

CURVE OF HUMAN EVOLUTION (*)

***A Theory of decision based on knowledge and
ignorance***

The present work is a revised and extended version of the original presented by the author in the course of “History of Economic Thought”, part of the Economics PhD Program of the SWISS MANAGEMENT CENTER. The work presented received an A+ (100).

(*) Replaces the original title: *Curve of Progress* (July 2012).

Carlos A. Bondone

(May 2012)

CURVE OF HUMAN EVOLUTION

A Theory of decision based on knowledge and ignorance

ABSTRACT

From the *theory of decision*, resulting in the *curve of human evolution*, that derives from the confrontation of the *curve of knowledge* and the *curve of ignorance*, presented here, we deduce that it will no longer be necessary to recur to the –deeply intuitive and correct– concepts of Adam Smith’s “*invisible hand*”, and Menger and Hayek’s “*spontaneous order*”, to explain the correlation of individual progress, concomitant with that of the society to which the individual belongs.

The conclusions of this text allow us to say:

- That the *Theory of Decision* presented here, based on Karl Popper’s and Friedrich A. Hayek’s epistemological fundamentals and the Theory of Economic Time (TET) have a scientific-mathematical corroboration (*Curve of human evolution*).
- Individual freedoms are essential when establishing the institutions related to generating and applying knowledge (*twin freedoms*).

After the “Curve of Human Evolution”, it is very possible that terms such as “freedom”, “elites”, “social justice”, “democracy”, so sensitive to human nature, will be treated in a knowledgeable-scientific context, and not as a marketing tool with the simple and spurious object of obtaining popular approval.

Buenos Aires, May 2012.

Carlos A. Bondone

CURVE OF HUMAN EVOLUTION

A Theory of decision based on knowledge and ignorance

CONTENTS

Introduction

Part I

FALLIBILITY AND ACTION

Fallibility of living beings

The Implication of fallibility in living beings – Action

Value

Qualifying and quantifying

The subjective value axiom

Marginal utility

Valuing allows us to compare and order

Comparing and ordering allows preference

Knowing to value

Knowing to predict

Knowledge

Part II

THEORY OF DECISION

Decision in live beings

The human being

Human action

Human decision

Rational decision \equiv human decision

Different men \equiv different fallibilities

Different men \equiv different decisions

Decision in society

Infinity in quality

Infinity in quantity

The need to finite decision

Man, sociable by necessity

Change and human decision

The need to delegate decisions

Part III

CURVE OF HUMAN EVOLUTION (CHE)

Human evolution is a function of knowledge

Curve of *knowledge*

Curve of *ignorance*

Curve of *human evolution (CHE)*

Fundamental conclusions of the *Curve of Human Ecolution*

Part IV

PUBLIC CHOICE ANALYSIS

Critical analysis

The curve of human evolution and Public Choice Analysis

Economists and the CHE

Summary of the critical analysis of Pubic Choice Analysis

Notes

Bibliography

INTRODUCTION

“All things are subject to the law of cause and effect. This supreme principle has no exceptions”

Carl Menger

Reading the content of the present work, the reader will find it is no coincidence that we start with the same quotation we presented in our book *The Theory of Economic Relativity*, since here we will also use the logical-deductive methodology, so that one subject will be the consequence of the preceding one and this will lead to the following.

At the same time, the conclusions in this work are based on the same fundamental notions that originated the *Theory of Economic Time*, and all that derives from it (the Theory of Currency with its theorem and axioms, the Theory of Interest, etc.).

This work begins analyzing fallibility as the basis for action in living beings; then it studies the action of living beings, continuing with the study of human decision, and culminating with the curves of *knowledge* and *ignorance* that determine the *curve of human evolution*.

Thus, we will be able to explain the progress (decadence) of human beings in society as a function of these two variables: *knowledge* and *ignorance*. The fundamental notions used in this analysis –of the social sphere- to obtain the curves of knowledge, ignorance, and their derivate, the curve of human evolution, are in line with theories developed by other sciences or disciplines (physics, chemistry, biology, economics, neuroscience, etc.).

In this manner we believe we can prove that evolution depends on the *invisible hand of knowledge*, and *causality that exempts us from the spontaneous order*.

Once we have understood the common and essential fundamentals of human decision in general, we go to the terrain of its application to Public Choice analysis. This must unavoidably be presented as critical analysis, in an attempt to contribute to this new discipline.

Part I

FALLIBILITY AND ACTION

“Fallibility is the basis for action”

Carlos A. Bondone

Fallibility of living beings

We know all living beings are fallible, and man, being a live being, does not escape that condition. We can also say that fallibility is essential and exclusive of living beings, or that being a live being implies fallibility.

Following what we expressed in the *Theory of economic relativity*, we can say:

“I believe there is no term ... that shows ... fallibility better than need, if we understand it in the sense of a problem that must be solved, an unsatisfactory situation, a desire to improve the present situation, etc”.

The original text said *I believe there is no term in economics that shows human fallibility better*. Here we have eliminated two terms.

- 1) *In economics*
- 2) *Human*

In this manner we can begin this work referred to living beings in general, and then concentrate on man in particular. And this is so because fallibility has implications common to all live beings, that each will confront according to their capacities.

The implication of fallibility in living beings – Action

Understanding there are entities that are live and those that are not, we say this work is destined to the study of living beings. More precisely, we refer here to the relations of living beings with all entities (living beings and things), and specifically those that have to do with the actions derived from their fallible nature.

Let us see the elements of life that interest us in this occasion:

- *Living being*: that to the effect of this work we will identify as the *actor*.

In turn, the presence of the living being implies the concomitant presence of two more elements, and their consequences:

- *Time*: without time there is no possibility of life. Specifically we refer to the present and the future, the arrow of philosophic time. We know (Heraclitus) that the presence

of *time implies change*: with time everything changes, and if there is change it is because time exists.

- *Fallibility*: the living being is fallible.

In turn, the presence of *fallibility implies*:

- *Need*: manifestation and/or consequence of fallibility. If there were no need, dissatisfaction, the living being would be infallible: *fallibility* → *need*. This reasoning allows us to understand simultaneously, in the context of our analysis, what the terms fallibility and need of living beings mean, we need no further precision. Here it is important to expand the concept of need, since generally it refers to overcoming states or situations, but we must also consider avoiding future states that could mean a worse situation, or simply opt for the least unsatisfactory of possible futures.

In turn, the presence of *need implies*:

- *Action*: activity of living beings to cope with needs. We understand action to be the effect of doing, and doing to be the effect of executing, causing. From the deductive reasoning we are carrying out we conclude that action is derived from the state of fallibility of living beings, an essential implication for the study of action, since it expresses that all action has an object, the need, that acts as the cause or motive of the action.

In turn, the *action implies*:

- *Object*: the action has an end or an objective for the actor.

In turn we can offer further precision on the objective, in so far as we are referring to the action of a living being that tends to satisfy, as best he can, his present and/or future needs, and in this manner we manifest that the objective implies:

- *Good*: here it is sufficient to present Carl Menger's text in Principles of Economics

“Things that can be placed in a causal connection with the satisfaction of needs of living beings we term useful things. If, however, we both recognize this causal connection, and have the power actually to direct the useful things to the satisfaction of our needs, we call them goods.”

Considering we are referring to living beings in general we must replace the word *human* with *living beings*, in the original text.

It is important to stress that there exists a *bi-univocal relation between “good-living being”*, since by definition one does not exist without the other. A thing becomes a good when it is useful to a living being, and the living being confers upon the thing the condition of *good* when the thing is useful to it.

In this simple and concrete scenario we can link the following elements ordered to describe what the existence of life implies, or life itself:

Living being → time (change) → fallibility → need → action → good (objective)

We can conclude by saying the good is equivalent to the *incentive*, in so far as all incentives exist in a state of need. Therefore, a good that as is expected as a result of an action is equivalent to an incentive for action, but action derives from the need arising from fallibility, therefore the relation *need-expected good* is necessary for living beings.

Value

From the logical-deductive conclusion of the previous paragraph arises that all action implies valuing the expected good that will result, knowing that it is a function of need. So we can say:

Fallibility implies valuing by the actor

We can refer to value and say that if we adopt the meaning of *value*⁽¹⁾ that is the “*Degree of utility or aptitude of things to satisfy needs or produce well-being or delight*”, and considering that our concept of need implies the well-being or delight, then we can assume that:

Valuing by the actor is the ordered action of qualifying and quantifying, oriented to satisfy the need that motivates him

It is important to observe that we begin the sentence with *Valuing by the actor is*, instead of *Value is*, and this is so because we wish to stress that value without an actor has no meaning. From here on, each time we refer to value it will be understood that it is the value of an actor.

Valuing things implies having the faculties of qualifying and quantifying. In other words, the faculties of qualifying and quantifying are the tools with which the actor values, both himself and the context

In other words, *fallible entities need to value.*

Qualifying and quantifying

Since we have already introduced ourselves in the specific subject of the action of living beings, we need to refer to the relevance of the faculties of qualifying and quantifying they have, and they are essential since they condition all action.

We can read in the Theory of Economic Relativity:⁽²⁾

When we are referring to the quality of an entity, we are alluding to the specific elements (one or more) that distinguish one entity from others. Notice that qualifying implies the act of comparing, since by definition we have said we

are “separating entities according to an element that distinguishes them”, that other sets do not possess; at the same time, the fact that we are speaking of differentiating leads to a situation in which “difference inevitably means comparison”, since without comparison there is no difference; thus we say men, dogs, etc.

When we mention quantity we are alluding to a number of entities with the same quality; thus we say one hundred men, fifty dogs, etc.

What I wish to clarify is that first we must define the quality of the entities we are considering, and then we can count them, incorporate the concept of quantity. In other words, we can only add homogeneous things; as the popular saying goes: you cannot add apples and oranges.

But this conclusion leads us, in turn, to another more important one: that we cannot apply quantity to that which has not been previously qualified. This leads us to consider the criteria discovered by humanity for qualifying. The answer is simple; we cannot quantify what has not been qualified, and by definition we know that qualifying is done by comparison, and from here comes the possibility of establishing an order.

In short, to qualify we compare, establishing an order, “we qualify with ordinals”, and once this is done, “we quantify with cardinals”; in other words, we “quantify (cardinal) what we previously qualified (ordinal)”.

This conclusion is extremely important for science, since the most difficult task for human knowledge is to qualify, specially the smallest things, because it is easier to compare and find differences among large things than small things. Small things appear so because they have undergone several processes of separation. This is why science says that we find more regularity in large things than in small ones, as it is much more complex to study the infinitely small than the infinitely large. The best proof of this is found in applying probability to very small things, as in quantum theory. This was a great surprise to physicists, who thought that, the smaller the entity, the greater the scientific determinism they would find; but we must remember this debate is not closed and this is part of the beauty of life and knowledge.

We must observe the relevance of what the *ordered actions of qualifying and quantifying* imply for the study of the action of living beings. The result of the action of living beings will depend in an important measure on the degree of development of their faculties for qualifying and quantifying. I.e., with the development of a greater efficiency in qualifying and quantifying, a better result should be obtained; a simple analysis that explains the differences of man with other living beings, and also differences among men. In other words, the process of Darwinian selection of the fittest implies the faculty of qualifying.

Let us see then the logical deductive chain at the stage we have now reached:

**Living being → time (change) → fallibility → need → action → good →
valuing → (qualifying → quantifying) → ...**

The subjective value axiom

Having *duly* clarified that value is imputable to the actor, i.e., that there is no value without an actor that values, it is pertinent to express the axiomatic relation *actor* \leftrightarrow *value*, remembering that actor implies the being that *necessarily acts because of his condition of fallibility*.

So we can postulate the following *axiom of value*:

“There is no value without an actor or actor without value”

The axiom of value has central implications in the action of living beings, especially concerning two fundamental aspects:

- The fallible living being is the guarantor of the action of valuing. I.e., it is not pertinent to consider any value not emanating from the fallible living being, value never emanates from things foreign or external to the living being that values. What is external to the living being is what can be subject of valuation on the part of the living being that values. It is pertinent to alert that when a living being values another living being, the latter is an entity valued by the former. Also, when he values himself he does so in his condition as a valuing subject that values an object, as an observer that interferes in the observation (Popper).
- The bi-univocal relation *fallible living being-value* determines that the actor is the *cause* (responsible) for the actions emanating from his valuation. Thus, valuing implies a faculty and a responsibility, at the same time, of the subject that values, since the act of valuing is intrinsic to his existential condition of fallible being.

This simple axiomatic chain deriving from the use of the logical-deductive method implies placing the living being at the centre of his action. I.e., the external context of the living being that acts, are things, among which are goods and living beings. Among these living beings affected by the action, are other living beings also in a circumstance of valuing. I.e., the actor acts among actors.

We conclude then that action belongs to the living being and that faculty-responsibility of valuing (through qualifying and quantifying), to undertake action, exclusively belongs to him, as he is the subject of the action, not the environment. In this manner we generalize saying *value is subjective to the actor*, not the context.

We only need to remember that the discovery of the subjective value theory is what allowed the displacement from the epicenter of things (dialectical-materialism), placing man at the epicenter (humanism).

Finally we must not forget that value is not quantifiable, but that it allows us to order the preference of the things that are valued, a task that is carried out by comparison.

Marginal utility ⁽³⁾

Fallibility led the living being to obtain goods to satisfy its needs. The spatial-temporal relation of the need and its satisfaction is subject-regulated by the subjective value the actor gives things.

We only need to say now that the subjective action of valuing by living beings is guided by the principle of *marginal utility*, which states: *the unitary value of n units is greater than the unitary value of n + 1 units, and smaller than the unitary value of n – 1 units.*

Marginal utility can be considered as the “rule” that guides or measures the subjective valuation by the actor, which allows us to order the things that are valued.

It is very important to stress that the concept of marginal utility is not limited to economic goods, but extends to all goods, since it refers to the relation between a need and its satisfaction by a good, considering the presence of quality and quantity or intensity, both of the need and the satisfaction produced by the good.

It is very important to see that we have introduced in our analysis of the action of living beings two aspects that up to now have only been considered within the human sphere, and more specifically the human economy, those of marginal utility and subjective value.

Valuing allows comparison and order

From what precedes this (subjective value and marginal utility) we deduce that though subjective value is not quantifiable, it allows us to compare entities and order them according to their needs.

We conclude then that ability to qualify and quantify will be conditioning factors of the actor’s actions, when comparing and ordering what is valued, and therefore of the responsibilities implied by any action.

Comparing and ordering allows preference

In turn, the capacities of comparing and ordering allow the actor to prefer. In other words, more useful to this work, we can say the preference of the actor is a function of his aptitude for comparing and ordering, according to his capacities for qualifying and quantifying.

We can then conclude with the following proposition referred to the actor’s action:

- Preferring implies the capacity of valuing to compare and order entities.
- Valuing implies the capacity of qualifying and quantifying entities.

Knowing to value

If we accept that *to know* means “*to be aware, through the exercise of intellectual faculties, of the nature, the quality and the relation of things*”,⁽⁴⁾ we realize that qualifying and quantifying, along with the consequences of comparing and ordering, conform the set of *knowing*. Thus, knowing underlies and conditions the action of valuing, from where we deduce the faculty of the actor of preferring.

In relation to the qualification *intellectual* stressed in the concept of knowing, it will appear when we “descend” –in truth, when we ascend if we are referring to intellectual capacity- to the sphere of human beings.

We conclude then that the action of preferring is preceded by the action of valuing, which is directly conditioned-related to knowing, which implies qualifying and quantifying, that allows us to compare and order.

