $R_s(t = t_0) < \frac{1}{c}$, $R_s(t = t_0) = \frac{1}{c}$ or $R_s(t = t_0) > \frac{1}{c}$, we have, on condition of balanced exchanges, the following three evolutions in the relative frame of reference:



This evolution is valid only in the specific case studied here.

25.8 The 4 frames of reference

We have seen above two frames of reference of relative and quantitative measures, whose transformation law is given by:

$$R_s(t - t_0) = \frac{Q_s(t - t_0)}{DU(t)}$$

We can also establish the quantitative measure frame of reference to sum of zero accounts, by transformation:

$$Z_q(t - t_0) = Q_s(t - t_0) - \left(\frac{M}{N}\right)(t)$$

Or the frame of reference on sum of zero accounts:

$$Z_r(t - t_0) = \frac{Z_q(t - t_0)}{DU(t)} = R_s(t - t_0) - \frac{1}{c}$$

Everyone is perfectly able to take the frame of reference that seems most appropriate to him. One free monetary system can provide at least 4 separate frames of reference for any individual part, this choice is purely individual:

1. The quantitative frame of reference.
2. The quantitative frame of reference at sum zero.
3. The relative frame of reference.
4. The relative frame of reference at sum zero.

25.9 Variations for a pseudo-autonomous individual

Let us study here the variation of a monetary account for a pseudo-autonomous individual. First by quantitative:

$$dQ_s(t) = DU(t)$$

By relative:

$$dR_s(t) = e^{-c(t-t_0)}\left(1 - cR_s(t_0)\right) = 1 - cR_s(t)$$

This allows us to affirm the conclusions completely equivalent (a) and (b):

(a) "In the quantitative frame of reference the account of a pseudo-autonomous individual appears as if it added a Universal Dividend between two units of time."

(b) "In the relative frame of reference the account of a pseudo- autonomous individual appears as if between two units of time he added to it 1 Universal Dividend, and at the same time it absolve them a proportion equal to 'c' ."

Understanding that these points are only appearance, an individual participant in a free currency chooses the frame of reference of its choice for its monetary accounts, quantitative, relative, quantitative zero-sum, relative zero-sum, or ant other frame of reference it deems most consistent with his experience, this in no way affecting the free currency established.

25.10 Generalization and law of frame of reference change

By generalizing the previous reasoning, it is possible to establish on the basis of one fair money frames of reference changes, showing the money inside monetary masses of any growth, thus showing monetary subtractions, or at the opposite, to find the frame of reference where, a monetary system which appears as having any growth associated with a monetary substraction unconditionally redistributed, will appear as having no growth (frame of reference named in the RTM "relative"), or also without monetary substraction (frame of reference named in the RTM "quantitative").

Given a fair money established in $[R_1, c_1]$ and its transformation in $[R_2, c_2]$, coinciding in $t = 0$ where $\left(\frac{M_1}{N_1}\right)(0) = \left(\frac{M_2}{N_2}\right)(0)$.

Since we are studying a change of frame of reference, let us note that for any t : $N_2(t) = N_1(t) = N(t)$, and besides that:

$$\left(\frac{M_1}{N_1}\right)(t) = \left(\frac{M_1}{N}\right)(0)\, e^{c_1 t}$$

and

$$\left(\frac{M_2}{N_2}\right)(t) = \left(\frac{M_2}{N}\right)(0)\, e^{c_2 t} = \left(\frac{M_1}{N}\right)(0)\, e^{c_2 t}$$

The law of transformation of M_1 in M_2 can be found (for example) by calculating beforehand "t" as M_1, then by referring back to it in M_2

$$t = \frac{1}{c_1}\ ln\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]$$

From what we deduce the transformation we were looking for :

$$\left(\frac{M_2}{N}\right)(t) = \left(\frac{M_1}{N}\right)(0)\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left(\frac{c_2}{c_1}\right)} \tag{25.16}$$

With the transformation established, applying to any monetary unit in a coherent way, and thus for any account $Q_s(t)$ we get the local transformation between R_1 and R_2 easily :

$$\frac{Q_s(t)_{R_2}}{Q_s(t)_{R_1}} = \frac{\left(\frac{M_2}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(t)}$$

And then finally $Q_s(t)_{R_2}$ is deduced directly from R_1 by :

$$Q_s(t)_{R_2} = Q_s(t)_{R_1}\left[\frac{\left(\frac{M_2}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(t)}\right] = Q_s(t)_{R_1}\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left(\frac{c_2}{c_1}-1\right)} \tag{25.17}$$

