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Economics as an Evolutionary System:
Psychological Development and Economic Behavior

Abstract
Consciousness changes occur in a clearly identifiable sequence that can be described as pre-conventional, conventional, and post-conventional levels. Each one of these levels is characterized by specific patterns of being, feeling and thinking, acting and communicating. When the historical evolution of economic systems and its key organizing institution of money are mapped on that same sequence, interesting insights arise on today's state of economic theory, and on its likely future evolution towards a Knowledge-based economy.
This paper is organized in four sections:

1. *Identification of the necessary characteristics of any development, as well as some potential failures in that process;*
2. *Description of development as empirically verified in the psychological domain, leading to the observation that the consciousness reference point is itself an evolutionary process;*
3. *The application of the psychological development process to economic behavior, with the conclusion that "economic man" is a valid model only within one particular consciousness level;*
4. *A synthesis of the implications of all the above for the future evolution of both human society in general and economics in particular.*

1. General Characteristics of a Successful or Pathological Development

All living or evolving systems go through change, via processes of either development or decay. And some general rules about development have been identified that remain valid whether we are dealing with individual systems such as biological or psychological ones; or collective systems such as cultural, social or economic ones.
At this most general level, there are two questions that need to be addressed:
What is genuine development?
Is there a difference between development and mere growth?
Table 1 synthesizes the four necessary conditions for a genuine development to occur.[1] Whenever one of those conditions is missing, a corresponding pathology will tend to manifest, resulting in a failed development and decay.

[1] The first three criteria were described by K. Wilber (1995, 1998). The fourth criterion originates from biological and psychological research (L. Kohlberg, 1996; K. Popper, 1957, 1994 (10))

Genuine Development Criteria	**Potential Pathologies**
1. Differentiation	**Fusion**
2. Integration and Transcendence	**Dissociation**
3. Richer Internal Hierarchy	**Anarchy, Chaos**
4. Overcoming Survival Challenge	**Recursive Loops**

Table 1: The four necessary characteristics of a genuine development and their potential pathologies

The first condition is ***Differentiation*****.** This means that the later condition compared to the earlier one has to maintain or increase the identity of the entity involved, enabling a clear distinction between the inner and the outer. Whenever this doesn't occur, a regressive **Fusion** occurs instead, and the entity may simply stop existing altogether.

The second necessary characteristic for genuine development is ***Integration and Transcendence.*** This means that the later condition not only has to include all the essential parts existing earlier, but that the new whole has to be greater than the sum of those parts. A failure in this condition will lead to a **Dissociation**, which means the loss of the capacity to apprehend, relate to, or interact with important parts of the system.

The third condition is a ***Richer Internal Hierarchy,*** a deepening of the ranking arrangement within the system.[2] All development involves a process where the previous units become parts of a bigger or more encompassing system. For instance, atoms, cells, organs, organisms, societies are one such a sequence. Or letters, words, sentences, paragraphs, chapters, books, libraries is another. Even if at one point the hierarchy seems to get lost (e.g. cells dissolving back to their constituent atoms), this should only be an intermediary step to enable the manifestation of a new combination at a higher level of complexity. Whenever there is no such deepening of the internal hierarchy, **Anarchy and Chaos** will result, and future development will fail.

[2] This is the one condition typically lacking in system theory approaches (Bateson, G., 1982; Wiener, N., 1963; Bertalanffy, L., 1985; Prigogine,I., 1992; Maturana H. and Varela, F. J., 1991, Varela, F. J., 1990, Varela et al., 1992) whenever they try to use feedback loops, non-linear connections or autopoesis as a way to make the system become self-sufficient. By negating the role of a richer internal hierarchy, systems analysis risks proposing only reductionist solutions to complex processes (Wilber, K., 1995).

The final condition is ***Overcoming Survival Challenges,*** the capacity to deal with and overcome difficulties and adversity. This is the most counterintuitive of the four criteria of development, and requires therefore more explanation. This criterion requires first that a challenge manifests, and second that it is successfully handled. If there is no challenge at all, or if the challenge is systematically refused, we end up with a failure of development that we'll call a "**Recursive Loop"**, a closed loop that repeats itself forever. A metaphor for this type of breakdown is a broken record, stuck on repeating the same segment of a track forever. The easiest way to understand this criterion is by examples in various domains of development.

For instance, in the biological domain, organisms or entire species genuinely develop when they are being tested by the environment or other species, and manage to adapt and survive such challenges. Even normal human birth is about overcoming such a survival challenge, and there is convincing empirical evidence that children born from a Caesarian section have less vital energy and tend to deal less successfully with other tests in life.

In the socio-political domain, free speech and democracy (defined by Habermas as ways to get rid of a leader in a non-violent way, when needed) have evolved as mechanisms to challenge the powers-that-be, and thereby facilitate social development. The alternative is *dictatorships* that repress any challenge to the status quo. In economic systems, competition between different corporations in a market has proven a useful development stimulus. When this is lacking, *monopolies* or *cartels* tend to stifle innovations and the corresponding economic development.[3] Similarly, in science or culture, different ideas or cultural expressions should be able to be challenged by new ones, and get falsified and discarded when appropriate. Whenever such challenges are systematically blocked or avoided, *dogmatism* manifests.

Political dictatorships, economic monopolies, ideological dogmatism have in common the potential failures in development due to recursive loops resulting from missing or suppressed challenges.

Survival challenges in the biological domain is where the clearest distinction between simple quantitative growth and genuine development show up. For example, imagine an organism or a robot that at death simply replaces itself forever without any change. Such an organism may be able to survive without growth indefinitely, but this would not be development. In a favorable environment without any challenge at all, an organism could even multiply and grow exponentially; but this would only be quantitative growth, *not* development as defined here.

Finally, in psychological development, going through ontological challenges - the ability to fundamentally challenge and re-assess oneself and one's beliefs - will similarly be shown to be one key condition for genuine development. Given their crucial role in changes of levels of consciousness, we will deal with this aspect of psychological development in more detail in the next section.

[3] Particularly J. Schumpeter's definition of "creative destruction" illustrates this view (1926).

All four conditions synthesized in Table 1 must be met for genuine development to occur. Whenever one or more are not met, the corresponding pathological regression(s) occur, leading to decay and potentially death. These four general criteria for authentic development will be relevant to evaluate changes in both individual psychological developments as well as in economic systems.

2. Evolutionary Psychology

A vast literature originating from the fields of ethnology, anthropology and development psychology shows that consciousness enhancements and personal development occur in clearly identifiable steps or levels.[4] Each level is characterized by specific qualitative psychological differences. The capacities to perceive, to feel, to think and to communicate are therefore all conditioned by the consciousness level at which one operates. Different authors use different labels to describe each level, but they can nevertheless all be regrouped conveniently into three significant categories: pre-conventional, conventional and post-conventional levels .

A primary closeness between body and spirit, nature and community psychologically characterizes a ***Pre-conventional level***. These concepts aren't yet sufficiently differentiated. The resulting worldview is magical/mythological, and abstract concepts like laws of nature can't be apprehended. A child at the pre-conventional level of development is unable to use the laws of logic or to alter behavioral roles. For example, a child will perceive the same quantity of liquid shown in vases of different sizes as different volumes. The idea and the object aren't yet differentiated. Everything is taken literally: "Laotze was 700 years old at birth" or "Moses parted the sea". Relationship to the collective doesn't include the possibility to switch roles or to make trade-offs, and rules are enforceable only through rewards and punishments rather than reason (See Table 2).

A failure of development at a pre-conventional level will manifest as a deficit in self-awareness, and in the ability to learn rationality and scientific reality standards.
The passage from a pre-conventional to a conventional level involves a *demystification* of the world, the loss of faith in the magical/mythological form of experiencing, acting and thinking typical of the pre-conventional consciousness.