We can then deduce that:

“Valuing is a function of knowing”

Knowing to predict

But the decision is not only based on preferring. It is also necessary for the living being, given his condition of fallible being, and within precisely that condition of fallibility, “to estimate” the possibility of occurrence of the result of the action.

From the combination of the faculties of preferring certain values over others, and predicting the probability of the occurrence of the same, the living being is in a better or worse position to decide what action to take.

It is very important to stress we are referring to the *subjective determination of the possibility* of the occurrence of an event, not the certainty of its occurrence, with which we are within the framework of the fallible living being. I.e., we are not involved with any form of determinism; on the contrary, the faculties of living beings have to do with the result.

We can deduce then that:

“Predicting is a function of knowing”

Knowledge

We observe then that the faculties of living beings to cope with the necessary condition of being fallible are based on knowing, since valuing and predicting are functions of knowledge.

This brief but concrete conclusion is in tune with the principle that simplicity leads to success. And in this opportunity it will be of transcending importance since it will allow us to develop a simple and conclusive theory of human progress in society, with epicenter in decision, the guide to all action. We can then deduce that:

“Valuing and predicting are functions of knowledge”

Part II
THEORY OF DECISION

*As we are all different
“from each according to his capacity
to each according to his need”*

Carlos A. Bondone⁽⁵⁾

Decision in living beings

If we accept that *deciding* means: “*Resolving. Being moved by will to make a certain determination*”,⁽⁶⁾ this leads us to conclude that: with preferring we are referring concretely to deciding.

There should be no problem in saying that living beings make decisions, each one will do so based on his genetic-evolutionary faculties, not forgetting the present circumstances for each decision. This implies that it is feasible to elaborate a general theory of decision, which must ramify subsequently according to the species we refer to.

To the effect of this essay, and in line with the concept of deciding, commonly accepted and previously presented, we consider the *decision* as:

“The action of preferring”

Knowing that

“Preferring is a function of knowledge”

From where we deduce that:

“Deciding is a function of knowing”

This simple causal-logical-deductive chain allows us to involve everything we have previously referred to, as valuing implies qualifying and quantifying, which allows us to compare and order, which are involved in preferring, all embraced by knowledge, which is involved in the faculty of predicting, implicated in every decision.

We have established then that *deciding*, along with being also an action of living beings – with everything this implies-, is what guides all other actions. Which implies it is the responsible, among all other actions, of evaluating the expected result of the action, the good.

We also know the decision belongs to the present looking to the future, on which the decision pretends to have an influence, i.e., on the end or objective sought by all actions of deciding.

Thus, living beings make decisions by taking advantage of the faculties of knowing. When we come to this point, where it is necessary to refer to the different faculties of valuing and predicting that living beings have –both functions of knowing- it is necessary to study man in particular.

Let us see then the logical deductive chain up to this point:

**Living being → time (change) → fallibility → need → action → good →
KNOWLEDGE → decision →...**

KNOWLEDGE = [to value (qualify → quantify) → preferring (comparing-ordering) → predicting]

The human being

Knowing that the essential difference in the action of living beings is in the greater-lesser development of knowledge to act in the quest to overcome their condition of fallibility, it is necessary for us to concentrate on how different the human being is from all other living beings in the occupation of knowing.

If we accept that man is *homo sapiens* ⁽⁷⁾ different from all other living beings and animals in particular, it is pertinent to analyze human action based on that difference. In other words, based on the action of living beings in general, and the action of deciding in particular, we will now approach human action because of the better capacity of humans to “obtain” knowledge.

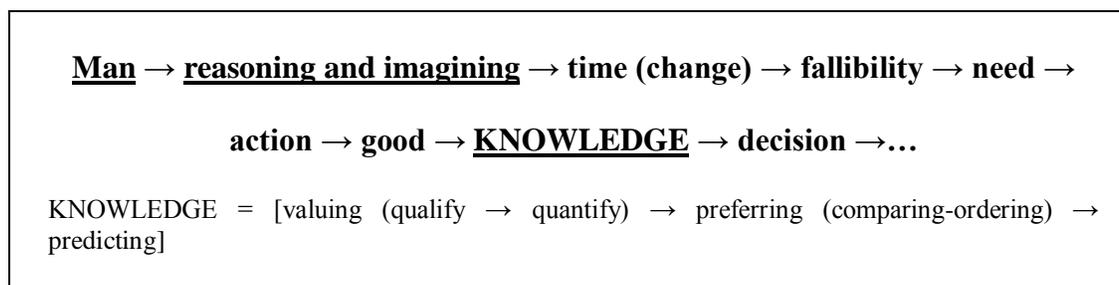
Reasoning: the capacity to *reason*, a consequence of a greater development of the brain, has allowed man to better cope with the state of nature typical of the senses. Thus we can say man is the summation of reason plus senses, different from animals that are basically senses. For the object of this work we need not go any further in this respect, nor do we need greater precision on the concepts of sense and reason; we only are interested in stressing that man “distances himself from the animal state in so far as his reason dominates his senses”, which does not imply considering that man has no senses.

Imagining: the greater development of his brain allowed man to establish another crucial difference relative to animals, which is the capacity to *imagine*. It is said that man began to differentiate himself from animals when he began to manifest the idea that there is life beyond death. In short, for our purpose here it is sufficient to accept the idea that man is an animal with the capacity to *imagine*.

If we combine both those capacities –*reasoning* and *imagining*- that identify man as different from all other animals, we see that completely different paths for the action of man and all the other animals derive from here. I.e., the capacities of *reasoning* and *imagining*, exclusive of man, put him within a sphere of *action* completely different from that of animals; it is pertinent to say that they have the capacity to decide, or simply react, instead of pro-acting.

We only need to add that from the capacity to reason and imagine arises the world of ideas and/or knowledge (Karl Popper's "World 3").

We must modify the logical deductive chain we had developed in this manner: replacing living being with man, and introduce immediately –before anything else- his capacity to reason and imagine. Replacing *living being* with *man → reasoning and imagining*, clearly shows that the difference of the rest of the logical deductive chain begins here (the innate in Popper?, the theoretical burden of proof in Popper?):



Human action

According to this simple logical-deductive chain, it is wrong to speak of non rational human actions, since that implies the animal state, not the human condition. It is pertinent to speak of a different rational condition according to each human being, relative to his capacity to reason and imagine, allowing him to know better. I.e., in the human being we must extend the sentence referred to living beings in general and say:

“The necessary action of fallible man will be a function of his capacity to know”.

Having come to this point, we will now focus on the last link in the chain we are developing, the decision that follows knowledge.

Human decision

The logical-deductive work we have carried out led us to deduce that the action of deciding is central in a set of actions, since it guides them. Given that preferential place of *decision*, among all other *human* actions, we need to stress the relevance of the special capacities of reasoning and imaging man has. And this is so because they allow him to have essential advantages for *knowing*.

We can continue simplifying this and say:

“Human knowledge is a function of his capacities of reasoning and imagining”

From this order of thought arises clearly that the capacities required for decision are more developed in human beings than in other living beings.

Rational decision ≡ human decision

Human decision is equivalent to rational decision. If it were not so, we would regress the analysis to the state of all living beings, without the presence of man.

We have said enough on human decision for the purpose of this work and we need not extend on this not so trivial “triviality”. Human decision cannot be non-rational, which does not imply that all decisions are of the same rationality.

Different men ≡ different fallibilities

Sometimes it seems easier to accept that we are different from all other living beings, but not that men are also different among themselves. Thus, for equality under the law to exist there must be laws that respect the fact that men are different. In other words, we cannot be equal under the law without previously recognizing that we are different among ourselves. Therefore legislation must be based on the premise of “protecting” the difference.

Once we have differentiated man from all other living beings, and animals in particular, we observe that human beings are different among themselves. That difference manifests itself in two aspects: 1) there are no two identical humans at the same time, and 2) in different times the “same” human being is different. The second difference among human beings can be expressed saying simply that the “John” of minute one is not the same as the “John” of minute two, since everything changes in time.

The second difference has multiplying or exponential implications in the infinite decisions human beings make in society, an important implication that we will have the opportunity to appreciate further, as we progress in this work.

We conclude then that human essence not only makes man different from all other things, but also makes men different among themselves, and the “same” man different in time. This essential “double difference” among men also determines that we be fallibly different.

Different men ≡ different decisions

Assuming the infinite differences of human beings in time, leads us to conclude that the capacities of reasoning and imagining will have the same characteristics. Therefore the same will be true for the capacities for knowing, for acquiring knowledge to decide.

All men are different at the moment of deciding, which is a function of the knowledge each has. We must understand clearly that the fact that different men share decisions of a similar characteristic does not imply that we should forget the individual essence of the decision that is different in each individual (I will have opted for blue in a way *necessarily different* from other men that opted for blue).

We wish to point to the *immensity* of the sphere of “differences” among human beings and of the same human being in time. This implies multiplying effects of diversity, larger than the diversity derived from the quantity of individuals that form society.

Decision in society

Living beings belonging to a species (herd, pack, society, etc.) that interact, must make decisions in a context (domain) shared with others of their species. In the case of man we refer to the context (domain) of society, in which man acts and decides.

It is necessary to alert that the fact of pointing to the two human differences —1) of the same human being as time passes (Robinson Crusoe), and (2) of a human with respect to

other humans (human society)—, leads us to the necessary consideration of the infinite sphere of qualities or quantities of decisions that are made in a society in a certain period of time. In other words, the amount of decisions in time in a society depends on the amount of individuals, of the time period, of the amount of qualities of decisions that can occur, and the amount of decisions of each quality that can occur.

It is evident that the scenario for decisions in a society cannot be more fallible, given the infinity it presents. Let us see the causes and consequences of the infinity of fallibility of human decision in society.

Infinity in quality

Since decision derives from values (an ordered set deriving from qualifying and then quantifying what has been qualified), it is necessary to see that the sphere of infinity of decisions that are made in a certain period (without time there is no action, that is why we must consider the magnitudes of time) in a society, is already present in the act of qualifying, before progressing to the act of quantifying. Taxonomy is present in all human action, not only in science.

The sphere of qualification is larger than that of quantification. A simple reflection corroborates this: you cannot quantify without qualifying, which implies that quantifications will multiply according to the qualifications that exist. In other words, quantification exponentiates the quantity of qualifications: *qualifications = (quantifications)ⁿ*.

Infinity in quantity

Though we know that the sole mention of qualification places us in the sphere of the infinite, it is no less true for the task of quantifying, especially considering that we must quantify what has been previously qualified, i.e., the fact that we are speaking of an ordered set, of qualifying and then quantifying clearly shows that when referring to deciding in society we are in the sphere of the infinite.

The need to finite decision

It is evident that the sphere of the infinite that is presented by human fallibility in society places the individual in the terrain of nano magnitudes, of the exponentially small.

Precisely, from this scenario of immensity that society represents for the fallible human individual arises the necessary road to evolution.

“The infinite fallibility of the individual in society makes it necessary for him to recur to the capacity of knowing the finite”

In this manner, the natural fallibility of man presents its two faces: the capacity to know the finite to confront infinite fallibility. For the purpose of this text, we will express this in an exaggerated summarized form: while Plato’s labyrinthic caverns do not allow man to reach the “truth”, and Socrates inquires about the truth he knows does not exist, both ratify human fallibility. Thus, due to the fact that there is no method to know (we present finiting as the solution to the labyrinth) or that we cannot know (our fallible infinite as the truth that we will

never know to the end), both Plato and Socrates pointed to the fallible human condition and how we could defend ourselves.

This logical-deductive chain allows us to conclude that man is social by necessity, not because of ethical or moral issues. Except if we consider ethics and morals as another aspect of human fallibility. Ethics and morals are a need that must be satisfied, the same as hunger and health, in the same manner that we do not need the invisible hand or the spontaneous order, because there is causality that explains matters.

Thus, the scenario of infinity that human fallibility in society presents in turn the “necessary” path to cope with it, to finite the road to knowledge.⁽⁸⁾

Man sociable by necessity

According to what we have seen, fallibility presents knowledge with its two faces (the duality present in all things):

- 1) Vulnerability relative to the infinite
- 2) The capacity-opportunity to dominate the finite

I.e., the road to the finite is the only resource to cope with the infinity of fallibility. The necessary condition of finiting implies limiting the sphere of knowledge. In this manner the condition of sociable man that shares knowledge appears as necessary; *each reader can determine the extension of this reflection.*

Change and human decision

Knowing that human decision is a function of knowledge, from this we derive that its sphere is the same as that of knowledge: to progress finiting considering the vulnerability of the infinite, both limits imposed by human fallibility in society.

We can conclude then by saying that the sphere of human decisions in society is a function of the knowledge that can be attained, as the condition of social human fallibility in time is a “datum” that changes in its form and its size with permanent infinity.

The need to delegate decisions

The point of intersection of the incommensurate infinite that imposes fallibility, and the finite of the capacity of the fallible to overcome it, place the fallible in the necessary process of delegating decisions. I.e., delegation is another necessary component of human nature, which makes the “invisible hand” and the “spontaneous order” unnecessary to explain human action and progress in society.

Delegation of decisions in society implies two considerations of crucial importance:

- 1) It appears necessary as a consequence of the limited infinity imposed by the infinity of fallibility and the finite capacity of knowing of the fallible individual in society.
- 2) It is of extreme relevance as a conditioning factor of human evolution, a situation we will appreciate in full when we refer to the curves of knowledge and ignorance, which will take us to the *curve of human evolution*. Developments we will see in the following part and that will explain the cause-effect relation between knowledge and

ignorance and human progress in society: *knowledge-ignorance* \rightarrow *evolution*. In other words, the curves we will present will be another way of seeing, appreciating, and corroborating what we have exposed. Once again, mathematics appears as an excellent expression of knowledge for explaining and corroborating.

Part III

CURVE OF HUMAN EVOLUTION - CHE

*“The universe is finite
but not limited”*

Albert Einstein

*“A good attempt at defining fallible
man that does not resign himself”*

Carlos A. Bondone ⁽⁹⁾

Having confirmed that man *needs* society to cope with the infinity that fallibility imposes on him, and that in turn society *needs* the individual with his capacity to reason and imagine within the finite to produce knowledge, now we can present what we will call the *curve of human evolution (CHE)*, which will arise from the confluence of two curves that support it, and that we will denominate *curve of knowledge* and *curve of ignorance*.

We will begin presenting the curves of knowledge and ignorance, with their corresponding forms and explanations, and then conclude with the CHE and all its implications, and all its possibilities for explaining historical processes of progress-decadence of some societies that would seem not to have a scientific explanation. The CHE explains the path, and the hope underlying the process of globalization of knowledge, mounted on the exponential expansion of electronics (software and hardware).

Human evolution is a function of knowledge

Having established that:

- Evolution is a function of knowledge, since it underlies valuing (qualifying and quantifying), preferring and predicting.
- It is necessary to finite to reach fallible knowledge.

From the above we deduce that understanding the origin of knowledge that can be applied to decision, and its corresponding use, help the progress of the individual in society.