Now, let us calculate the variation between two units of time of an autonomous pseudo-account in R_2 :

$$dQ_s(t)_{R_2} = dQ_s(t)_{R_1}\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left(\frac{c_2}{c_1}-1\right)} + Q_s(t)_{R_1} d\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left(\frac{c_2}{c_1}-1\right)}$$

With

$$dQ_s(t)_{R_1} = DU(t)_{R_1} = c_1\left(\frac{M_1}{N}\right)(t)$$

and

$$d\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left(\frac{c_2}{c_1}-1\right)} = (c_2 - c_1)\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left(\frac{c_2}{c_1}-1\right)}$$

Taking into account that (25.16) and (25.17), we have :

$$dQ_s(t)_{R_2} = c_1\left(\frac{M_2}{N}\right)(t) + (c_2 - c_1)\, Q_s(t)_{R_2}$$

Which can also be written under the form of :

$$dQ_s(t)_{R_2} = DU_{R_2} + (c_1 - c_2)\left[\left(\frac{M_2}{N}\right)(t) - Q_s(t)_{R_2}\right] \tag{25.18}$$

Let us recall here that

$$\sum_{R_2} Q_s(t)_{R_2} = \sum_{R_2} \left(\frac{M_2}{N} \right)(t) = M_2$$

So, it appears in R_2 that the monetary system is acting "as if it was being taxed on every individual account $(c_1 - c_2)\, Q_s(t)_{R_2}$ of money, unconditionally paid for every member equally $(c_1 - c_2)\left(\frac{M_2}{N}\right)(t)$, to which is added DU_{R_2}.

The transformation we have seen between these frame of reference, at the opposite, with any monetary growth rate c_2 and any monetary subtraction rate unconditionally paid too $(c_1 - c_2)$ to find back the quantitative frame of reference of growth c_1 and of zero monetary subtraction, where the equivalent fair money appears as its sharp quantitative form.

Let us note also that for each change in the frame of reference $[R_2, c_2 = 0]$, we get:

$$dQ_s(t)_{R_2} = c_1 \left(\frac{M_2}{N} \right)(t) - c_1\, Q_s(t)_{R_2} = DU(0)_{R_1} - c_1\, Q_s(t)_{R_2}$$

And with $c_2 = 0$ we have $DU(t)_{R_2} = DU(0)_{R_2}$ which is then an arbitrary constant, that we can defined as equal to $DU(0)_{R_1}$, constant which does not change the calculation of the differential, and then we get :

$$dR_s(t)_{R_2} = 1 - c_1\, R_s(t)_{R_2}$$

Which is the form defined at the paragraph 9, therefore it is $DU(0)_{R_1}$ ignoring a constant factor, of the transformation of $[R_1, c_1]$ in this Relative frame of reference $[R_2, c_2 = 0]$ where monetary growth appears as null.

We established a General Low of Frame of Reference Change where one fair money appears as a arbitrary rate, associated to a tax rate and monetary redistribution defined. This one Law let us find back the underlying fair money of monetary system having this characteristic.

Another remarkable result is that, if we set RdB_{R_2} the quantity calculated in R_2 : $RdB_{R_2} = DU_{R_2} + (c_1 - c_2)\left(\frac{M_2}{N}\right)(t) = c_1\left(\frac{M_2}{N}\right)$ related to what is positively added on each account, they we will always have, for any c_2 :

$$\frac{\left(\frac{M_2}{N}\right)}{RdB_{R_2}} = \frac{\left(\frac{M_1}{N}\right)}{DU_{R_1}} = \frac{1}{c_1} \tag{25.19}$$

Which we can formulate as "the number of UD in the frame of reference R_1 is equal to the number of UBI in the frame of reference R_2".

Theorem :

It exists then frames of references $R_{[C_x,x]}$ where C_x defines a growth rate, x being a tax rate and unconditional redistribution, and as such $C_x + x = c$, which are all equivalent and let us represent one same money, according to the Law of transformation previously established and a relativist invariant :

$$\frac{\left(\frac{M}{N}\right)_{R_{[C_x,x]}}}{RdB_{R_{[C_x,x]}}} = \frac{\left(\frac{M}{N}\right)_{R_{[c,0]}}}{DU_{R_{[c,0]}}} = \frac{1}{c} \tag{25.20}$$

25.10.1 As discrete calculations

The implementation of a UD calculated on a discrete unit of time, require us to do the same calculations in a discrete mode, and not in a continuous mode, which makes a really small difference (smaller at smaller time step) that we need to take into account if we want to be really precise.