[4] Commoner B. et al., 1990; Coomaraswami, C., 1943; Lovejoy, K., 1936; Plotin, 1966-1988; Smith, H., 1989; 1992; Wilber, K., 1977, 2000; For development psychology: Baldwin, J., 1906-1915; Erikson, E. H., 1992, Gilligan, C., 1982; Kohlberg, L., 1984, 1996; Loevinger, J., 1977;Maslow, A., 1970; Piaget, J., 1977; Sullivan, H., 1980;

Development Levels	Emotional /Cognitive Characteristics	Consciousness Reference Point	Relationships with Collective/Social
Pre-conventional	Fusion object - idea Instinctive, Un-socialized Psycho-biologically determined • Needs • Emotions • Motivations Here/Now priorities	Autism, Primary Narcissism Pre-personal, symbiotic, archaic Collectively determined role identity Cyclical time framework	Belonging, *"Participation Mystique"* Magical/ Mythological Worldview Magical/Mythological Determinism Ritualized Praxis
Conventional	Concrete Operational Linear, Rational Competitive Short-term priorities	Ego-based/ Individualistic Socio- and ethnocentric Causal/ analytical Linear time framework	Self-development Science, Legal systems, Nation-State Functional specialization. Technocratic development, Experimental Praxis
Post-conventional	Integration All-perspective embracing, Reciprocal tolerance Cooperative/Altruistic/Solidarity Sustainability priorities	Transpersonal Multiple Roles &Perspectives Complementarity Universal & Pluralistic, Inclusive/ Empathic Multiple Time Framework Synchronicities	Self-transcendence Multicultural Human Rights, Universal Fairness Openness, Assimilation Integral Praxis

Table 2: Consciousness development levels and characteristics

The ***Conventional level*** in psychological development starts with the build-up of individuality, with the capability to more clearly distinguish between the interior and exterior, with the faculty to change roles, with higher abstraction and logical capacities, and the emergence of communication skills using complex symbolic and linguistic means. All these characteristics are but visible expressions of an underlying consciousness expansion. The individual Self learns to define itself in

terms of its relationships with the immediate community and society, with the result of a growing distinction between the Self and the body, nature or the collective. The cause-and-effect relationships, linear logical deductions, and the understanding of the purpose of different roles grow to become the dominant form of perception.[5]

The breakthrough from the conventional level to a post-conventional one requires a passage through a *"Critical Self-Assessment"* ("performativen Selbstwiderspruch" in K. O. Apel, 1973; J. Habermas, 1972, 1988). This includes a fundamental re-assessment of the limitations of any purely logical construct that doesn't take into account the realities of the factual world (J. R., Searle, 1995).

A failure in going through such a Critical Self-Assessment may result in the assumption that "reality is purely subjective" and therefore "everything depends only one's own interpretation". This leads to the flawed conclusion that only *one* particular perspective is valid (i.e. mine), and all others invalid. The final outcomes are different forms of what we called the Recursive Loops in the general development criteria section. The three main ways in which such a "broken record" manifests at this stage of psychological development are predictably different failures of rationality (S. Brunnhuber, 1999):

- "Circular logic" (H. Albert, 1987, 1991), wherein the conclusions are already predetermined by the premises posited at the beginning of a reasoning;

- Dogmatism, which occurs when there is a systematic refusal to deal with criticism, and the defense of the logical coherence of one's beliefs becomes more important than the external evidence[6];

- And "infinite historical regression" when the criticism is dealt with by going forever further into a historical past without ever resolving it (e.g. "this psychological problem originated when you were five years old, one year old, at birth, from pre-birth, from your great grandfather, …from Adam and Eve.").

Notice that even the identification of a "rational consciousness level" as a "rational law" creates the danger for such a Recursive Loop. If the argumentation were to remain purely at the rational level, without continuous critical verification through external "real-life" evidence, it would sooner or later lead to a dogmatic circular logic.

[5] In the domain of social sciences one describes the conventional level as one of "differentiating the value domains" in natural sciences, politics, law, religion, art or medicine. (M. Weber, 1921; J. Habermas, 1977; 1988)

[6] The anecdote of the Roman cardinal who refused to look into Galileo's telescope because "everything that was supposed to be in the Universe was already described in the Bible" is an illustration of this attitude.

Whenever the conventional consciousness level gets stuck in one of those Recursive Loop processes, it degenerates into "hyper-rationality" (J. Gebser, 1992). It is important to distinguish between reason and hyper-rationality. The relevance or need for reasoning or logical rigor is not being questioned here. However, hyper-rationalism arises when reason claims to have the monopoly of legitimate interpretations of reality, when it claims that the *only* valid thinking is separate from any emotional perception or background. Any input other than itself is simply dismissed as "irrational". This "hyper-rational" structure is a key characteristic of "Economic Man", and we will show later why this psychological construct is valid, but only at this conventional level of consciousness. This will explain also why "Economic Man" loses its explanatory power at both the pre-conventional and the post-conventional levels.

At the ***Post-conventional level***, the consciousness reference point shifts again, and therefore also the emotional/cognitive characteristics and the relationships to the social/ collective. However, these new emotional/cognitive standards have to justify themselves in terms of the logical and rational criteria acquired at the conventional level. Indeed, on the basis of the general principles of genuine development, all later stages must not only be different from the previous ones, but also integrate and transcend the realizations of the previous ones. This means that a post-conventional level has to pass the test of conventional criteria such as legitimacy (e.g. democratic processes), respect the laws of nature and biology (e.g. physics and medicine), and integrate the findings of anthropology, sociology or economics (e.g. logic and statistics).

In the social domain, instead of the magical/mythical (from the pre-conventional level) or functionally specialized worldviews (from the conventional level), new standards become important to evaluate reality such as: reciprocal tolerance and pluralism, cooperation, universal fairness, inclusiveness, solidarity, and complementary relationships. These values are internally coherent, and different from what manifested at the conventional level. They change the consciousness reference point, and therefore also the ways of being, thinking, doing, and communicating.

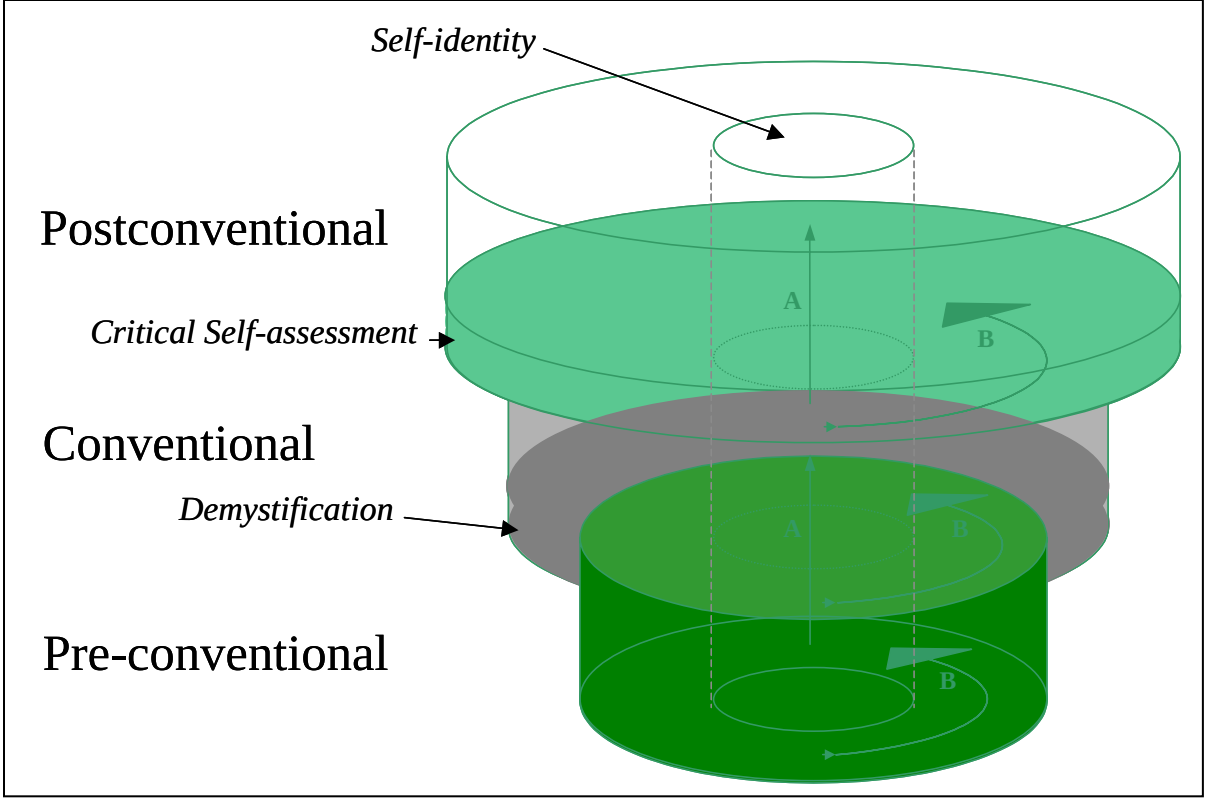
Two aspects of the schema just presented are of particular importance. One is the differences and similarities between the pre- and post-conventional levels; and the other is the difference in Praxis. Each will be dealt with in turn next.