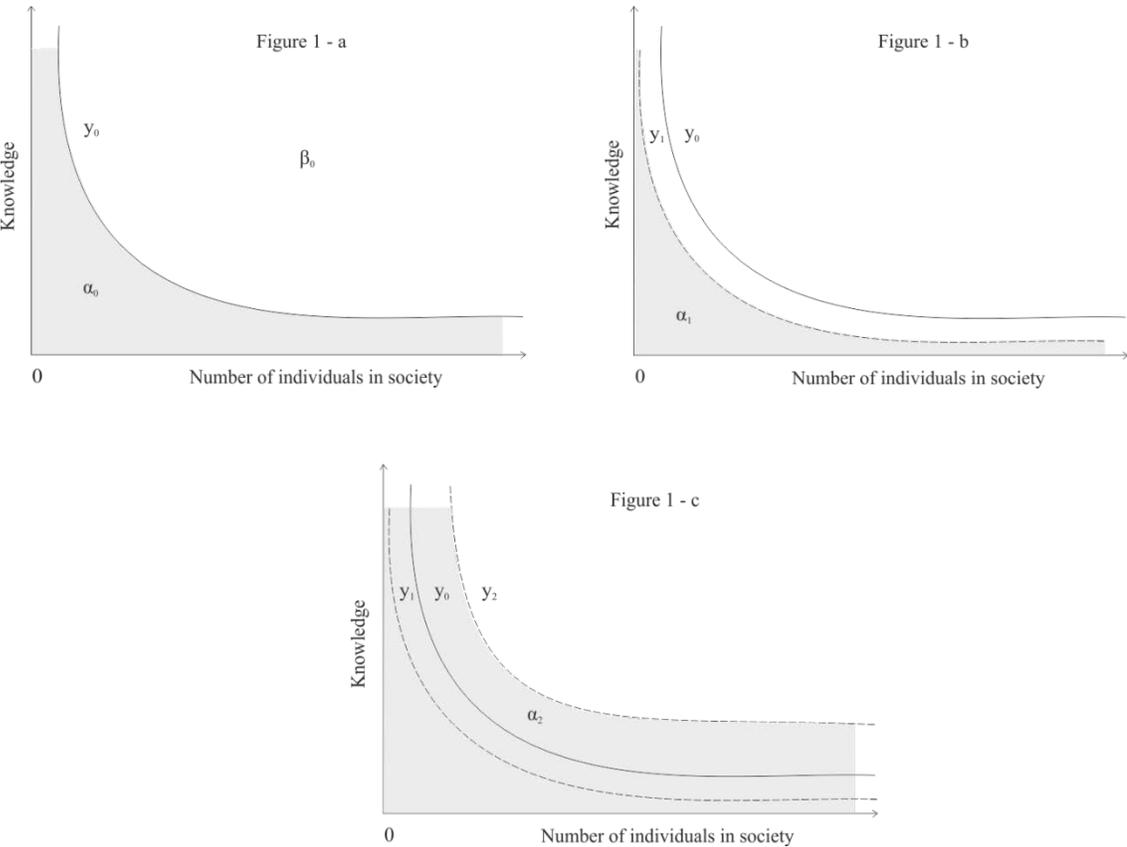
Curve of knowledge

We can establish a causal relation between the origin of the *knowledge applicable to decision*, from here on *knowledge* ⁽¹⁰⁾ generated in a society, considering the subsets of individuals that generate it.

According to the conclusions of the logical deductive chain we have developed in this work, the higher amount of knowledge arises from groups formed by small quantities of components of society, appearing as a necessary condition imposed by the need to finite knowledge. As a result we can present the following function of knowledge:

$$y = f(g_{x,c,n,m,q})$$

Where (y) is the weighted amount of knowledge generated applicable to a decision, (f) is a function of the amount of knowledge generated (g), with its differential (x), multiplied by the coefficient of the relative weighted importance (c), taken in (n) numbers of groups, of the same amount of individuals (m) that participate in the generation of knowledge, multiplied in turn by the coefficient (q)⁽¹¹⁾ that indicates the number of times that knowledge can be applied. In other words, 1000 “groups” of 1 person would generate knowledge with a “weighted value” of 50% of total knowledge, 100 “groups” of 10 persons would originate knowledge equivalent to 20%, and so on, numbers that are multiplied by the other parameters. In this manner, 1000 persons individually will have generated the “weighted value” of 50% knowledge, 100 groups of 10 persons 20%, and so on.



From the concrete study by specialists in statistics will arise the inverse relation of knowledge generated as the number of individuals in a society grows. Inverse relation that

will also decrease. Let us see and analyze the figure we propose to explain the generation of knowledge that can be used in decision, that we denominate the *curve of knowledge*.

In figure 1-a, the curve of knowledge we propose is represented by y_0 , which shows a decrease in relation to the amount of individuals (abscissa) that form the society where the knowledge is generated (ordinate). Thus we observe a curve with greater generation of weighted knowledge in small groups, that descends as the amount of individuals in the society grows.

This figure must be seen from its two essential aspects, that of the curve generated by the function y_0 , which by definition is a behavior variable, and that of the area that is generated under it, from the origin, which constitutes the stock of knowledge that accumulates as the number of individuals that generate knowledge grows, stock that we will call α_0 .⁽¹²⁾ In other words, the curve y_0 is the derivative that explains the incremental way in which the stock of knowledge (α_0) is generated, and the stock of knowledge is the integral of the incremental function of knowledge. This observation will be very useful in what follows. We can also say that the area above y_0 is the area of *fallibility* (β_0), the infinite that is never reached. In a loose manner, if pertinent, “we could say”: if God implies faith in the unknown, his existence is unquestionable, because of the necessary existence of the *world* β of ignorance, the “fourth” world we have added to Popper’s three worlds.

Figure 1-b shows us a downward displacement in the curve of knowledge, which implies an inferior level of efficiency ($y_1 < y_0$) in generating knowledge at the same level as x , which explains that with the same number of individuals a smaller stock of knowledge ($\alpha_1 < \alpha_0$) is generated. It is pertinent to establish this relation for the same community in different moments or for different communities at the same moment. We must stress the difference between moving along the curve and a displacement of the curve itself, which implies changes in the fundamentals.

Figure 1-c shows the inverse situation, when efficiency in generating knowledge is greater, the case of y_2 , and we observe $y_2 > y_0 > y_{01}$ y $\alpha_2 > \alpha_0 > \alpha_1$.

It is important to stress that it is pertinent to draw this graphic considering absolute or percentage values of x , a situation that is very useful for studying the comparative efficiency in different societies, and the behavior of a society at different moments.

We reiterate that both the slope and the level of the curve, both generators of the stock of the knowledge available for decisions, will be very significant when making comparisons of the same community at different moments or different societies at a certain point in time.

We cannot leave this section without mentioning that the *process of delegation* that society implements at the time of choosing the groups of generators of knowledge, and the components or “delegates” of the same, is crucial for analyzing the slope and the displacements of the curve, that will explain the stock of knowledge available for decision making, both in quantity and in quality. That is, given that knowledge is delegated in specialized subsets of society, we see that the stock of knowledge obtained will depend on the quality and the respect for institutions (freedom or restriction).

We consider important to state that knowledge is a specific field of epistemology, which is the reason we refer so much to it, especially in the person of the great genius that Karl Popper was, in our understanding one of the greatest geniuses of humanity, especially since we consider social sciences to be much more difficult to master than natural sciences (in agreement with an expression by Albert Einstein). Having said this, we can agree with Popper’s idea that the being with new knowledge is a new being, which produce an interaction of the is and the ought in constant feedback *being* \leftrightarrow *ought*. Philosophy must also

be included, and in this respect we simply say that Kuhn's paradigms act as an explanation of the adoption of knowledge, in so far as he discusses the suitability of the minority that generates knowledge. We leave things there, since these are issues of individuals better equipped than myself to approach them. We simply tried to present a contribution and if this is not so, it is easy to discard it.

We will end this section with another reference to Karl Popper, considering the generation of knowledge, the stock of knowledge or Popper's World 3, finds its origin in the sphere of metaphysics.⁽¹³⁾ Thus we can say the curve of knowledge we have arrived at can be seen as the process of human metaphysics. We must suggest here reading *Quantum theory and the schism in Physics* by Karl Popper, one of the best books I have read, and from its reflections you can deduce that "something can derive from nothing". Our knowledge?

Having established the stock of knowledge available for human decision in society, and the way it is generated, now we must study the greater or lesser use made of it.

Curve of ignorance

It is very appropriate to confront the knowledge available with the degree of use of the same. A study that does not imply saying we are studying the glass half full from the point of view of the empty part, an inconsistent situation since we would be in the presence of complementary-dependent variables. In other words, here we study the use of the part of the glass that is full (the *stock* of knowledge), the only datum we have, since we do not even know the size of the "glass". It is very realistic, adequate and pertinent to stress that each individual that composes society is 99,99% ignorant of the stock of knowledge available for decision making in that community, knowing the 0.01% pertaining to their specialty.

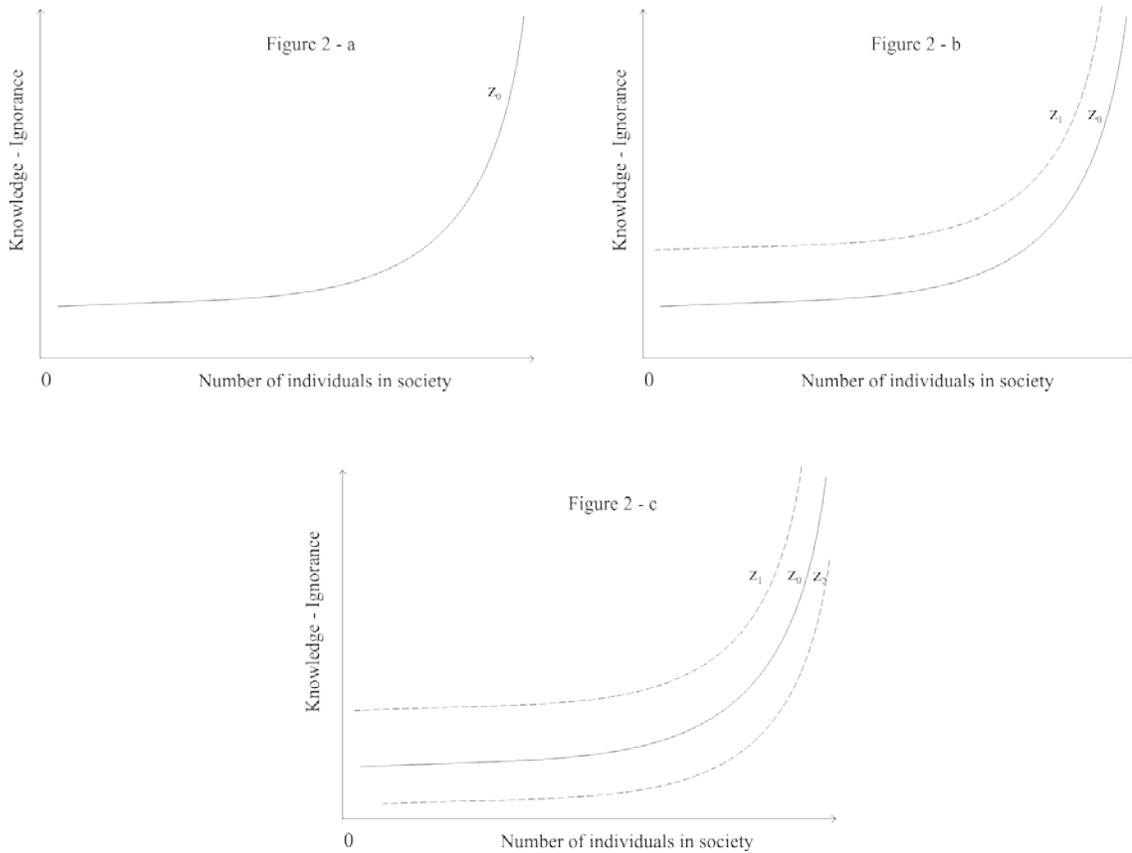
We can establish a causal relation between the use of available knowledge and the knowledge not used when deciding, that we call the *curve of ignorance*. It is important to reiterate the *need* to consider ignorance in the use of available knowledge, since it allows us to quantify based on what we know, and in this manner avoid "studying" based on what is unknown, which would only lead us to desperation.

Knowing that the *ignorance* –of what we know- grows along with the number of individuals, we can draw the following *curve of ignorance*:

In figure 2-a, the curve of ignorance we propose, represented by z_0 , moves upward as the number of individuals that compose the society increases. As we move to the right the quantities of individuals and of ignorance increase at the same time, i.e., we will have more individuals that are more ignorant.

Figure 2-b shows an upward displacement of the function of ignorance, that indicates that $z_1 > z_0$, at the same level as x_1 , which expresses a greater ignorance with the same number of individuals. We stress the difference between moving along the curve and a displacement of the same, which implies changes in the fundamentals.

Figure 2-c shows the inverse situation, with a downward displacement of z , to z_2 , that indicates that $z_1 > z_0 > z_2$, at the same level of x .



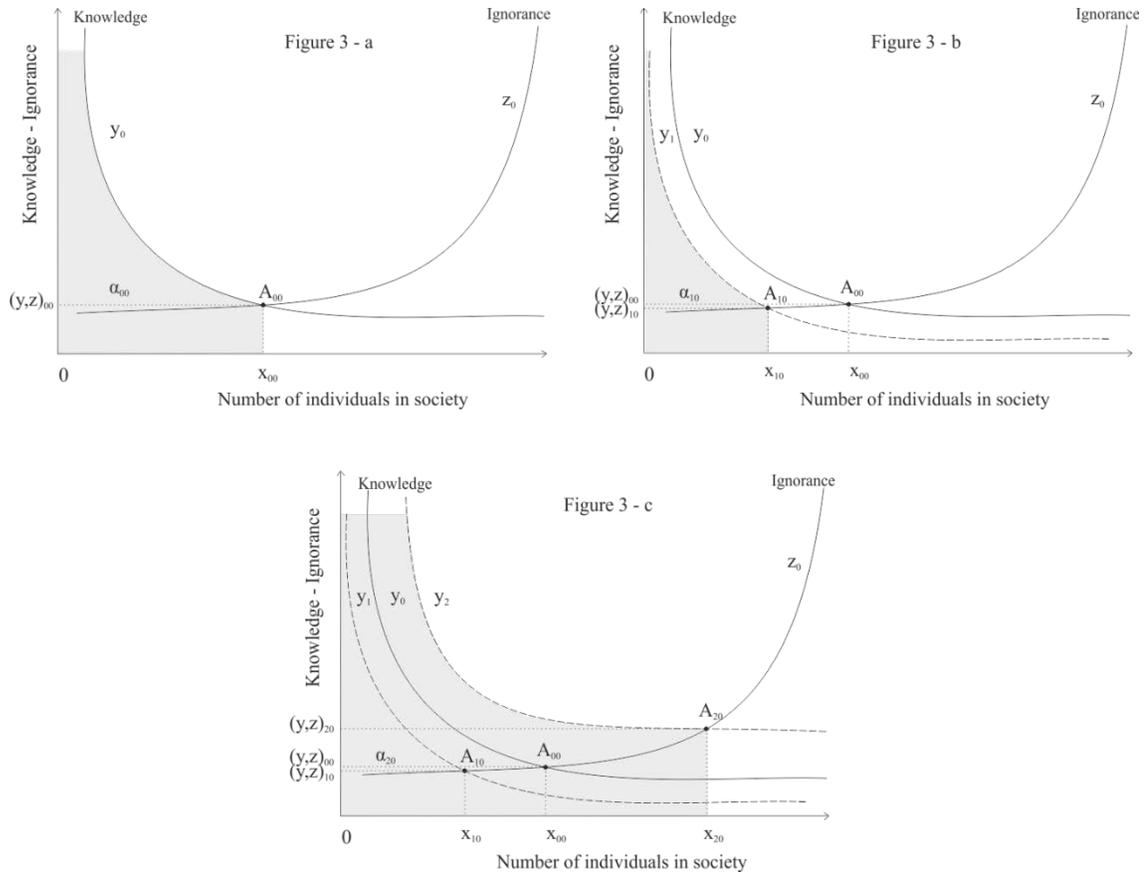
Here we reiterate it is pertinent to draw this graphic considering absolute or percentage values of x , and in the last case it will be very useful to study the comparative efficiency of different societies or the same society at different points in time.