As discrete transformation, we will have :

$$\left(\frac{M_1}{N_1}\right)(t) = \left(\frac{M_1}{N}\right)(0)\,(1+c)^t$$

And thus:

$$t = \frac{ln\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]}{ln\,(1+c)}$$

Which implies:

$$\left(\frac{M_2}{N}\right)(t) = \left(\frac{M_1}{N}\right)(0)\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left[\frac{ln(1+c_2)}{ln(1+c_1)}\right]}$$

And thus:

$$Q_s(t)_{R_2} = Q_s(t)_{R_1}\left[\frac{\left(\frac{M_2}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(t)}\right] = Q_s(t)_{R_1}\left[\frac{\left(\frac{M_1}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(0)}\right]^{\left[\frac{ln(1+c_2)}{ln(1+c_1)}-1\right]} \tag{25.21}$$

Now we will retrieve the "tax rate" according only to the data already calculated from R_1. This is necessary to be able to do in practice a frame of reference change simple and direct with only data from the fundamental frame of reference.

The reason is that in discrete calculation several options are possible depending on the data we take at a time "t" or at a time "t+1" to calculate the estimated differentials of a function.

In R_1 we will have the equality :

$$DU_{R_1}(t) - [Q_s(t+1)_{R_1} - Q_s(t)_{R_1}] = 0$$

Let us apply the transformation of R_1 to R_2 by multiplying by $\left[\frac{\left(\frac{M_2}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(t)}\right]$ and by noting that $\left[\frac{\left(\frac{M_2}{N}\right)(t)}{\left(\frac{M_1}{N}\right)(t)}\right] = \frac{(1+c_1)}{(1+c_2)}\left[\frac{\left(\frac{M_2}{N}\right)(t+1)}{\left(\frac{M_1}{N}\right)(t+1)}\right]$, we get :

$$RdB_{R_2}(t) - \left[Q_s(t+1)_{R_2}\frac{(1+c_1)}{(1+c_2)} - Q_s(t)_{R_2}\right] = 0$$

In R_2 monetary growth rate being c_2 the rate of the "appearing tax" equivalent is, as we saw earlier with the continuous calculation, the rate $c_1 - c_2$, and the previous equation we retrieve this value from the exact calculation :

$$c_1 - c_2 = (1+c_2)\left(\frac{RdB_{R_2}(t) - [Q_s(t+1)_{R_2} - Q_s(t)_{R_2}]}{Q_s(t+1)_{R_2}}\right) \tag{25.22}$$

All the right terms being already calculated by direct transformation from R_1.

We have a ratio calculated between values taken at the occurrence "t" and other at the occurrence "t+1" which is expected in the calculation of a discrete differential.

The presence of the factor $(1 + c_2)$ is not surprising since it is the expansion rate discrete of R_2, which multiplied by the data "t" gives an approximation of the data in "t+1". We should now understand that it produces a good intermediary value of the numerator between "t" and "t+1".

We have here the instantaneous calculation of the "apparent tax" in R_2 from data directly taken from R_1, letting a display $RdB_{R_2} = DU_{R_2} + (apparenttax)_{R_2}$.

Finally, by noting that $RdB_{R_2} = DU_{R_2} + (c_1 - c_2)\left(\frac{M_2}{N}\right) = c_1\left(\frac{M_2}{N}\right)$ we can get the calculation of the apparent tax in discrete differential in the form of :

$$(taxe\,apparente)_{R_2} = (c_1 - c_2)\left[\frac{Q_s(t)_{R_2} + c_1\left(\frac{M_2}{N}\right)}{(1 + c_1)}\right] \tag{25.23}$$

This form use again the tax rate $(c_1 - c_2)$ applied to the account increased of the UBI (targeting its value in "t+1", without tax), and brought back to this value approximated in "t+1" to its value in "t" by the division by : $(1 + c_1)$.

We immediately note that when the account is worth the average, the theoretical tax is applied directly to the account without intermediary approximation.

25.11 Variations of N and calculation of UD

Given prior analyze, one should bear in mind that it's the convergence of half life that is the target reached by a fair money, new entrants replacing dead human being (see about this the forms (25.4) et (25.14) concerning the time condition valid for any individual).