Pre- and post-conventional Similarities and Differences

The pre- and post-conventional levels have some characteristics that superficially are similar, and therefore there is some risk of confusion between them[7]. This can result in errors in categorizing certain states, notwithstanding the totally different realities of the pre- and post-conventional levels. [8]

[7] K. Wilber calls such confusion the "Pre- Post- Fallacy". See Wilber 1995, 1998;

[8] For example, children in early pre-conventional states do not experience the ego as being separated from the outer world. Some post-conventional mystical experiences similarly are characterized by the direct



In both the pre- and post-conventional levels the connections and relationships to nature, community and wholeness are central. So, how can we distinguish between the two?
The answer comes from the presence or absence of specific steps that need to accompany the transition from one level to another. As briefly stated earlier, the transition from the pre-conventional level to the conventional one requires a *Demystification* step; and the transition from conventional to post-conventional a *Critical Self-Assessment* step. Both are *ontological challenges*, fundamental re-assessments of one's being. Such ontological challenges are the form in which the fourth criterion of development – Overcoming

Figure 1: Pre-conventional, conventional, and post-conventional breakthrough

Survival Challenges – manifests in psychological development during transitions from one consciousness level to the next.
Figure 1 presents graphically the relationships between the different consciousness levels and those necessary intermediary steps.

This Figure also illustrates the difference between breakthrough to a different level (A), and additional learning within a specific level (B).

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experience of non-duality with all that is ("*samadhi*"). S. Freud (1923) automatically classified such post-conventional states as regressions to infantile stages, thereby falling into the trap of the pre- and post-conventional fallacy. C.G. Jung (1958) made the opposite mistake by interpreting all pre-conventional experiences as post-conventional "numinous" states. Finally, cognitive science (Beck, A. T., 1972; Ellis, A., 1962) condemns *both* pre- and post-conventional realities as a lack of adaptation to the conventional reality, implying that the conventional one is the only legitimate one.

One can assess the nature of a particular psychological state by whether an ontological shift has occurred or not – i.e. through the presence or absence of the corresponding intermediary steps of Demystification and Critical Self-Assessment. Both ontological shifts have in common the use of tools of the new level to challenge the assumptions of the previous one. Demystification uses rationality to question the magical/mythical reality of the pre-conventional level.[9] Similarly, critical self-assessment uses the awareness obtained at the post-conventional level to challenge the monopoly of the rational reality of the conventional level.
Such transitions are often experienced as personal crises, painful re-appraisals of the world and oneself. But they are necessary ingredients in the development process that leads from a biologically and community-determined consciousness (pre-conventional), to an individualistic rational consciousness (conventional), and finally to a transpersonal consciousness (post-conventional).

Figure 1 also shows graphically the continuity of the identity throughout the different consciousness levels, which doesn't exclude changes in the interpretations of the role of the self in the larger worldviews of different levels.

For the purposes of this article, the most important transition to fully understand is the one from the conventional to the post-conventional consciousness levels. We will therefore now pull together synthetically the components of success in such a psychological transition. The starting point is a fully developed individual ego that has learned to use rational thinking, introspection, role-playing, and effective communications to create an integrated value system. This provides the basis on which different sorts of individual experiences and memories can be accumulated. Trans- or post-conventional states can then be assimilated as part of an individual's own biography, and are not confused with primary collective experiences, or with undifferentiated archaic fusion. When the ontological challenge is met – i.e. when one maintains a critical self-assessment operational throughout these experiences - the post-conventional consciousness level is reached.

Differences in Praxis

The second important aspect of the schema with three levels of consciousness is the differences in Praxis, or pragmatic real-life behavior patterns (Kuhn, 1967; Habermas 1972, 1988).

Each level of consciousness involves different worldviews and notions of the Self. So whenever there is a change in consciousness levels, a given inner and outer reality is re-interpreted differently. For example, at the pre-conventional level the capacity to interpret magical or mythological experiences through the means of scientific laws simply isn't available. In contrast, at the conventional

[9] In a child's development, losing his or her belief in Father Christmas or in St Nicholas is an example of such a demystification.

level, scientific interpretations become the dominant ones. But these changes in perception are only half of the story.

It isn't enough to "see reality differently", one must also "act differently" on the basis of that new perception. This is what is meant with the differences in Praxis at the different consciousness levels.

For example, at the pre-conventional level one would ritually worship the sun, while at the conventional level one would measure its astronomical movements with a scientific apparatus to be able to predict its course. But that isn't the end of it. With the change to the post-conventional worldview, one would for instance use solar energy as a way to reduce global ecological stress.
Another example: from primitive agriculture; one can move to chemical-based agro-business; and finally to ecological permaculture. Another illustration that we will elaborate on later: economic systems evolve from using commodity-based currencies; to paper-based fiat currencies; to the simultaneous use of various electronic complementary currency systems.

In each of these cases, a change in perception of reality is a necessary first step, but this move needs to be completed by the second step of a different Praxis. Concrete, real-life changes in upbringing one's children, in political activities, in economic and scientific initiatives, in the way one deals with day-to-day choices, will end up changing fundamentally the relationship between the individual, his or her community, and the environment. The self and the world aren't just interpreted differently; they are also fundamentally changed by what one does.

Notice that when psychological development is successful, the general principles of development identified at the beginning of this article are respected. Specifically:

- Differentiation: each level of consciousness respects the identity of the person involved and builds on it, as shown in Figure 1.
- Integration and transcendence: each level has to survive the acid test of the capacities acquired at the previous levels. In any later stage, both the learning and the Praxis do not exclude those acquired at a previous level, but rather include and transcend them. The examples of the sun, or of agriculture illustrate this clearly.
- Richer internal hierarchy: here also the later characteristics always include the earlier ones, but as a subset of the new reality instead of being perceived as the whole reality as was the case at the previous level.
- Overcoming Survival Challenge: the necessary presence of ontological shifts - respectively the necessity of a demystification (when shifting to the conventional level) and of a Critical Self-Assessment (when moving to the post-conventional one) - are manifestations of this last criterion.

We will later see that the above principles will also be complied with in evolutionary economics.

To summarize what will be needed for the balance of this article, the following aspects of the psychological development process are important. Each level of consciousness is internally coherent, but each is actually better comprehensible when seen from the next level up.
Each one of the levels of consciousness has its own typical emotional and cognitive characteristics, which in turn lead to specific behavior patterns. The relationships and interactions with nature and community are significantly different at each level, and involve changes in Praxis leading to substantial differences in economic behavior as well. These changes in Praxis reveal the turning point at which the inner reality and the outer one have become coherent at the next level of consciousness.

To understand the issues that contemporary economic theory is dealing with, the transition from a conventional world to a post-conventional one is the most important. Practically everything we know about economic theory has evolved under the conventional modes of thinking. And the challenge is to discover which way this theoretical construct is likely to evolve as the shifts towards post-conventional economic behaviors become more prevalent or significant.

3. Evolutionary Economic Systems

The psychological development framework just presented above is based on a strong theoretical framework that has evolved over the past century of psychological research. More importantly, a huge volume of clinical and field experience empirically supports it. Therefore, until someone proposes a better one, it should also be a valid psychological framework for economics.

Unfortunately, the psychological hypothesis implied in economic theory has remained frozen for several centuries on an assumption of human behavior synthesized as "*Homo Economicus".* One typical definition describes him as: "A hypothetical man supposed to be free from altruistic sentiments and motives interfering with a purely selfish pursuit of wealth and its enjoyment."[10] This concept, initially introduced by Adam Smith, actually pre-dates the discovery of the unconscious by Freud by over a century.

In all fairness, at least since Wesley Clair Mitchell, economists are aware of the oversimplifications built into "Economic Man". This same economist also pointed out that "Economics without input from psychology is similar to doing mechanics while ignoring the laws of physics"[11]. But in practice, precious little has become

[10] Webster New International Dictionary of the English Language.
[11] Mitchell, Wesley Clair (1925)

available so far to try to replace this mythical man with another model closer to real human behavior. This is what will be attempted in this section of this paper.

The key question becomes: what are the implications for economic behavior of the psychological development process described earlier?
What will be shown is that economic activities and their institutional framework exhibit themselves an evolutionary pattern, directly related to the level of consciousness of the people involved. This shouldn't come as a surprise, because the value system corresponding to a specific psychological development level affects the nature of all interactions, including therefore economic exchanges. For that reason, if the psychological reference shifts, we should expect both individual and collective changes in economic activity and institutions as well.