We can conclude that ignorance has three origins: 1) not having obtained the knowledge, the *world β* ; 2) Having obtained the knowledge, the actor does not know of its existence; and 3) having knowledge of its existence, the actor ignores it. The curve of ignorance used in our development refers to cases 2 and 3, i.e., when deciding we ignore what is known by omission or by action.

We cannot end this section without mentioning that the *process of delegation* society executes when choosing its delegates, responsible for applying the available knowledge, becomes crucial when analyzing the slope and the displacements of the *curve of ignorance*, that will explain the use or not of the stock of available knowledge to make decisions. I.e., since the decisions that apply the available knowledge are made by the groups in which society has delegated this function, we can see that the curve of ignorance will be determined by the institutions adopted to that effect and if they are respected.

Curve of Human Evolution (CHE)

If we “confront-match” the (available) *knowledge curve* and the *ignorance (disregard) curve*, we can obtain an interesting graphic to show in a simple manner the conclusions of the theory of human decision in society that we are presenting, let us see:



It is important not to let yourself be tempted to think of these curves as representative of supply and demand in the economy. This is so, because we are speaking of the “supply” of knowledge of an available stock, and the non use of it. In other words, the curves presented here would be an excellent economic tool for the study of how economic goods become goods, or simply things, i.e., of the condition called “unemployment”. Having said this, we will now continue with the analysis of these curves that is so fruitful.

In figure 3-a we observe the enormous relevance of the point A_{00} — the sub-indices refer to the respective curves y_0 and z_0 from which they come — that appears as the intersection of the two curves. Said point, that we call *effective point of used knowledge*, tells us:

- The point that implies the degree of use of knowledge. It is not possible to think of a point to the left or right of x_{00} , since it is not possible to consider its occurrence, knowledge is or is not used, which does not mean disregarding the idea underlying the exercise.
- The area α_{00} will be indicating the stock of disposable knowledge used, being what appears to the right of x_{00} the knowledge ignored.
- On the other hand, the level $(y,z)_{00}$ is indicating the median level of knowledge used by the x_{00} individuals that dispose of it, instant in which $y = z$.

In figure 3-b we add the curve y_1 that showed us a generalized decrease of knowledge, which indicates that the same curve of ignorance (z_0), the point of intersection displaces to

A_{10} , reducing the stock of knowledge used to α_{10} . Thus we observe a correlation between $y_1 < y_0$, with $\alpha_{10} < \alpha_{00}$, with $(y,z)_{10} < (y,z)_{00}$, and with $x_{10} < x_{00}$.

In figure 3-c we add the curve y_2 that shows a generalized increase in the disposable knowledge, which indicates that with the same curve of ignorance (z_0), the point of intersection displaces to A_{20} , amplifying the stock of knowledge used to α_{20} . Thus we observe a correlation between $y_1 < y_0 < y_2$ with $\alpha_{10} < \alpha_{00} < \alpha_{20}$, with $(y,z)_{10} < (y,z)_{00} < (y,z)_{20}$, and with $x_{10} < x_{00} < x_{20}$.

We can clearly observe that with the state of ignorance constant, an increase in the generation of knowledge increases the amount of individuals that acquire knowledge according to the average of the level of knowledge used.

Figure 4-a, identical to 3-a, is what we will use now to study the displacements of the curve of ignorance we have seen, while the curve of knowledge remains constant (y_0).

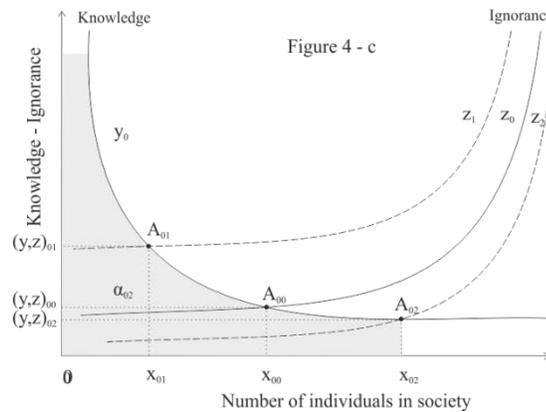
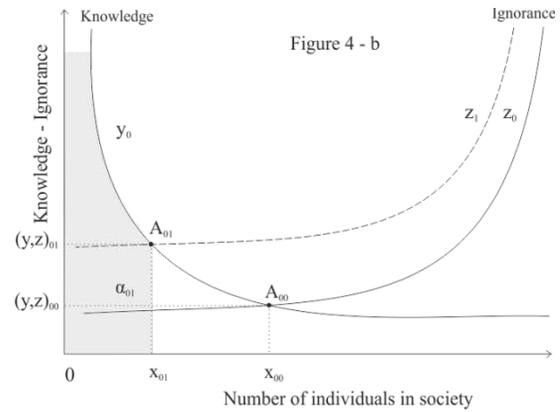
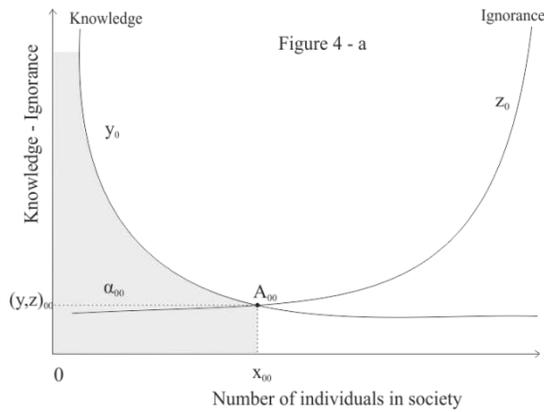
In figure 4-b we observe the consequences of considering an upward displacement of the curve of ignorance (z_1), with the same curve of knowledge (y_0). We can observe a displacement to the left of the effective point of knowledge used (A_{01}), a reduction of the area of knowledge used (α_{01}) and an increase in the average level of knowledge used $(y,z)_{01}$.

Thus we observe that $z_1 > z_0$, that $\alpha_{01} < \alpha_{00}$, that $x_{01} < x_{00}$, **“but”** $(y,z)_{01} > (y,z)_{00}$. This final position clearly shows that the consequence of an increase of “structural” ignorance (displacement of the curve because of a variation of its fundamentals) does not only produce a decrease in the stock of used knowledge, but that it will be distributed among less people in detriment of a greater number of individuals with less use of knowledge.

In figure 4-c we observe the consequences of considering a downward displacement of the curve of ignorance (z_2). This displacement indicates that with the curve of knowledge (y_0) remaining the same, the point of intersection is displaced to A_{02} , increasing the stock of knowledge used to α_{02} . Thus we observe a correlation between $z_1 > z_0 > z_2$, with $\alpha_{01} < \alpha_{00} < \alpha_{02}$, and $x_{01} < x_{00} < x_{02}$, **“but”** $(y,z)_{01} > (y,z)_{00} > (y,z)_{02}$. This final position clearly shows that the consequence of a decrease of “structural” ignorance (displacement of the curve due to a variation in the fundamentals) not only increases the stock of used knowledge, but that it will be distributed among more people, **“but”** at the cost of a decrease in the average level of knowledge used.

Now we will show the *Curve of Human Evolution*, and how it behaves in each case that can occur. To this end we present figure 5 where we include four case studies: two with z constant and displacement of y and two with y constant and displacement of z .

In figure 5, that we have called *Curve of Human Evolution*, it is important to observe how the relation between the slopes of both curves and their displacements plays out. For a very concrete and suggestive study we will first do an analysis of the implications of the displacement of y , while we maintain the same z , and then displace z with the same y , and we will finally consider simultaneous displacements of both the curves that originate the CHE.

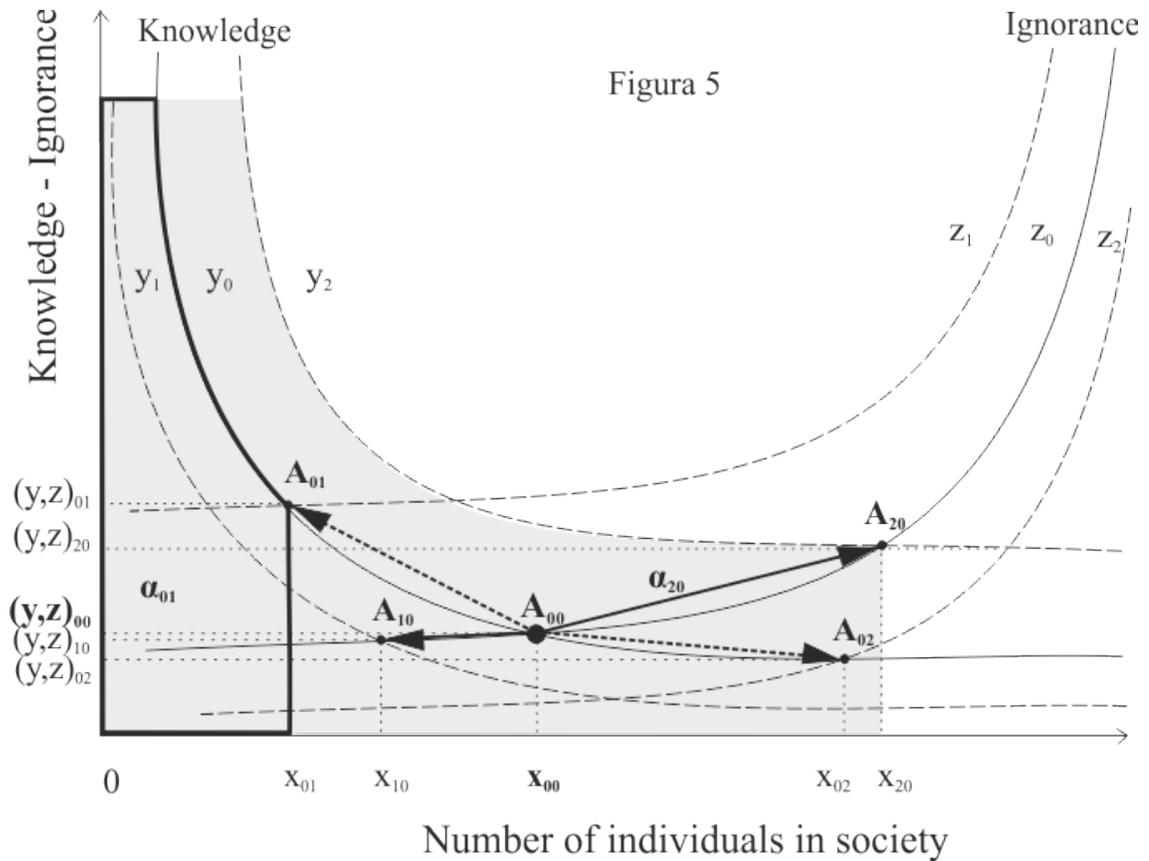


The study will be carried out drawing the line or CHE, which will consist of uniting the *effective point of knowledge used* from its point of origin (A_{00}) to the point of destination, and in the same order the correlation of the coordinates that determine each one.

Let us see

With y constant and displacement of z (dotted arrow)

z	A	x	$y-z$	α	Arrow
Up (z_1)	$A_{00} \rightarrow A_{01}$	$x_{00} > x_{01}$	$(y,z)_{00} < (y,z)_{01}$	$\alpha_{00} > \alpha_{01}$	Left - up
Down (z_2)	$A_{00} \rightarrow A_{02}$	$x_{00} < x_{02}$	$(y,z)_{00} > (y,z)_{02}$	$\alpha_{00} < \alpha_{02}$	Right - down



We can observe that the improvement represented by the decrease of ignorance (down z_2) that implies an increase in the number of individuals that use the knowledge (x_{02}), goes hand in hand with the decrease in the average level of knowledge ($(y,z)_{02}$), and the decline due to the increase in the level of ignorance (z_0 up) implies a decrease in the number of individuals (x_{01}), **“But”** with higher average levels of knowledge used ($(y,z)_{01}$). In other words, a greater number of individuals participate in the use of knowledge but with a lower average level, and the inverse, a lower number of individuals that participate in the use of the knowledge at the “cost” of a higher average level. We must not forget that here we suppose that y is constant.

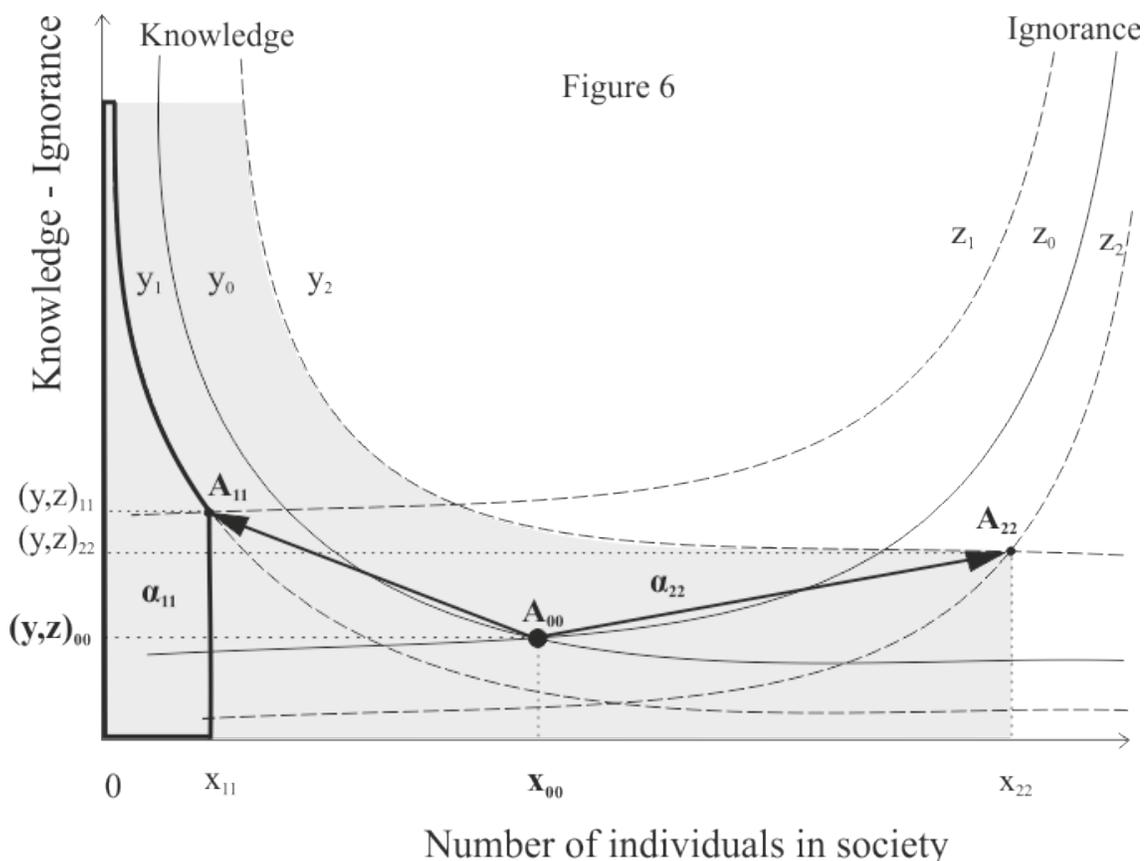
With z constant and displacement of y (continuous arrow)

y	A	x	$y-z$	α	Arrow
Down (y_1)	$A_{00} \rightarrow A_{10}$	$x_{00} > x_{10}$	$(y,z)_{00} > (y,z)_{10}$	$\alpha_{00} > \alpha_{10}$	Left - down
Up (y_2)	$A_{00} \rightarrow A_{20}$	$x_{00} < x_{20}$	$(y,z)_{00} < (y,z)_{20}$	$\alpha_{00} < \alpha_{20}$	Right - up

We can observe that with a lower level of stock (α_{10}) of knowledge available both the number of individuals reached by it (x_{10}), and the average level of knowledge used ($(y,z)_{10}$) decreases, and a greater stock (α_{20}) implies both an increase in the number of individuals

reached by it (x_{20}), and of the average level of knowledge used ($(y,z)_{20}$). The conclusions we have come to indicate that with a constant level of ignorance an increase in the stock of knowledge ($\uparrow y$) produces a rise in all the markers. Evidently this explains, among other cases, the progress in all the indicators of a society that opens its borders to all available knowledge, inside and outside those borders. We can also deduce the inverse case, the decline produced by the closing of borders to available knowledge (Argentina from 1930 to the present...).