It is not a question, seeking a practical method for calculating the UD, to estimate by looking only at the local differential calculus. Keep in mind the fundamental operation of a free currency which is also to ensure for every human, during its life, especially in the center of time symmetry, in half-life, the same relative part of money as its predecessors and successors to the same point.

In particular, one should be convinced by thinking of the necessity to approach the practical solution by taking into consideration these extreme cases, as the one of the strongest growth of the number of members of a fair money (equivalent to a pseudo-initialization of the money), where the calculated UD in relative ($DU(t) = c\left(\frac{M}{N}\right)(t)$) will suffer a huge discontinuity, destroying the continuity of the progression, and would become extremely low compared to initial fewer participants, and would own in this case a huge share of money compared to the new entrants, unrelated to the calculated UD.

In other words, more mathematically, the fundamental equations (25.1) and (25.4) analysis expressed in the form of a free currency, have no identified solutions only for $\left(\frac{M}{N}\right)$ continuous and differentiable (or quasi-continuous and almost differentiable), so it will require to be closed as best as possible in case of discontinuous variations.

This reflection joins the need to have a UD(t = 0) not relative, because to establish a monetary proportion, it is still necessary that the currency exists first. We understand that in this case there will then be the convergence of phenomena between the initialization of a free currency and the huge increase in the number of members of an installed currency. The solution complies with the RMT, needed to be independent of time (principle of relativity), we now understand that we must in these cases establish a non-relative amount of UD(t), so a fixed amount and stable until the relative area is reached.

N(t) is unknown, so to assess the form of a general method of practical generation, we need a method simpler and more readable, we can approach via modeling of the variation of N in the form $dN(t) = \alpha N(t)$ or $N(t + dt) = N(t) + dN(t) = (1 + \alpha)N(t)$ and take an approximation for M according to $M(t + dt) \approx (1 + c)M(t)$.

One should note that : α must be understood as generally "small" in duration of the order of $\left(\frac{ev}{2}\right)$, et even before c. Indeed, on the experimental basis of France, between 1950 and 1990, population changed from 41 to 56 million, which corresponds to $\alpha = \frac{ln(\frac{56}{41})}{40} = 0,78\%$/year whereas $c = \frac{ln(40)}{40} = 9,22\%$/year.

We get an approximation of the differential variation in Dividend:

$$DU(t + dt) = c\,\frac{M(t + dt)}{N(t + dt)} \approx c\,\frac{(1 + c)M(t)}{(1 + \alpha)N(t)}$$

Hence we deduce a first form:

$$DU(t + dt) \approx \frac{(1 + c)}{(1 + \alpha)}DU(t)$$

And a second form approximated to first order ("c" being small):

$$DU(t + dt) \approx \frac{(c + c^2)M(t)}{N(t + dt)} \approx c\,\frac{M(t)}{N(t + dt)}$$

A simple lower bound appears for α positive if $\alpha \approx c$ we have $DU(t + dt) \approx DU(t)$, and another simple lower bound appears for α small and negative, that we are happy to find in this form, since it is very close to the definition: $DU(t) = c\,\frac{M(t)}{N(t)}$.

From these two minimum limits revealed by this approximation we can derive a simple practical calculation of UD, showing a quantitative form and another relative one, adapting flexibly to evolutions in N:

$$DU(t + dt) = Max\left[DU(t); c\,\frac{M(t)}{N(t + dt)}\right] \tag{25.24}$$

In particular it is recognized that for N stable, form will quickly converge to its fundamental relative expression (which is absolutely necessary):

$$DU = c\,\frac{M}{N}$$

This form is extremely convenient especially for the development of an independent free currency from scratch, but also equivalently to manage flexibly the unpredictable variations of N, while having an invariant distribution in space and time and without going away from the basic form.

Being simple, easy to understand, and reassuring from a quantitative point of view, this form seems the best that can be found.

We can summarize the operation as follows:

"The UD never drops in quantitative and is always at least equal to a relative proportion "c" of the monetary mass."

Other forms are evidently possible given the uncertainty of N(t), the simplest forms being the bests...

In general, to ensure the relevance of this form, and possibly compare it with others, such as the trivial but dangerous theoretical form, which is only differential $DU(t + dt) = (1 + c)DU(t)$, it is necessary to simulate any N(t) and then test different forms, just keeping in mind that it is for this, to place individuals of limited lifetime, simulating operations on larger periods than "ev", and assess whether for all of these individuals the basic principles are respected, almost all the time.

RTM multi-format by Vincent Texier, forked from a project by Stéphane Klein.