Money Evolution We will see that the classical hypothesis of "Economic Man" is not an invalid model, but that it corresponds only to a particular phase in the development of consciousness – the conventional one - and is therefore an appropriate model of economic behavior only for that particular development stage. As humanity evolves psychologically, it would be interesting to try to foresee what this would mean for the evolution of economic behavior and therefore for economic theory itself.

One of the more revelatory signs of different levels of psychological operation of an economy turns out to be changes in its money system. Every society, including our own, invariably considers its own currency system as self-evident. This is remarkable, given the extraordinary variety of things that have been used as currency in different societies.[12] As psychologists would point out, such "obviousness" is invariably a sign of something that hasn't yet been brought up to conscious awareness. Money systems are therefore an ideal area to observe in an unadulterated way the average level of consciousness of a society. We should expect it to be a somewhat lagging variable: individual psychological changes can and do happen one person at the time, but for something to become credible money it needs to be acceptable for a non-negligible part of "ordinary" people in a society. So one needs to have accumulated over time a critical mass of individual consciousness transformations before an institution like money can change. Notice that we do not necessitate a linear mechanical cause and effect relationship between consciousness levels and money systems. What we are dealing with instead is a correlation, a coherence between personal values and perceptions and the values built into the money system.

[12] Without even mentioning the most recently prevailing forms of money, such as paper, gold, silver or bronze, one can create a full money alphabet with a small selection of objects that served as symbolic of value: amber, beads, cowries, drums, eggs, feathers, gongs, hoes, ivory, jade, kettles, leather, mats, nails, oxen, pigs, quartz, rice, salt, thimbles, umiaks, wampums, yarns and zappozats, which are decorated axes See Glyn, Davies (1994) pg. 27

Economic textbooks tend to define money in terms of what it *does:* i.e. its functions as standard of value, medium of exchange, and store of value. Here we are more interested in what money *is.* For our purposes we can define money as *an agreement* within a community to use something as a means of payment.(Lietaer, 2001)
So what is the evolutionary pattern of our collective agreements (typically unconscious ones) over money systems over time?

In his massive study entitled "*The History of Money from Ancient Times to the Present Day",* Glyn Davies remarks that over the past five thousand years there have only been two fundamental innovations in the technology of money. The first was paper money, invented in China during the 9th century and spreading to Western Europe during the early Industrial Revolution. Notice that this technological change had one key institutional consequence: the transfer of the power of creation of money from sovereigns like kings and emperors to the banking system.
We are now in the middle of the second fundamental innovation: electronic money. Already today, over 95% of the money existing in the world resides in the form of bits and bytes in computers at banks and brokers. And interestingly - although rarely noticed - this technological change again seems to be accompanied by a shift of the power of creation of money, this time from the banking system to new actors in the community. As Konrad Alt, from the US Treasury Department, stated: "We are witnessing nothing less than the birth of a new industry –the development, issuance and management of private currencies". Evidence about these private currencies will be provided later.

But what is most interesting to observe here are that the shifts from the pre-conventional to the conventional, and then to the post-conventional levels of monetary evolution, happen to be articulated around these two key technological money changes. Because in psychological development, historically not all people switch levels at the same time, we should also find transition monetary models that actually partially belong to different levels. The money changes that historically accompanied the three levels of consciousness will be described next.

Pre-conventional: Commodity-based Money Systems

The history of pre-conventional money is a very long one, spanning many Millennia. The one common characteristic among all pre-conventional currency systems is that some valuable material object is being used as means of payment.
The oldest technique for exchanges is **Barter,** the exchange of goods or services without any form of currency. Barter requires as a prerequisite that the parties have "matching needs and resources". This is a strong constraint to the fluidity of

exchanges, and according to Aristotle (384-322 BC) the reason money was invented in the first place.
The second typical step were **Commodity Currencies,** the use as means of payment and/or as standard of value of a product or commodity that has also a well-established utilitarian value. Many so-called "primitive" currencies are of that type, including cattle, rice, eggs, or salt (Einzig, 1948).
The next step is the establishment of an authority in the system - typically the sovereign of the area involved - that standardizes and guarantees the purity, weight and other qualities of the particular commodity used as currency. **Coinage** followed fairly quickly when that stage was reached. Herodotus credits the Lydians with this particular invention in the 7th century BC, and from then on it has spread like wildfire all over the Ancient World. Precious metal coinage remained the main form of currency used for between one and two thousand years depending on the area, until our first key technological revolution: paper money.

Conventional: Paper-based Money Systems

The first paper currency was issued in China during the reign of Hien Tsung (806-821 AD) as a temporary substitute for the traditional bronze coins.[13] The first time the West heard about paper currency - with total disbelief - was through Marco Polo who was in China from 1275 to 1292. But we have to wait until the beginning of the Industrial Revolution for paper currency to be used among ordinary people in the Western world.[14]

The Gold Standard was the transition mechanism between the commodity-based currencies and the paper currencies. As Nobel laureate Robert Mundell most succinctly described this money system: "Currencies were just names for particular weights of gold."[15] During that time, the paper money issued was *supposed* to be 100% backed by gold coinage or bullion. In fact, this wasn't true most of the time, but the idea of a gold backing was still deemed an important fig leaf.[16] This fig leaf was officially dropped only in 1972, when President Nixon unilaterally eliminated convertibility of the dollar into gold even for Central Banks, putting thereby an end to the Bretton Woods Agreement of 1945.

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[13] Davies, Glyn (1994) pg 180
[14] Merchants in Italy invented private paper receipts for specific quantities of metallic coins called "bills of exchange" during the 13th century, and their use among professionals spread to the rest of Europe particularly through the Hanseatic League during the 15th-16th century. There was even a trade fair in Medina del Campo in Spain where trading of bills of exchange was the only activity. See Bouyer-Xambeu, Marie Therese; et al. (1984). Paper currency to be used among ordinary people was first attempted (and failed) in Sweden only in the 17th century. Two generations later, the notes of the Bank of England became the first , successful paper currency widely used by common citizens in Europe. See Kindleberger, Charles A (1993).
[15] Wall Street Journal Op-Ed page, December 10, 1999
[16] For example, the Bank of England ratio of gold reserves to note issuance ranged from 70% in 1794, to less than 50% in the early 19th century, to less than 10% by 1913. See Cannan, Edwin (1969) pg. xliv; and Gallarotti Giullio (1995) pg 167.

In reality, paper money was almost always what is technically called a ***"fiat"*** currency,[17] i.e. a currency created out of nothing, for which an authority simply declares that something that intrinsically has no value (i.e. a small piece of paper) has a particular value.
This "technological" shift, as noted already, also facilitated a gradual shift of the power of creating money from the sovereigns of the pre-conventional era to the banking system of the conventional era.
A legally enforced monopoly of this kind of money as **"Legal Tender"** further strengthened this banking privilege**.** Legal tender means that if someone owes a debt and offers to pay with this currency; if the currency is refused the debt can be legally declared void. One important debt covered in this respect is tax payments.
And as far as conventional economic theory goes, the implicit hypothesis remains that those "national" currencies are the only currencies in existence.

However, as Richard Timberlane put it: "Money to be money […] does not have to be legal tender. It can be what one might call 'common tender', i.e. commonly accepted in payment of debt without coercion through legal means." [18]
We will see next that in reality this is now happening in an increasing way.

Post-conventional: Electronic Money Systems

As we are starting to see the beginning of an evolutionary pattern towards post-conventional psychology, can we also detect some of the early signs of a post-conventional monetary system? As this is about the future, this exploration has to remain tentative and will undoubtedly be more controversial than what has been said about a well-known past.

There is no debate that the bulk of our money today is electronic. Only an estimated 5% of all money in circulation is still in paper form. There is even a country that has officially declared that all its money will soon be exclusively in electronic form: the Singapore government intends to go 100% electronic by 2008.

What is less widely perceived is that – just like was the case when paper money was introduced – the power of money creation is again shifting. In reality, the monopoly of bank money has already died without much fanfare over the past couple of decades.

[17] "*Fiat Lux*" were the first Words that God pronounced, according to Genesis: " Let light be." The next sentence is, "And light was, and He saw it was good." We are dealing with the truly Godlike function of creating something out of nothing *("ex nihilo")* by the power of the Word.
[18] Timberlake, Richard H. 1987 pg 437-447.

Given that those new types of currencies are less familiar, a few specific examples will need to be provided next.

We will address three topics in this section:

- The emergence of private commercial currencies;
- Of social purpose currencies;
- And the motivations behind the appearance of these non-conventional currencies.

Private Commercial Currencies

The Emergence of post-conventional Currencies

There are two major types of private commercial currencies in operation today: loyalty currencies (the best known of which are airline miles), and the so-called "barter currencies".