Now we simplify the data and present figure 6 in which we underscore only the effective points of knowledge used in the extreme cases (A_{11} and A_{22}) arising from the pertinent displacements in z and y , which will be compared based on the point of origin (A_{00}), which will lead us to interesting conclusion.



We are in the presence of the extreme case:

With y and z in displacement (continuous solid arrow)

$y-z$	A	x	$y-z$	α	Arrow
(y_1, z_1)	$A_{00} \rightarrow A_{11}$	$x_{00} > x_{11}$	$(y,z)_{00} < (y,z)_{11}$	$\alpha_{00} > \alpha_{11}$	Left - up
(y_2, z_2)	$A_{00} \rightarrow A_{22}$	$x_{00} < x_{22}$	$(y,z)_{00} < (y,z)_{22}$	$\alpha_{00} < \alpha_{22}$	Right - up

This ratifies that:

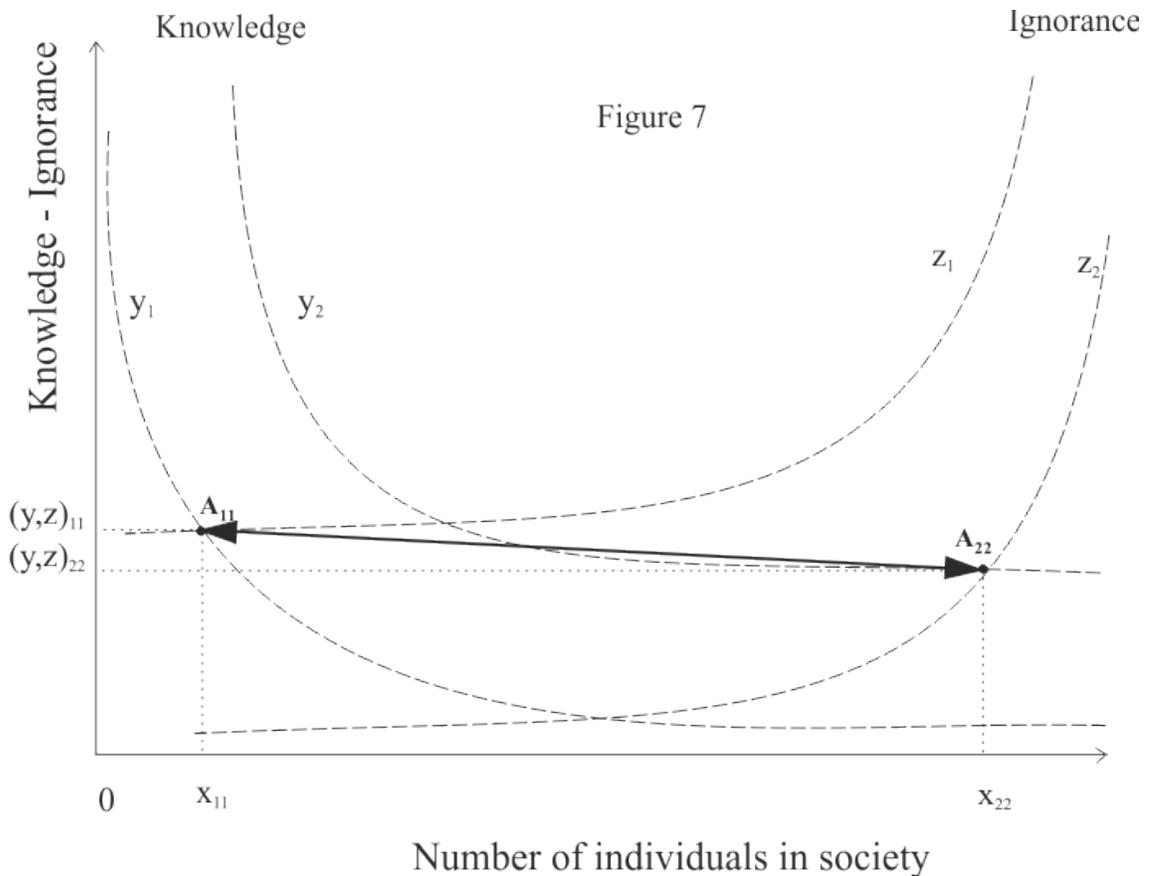
- *Worse state of knowledge (y_1) with greater level of ignorance (z_1):* presents a smaller number of individuals reached by knowledge (x_{11}), with higher levels of average knowledge used (y,z)₁₁. I.e., in a general context of greater ignorance and smaller stock of knowledge there is a smaller proportion of individuals using a greater average of knowledge (relative to A_{00}).
- *Better state of knowledge (y_2) with a lower level of ignorance (z_2):* presents a greater number of individuals reached by knowledge (x_{22}), with a higher average level of knowledge (y,z)₂₂. I.e., in a general context of less ignorance and greater stock of knowledge there is a greater proportion of individuals using a greater stock of knowledge, and a higher average of knowledge used (relative to A_{00}).

We must not forget that the analysis of this section refers to comparing the new extreme positions (A_{11} and A_{22}) derived from the also extreme curves of knowledge and ignorance (y_1z_1 and y_2z_2), **relative to a starting position of A_{00}** , starting from y_0z_0 from where we begin the comparative analysis. Now let us see the analysis that arises from comparing directly two positions that interest us, i.e., we disregard the “supposed” change from an original position (A_{00}) — that we used as an intermediary for the explanation and to show a not so linear process —, and compare directly two positions, which will necessarily be different.

To this end we present figure 7, where we directly show the “movement” between $A_{11} \leftrightarrow A_{22}$, representative of real cases that can be compared in a world in constant change, i.e., where none of the curves remain constant and we analyze specific data from reality.

We could say the *Curve of human evolution*, represented by the thick line with a double arrow at each end, is the behavior of a community, since:

- We have represented the curve of extreme knowledge and ignorance, y_1 and y_2 , and z_1 and z_2 , with the express object of presenting a synthesis of the tendency that a CHE should present, as the number of individuals increases in a situation of improvement due to an increase of knowledge ($y_2 > y_1$) and an improvement due to the decrease of ignorance ($z_2 < z_1$), and vice versa.
- It shows an increase of the stock of knowledge, since ($a_{22} > a_{11}$); areas not drawn here but they appear in graphic 6, and vice versa.
- Shows an increase in the number of people with access to knowledge ($x_{22} > x_{11}$), and vice versa.



- In turn, the synthesis of the struggle between the infinity of fallibility and the limit of the capacity of knowledge, derived from the human capacity of reasoning and imagining to cope with said infinity, shows that:
 - 1) As the number of individuals grows the average level of knowledge used decreases ($A_{22} < A_{11}$). Which is saying that the expansion of knowledge comes at the price of a lower average intensity of use (just as in physics, chemistry, economics, etc.). This is what we observe in the business world, they are born in a niche of a few users and with a high price; and ending in a competition of costs with low prices for a great number of users.
 - 2) The relation ($A_{22} < A_{11}$), synthesis of the interplay of the behavior of the slopes of the curves of knowledge (decreasing) and of ignorance (increasing), would confirm the idea of many scientists, especially in the field of physics, that the more we know the greater the ignorance we perceive. I.e., as human beings increase their knowledge they discover that the infinite of what we do not know (our β_0 of figure 1-a) appears wider and more complex —both at the micro and the macro levels— a situation that our previous ignorance did not allow us to perceive. The business world operates in the same manner, since competition is in constant movement towards better things.

- 3) If we consider the falling slope of the curve of knowledge referred to the passage of time, we can conclude that the whole stock of knowledge can be considered “non renewable”, since we know that with the passage of time it presents “different forms”. This firm conclusion, derived from the curve of knowledge, determines that we must not consider non renewable natural resources as a special or strange case, since all knowledge, as a resource, will be non renewable.
- 4) These reflections ratify that the fallibility of human beings implies their condition as maximizers by nature. It would not be conceivable to analyze man without this necessary condition of being a maximizer, determined by nature. He tries to maximize knowledge and will never reach the feasible maximum (again the Plato-Socrates confluence).

Finally, it is important to stress that the process of human evolution does not present a linear relation as we see in figure 7, instead it is better to imagine it as a “web”, with the help of the theoretical basis contributed by figure 6, with the help of the intermediate point A_{00} as a reference.

Fundamental conclusions of the *curve of human evolution*

We believe it is convenient to present the following conclusions derived immediately from the curve of knowledge, possibly involving all others.

Decision theory: the curves are in line with the theory of human decision in society presented here. Possibly this would be better expressed saying: these curves are, at the same time, expression and mathematical corroboration of the decision theory we have presented, based on knowledge and ignorance.

Incidence of fallibility: the way the consequences derived from the displacement of both curves are *neutralized* and *strengthened* is a clear expression of the incidence of the fully operating fallibility of man, manifest in two central aspects (faces):

- The *impotence* relative to the infinity of fallibility (world β), mitigated by the *capacity* of limiting knowledge (α). Capacity that also arises from fallibility, in a kind of “limited but growing capacity”.
- The limitation appears in the quality of smallness and expands with quantity (big-bang?, implosion?, ...)

Progress and maximizing man: the fact that the only situation in which there is improvement in both variables goes hand in hand with a greater knowledge and its greater use, is a clear demonstration that humans progress because of their maximizing spirit. I.e., it is not prudent to analyze the actions or behavior of humans without considering this aspect of their nature, both for explaining progress and failure. In other words, once valued and ordered, each individual occupies his “most optimum fallible place” in his society, and each society within the concert of societies.

The process of delegation and knowledge: the curves of knowledge and of ignorance, and the CHE, clearly reveal the relevance of the process of delegation for those that generate

knowledge and those that apply it. This aspect will be crucial when analyzing the behavior of individuals in society, in any sphere, political, economic, cultural, educational, business, etc...

We reiterate what we expressed when speaking of the delegation of decision in society, since it derives from the state of the nature of fallible man. The infinity presented at each instant by decision making, be it because of the number of decisions, the number of individuals that decide or the number of individuals affected, established the delegation of decision making as a *necessary condition*. In other words, the world of infinity that operates as a consequence of the obstacle of fallibility (ignorance) and the capacity to overcome it (through knowing), has created the need for man to delegate decisions, that urgently and in infinite numbers must be taken daily in life in a society.

We can express the necessary condition of the process of delegation in these words: the immediacy, periodicity, and the number of decisions that are made in society, determine that it is indispensable to delegate in the few the capacity of making decisions for the many. Given this reality, we realize that the *CHE* creates complicated situations for political, social, economic, intellectual, and academic leaders. ⁽¹⁴⁾

The curves of knowledge and ignorance, that compose the *CHE*, will have a lot to say about the specific curves of knowledge, ignorance, and progress that will arise when they are exclusively applied to the process of selection of the delegates or representatives, to generate and apply knowledge.

Another way of seeing the process of delegation as a necessary condition for the individual in society, is remembering the previous sentence:

...each individual that composes society is 99,99% ignorant of the stock of knowledge available for decision making in that community, knowing the 0.01% pertaining to their specialty.

Though the reader can have understood this from the preceding reasoning, in referring the analysis of the curves developed here to a specific issue of decision, we can also say that these curves cannot only be applied to any type of human society, be it a country, a province, a city, a company, a civil society, an educational society, a club, a political society, etc., but also to any specific subject of analysis.

Before we end this section on the conclusions or teachings that arise from the *CHE*, let us refresh the following:

- To generate more groups of few individuals that generate quality knowledge many individuals are required. But adding individuals without increasing the stock of correlative knowledge, implies a decrease in the average level of progress in society. Which is in line with the concept of qualifying first and then quantifying, or there will be "*more and worse*".
- A greater number of individuals in decision making implies a higher degree of ignorance.
- The increase in quality is a guarantee of progress, no matter the number of individuals.
- The increase of quantity without quality guarantees social decadence.
- The increase of quality and quantity is the best scenario for social progress.

- The CHE can be compared with the struggle against an epidemic, once the vaccine-solution is known, it is necessary to vaccinate.
- Knowledge is a synonym of energy that expands, disappears (black hole) and contracts, and expands again (implosion) in time.
- We can show the CHE as a function of time, not only of the number of individuals in society.
- The generation of knowledge implies a *growing* formation of minorities that express their differences, and their application implies *decreasing* expansion.
- Quality and quantity are in contradiction, a synthesis of the two extremes that human fallibility presents, the impossibility to know everything, and the capacity to know the finite.
- All theories (such as the theory of games) that imply non use of disposable knowledge (within which is information) are included in the curve of ignorance.

We can conclude the study of the CHE:

“Human evolution is the consequence of the knowledge generated by minorities —of which we can participate— with the ignorance of the majorities —of which we all are parte since there are infinite specific subjects of knowledge. Both to generate and to use knowledge, each one delegates or is delegated, in both cases by act or omission”.

Part IV

PUBLIC CHOICE ANALYSIS

“Homo politicus and homo economicus are the same”

Gordon Tullock

Critical Analysis

Though the theory of decision presented here refers to man in general —from where derive the curves of knowledge and ignorance, and their synthesis, the CHE— it is no less true that one of the central applications of the issues considered is that of public decisions, that is why we will apply our study to Public Choice Analysis.

Public Choice Analysis, in so far as it pretends to study politics based on the postulates of economics, allows us to make two reflections, of a critical nature, that we consider fundamental:

- 1) It presupposes that economics can contribute to politics, but we must alert that economics has theoretical aspects of great relevance still unsolved. We refer specifically to theoretical developments that arose as a consequence of the irruption of TET ⁽¹⁵⁾ and its new theory of interest that:
 - a) Shows it is erroneous to consider interest as the price of currency, be it money (Keynesian) or credit (quantitativist and Austrian).
 - b) Shows the unfortunate errors of Mises’ Pure Time-Preference Theory (PTPT) of interest, which incurs in a vicious circle: a theory of interest that cannot explain the origins of savings in general and capital in particular, and on the other hand pretends to use the formation of capital to demonstrate the existence of interest. A vice that will only be solved by TET at the beginning of twenty-first century: interest is the price of economic time, explaining in a simple manner its role in the formation of the stock of all economic goods (savings, wealth, capital, etc.).
 - c) Denounces the dichotomies that arise from Böhm-Bawerk and Wicksell and appear in all the theories developed later.
 - d) Presents the theorem of currency and its derived axioms of equality and equivalence, which show that all economic models based on considering prices and monetary interest as different variables are inconsistent.
 - e) Denounces that monetary-financial crises are not caused by capitalism but are inflicted upon it, according to the “asymmetries” of the adopted monetary-financial systems. ⁽¹⁶⁾

- 2) As we have seen in these pages there is a theory that is not exclusive of economics, since it precedes the disciplines of knowledge. The theory of decision we have presented, and its derived CHE, has been developed in the sphere of goods, with no need to refer to the economic terrain of *scarce* goods. This has been one of the purposes of this work, to study human decision in society, not needing to enter into the terrain of economics; i.e., decisions that relate to all spheres of life in society. Consideration that does not deny economics is merits, having developed more than other disciplines some of the concepts used (subjective value theory, marginal utility, diminishing returns...).
- 3) Still sustains concepts such as “the invisible hand” and the “spontaneous order” to explain the concomitance of individual and social human progress, instead of presenting it in the terrain of cause and effect, as does the theory presented here (naturally sociable human being, necessary condition imposed by human fallibility).
- 4) Theory of prices that, not having perceived the axioms of equivalence and equality in monetary interest and the price of currency, had not understood the impossibility of economic calculus in capitalism. Relevance that only Mises had shown, but only referred specifically to socialism, since he had not seen this situation also arose with currency-financial systems with twin asymmetries. ⁽¹⁷⁾ In other words, economics cannot criticize lobbies, since it is responsible for the *control of the price of currency*, which operates as a vote with the same weight, a situation that was only understood by TET at the beginning of the twenty-first century.
- 5) Economics did not realize that the best way minorities found to impose their will on majorities is through currency-financial systems based on the twin asymmetries. That is the best lobby, institutionalized and legally sanctioned, based on current economic theory, which is denounced by TET at the beginning of the twenty-first century.

The curve of human evolution and Public Choice Analysis

Given the huge relevance of the issues included in Public Choice Analysis, no less than decisions and/or election in politics, we will present a list of the fundamental aspects it studies, as they are included in the theory of human decision in society, and the *CHE*, we have presented.

To apply the *CHE* to the analysis of decisions it is important to observe that said curve derives from to data: the stock of knowledge that can be applied to decisions, and the use of that stock. I.e., progress has two determining factors and ways to solve it:

- 1) Conditions to generate knowledge. That is solved with freedom so that the enormous number of different minorities originates the greater possible amount of knowledge.
- 2) The conditions for using the knowledge. That is solved with freedom to use the disposable knowledge in the multiplicity of different uses that the immense majority of individuals decide considering each one is different.

This means that progress is the sum of the freedom of ideas to create knowledge, plus freedom of ideas to apply it, which for expository reason we will call *twin freedoms (I²)*. Expression that could represent Popper’s World 3, the world of ideas.

Wealth and progress: the curve of knowledge shows us that progress comes from knowledge and its use, not wealth. I.e., the *CHE* explains why North America progressed

from scarcity and South America dilapidated “Wealth”; Argentina grew until 1930 based on knowledge, that it later dilapidated led by ignorance; Japan and its progress based on natural sterility, with few individuals; etc.

The CHE implies that the equal distribution of wealth is anti natural, which makes any disposition that tends towards it inappropriate: redistribution of products, taxing profits, subsidies (goes against progress and promotes ignorance), etc.

The CHE explains the case of the *different civilizations that disappeared*, that can be explained because they were based on “received” (natural) wealth and not generated wealth (knowledge). Natural-received wealth that lost relevance relative to the growing weight of wealth generated by knowledge (Egypt, Greece, Rome, Spain, etc.). Wealth (good) does not exist in itself; it becomes wealth when human beings know what it applies to.

On the other hand, the CHE can explain that including the underdeveloped in globalization would imply a faster growth for these relative to developed countries, a situation explained by the CHE in the part explained in figure 8, from A11 to A22. Hong Kong is a typical case showing that progress should not be stopped, also showing that Paul Romer’s line of investigation of *charter cities* or *free cities* is adequate. The investigations conducted by Milton and Rose Friedman in “*The Tide in the Affairs of Men*” is another example of studies that corroborate the CHE, even though they have not been conceived with knowledge of its existence. Crises would be situations of extreme movements in the curve that would be clearly observed in the “web” graphic we have proposed, though generally a landscape orientation is to be expected.

Here we can reiterate the concept that all wealth becomes *non renewable* with the passage of time, not only natural wealth but also that derived from knowledge (the wagon, the Ford “T”, are two of the infinite daily samples that the current vertiginous rhythm presents us as non renewable resources). The fear induced by non renewable natural resources (oil) appears completely unfounded, apart from it not being exclusive of natural resources. *Non renewable knowledge* can be assimilated to “falsifiability” in Popper’s epistemology.

Quantity and quality in progress: the CHE does not tie progress to the number of individuals that compose a society, as is the case with quality that implies knowledge. In this manner we can understand the progress of the USA based on the *twin freedoms*, in a situation where the number of individuals is increased (states that united to form a nation of more individuals), and the progress of nations with less population (Switzerland, Sweden, etc.). On the other hand we observe the inverse cases, societies that did not progress because they did not apply the method of *twin freedoms*, no matter if they had big populations (China, India) or small populations (Haiti).

We can also mention the case of societies that improved or deteriorated according to their adhering to or abandoning the *twin freedoms*, no matter if their populations were big or small: Argentina with few inhabitants went from progress to decadence when it abandoned the *twin freedoms*; Chile, with few inhabitants is on the road to progress since it adopted the *twin freedoms*. On the other hand we observe the BRICS ⁽¹⁸⁾ that, with big populations, are on the path to progress applying the *twin freedoms*. And in the case of countries with few inhabitants: South Korea and North Korea; one has seen progress linked to the *twin freedoms* and the other has not, and both are Korean.

The cases of countries that incorporate the *twin freedoms* and that are showing “accelerated” growth, to the point of the inconsistency of saying their progress should be

regulated, controlled and/or reduced. ⁽¹⁹⁾ The explanation the *CHE* offers us is that they have allowed the use of the stock of knowledge already developed by other nations, i.e., they do not need to travel the same path generating knowledge that is already available, they simply acquire and use it. Knowledge that today is cheaper since it is generated based on production on a grand scale, i.e., the same knowledge is today much cheaper than when it was generated, in line with the principle that any business starts with high prices in a niche and ends up competing with costs in an expanded market. In other words, the greater level of growth in a backward country that applies knowledge that is available in the rest of the world — compared to the growth of countries that generate knowledge (a relative situation of decreasing yields in knowledge production)— “*is guaranteed*” from the moment the *twin freedoms* are applied. Once again, progress is the result of the *hunger* for progress, more than what the starting point might be.

But if what we want is a striking example, showing that quantity does not determine progress, we only need to look to the cases of China, with lots of poor people in an extended country, *versus* Hong Kong, with very few very rich people in a very small territory, and in both cases we are speaking of Chinese.

Institutions and progress: since institutions are the “compass” of the *CHE*, the creation of the “social contract” the community of individuals must respect depends on them. With this criterion we can understand the greater success of the societies that respect the law created based on the *twin freedoms*, relative to societies that forget them and instead decide based on majorities (or minorities). This aspect is central when analyzing *progress in democracy and/or totalitarianism*.

Ideologies and progress. We consider two concepts of *idea* ⁽²⁰⁾ among others that are possible: 1) *First and most obvious of the acts of understanding, which is limited to simply knowing a thing*, and 2) *Pure rational knowledge, due to the natural conditions of our understanding*. It is evident that what we have called knowledge here corresponds to the second meaning of the word *idea*.

On the other hand, *ideology* also has two meanings: 1) *The set of fundamental ideas that define the thinking of a person, a collective, an epoch*; and 2) *a philosophical doctrine, which had its main representative in A.L Destutt de Tracy, centered in the study of the origin of ideas*.

Thus we need to realize that the stock of available knowledge for decisions refers to the second concept of *idea*, and the curve of knowledge to the second concept of *ideology* (the best use of this term since it refers to the origin of ideas, of knowledge).

In this manner we can conclude that it is not pertinent to include ideologies in the stock of knowledge, in the sense of the first meaning (that is limited to the simple knowledge of a thing), since relative to the *CHE*, they belong to the world of ignorance. In other words, what is commonly called ideologies —that are not part of the knowledge available for making the best decision for progress in society— belong to the curve of ignorance.

In short, ideologies, in so far as they are sustained by “fan-clubs” of simple informal ideas, affect progress if they are seen as belonging to the world of knowledge when making decisions. Their real and concrete participation is not denied, but they must be seen in the right light, in this manner we can detect that a totalitarian leader is no more than a generator of “fans”.

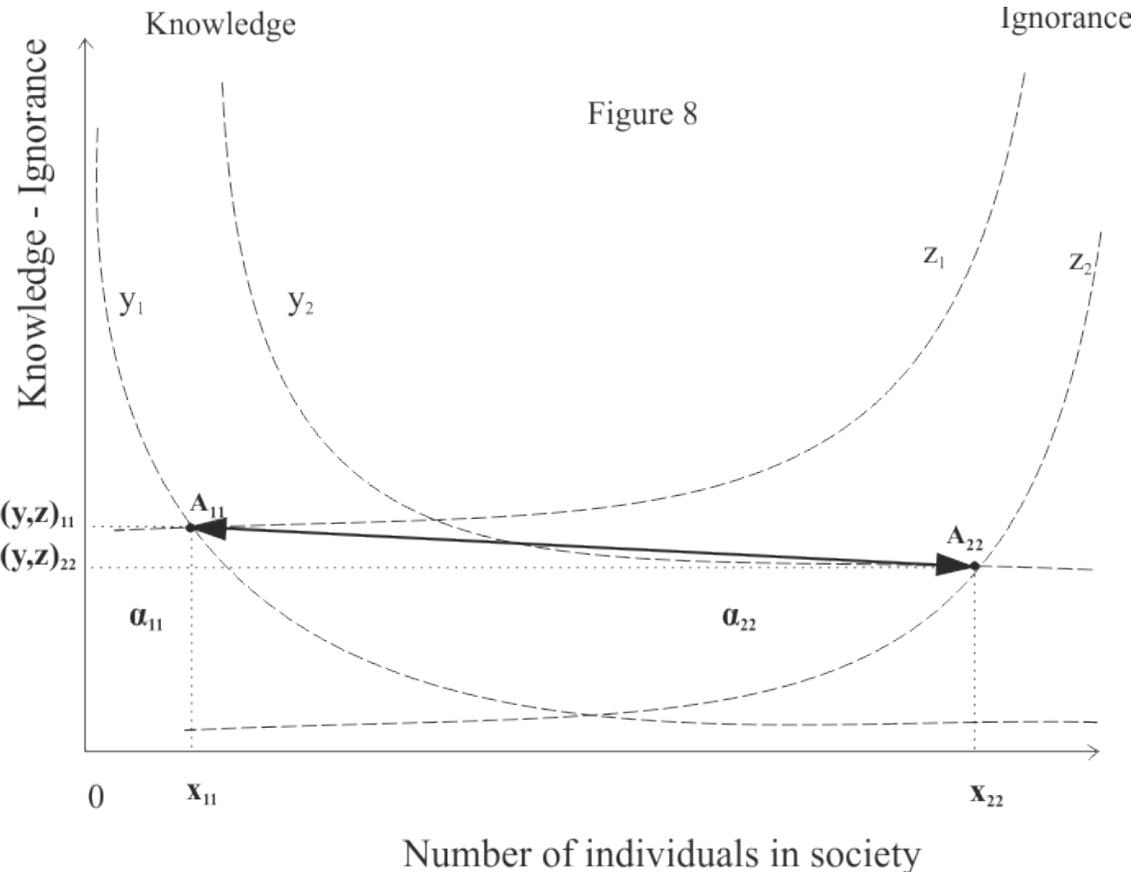
Representation and progress: any collective action implies the process of delegating in representatives, which —supposing there are appropriate institutions— implies that their capacities will have incidence in the results shown by the *CHE*. In other words, we can say that while the institutions are the “compass” that establishes the fundamentals for generating and using knowledge, the representatives are the “organization” for executing them.

This clearly shows that the capacity of the representatives is crucial, since the *CHE* is in their hands. An aspect that is also central when considering *progress in democracy and/or totalitarianism*.

The curves of knowledge, ignorance, and evolution derived from them are very eloquent when explaining the result we can expect according to the good or bad selection of societies of representatives or delegates for decision making. Let us analyze what figure 8 tells us if we look at it from the point of view of the representative chosen to decide for society.

Figure 8 shows us the following aspects referred to the *delegate-representative*:

“Increasing” responsibility of the representative (elected delegate): as the number of those represented grows, since he knows he represents a greater number of ignorant. He has two options, acting as a responsible leader of the destiny of his constituents looking to x_{22} , or taking advantage of their ignorance looking to x_{11} . In other words, it is similar to paternal responsibility.



“Decreasing” responsibility of the representative: as the available knowledge increases, since it implies a reduction of risk when deciding, since there would be more frequent similar decisions of which the proceedings are known and there are less decisions made in ignorance. Which puts us squarely in the terrain of capacity at the time of a displacement of the type $y_1 \rightarrow y_2$.

Capacity of the representative: it is central in decision making, as it leads society to the left or right, and displaces both the curve of knowledge and the curve of ignorance up or down. I.e. the CHE is placed in the hands of the representatives of society, therefore the process of selection of the most apt defined by Darwin is fully present.

Virtuous circle of progress: arises from generating knowledge as the number of individuals that generate knowledge grows and ignorance decreases. We can observe that it is important for the virtuous circle of knowledge to proceed in the sphere of the representatives on which the population delegates social decisions. This means the function of the representative makes the circle virtuous towards A_{22} or vicious towards A_{11} .

Progress in democracy and/or totalitarianism: there is a debate relative to the feasibility of a democratic society failing and a society with a totalitarian regime progressing.⁽²¹⁾ The CHE is categorical: the system of government is not essential for progress, but the presence (or not) of the *Twin freedoms* is. History shows us the case of progress with totalitarian political regimes (China today; Chile under Pinochet, etc.) and also failures (Argentina with de facto governments; China of the past, etc.). On the other hand, the presence of democratic systems that go in the opposite sense of the CHE is evident (again my dear country, Argentina, where it was said that “with democracy, you eat, you live, and you educate”, and at the same time generations were condemned to the deepest poverty). Argentina is a clear example of continued deterioration due to the abandonment of f^2 , with all forms of government, a situation that corroborates what we have expressed in *Capitalism and currency, Currency Theory, etc.*, here without reference to economics as we did in those opportunities, which validates the fundamentals on which we have based the two approaches, which have in common the same *world of ideas*, in the logical deductive chain from where they derived.

Comparisons between neighboring countries Chile and Argentina are very revealing: while Chile is on the path to progress, from a totalitarian regime to a democratic one, with the constant *reaffirming of the twin freedoms*, Argentina also goes from a totalitarian regime to a democratic one, but on a course of decadence instead of progress, because of the constant *denying of the twin freedoms*. My tribute to the beloved Chilean people for leaving behind (totalitarianism) and keeping (*twin freedoms*) what they should.