Twenty years ago, airline loyalty currencies were only a marketing gimmick issued by each airline individually. But today, there are 5 major alliances issuing annually over 1.5 Trillion passenger miles, a multiple of all conventional national currencies issued per year. More significant: 2/3 of all British Airline Miles, for example, are now cashed in for something else than purchasing air travel. The first non-airline uses included paying for rental cars, hotels, and telephone services. But now even Sainsbury, the largest supermarket chain in the UK, is accepting British Airways Miles as payment in their shops.
Phone companies, book-chains, supermarkets have similarly started issuing their own loyalty currencies. Just like what happened in airline companies, initially each of those currencies has only a narrow use, but alliances among different issuers gradually broaden the acceptability of such currencies.

The second type of commercial currency is barter credits. Barter - the exchange of goods or services without the use of any currency - has been around since the dawn of mankind. Until the 1980s, barter used to be considered a shady business mostly associated with tax evasion and illegality. International barter, "countertrade" in technical parlance, was used as a last resource with countries without convertible currencies, such as the old Comecon or some Less Developed Countries.
All this started to change when in 1982 the US Congress formally legalized barter and introduced specific IRS tax-reporting requirements. The barter industry has now over 600 professional barter companies, regrouped in two official trade organizations (the International Reciprocal Trade Association (IRTA, website www.irta.com) and the National Association of Trade Exchanges (NATE; www.nate.org.) BarterNews, the leading industry publication (with a circulation of 30,000; see www.barternews), estimates that broker-facilitated barter deals in North America now amount to approximately US$ 10 Billion per year, and are

growing at 15% per year, three times faster than normal currency facilitated transactions.

Far from being a "primitive" form of pre-money trade - as Aristotle was the first to label it – part of their growth today may be a sign of maturing of an information society. Corporations in major industries such as media, travel and hotels are now handling up to half of their transactions without exchanging conventional national currency. Notice, however, that in many of those deals, the word "barter" is in fact a misnomer, as these systems use in fact a "barter currency" useable among the members of each barter group. There are also now attempts at improving liquidity by creating a "universal currency" and facilitating some clearing among different groups.
More noteworthy still is countertrade, or international corporate barter. *Fortune* reports that two out of three of the major global corporations perform now such transactions routinely, and have specialized departments focusing on such deals. The US Department of Commerce, the World Trade Organization (WTO), and *The Economist* (UK), all estimate countertrade to be common among 200 countries around the world, with a staggering volume now ranging between $800 Billion and $1.2 Trillion per year. This represents between 10 and 15% of all international trade!

The driving forces behind this unexpected phenomenon of a barter resurgence vary widely. Some barter deals still are being done simply because the countries involved don't have access to hard currency financing: a typical example is the PepsiCola deal in Russia with payments in Stolichnaya vodka. But this argument cannot explain why there is such a growth of barter even within the same country: for instance, why United Airlines would barter airline seats for TV advertising spots with CNN in Atlanta.…
In fact, shocking as it may be to some people, it turns out to be more cost effective to use one's own inventories as working capital instead of having to borrow dollars with interest to perform such exchanges. Furthermore, the old argument that multilateral barter is too complex to arrange so that each party ends up having exactly what is wanted – another line of reasoning dating back to Aristotle - is now also being turned on its head. Cheap computing and sophisticated relational databases now enable such matches to be made automatically, at a very low cost.[19]

In any case, as was noted by Konrad Alt at the US Treasury quoted earlier, the time may have come to acknowledge that something different and non-negligible has started happening in the monetary domain. These non-conventional

[19] See also literature describing the role of barter in modern economies, such as: Amann, Erwin & Marin, Dalia "Risk-sharing in international trade: an analysis of countertrade" The Journal of Industrial Economics Volume XLII (March 1994) pg. 63-77; Williamson, Stev & Wright, Randall "Barter and Monetary Exchange under Private Information" The American Economic Review March 1994 pgs 104-123; Taurand, Francis "Le troc en Economie Monetaire" L'Actualite Economique, Revue d'analyse economique Vol 52 numero 2, Juin 1986.

currencies are obviously facilitating transactions that otherwise might not happen, and they have grown to the point where they can't be dismissed as insignificant. For instance, one could acknowledge their existence by updating our definitions of quantities of money.[20]

One should notice that none of these new commercial private currencies, whether loyalty or barter currencies would have appeared had it not been for universally available and cheap information technologies. They are therefore part of the shift of the power of creating money relating to the appearance of electronic money; similar to what happened with the shift from sovereigns to the banking system when paper money became important.
The same applies for the social purpose complementary currencies that will be described next.

Social Purpose Complementary Currencies

Social Purpose Complementary Currencies are those aiming at resolving a variety of social problems, such as elderly care currencies, unemployment currencies or environmental currencies. Currencies are called complementary when they do not aim at replacing conventional national currency, but are designed to function in parallel with – or as complement to - conventional currencies.

The following graph (Figure 3) shows the evolution of the number of social purpose complementary currency systems operational in a dozen different countries. In 1984, there was only one such system. By 1990, one could find about one hundred around the world. Today, there are over 4000!

[20] Neo-classical economics usually defines three different types of quantities of money:
M1 = Money issued by Central Banks, also called "High Powered Money"
M2 = M1 + checking accounts and short-term deposits (up to 1 year)
M3 = M2 + savings accounts and longer-term deposits.
We could define M4 = M3 + complementary currencies as defined in this text.

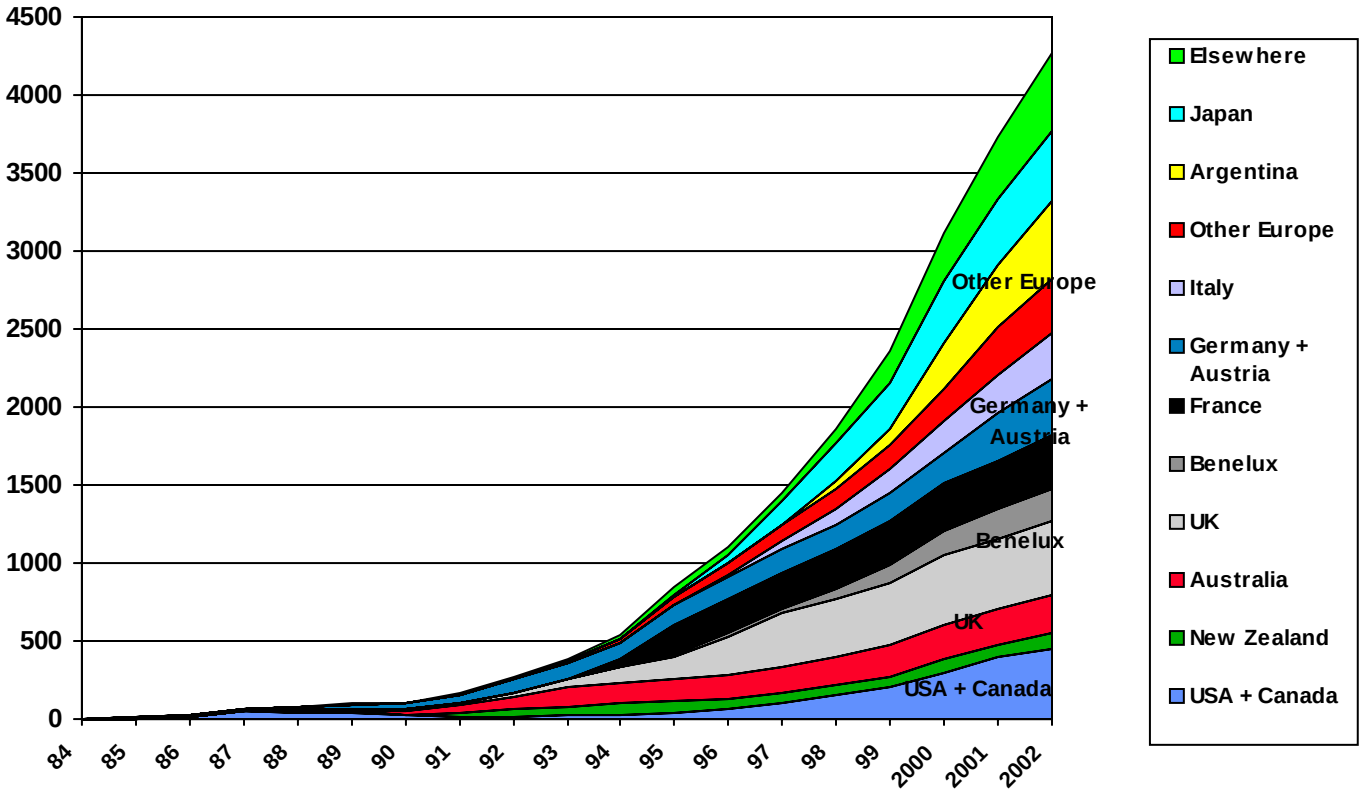


Figure 3: Number of Social Purpose Complementary Currency Systems Operational in a dozen countries (1984-2001) (Source: *The Future of Money*).

Notice that this is not the first time in history that such "local" currencies have appeared.[21] The last time was in the 1930's as "emergency currencies" in the middle of the Depression. What is different about such local currencies today is that they have appeared without being triggered by a major economic collapse, a war or a civil war. Another key difference: the current systems are designed not as short-term emergency measures, but as systematic tools to solve some specific social problems. Finally, the vast majority of them today are electronic currency innovations. Just like the commercial loyalty currencies, they wouldn't be thinkable without low cost computing being available to everybody.

There are a wide variety of social purposes pursued by various local complementary currency systems. They vary from elderly care to local unemployment; from the restoration of community in well-off neighborhoods near Washington DC to getting kids off drugs and crime in ghettos in Chicago; they operate in a megapolis like Mexico City and in fishing villages in Canada; they use low-tech paper based systems in Berkeley, CA, to high tech smart card applications in Asia; they were designed for small groups of 50 people in Australia, a city of 2.3 million people in Brazil or prefectures of 10 Million in Japan.

[21] For instance, in the US there have been a number of historical periods where local currencies sprung up. They became popular during the Panic of 1837, the Civil War years, and the Panics of 1873, 1893 and particularly of 1907 and the Great Depression of the 1930s. During the Depression, more than 5000 local currency systems operated in the US. For a detailed catalog of this last period, see Mitchell, Ralph A. And Shafer, Neil (1984)

While local activists on a shoestring budget have started most of these systems, governments actively support others:

- The city planning office of Curitiba, the capital city of Paraná in Southern Brazil, has launched and managed for over 25 years a community currency that is providing now up to one third of all income of its citizens, and has been a key for its remarkable development as the "most ecological city in the world" by UN standards;
- In Australia and New Zealand local authorities are funding local currency start ups;
- In the US, the IRS has declared one such system (Time Dollars) officially tax-free; and 31 States now pay State employees to start up Time Dollar systems;
- In Japan, the Head of the Services Department of the Ministry of International Trade and Industry (MITI) has started 40 different experimental "eco-money projects", in order to choose the models that would be most appropriate for general application in the country;
- During the Summer of 2001 in the UK, the Blair government financed a 500,000 Pound start up for a Time Bank in London.

Detailed descriptions of those various systems, their specific uses, and their respective qualities and problems are available elsewhere.[22] What matters here is what they have in common:

- 95% of these systems are computer driven;
- They have already proven that they can solve real-life social problems without burdening taxpayers or governmental budgets;
- The vast majority are small-scale affairs that are purposely kept on a local scale. But the only mature system today (the WIR in Switzerland) has now 80,000 members including one quarter of all small and medium size businesses in the country, and enjoys an annual turnover equivalent to US$2 Billion.

There is one generic question that should be addressed if one is to fully understand the societal implications of this phenomenon. Why would people bother with creating and using a currency other than the familiar national money?

According to one implicit economic assumption dating back to Adam Smith, money is supposed to be value neutral. It is indeed seen as a passive instrument that doesn't affect the nature of the exchanges or the relationships between its users. This is why the predictable reaction to the above phenomenon by someone trained in economics is to dismiss it as a tax-dodging scheme.
However, in this case, this explanation clearly doesn't hold. As any drug dealer or tax evader can explain: "the best way to avoid taxes is to get paid in cash, and specifically in national currency bills. The most ineffective way would be to be

[22] See Lietaer, Bernard (2001) Part Two

part of a system where every transaction is recorded on some computer somewhere…"

Is Money Value Neutral?

As more than 95% of the 4000 systems currently operational in the world are computerized systems, there *has* to be another reason that explains this strange phenomenon. What could that be?

In fact, what both empirical fieldwork and theoretical research have proven is that Adam Smith's assumption that money is value neutral simply isn't valid. Instead, what has shown up again and again is that *the use of different kinds of currency does significantly affect both the behavior and relationships of the people using it*. And the users of complementary currencies actually state that this is indeed one of the main reasons why they are bothering with the use of different currencies in the first place.[23]

Rather than argue from theory[24], two concrete examples will show that the use of different money types can encourage different behavior patterns. Among the many possible choices, the Japanese *Hureai Kippu* currency, an elderly care system of which more than 300 examples are currently operational in Japan will be used as illustration of how a currency isn't "socially neutral". A second example demonstrates the non-neutrality of money systems in the choice of time horizons for investments.

One Illustration: Japanese *Hureai Kippu*

The Japanese population is the second fastest aging one of the entire world. There are already 800,000 retired people needing daily help and another 1 million handicapped people, and the Japanese Ministry of Health forecasts a vast increase in these numbers over the foreseeable future. In order to face this rapidly rising problem, Tsutomo Hotta, a highly-respected retired Supreme Court Judge, started in 1995 a new type of health-care currency, that he called *Hureai Kippu* (literally *"caring relationship ticket").* [25] It is designed to complement the normal national health care plan: any help not covered by health insurance can be obtained through this means. Each contributing volunteer has a Time

[23] In a German survey of all members of six different Local Exchange Trading Systems (LETS), a majority (57.3%) state a different social contact as their main reason to participate in this exchange system. See Meier, Daniela (2000) pg 6.

[24] For theoretical considerations, see Ibid. chapter 6 and 9.

25 Information collected by personal interviews with Hotta-san in Tokyo. See also: A l'ecoute du Japon (Brussels: Information bulletin of the Japanese Mission to the European Union) July 3, 1995 pg. 7-8.

Account, managed exactly as a savings account, except that the unit of account is hours of service instead of Yen. Different values apply to different kinds of tasks. For instance, a meal served between 9 a.m. and 5 p.m. has a lower credit value than those served outside that time slot; household chores and shopping have a lower credit value than personal body care. These *Hureai Kippu* Credits are guaranteed to be available to the volunteers themselves, or to someone else of their choice, within or outside of the family, whenever they may need similar help. Two national electronic clearing houses have sprung to enable people to send their credits, for example to their parents, even when they live in other parts of the country.

Most significantly for our purpose, a survey among the elderly themselves reveals that they prefer the services provided by people paid in *Hureai Kippu* over those paid in Yen, because the relationships turn out to be of a different quality than those established with Yen-paid social service workers. In addition, it enables them to stay in their own familiar homes even when they can't take care of themselves anymore, rather than being sent to seniority retirement places, where the costs to the taxpayer skyrockets as well. So it is a win/win all around: for the quality of life of the elderly, for inter-generational relations, and even for the taxpayer. Started in 1995 with a few local systems, this approach has grown to over 300 time credit systems by 1998.
Interestingly, as of mid 2001 the Chinese government has started implementing a similar system in China, because they also try to reduce the number of people needing to be moved into seniority homes as their own populations now starts aging rapidly.

Just to prove that this difference in relationships when two different types of currencies are used isn't a peculiar "oriental" phenomenon, one could mention a completely independent experiment known as Elderplan, also on-going since 1995, but in Brooklyn, NY. Here the unit of account is called Time Dollars, the brainchild of Edgar Cahn, a well-known lawyer and professor in Washington DC. Here again, the users report that they enjoy the better quality in human relations made possible by this approach. Since the year 2000, the Elderplan system has started spreading beyond Brooklyn to Queens, Staten Island and Manhattan.