On the other hand we can think that democracy and the *twin freedoms* reinforce each other, since there is no democracy without *twin freedoms*. Whatever the conclusions may be, it is clear that the CHE indicates what fundamentals of the democratic model of social organization must be “revised”, those that basically “reinforce” the regime of minorities, without losing sight of course of the regime of majorities. A situation that the natural order points to, since forgetting this implies generating the conditions for backwardness.

The conclusions of the CHE referred to the link with democracy and/or totalitarianism do not incite us to forget democracy, on the contrary, they incite us to perfect it, considering Winston Churchill’s words: “---it is the worst form of government except for all others that

have been tried from time to time...” - which leads us to the following point: equal vote. That is why when thinking of a way to perfect the democratic system of government, the *CHE* suggests this line of thought:

- Backwardness of nations is a consequence of the preponderance of ignorant majorities over apt minorities. Which implies an enormous challenge to open the road to individual freedom that allows for the *twin freedoms*.
- It is not necessarily true that to progress the population must grow, on the contrary, populating in ignorance guarantees decadence.
- It is more appropriate to improve democracy based on the concept of the necessarily sociable man, than the benevolent man, a concept as inconsistent as pretending to demonstrate an infallible man.
- The road to progress requires focusing more on not limiting the individual than on limiting the state.

Equal vote and human evolution: the political structures based on this principal hamper the *CHE*, since this system implies contradicting human nature that determines that *each person is different*.

Though all types of social organization imply the selection of a group to decide in representation of the many that compose the society, in this opportunity we concentrate exclusively on the case in which the deciding group is elected through the system of majorities with equal vote. The importance we assign this case is understandable, since modern democracies are based on this criterion, although with other differences (obligatory or voluntary vote, different majority regimes and electoral systems, etc.)

The norm of equal voting rights for all individuals implies a vain attempt to deny the human faculty of qualifying, which comes before quantifying. This is so since it is based on the concept that valuing is only quantifying, an action that has no existence by itself, since it must be preceded by the necessary process of qualifying. In other words, the equal vote implies limiting the individual freedom of qualifying, i.e., of valuing.

From the theory of decision, the curves of knowledge and ignorance, and the *CHE* we have seen, arises this brief synthesis of the subject:

- Anything that goes against the reality of everyone being different, the basis for the Theory of Subjective Value (TSV), conspires against human nature.
- Human progress (individual in society) depends on the social application of quality and quantity of knowledge provided by specialized minorities
- In turn, the *CHE* implies the following:

CONSEQUENCES OF THE RULE OF EQUAL VOTE

- IT goes against the human essence of “all different”.
- Since a uniform value is established, this violates the theory of subjective value.
- It cancels the information arising from the differences among human beings.
- It is the most disquieting imperfection of democracy.
- I goes against the government of the people, by the people and for the people, since it silences the ideas derived from differences.
- It is inconsistent to defend simultaneously freedom of expression and equal vote.
- It is equivalent to managing the economy with price controls, with the backwardness this originates, since it lowers the standard.
- It is equivalent to the economy working with the same remuneration for all factors of production (goods, work and time).
- It is equivalent to the inconsistent use of “aggregates” in the economy (grouping different qualities).⁽²²⁾ Thus, the “aggregates” become the tools for populists
- The equal vote is a subsidy for ignorance.
- The duo formed by the *irregular currency-financial systems, deriving from the twin asymmetries*, and the *equal vote*, conform the most harmful institutions of democracy. A duo that must be seriously revised if democracy is to be perfected.

**LAWS must be established with the premise that we are all different, then we
will all be equal under the law.**

We can also add the following conclusions, easy to observe when applying the equal vote:

- As Bruno Leoni said, evolution is left to chance (the terrain preferred by ignorance), since representatives are not selected according to the curve of knowledge —capable minority— but according to the curve of ignorance —ignorant majority. I.e., the *CHE* ratifies Bruno Leoni’s acute and precise concept when he rejected the postures that made ignorance a benefit, operating at random. We have demonstrated that chance only benefits the *capitalist that controls the game*, the true face of the *totalitarian leaders* enshrined by equal voting rights in communities trapped in ignorance. It is the case of the *benevolent totalitarian chief* that ends up being the hated deposed tyrant. Yes, the level of ignorance of a society is shown by the number of beloved leaders that end up being repudiated. Again Argentina is a typical case: after 1930 all governments, elected or not, traveled the path from hopeful idolatry to condemnation because of their failure. It is very important to say we are not the first in stating that the idolatries are one of many manifestations of ignorance.
- Human beings, in their quest to express their differences, in the rule of equal voting rights will find a simple “anti-natural” obstacle to elude.

The compulsory vote: Given that a greater number of voters implies moving to the right on the curve of ignorance, if not an upward displacement, adding a compulsive component will worsen the situation of ignorance. I.e., the *CHE* will not allow us to make a favorable reading of the compulsory vote, whatever the level of the curve of knowledge.

Education and progress: Since progress is in direct relation to the generation and use of knowledge, it is evident that the center of human development is education. In this sense, the *CHE* is categorical: education for progress must be based on the explicit acceptance of two necessary natural conditions of man, which act as the bottom and top limits for progress: the *obstacle* represented by *infinite fallibility*, and the *capacity* to overcome obstacles existent in the natural *difference* among individuals in a society.

A statistical analysis of the specific subject of education will show that the *CHE* is in direct relation to the level of permission-repression of differences in education. In other words, societies educated in the sense of imposing an *anti-natural equality* will assist to the destruction of human nature, and, on the contrary, those that educate based on the need to respect *natural differences* will be on the path of progress of human nature in society.⁽²³⁾

We could end this section saying that education is the sphere in which the demand for aptitude is most appropriate. That is why it is where it is most visible, its absence even more than its presence.

Justice and progress: since it is a subject already included in the institutions that will (or will not) allow the presence of the *twin freedoms*, here we will only mention the link between Constitution and laws. Supposing a Constitution based on the *twin freedoms*, the function of justice is central, if it admits laws that infringe upon them. Again, Argentina: if you revise the laws that infringe on the constitutional principles based on the *twin freedoms*, we will see

a sorry state of Justice, though we cannot deny the responsibility of the Legislative branch where this state of matters originates. In other words, whoever reads the Argentine Constitution cannot understand Argentine decline, which implies it is not a country governed by the Constitution, but by the number of decisions (laws, decrees, regulations that act as laws, “notifications”,... etc.) produced by temporary circumstantial majorities, driven by the “anti-natural” desire of equality among men, which can only produce backwardness, and violence.

The majority regime and progress: *The process of delegation in the use of knowledge* we have mentioned before invalidates the arguments that pretend to justify any majority regime, with or without the system of equal voting rights.

Let us analyze the main arguments presented to justify the different majority regimes, and how the necessary *process of delegation* in society makes them inconsistent:

- 1) *Urgency*: the argument used to justify majorities (generally a simple majority) because of the impossibility of “waiting” until unanimity is attained. Given that the urgency can appear with the presence of simple or qualified majorities, the argument can be extended to all kinds of decisions in society. Whatever the majority regime, the act of voting leads to delegating, and this eliminates urgency as an argument.
- 2) *Unanimity or majorities (simple or qualified)*: again, the necessary process of delegation voids any majority regime, since the decisions the elected representative will make at the time they are made will surely be based on majorities that are different from those that voted him, because the number of approvals and/or rejections has varied or the composition has changed, i.e., there will be those that voted for him that do not agree with the decision and vice versa.

The indivisibility of the good –“the package”- and progress: it is said that a vote chooses a “package” and does not allow divisibility as in the economic sphere of the market. In the great majority of cases the process of delegation implies the existence of a “package” of decisions that must be made during a future period. I.e., in a society (company) representatives are elected (directors) for a certain period of time seeking an objective; during that period of time no voter (shareholder) takes part in the decisions.

In short, it is pertinent to do a comparative analysis of the political and economic fields within similar frameworks. In the case we are seeing it is the framework of the “package” of decisions that are left to the representative for a period of time. In other words, it is not prudent to confuse the process of selecting a good in the market with the process of delegation, no matter what the field (economy, politics, etc.).

The error is in believing that in the economy man does not delegate decisions, but does so in politics. Therefore, any temporal delegation in a society implies a “package of decisions” towards a goal, which is coping with the state of fallibility.

Information and progress: since information is included in knowledge, the theory of decision and the CHE clearly establish that information does not escape the necessary conditions imposed by fallible human nature (limit) and its —also natural— capacities (knowing). So we can categorically state that it is wrong to pose the existence of complete

information (knowledge) for decision making, since that would imply infallibility and the inexistence of the need to finite when maximizing, conditions that do not exist in nature.

Incentive and progress: since it depends on individual subjective valuations, there will be different incentives according to the individuals, issues and circumstances, a situation that arises both in economics and politics. The *necessary* process of delegation in society makes me delegate an incentive on an important issue of my life on leaders, businessmen or politicians. This does not imply saying everything is similar, but that man uses his same nature to know and apply the knowledge to all the issues his fallible nature presents.

The “invisible hand” and progress: the theory of decision and the CHE we have seen clearly reveal the causes of human evolution, since explaining it is no longer a mystery. In other words, human evolution arises as a natural consequence of human fallibility and humanity’s capacity to overcome it with the *finite* knowledge it generates and uses.

There is no invisible hand, since now we can explain the cause-effect relation between the individual and the society in which he acts. A relation that goes in both directions and which is born as a necessary condition imposed by the two motors that drive growth: the need to overcome infinite human fallibility with the human capacity of doing so knowing the finite. A state of matters that the *theory of decision* and its derivate, the *CHE* capture with a high level of explanation, as we have been able to appreciate.

On the other hand we again see that a postulate derived from economics, such as Adam Smith’s *invisible hand* comes before economics. But the theory of decision and the CHE do not leave the simultaneity of progress of the individual and society in the darkness of invisibility, they appear as necessary conditions. In other words, the *CHE* places us in the scientific world of cause and effect, and avoids having to resort to the “invisible” to explain the simultaneous progress of the individual and his equals at the same time.

Spontaneous order and progress: Hayek has postulated (in truth, Menger had already done so, and there are more precedents) that humans solve the problems of fallibility spontaneously. The theory of decision and the CHE can be considered a clear proof of said postulate, since spontaneous order is necessary for evolution. Spontaneous order is a way to refer to evolution without a theory sustaining it. But now we can start to speak of “...consequence of the CHE”.

On the other hand, we again see that a postulate derived from economics, such as the *spontaneous order of the Austrian School (Menger –Hayek)*, comes before economics itself, and can be explained with a necessary cause-effect relation, not as a “capricious” spontaneity.

Economists and the curve of human evolution

I am not the first theoretician of economics interested in political problems, which is not so strange since we have chosen as our work the study of social issues. Which I consider much more difficult than other disciplines of knowledge, but this is only a personal opinion. Whatever the situation, evidently we are driven by the desire to reach a society of better subjects, since we cannot think of a better society, such an entity does not exist, what exists is a set of (better or worse) human beings.

We believe it is convenient to summarize the ideas of economic thinkers that have had greater impact on us, with their approach to political ideas or, more precisely, try to propose or suggest ideas derived from economics to politics, and among these we wish to underscore those from the Austrian School, that in our view have greater scientific basis, not limiting themselves to simple good intentions derived from ideologies with no scientific basis.

It will possibly sound strange to the advanced reader of our economic theories (Theory of Economic Time; Interest Theory; Currency Theory; etc.) that we refer with eulogistic spirit to the thinkers of the Austrian School of Economics, since we have considered that only the teachings of Carl Menger to have a true scientific basis, along with a few contributions from his disciples (Impossibility of calculus in socialism —with a theoretical objection by TET—, and others). In this work we have considered dispensable the concept of *spontaneous order* that is presented as a fundamental pillar by Hayek, and replaced it with the scientific development of the CHE. It is very positive that they have “sensed” with sharp understanding the situation, to the point that we can deduce that the *CHE*, and other theoretical developments we have presented (TET, etc.) derived as a continuation or corroboration of concerns of the Austrian School, which would place our theories in the framework of this school of thought. Whatever the impression may be, the truth is that “other theories” did not have that sharp Austrian-Popperian intuition.

Continuing with what we have expressed, it is our duty and the moment to stress the “vision” that oriented Hayek, who was not that far from discovering the CHE, and his genius and intellectual honesty led him to express that there is no satisfactory theory of currency (we believe he would have agreed with what we have proposed, since it answers all the doubts he accurately posed).

To the effect of ratifying what we have expressed in the previous paragraph, we will now reproduce some of the paragraphs written by Michael Wohlgemuth in this sense. This exempts us from writing anything else on the matter, considering it would be difficult to do it better than him. Let us see the following paragraphs (separated by dotted lines):

In a similar manner, Hayek (1960) says:

“Democracy is, above all, a process of forming opinion. Its chief advantage lies not in its method of selecting those who govern but in the fact that, because a great part of the population takes an active part in the formation of opinion, a correspondingly wide range of persons is available from which to select... It is in its dynamic, rather than in its static, aspects that the value of democracy proves itself... The ideal of democracy rests on the belief that the view which will direct government emerges from an independent and spontaneous process. It requires, therefore, the existence of a large sphere independent of majority control in which the opinions of the individuals are formed.” (The Constitution of Liberty, pp.107-108)

.....

This argument is summarized by Hayek (1978) as follows:

The central belief from which all liberal postulates may be said to spring is that more successful solutions of the problems of society are to be expected if we do not rely on the application of anyone's given knowledge, but encourage the interpersonal process of exchange of opinion from which better knowledge can be expected to emerge... Freedom for individual opinion was demanded precisely because every individual was regarded as fallible, and the discovery of the best knowledge was expected only from the continuous testing of all beliefs with free discussion secured. (New studies in Philosophy, 1978, pag 148)

.....

The growth of civilization depends on the freedom of minorities to act, a task that is not small:

“The idea that the efforts of all should be directed by the majority opinion or that society is better if it conforms to the standards of the majority is, in truth, a reversion of the principal by which civilization has grown. It general adoption would mean probably stagnation, if not decadence, of civilization. Progress consists of the few convincing the many. New visions must appear somewhere before they can become main stream... it is always starting with a minority that acts differently from the majority that the majority ends up learning to do something better” (Hayek, The Constitution of Liberty - 1960)

.....

... at least allow us to reach the following minimum requisites for a political process of creation of knowledge:

“(1) allow the general availability of knowledge of the existence of alternative approaches on a subject; (2) make representative alternative perspective easily available for those who wish to research more; and (3) provide a means by which those that have alternative visions can continue to reach others that are interested” (di Zerega, Democracy as a spontaneous order – 1989b:219)

These conditions and not the logical requirements to build perfect functions based on majority preferences, should be the main preoccupation of an Austrian evaluation of democracy as a process of discovery. Communication of political knowledge up to know has received small attention in the modern economy of politics. But there are contributions by other social sciences that can be used as a starting point or even as elements of an Austrian evaluation of the political process. These are theories on the creation and influence of what is commonly denominated “public opinion”.

.....

And, again, as Boulding stated (The Image, Knowledge in Life and Society) in clear contrast with Arrow's vision:

“The nature of the political process... is not the sum of fixed individual preferences but the process of mutual modification of images both related and evaluative in the course of mutual communication, discussion and debate. The course of the debate is punctuated by decisions that are essential temporary in nature in the sense that they do not close the debate, though, of course, they have the effect of modifying it”.

.....