Finally, statistical data is becoming available about the social non-neutrality of different money systems. For example, using legal tender for services rendered among friends and neighbors tends to be taboo, taboos that don't apply to the use of other types of currency.[26] Similarly, a survey performed among members of six Local Exchange Trading Systems (LETS) in Germany, found strong statistical support for the hypothesis that the use of local money significantly differs from that of legal tender.[27]

[26] Belk.& Wallendorf. (1990) Furham & Argyle (1998); Lea et al (1987). Webley et al. (1983); Luo (1999).
[27] It is interesting that this 1998 survey covered both East and West German LETS systems, with the same results. More than 50% of the respondents state that they appreciate the opportunity offered by the local currency to get help from friends without having to ask for a favor. Furthermore, nearly two-thirds of the

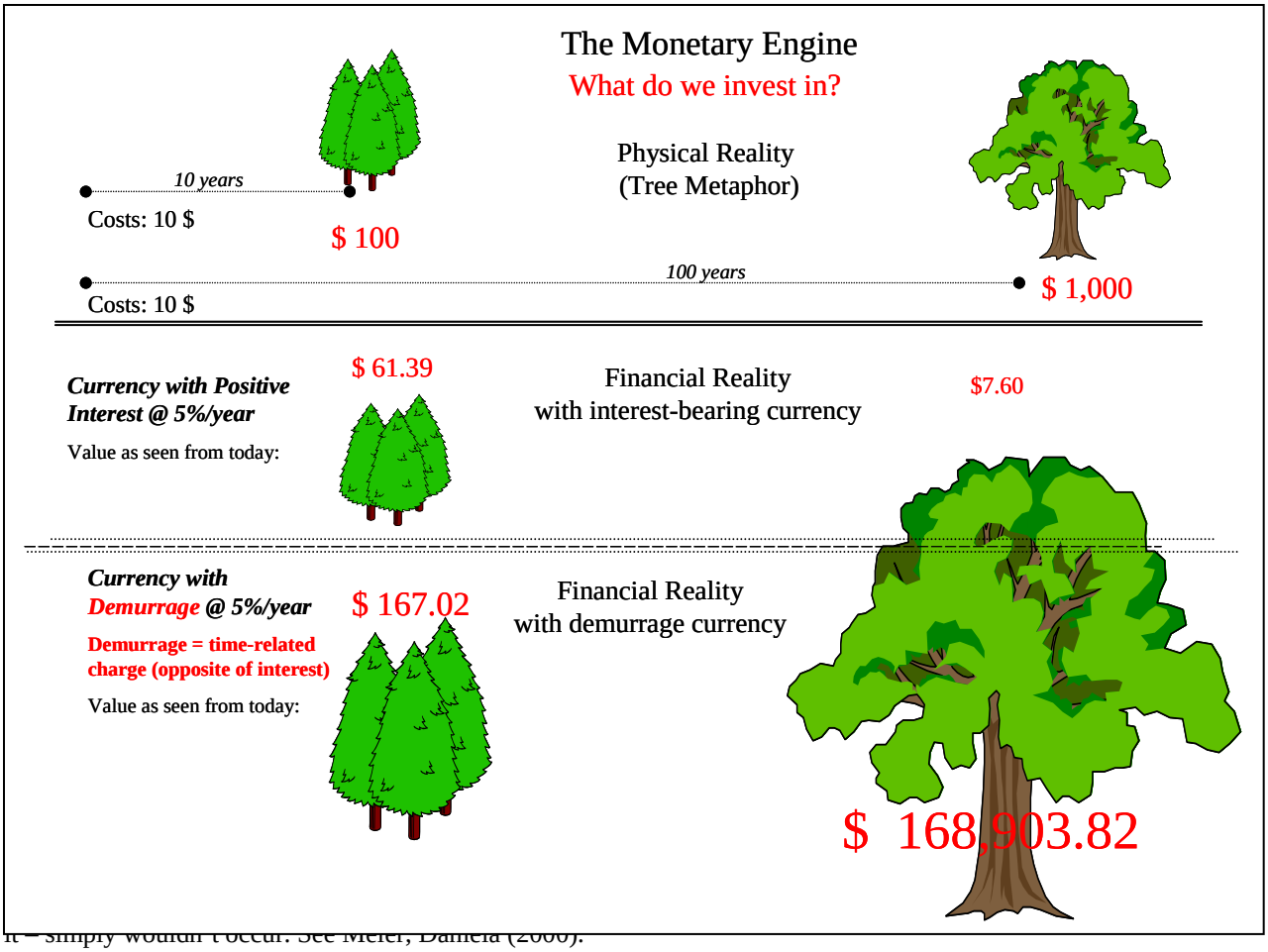
Interest and Time Perception

It is generally assumed that there is no relationship between the short-term thinking typical of our civilization and the kind of money we are using. This section will show why this isn't the case. Specifically, the point is that whether one uses an interest bearing currency or not, dramatically affects the kind of investments that will be made in a society.

To illustrate this point, we will use a simple metaphor. Let us suppose that we have to choose between 2 simple investments: planting a pine tree or an oak tree. The costs of planting either one are assumed the same at US$10 per tree.

The top part of the graph (Figure 6) shows that after growing 10 years the pine ready for harvesting is worth US$100; while the oak takes 100 years and is then worth US$1,000

Figure 6 : Tree investment metaphor in physical reality, and in two different monetary systems



it – simply wouldn't occur. See Meier, Daniela (2006).

Let us further assume that all the numbers used in these examples are in constant dollars.

The middle part of the Figure illustrates the situation when we live in a world with a positive interest rate currency.[28] If one looks at the financial world through a positive interest rate currency (in our example, at the rate of 5%/year), one sees why one will always invest in pines and not oaks. The pine value discounted to today is valued at $61.71, but the oak's value seen from today melts down to an insignificant $7.60. It makes therefore a lot of financial sense to cut down oaks and plant pines, something we are doing metaphorically (and sometimes literally) on a worldwide scale today.

Finally, the bottom part illustrates what happens when a currency with demurrage is in operation. Demurrage is a time-related charge on hoarding money i.e. the reverse of interest. This may sound like a very strange idea to us today, but entire civilizations used to consider it quite normal for many centuries (including the Egyptians for a couple of thousand years; and the Western Europeans for three hundred years, during the "Age of Cathedrals" from the 10th to the 13th century.)[29] Just to put to rest an immediate objection in the minds of today's readers: people would still save and invest in those societies, but they wouldn't save in the form of this kind of money, but rather in the form of productive assets. Such currencies were used exclusively as a medium of exchange, and not as a store of value…
Now what happens to our little tree metaphor in those societies?
With a demurrage-charged currency (also @ 5%/year), oaks become the obvious winners as an oak tree *as seen from today* would be worth a whopping US$ 168,903 !
That this is not just theory is demonstrated by the fact that societies using such currencies would invest with time horizons that look outlandish to us today. For example, their buildings were designed to last forever: we can still visit their temples and cathedrals today…In contrast, how many of our own creations will be standing in 800 years?[30]

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[28]This metaphor has been somewhat simplified for didactic purposes. The applicable discount rate is not only interest but the "cost of capital of the project" which includes three components:

- the interest rate of the currency involved;
- the cost of the equity financing of the project;
- and an adjustment reflecting the uncertainty about the cash flow of the project itself.

The third component is completely project-related and therefore unaffected by the currency used. It would remain identical whatever the monetary system. For relatively safe investments like trees, this project risk is also very low. The first two, in contrast, are directly affected by the monetary system of the currency involved. And interest has typically the larger influence of these two, which is the reason we focus on it here.

[29] See detailed case studies in Lietaer, Bernard: (2000)

[30] We do not claim that *all* things should be built to last forever: Schumpeter has convincingly described the advantages of "creative destructive" processes. But we do claim that not all things should be done for short-term benefit either.

The purpose of this metaphor was to show that, contrary to the generally prevailing hypothesis, the type of money system operational in a society can significantly affect investment patterns and priorities in time perceptions.
It is also interesting that none of the 4000 social purpose complementary currency systems that have spontaneously manifested over the past 15 years have interest built in, while all our conventional national currencies invariably do.

The relevance of both examples above – the Japanese *Hureai Kippu* system and the tree investment metaphor - is that monetary experiments may have a deeper

Pre-conventional, Conventional and Post-conventional Economic Systems

relevance for our societies than is sometimes perceived. If it is true that money is not value neutral, that different behavior patterns can be generated - spontaneously, without regulation or coercion, when different types of money system are made available - then monetary experimentation may become a key social engineering or evolution-promoting tool in a post-conventional world.
For example, complementary money systems have been started in over a dozen different countries that aim at promoting objectives such as long-term sustainability in social, political and ecological terms.[31] Humanity faces today a series of challenges the likes of which we haven't seen in historical times. Should we continue to assume that a Knowledge society will not be able or willing to use the remarkable motivation power of money to try to solve some of them?

Now that we have identified the characteristics of the key money variable at the three development levels discussed previously – in pre-conventional, conventional, and post conventional realities – we can build on it to identify the evolution of the corresponding economic systems themselves.

Table 3 presents a synthetic overview of what the three levels discussed previously would mean for the economic framework of society.

[31] See Lietaer, Bernard (2002).