1. qualitative components of public opinion

Public opinion is not a mere aggregate of opinions individually sustained (Hueckfeldt/Sprague, 1995:188, Citizens, Politics, and Social Communication - information and influence in an election campaign). As Lowell pointed out (1913: chapter I) in his classical treatise, the impact of individual opinions (again: tastes and theories) on public opinion depends on qualitative more than quantitative criteria. While to obtain an electoral result votes are counted but not “weighed”, contributions to public opinion also depend on the intensity with which experiences are felt; the vehemence with which they are expressed and the persuasion with which the theoretical part of opinions is presented. Thus, a decided minority opinion can overcome a majority that is less interested, less active or less affected in the process of formation and articulation of public opinion. (Highlight is ours).

Evidently Wohlgemuth’s expression of his desire that the Austrian School of thought contribute in the political terrain, can quite possibly find its highest expression in the CHE presented here. In other words, we can find a complete correlation between the principals and arguments expressed in this summary by Wohlgemuth and those that underlie the curves of knowledge and ignorance and come together in the CHE. I.e. we cannot consider the convergence of Wohlgemuth fundamentals, the theories presented here, and the epistemology of Karl Popper a mere coincidence.

According to the CHE, Public Choice must recognize the neoclassic precedent of maximizing man in action, and the Austrian components of spontaneous order, the relevance of information (since it is knowledge) for decision making, and other aspects that Wohlgemuth emphasizes.

Could it be that Gabriel Zanotti was right when he referred to me in a Congress saying: *Carlos Bondone is to Carl Menger as Galileo was to Copernicus.* Idea that we can apply here saying: *The CHE would be the scientific corroboration of the “invisible hand”, the “spontaneous order”, and Popper’s epistemology (to which it adds the “world four”, the world β , the sphere of the “unknown”).*

Summary of the critical analysis of Public Choice Analysis

Finally we present here a summary that allows us to apply the *theory of decision* presented in these pages to Public Choice Analysis, with the scope and precision offered by the curves of knowledge and ignorance, and the CHE derived from them.

Thus, the theory of human decision in society we have presented:

- Precedes the disciplinary classification of the sphere of decision making (economics, politics, art, etc.).
- Includes all spheres of knowledge related with fallible man, both referred to scarce goods, i.e. economic goods, and those goods that are not scarce.

To develop the theory of decision and the CHE we have not needed to refer in the least to any discipline of knowledge (physics, chemistry, economics, social sciences, neuroscience,⁽²⁴⁾ etc.). We have used knowledge that each of those disciplines has developed in more depth: *decreasing yields, marginal utility; spontaneous order, invisible hand; etc.*, very important in physics, chemistry and economics (we can say spontaneous order and invisible hand are equivalent to probabilities in physics and chemistry).

Arrived at this point, we ask ourselves:

- Is it pertinent to consider actions (decisions) on goods that are not scarce?, non-scarcity implies infallibility? Does non-infallibility imply non-action?
- Is politics related to things that are not related to the economy?
- Is there a sphere of the political, artistic, scientific, ethical or moral that is not at the same time of the economic sphere and vice versa, is there an economical sphere that has nothing to do with the political, ethical, moral...?
- Or is there only the human sphere that copes with a set of fallibilities?
- Since natural differences among humans are the essence and reason for the existence of competition, and that human beings accept it in the world of show business (music, movies, sports, theatre, etc.) and not so in the economic and political sphere: should not the process of the selection of the fittest used in show business be the model we should copy in democracy? Could democracy possibly still be amateurish?

Whatever the answers, it is pertinent to express them at the beginning of the Public Choice Analysis, since we can find similar theories to those developed here, with an attempt to apply them in politics coming from economics, when in truth they correspond to the sphere of universal knowledge, relative to the different disciplines of knowledge.

To corroborate what we have said, suffice it to say that without the use of economics:

“The curve of human evolution clearly explains the reason for each crisis ^(*), (inevitably) leaves more with less and the few with more”.

(*) Currency-financial, “necessarily recurring” derived from the *twin asymmetries* we denounce in our *Currency Theory*. Asymmetries that constitute the “*lack of twin freedoms*” in the sphere of currency and finance.

Finally, we reiterate what was said in the abstract:

After the “Curve of human Evolution”, it is very possible that terms such as “freedom”, “elites”, “social justice”, “democracy”, so sensitive to human nature, will be treated in a knowledgeable-scientific context, and not as a marketing tool with the simple and spurious object of obtaining popular approval.

Buenos Aires, May 2012.

Carlos A. Bondone

Notes

- (1) Diccionario enciclopédico Espasa 1 a_z, Quinta Edición – Espasa Calpe – Madrid.
- (2) See bibliography.
- (3) The analysis of the subjective value theory can be seen in several text books, but what interest us here is that with it the so called marginal utility law that goods offer man is developed, as opposed to total utility. We can say this concept was developed by Hermann Heinrich Gossen, with which he gave origin to the three laws that bear his name (which are extracted from F. A. Hayek’s book “The Trend of economic thinking”).
- (4) Diccionario enciclopédico Espasa 1 a_z, Quinta Edición – Espasa Calpe – Madrid.
- (5) An expression that shows a 180 degree turn relative to the meaning and ideology of its author, Karl Marx, since in him this would be preceded by “Since we are equal”.
- (6) Diccionario enciclopédico Espasa 1 a_z, Quinta Edición – Espasa Calpe – Madrid.
- (7) *Homo sapiens*, that can be translated literally as “wise man”, here we refer to the “wise animal”, since *homos* (*homeo*) means equal, same, as a reference to the animal species, and *sapiens* refers to what distinguishes them from the rest of their species, being “wise, i.e., greater capacity for knowledge.
- (8) Finiting is in line with the “urban legend”, the Vigin Mary beat the devil in the sowing competition, since she used small strands of thread that she replaced very fast, while the demon tried to avoid having to thread the needle once and again, using a huge strand, which produced a tangle that immobilized him.
- (9) Introductory quote to chapter 1 of the Theory of Economic Relativity.
- (10) The knowledge we are referring to comprises the world of ideas of Karl Popper’s metaphysics.
- (11) This coefficient can be used, or not, according to the data that will be introduced at the time of the statistical study of the curves.
- (12) Thus, α would be the Popperian world 3.
- (13) Here we see knowledge as a consequence of metaphysics, i.e., our curve of knowledge would be the representation of Karl Popper’s metaphysics, as a *Schism of Physics* that allows “something to arise from nothing”.
- (14) On the responsibility of scientists and academics, I recommend reading Gabriel Zanotti at: <http://puntodevistaeconomico.wordpress.com/2012/04/29/la-vida-academica-y-los-borg/>
- (15) Cited in bibliography and those shown at: www.carlosbondeone.com
- (16) See *Currency theory*, cited in bibliography
- (17) See *Currency theory*, cited in bibliography
- (18) Acronym implying Brazil, Russia, India, and China.
- (19) We do not consider here the crises generated by the bad use and abuse of credit, derived from irregular systems based on the twin asymmetries. The subject is explained in *Currency Theory*.
- (20) Diccionario enciclopédico Espasa 1 a_z, Quinta Edición – Espasa Calpe – Madrid.
- (21) We must not forget that there are “freely elected” totalitarian regimes that use democracy as a smokescreen.
- (22) That, as in the case of currency, was only understood by TET at the beginning of the twenty first century.

⁽²³⁾ I must refer to a sad use and habit in public universities in Argentina, at least in the case I saw. When receiving their diplomas university graduating students were “allowed to choose” a text to be sworn in (instead of leaving it to their criterion), but the worst came later. They had the “freedom” to be sworn in with another text that the majority accepted, that implied simply renouncing the use of their profession to “earn money”, since they had been educated for free by the State. I.e., slavery has been officially accepted, we have replaced the “cotton lord” with the State, since we have found in the subsidy of “education” (if the light of the *curve of human evolution* can be considered so) the modern version of the “just price of slavery”.

⁽²⁴⁾ Neuroscience: has corroborated the stimulus on emotional regions originated when we cooperate. Considered a type of intuitive and automatic guide that the curve of human evolution derives as a necessary condition.

Bibliography:

Aguiar Fernando - Teoría de la decisión e incertidumbre: modelos normativos y descriptivos- IESA/CSIC - EMPIRIA. Revista de Metodología de Ciencias Sociales. N." 8, 2004, pp. 139-160

Bondone Carlos A. – Teoría de la Relatividad Económica – Solución a las Crisis Monetarias – Crítica a las teorías económicas actuales: austriacos, keynesianos y cuantitativistas – An English version can be found <http://www.carlosbondone.com/>

Bondone Carlos A. – Capitalismo y Moneda – Ediciones Osmar E. Buyatti (2009) - ([http://www.carlosbondone.com/pdf/Capitalismo_y_Moneda_\(Carlos_Bondone\).pdf](http://www.carlosbondone.com/pdf/Capitalismo_y_Moneda_(Carlos_Bondone).pdf))

Bondone Carlos A. – Teoría del interés – Agosto 2011 - <http://www.carlosbondone.com/teoria-del-tiempo-economico/aplicacion/teoria-del-interes.html>

Bondone Carlos A. – Currency Theory (Crises of currency – financial theories) – Febrero 2012 - <http://www.carlosbondone.com/teoria-del-tiempo-economico/aplicacion/teoria-de-la-moneda.html>

Buchanan James - Democracia limitada o ilimitada (CEP – Centro de Estudios Públicos - Chile).

Frey Bruno S. - La relación entre la eficiencia y la organización política - Revista Libertas 23 (Octubre 1995) Instituto Universitario ESEADE www.eseade.edu.ar

Gordon Tullock, Arthur Seldon and Gordon L. Brady – Government Failure (A primer in public Choice) – Cato Institute Washington, D.C.

Jasay A. de - La antinomia del contractualismo Revista Libertas 23 (Octubre 1995) Instituto Universitario ESEADE www.eseade.edu.ar*

Leoni Bruno - El proceso electoral y el proceso de mercado - Revista Libertas 27 (Octubre 1997) Instituto Universitario ESEADE www.eseade.edu.ar - * Publicado originalmente en *Il Político*, vol. XXV, N° 4 (1960). Reproducido como apéndice en *Freedom and the Law*, Liberty Fund Inc., Indianapolis 1991. Translation and edition in *Libertas* authorized.*

Friedman Milton and Friedman Rose D.: La corriente en los asuntos de los hombres - Revista Libertas VI: 11 (Octubre 1989) Instituto Universitario ESEADE www.eseade.edu.ar - *Thinking about America*. Published with authorization from the author and the Hoover Institution (Stanford University).*

Feyerabend, Paul K., Ambigüedad y Armonía, translation by Antoni Beltrán y José Romo, Ediciones Paidós Ibérica, Barcelona, Spain, 1999.

Feyerabend, Paul, Adiós a la Razón, translation by José R. de Rivera, Editorial Tecnos, Third edition, Madrid, Spain, 1992.

Feyerabend, Paul, Diálogos sobre el Conocimiento, translation by Jerónima García Bonafé, Ediciones Cátedra, Madrid, Spain, 1991.

Feyerabend, Paul, La Conquista de la Abundancia, La abstracción frente a la riqueza del ser, traducido por Radamés Molina y César Mora, Ediciones Paidós Ibérica, Barcelona, Spain, 2001.

Krause Martín - Economía, instituciones y políticas públicas – Buenos Aires - Editorial La Ley.

Kuhn, Thomas S., La Estructura de las Revoluciones Científicas, translation by Agustín Contín, Editorial Fondo de Cultura Económica, 6ª reimpresión, Buenos Aires, Argentina, 1999.

Popper, Karl R., Búsqueda sin Término, Una autobiografía Intelectual, translation by Carmen García Trevijano, Editorial Tecnos, 3ª edición, Madrid, Spain, 1994.

Popper, Karl R., El Cuerpo y La Mente, translation by Olga Domínguez Scheidreiter, Ediciones Paidós Ibérica, Barcelona, Spain, 1997.

Popper, Karl R., El Mito del Marco Común, En defensa de la Ciencia y la Racionalidad, translation by Marco Aurelio Galmarini, Ediciones Paidós Ibérica, 1ª edición, Barcelona, Spain, 1997.

Popper, Karl R., El Universo Abierto, Un Argumento en Favor del Indeterminismo, vol. II, translation by Marta Sansigre Vidal, Editorial Tecnos, 3ª edición, Madrid, Spain, 1996.

Popper, Karl R., La Lección de Este Siglo, con dos charlas sobre la Libertad y el Estado Democrático, translation by Emilia Ghelfi, Temas Grupos Editorial, 1ª edición, Buenos Aires, Argentina, 1997.

Popper, Karl R., La Lógica de la Investigación Científica, translation by Víctor Sánchez de Zavala, Editorial Tecnos, 11ª new edition, Madrid, Spain, 1999.

Popper, Karl R., La Miseria del Historicismo, translation by Pedro Schwartz, Alianza Editorial, 1ª edición en Alianza Bolsillo, Argentina, 1992.

Popper, Karl R., La Responsabilidad de Vivir, Escritos sobre Política, Historia y Conocimiento, translation by Concha Roldán, Ediciones Paidós Ibérica, 1ª edición, Barcelona, Spain, 1995.

Popper, Karl R., Los Dos Problemas Fundamentales de la Epistemología, Basado en Manuscritos de los años 1930-1933, translation by M. Asunción Albisu Aparicio, Editorial Tecnos, Madrid, Spain, 1998.

Popper, Karl R., Realismo y el Objetivo de la Ciencia, Post Scriptum of La Lógica de la Investigación Científica, vol. I, translation by Marta Sansigre Vidal, Editorial Tecnos, 2ª edición, Madrid, Spain, 1998.

Popper, Karl R., Teoría Cuántica y el Cisma en Física, vol. III, translation by Marta Sansigre Vidal, Editorial Tecnos, 3ª edición, Madrid, Spain, 1996.

Popper, Karl R., Un Mundo de Propensiones, translation by José Miguel Esteban Cloquell, Editorial Tecnos, 2ª edición, Madrid, Spain, 1996.

Popper, Karl R., Conjeturas y Refutaciones, El Desarrollo del Conocimiento Científico, translation by Néstor Míguez, Editorial Paidós Básico, 4ª reimpresión, Barcelona, Spain, 1994.

Scott John – El análisis económico de la política: métodos y límites.

*Sowell Thomas*** - *Ensayo - Transacciones políticas** - *This work corresponds to chapter 5 of the book *Knowledge and Decisions*, published by the author in 1980. The translation used is based on the edition by Basic Books, Inc. Publishers (Nueva York) en 1980 and has been duly authorized. ** Professor and researcher of the Hoover Institution, Stanford University, and author of several works, including *Classical Economics Reconsidered* (1974), *Markets and Minorities* (1981) y *Ethnic America* (1981).

Tullock Gordon - *El desarrollo del gobierno** - Revista Libertas 27 (Octubre 1997) Instituto Universitario ESEADE www.eseade.edu.ar - * Work originally published in *Taiwan Journal of Political Economy* 9, vol. 1 (1995). Translation and edition authorised by the Author

Tullock Gordon - CONFERENCIA - Votación y Sistemas Electorales – Stenographic version of the conference in the Centro de Estudios Públicos, December 18 1980. Distinguished Professor, Virginia Polytechnic Institute, USA.

Wohlgemuth Michael: Democracy as a process of Discovery: Towards an Austrian Economy of the political process”. Revista Libertas 34 (Mayo 2001) ESEADE. www.eseade.edu.ar. Discussion Paper 17-99, Max-Planck-Institut zur Erforschung von Wirtschaftssystemen, Jena.