Table 3: Some Characteristics of Pre- conventional, conventional and post-conventional Economic Systems

First of all, we should realize that all three levels of economic systems are being practiced now simultaneously, somewhere in the world.

For example, anthropologists and ethnologists describe many agricultural and some hunter-gatherer cultures that operate still today at the pre-conventional stage, and are exchanging as "primitive barter", without any currency as a medium of exchange. By now, many of these "primitive" societies have evolved to using various types of commodity currencies as well (e.g. salt, cattle). Religious and mythological references justify the local and regional traditions that govern such exchanges. In those societies cyclical time perception is dominant, marked by seasonal events and periodic festivals around which markets are organized. Economic exchanges are a subpart of ritual processes, and have evolved over time to ensure that they also provide the key necessities that makes sense for each party's survival and well being. We will label as *homo ritualis* the human that is operating completely at this level of reality.

Because we have the majority of humanity today operating at the conventional level of psychological development, we should also expect that the majority of

Evolutionary Stage	**Economic System**	**Currency System**	**Organizing Framework**	**Time Perception**	**Human type**
Pre-conventional	Primitive barter, Agrarian societies	**Commodity-based** No currency Commodity Currencies	Religions – Mythologies Local/Regional traditions	Cyclical Here/Now priorities	*Homo Ritualis*
Conventional	Industrial Age Competitive Markets	**Paper-based** "Gold Standard" Bretton-Woods Treaty	National: Legal systems International: Treaty systems	Linear Short-term priorities	*Homo Economicus*
Post-conventional	Post-industrial, Knowledge society.	**Electronic** Complementary Currency Systems	Global/Local Complementary Systems Multiple organizing frameworks Conscious choice in transactional effects	Simultaneous Multiple Time perceptions Conscious choice in time priorities	*Homo Universalis*

the economic exchanges operate at that level. This is the world of the Industrial Age where competitive markets operate in which monopolies of national currencies were created by law or by international treaty. The predominant time perception is Aristotelian: linear, granular time going from an infinite past towards an infinite future, with in economic terms a particular emphasis on the short-term. All the characteristics of the conventional value system and psychological framework apply to *homo economicus.* He fits perfectly the conventional consciousness descriptions of Table 2: a totally rational, competitive, individualistic being, "unencumbered" by any post-conventional concerns like altruism, solidarity, or sustainability. It is also the level on which conventional economic theory has been built.

Finally, there are some early signs of a post-conventional reality taking shape. It should be emphasized that these new processes are still embryonic at this point. It is now widely acknowledged that "advanced economies" are being transformed into post-conventional, Knowledge-based economies. But, the monetary system, being a lagging variable, is still almost exclusively conventional. Observing from the conventional level the budding signs of the new post-conventional monetary changes, one may be tempted to dismiss them as below contempt. We could describe the whole field of complementary currencies today roughly at the stage where aeronautics was when the Wright brothers took off with their first plane. The miracle is that their contraption flew at all. But their real achievement was that they did prove that flying was possible.
When an innovation of this type appears, it is most likely to be muddled, incomplete, confusing and insignificant in scale. After all, during the transition from the pre-conventional level to the conventional one, many people didn't consider the first paper currencies in Europe very convincing or significant either…[32]

To return to the post-conventional psychological characteristics described in Table 2, we find as dominant emotions reciprocal tolerance and recognition, solidarity and long-term sustainability. Values such as universality while respecting cultural diversity, the capacity to empathize with others, and universal fairness are becoming relevant on the agenda. This is a world where the old polarities between the individual and the collective, and today's hot debate between the local and the global, have been integrated and transcended.
As shown in Table 3, complementary currencies would support such a value system, and would help in creating an economic balance between the local and global priorities. People in such a society would have become aware of the non-neutrality of money choices, and the corresponding Praxis is to choose as currency for their transactions the ones that support the objectives or the type of relationships that they want to promote in that particular transaction. For instance, when dealing with long-distance or commercial relationships, they would continue to use the conventional currencies of today. But when exchanges

[32] The Swedish inventor of bank-issued paper money in Europe ended up condemned to death, and saved his life only through the intervention of the king's mercy.

involve their neighbors, or have as purpose to promote better care for the elderly or a wider variety of life experiences for their children, it would make sense to use complementary currencies of another type than the scarce national currencies.

Pre- and post-conventional Fallacy in Evolutionary Economics

Just as is the case in psychology, there is a risk in confusing characteristics of post-conventional economic levels with some aspects of the pre-conventional. And just as in psychology, one needs to look beyond the superficial similarities before one can decide in each case with what one is dealing.
For example, conventional economists may dismiss today's barter currencies as a regression into "primitive pre-money exchanges". And yes, there *are* cases of barter that are pre-conventional economic regressions: barter appears spontaneously when a national currency collapses, as was the case in the late 1990s with the Russian Rubble or at least in part in Argentina in the first years of the 21st century. But there are also sophisticated information-age corporate barter exchanges that are genuinely post-conventional. They are performed because they are actually more cost-effective than normal dollar denominated transactions.
In short, exactly as in the case of psychological developments, regressions towards a pre-conventional level *and* advances towards post-conventional level can *both* be observed in the field. And one needs to analyze case by case beyond superficial similarities to find out what is really happening.

Evolutionary Economics as a Development Process

How well does the evolution in money and economic systems map the psychological development process of the previous chapter?

At the pre-conventional level, when the capacity to distinguish between idea and object isn't universally developed (see Table 2), it makes sense that only physical, valuable objects would be used as medium of exchange. Once the abilities for abstraction are fully developed, it becomes possible to gradually substitute a scarce commodity first with a paper receipt supposedly pointing to where the metal is kept (i.e. the "gold standard"), and finally with a pure fiat currency without any material backing.

In the post-conventional worldview, the concept of complementarity is part of the core consciousness, and therefore complementary currencies are a natural fit. In this context, the conventional national currencies just become one of the available options for settling payments. As the awareness that money isn't value

neutral spreads, the Praxis to choose a currency most appropriate to the purposes of the exchange should also follow.

At the start of this article, four criteria were identified as necessary conditions for a genuine development process to happen: differentiation, integration and transcendence, hierarchical development, and overcoming survival challenges. These four principles are respected in both:

- the evolutionary money sequence,
- and in the development from *Homo Ritualis* to *Homo Economicus* to *Homo Universalis*.

4. Implications for the Future of Society and Economical Theory

If this evolutionary schema continues to prove itself valid, it could mean a positive, optimistic future for both human society and for economic theory.

Humanity is a young species, and it is actually not the first time that it undergoes a major consciousness mutation. The shift from the pre-conventional to the conventional consciousness level facilitated the transition from an Agrarian to an Industrial Age. Although such a transition was obviously not painless – just think of the fate of the small farmers or the loss of power of the landed aristocracy – it did lead to a richer, more complex, more interesting world. We are struggling now with the cumulative negative consequences and the limitations of that Industrial Age, but this shouldn't blind us to the fact that an improvement in living standards and of life expectancies did occur for the so-called "developed" countries. On the basis of this precedent, we can expect that a post-conventional worldview will continue to evolve and grow in acceptance until it ends up becoming a new common-sense. In light of such an evolution, we can perhaps hope that the vaunted Knowledge Society of the future may disprove some of the apocalyptic views of today's ecological and social literature.

Similarly, the reputation of economics as "the dismal science" may also be a temporary phenomenon. This name may become inappropriate if economic theory moves from the conventional world of *homo economicus* to a broader post-conventional worldview.
But this may take some time. It took almost a century to progress from the economic theories based on agrarian metaphors of the French Physiocrats to Adam Smith's industrial age economics. Things move faster now, but we are still waiting for an Adam Smith for the Knowledge Age…It can be anticipated, however, that one of the ingredients in that post-conventional economic theory will be a psychological model that takes account of the characteristics of the post-conventional human.

The signs of tensions between conventional and post-conventional economic thinking manifest today as an ideological battle that lines up on the one side proponents of neo-classical, abstract mathematical modeling of economic reality; and on the other economic "young Turks" who are attacking this approach. The critiques leveled by each group against the other are revelatory of the underlying issues at hand. Conventional economists criticize the new group as lacking "scientific rigor" and not understanding "the specificities of the field of economics"; while the latter condemns the former as teaching an "autistic dogma", locked into "circular logic" arguments, and lacking "social relevance". Just return to the value systems mapped in Table 2, and the arguments on both sides become quite predictable.

If this debate is part of a development process in economic theory, then we can forecast that the ultimate outcome will be an integration and transcendence of these two positions. This may be the one of the most interesting challenges that economists and economic theory will have to deal with in the foreseeable future.

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