



**St Edmund's  
College**

**“Shackle: Time and Uncertainty in Economics”**

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**Author: Andres F Cantillo**

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**University of Cambridge**

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***“I like models that try to understand the forces that drive the economy. What I don’t agree is with models that take into account those forces, but forget the main one which is the fundamental uncertainty.”***

**Professor Geoffrey Harcourt  
The Stone Room  
University of Cambridge  
Michaelmas term 2009**

## ***INTRODUCTION***

The aim of the present paper is to use George Shackle’s Bounded Uncertainty in order to explain the role of the economic scientist in the economic phenomenon. First, I will show why deterministic approaches are not sustainable in a context where novelty and surprise are fundamental according to Shackle. This would be the case of Economics. Then, I will state that an evolutionary approach is a useful language to build a criterion that allows the economic scientist to explain the present consideration of economic entities as stereotypes. By being coherent with innovation and surprise, this language is also useful in an individual and social context to create the future and to be innovative itself. I will suggest how the consequences from Shackle’s solutions to the problem of uncertainty (his notion of potential surprise) can be related to the conceptualization of money. It is not possible to theorize about objective knowledge in economics because there is no such objectivity, but it is feasible to theorize about subjective belief. The role of theory as a belief itself is consistent with this perspective. Its “use” instead of its “veracity” prevails as a criterion of choice amongst theories. It is possible to theorize about subjective bounded uncertainty and the demand for money. I will sketch a viable use of Shackle’s language of potential surprise and the Keynesian concept of Animal Spirits in order to formulate a monetary-fiscal policy based on the role played by emotions in the presence of uncertainty. It will also be proposed an alternative criterion to optimization as the tool for setting scalar variables under uncertainty. The main conclusion of the present article is that Shackle’s notion of uncertainty and his establishment of a new language based on it, are a useful tool for the society in the formulation of fiscal and monetary policies coherent with the permanent social creative process.

## **1. The Origin of Shackle's Discussion about Uncertainty and the role of the Analyst:**

Shackle's questions about uncertainty, time and decision can be traced back to his doctoral thesis (Shackle, 1968). In it, the author offers an interpretation of Keynes' General Theory based on Myrdal's notions of ex-ante and ex-post<sup>1</sup>. He also formulates an explanation of the economic cycle using the multiplier-accelerator mechanism in which the occurrence of unexpected gains and losses is fundamental for it to operate. In both Myrdal's notions and in the multiplier accelerator mechanisms, the fallibility of expectations is crucial. In the case of Myrdal's notions, that fallibility is expressed in the difference between the expected investment at the beginning of the period and its actual amount at the end of the period due to the development of the market process over a lapse of time. In the case of the multiplier accelerator mechanism this fallibility is necessary to explain why entrepreneurs may keep investing when facing increases in actual savings as the aggregate product grows. The entrepreneurs must increase investment if the aggregate product is to keep growing in spite of the consequent increase in the marginal propensity to save, which decreases the demand for consumption goods. The additional demand required in order to sustain the increase in the aggregate product must be filled with additional demand for production goods. And the additional investment will only occur in the presence of unexpected profits that would lead to a change in the existing plans for investment<sup>2</sup>. This change of plans only occurs if there is something new in the information set of the individual; if the individual is surprised.

Shackle (Shackle, 1968) makes explicit the problem that was going to occupy his attention for the most part of his academic life:

*"The General Theory has nothing, virtually, to say about how expectations are formed." (Shackle, 1968, p. xxiv)*

Hence, Shackle's concern about the process of decision making in Economics is related to the unsolvable lack of knowledge with which expectations are made. This lack of knowledge takes the form of time if looked at by the eyes of the analyst. It is the way to

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<sup>1</sup> Shackle understands ex-ante and ex-post in the following way: "When we speak, for instance, of an individual's consumption ex ante we shall mean the outlay per unit time which he expects to spend on consumption in a short interval separating two fixed dates, at the earlier of which the present moment has just arrived. When the present moment has arrived at the latter of the two dates, so that consumption-outlay of this interval can be spoken as something realized, it will be called his consumption ex post." (Shackle G. , Expectations Investment and Income, 1968)p.9

<sup>2</sup> Here is also an explanation for Shackle's focus on surprise as the key factor that explains the crucial choice. Surprise is the incentive for a change of plans. It can only occur in a world where the list of possible outcomes of a situation is not complete. Therefore crucial decision requires surprise, and surprise is the feeling that accompanies novelty, because novelty by definition is unexpected. It might be possible that human imagination comes from the developed capacity of adaptation to new situations; likewise human attitudes toward risky situations.

explain irreversibility in Economics. The past lies in the individual's memory; the future is to be imagined and built by the unending accumulation of "present moments". Decision can only occur in a certain "present moment". And the present solitary moment is the time of the experience in which the unknown future becomes known by transforming in the "present moment". This is the only way to know the future; paradoxically, when it is not future any more.

But why is this lack of knowledge unsolvable? The nature of the economic phenomena provided by the use of money allows the simultaneous decisions to affect each other, and imagination to play a role by means of speculation. Shackle asserts that if it were possible for the agents (consumers, firms, economist, government) to predict their demands and supplies, it would not be necessary to hoard money. Hence Shackle makes his battle horse the inherently unpredictable character of the monetary economy<sup>3</sup>. His main argument is that a monetary economy is driven by expectations, that expectations, although bounded by what is considered as possible (Non empty decision), cannot be predicted.

Prediction in economics is a consequence of the assumption of the usefulness of determinism. If the economic phenomenon is deterministic, it is also predictable. The influence of economic knowledge in individual decisions generates the well known link between rationality, determinism and prediction (i.e. rational expectations). Shackle's view can be considered the inverse of rational expectations. Determinism leads inevitably to rationality. For this reason Shackle's main argument is opposed to the notion of determinism.

In his *Epistemics and Economics* (Shackle, 1976) mentions that determinism came to economics by assimilating economics to physics in the formulation of closed, complete and self-competent models. Determinism is not inherent to the economic phenomena but to a particular philosophical conception. He finds the main point of difference between economics and physics. Economics is about thoughts (Expectations) and not about closed models of the reality. Those thoughts are bounded by stereotypes. Economics might be similar to physics if the future could be predicted, if knowledge could be objective or in other words deterministic. If the decision makers can use the knowledge acquired, scientist's knowledge and agent's expectations about some economic variable (i.e. the determination of a price) must necessarily converge, as they do for example in rational expectations models. If, on the other hand, determinism is not achievable in economics, subjectivity, permanent change, uncertainty, institutions, psychology and other colors of the spectrum of human behavior in its economic affairs need to be at the center of the explanation. Thoughts are subjective and can diverge;

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<sup>3</sup> According to Keynes "A monetary economy, we shall find, is essentially one in which changing views about the future are capable of influencing the quantity of employment and not merely its direction" (Keynes, 1937)

rational expectations and determinism can only be right or wrong, hence, there is only space for reason. Therefore the philosophical discussion about determinism is of capital importance in Shackle's understanding of expectations. A discussion about the matter is proposed below. In it I invite the reader to question the determinist approach. The best way to understand an ever-changing reality in which the theory is part of the change is by interacting with it, by taking the initiative when considered appropriate; by harmonizing theory with the phenomena; in a few words, by changing also; in Veblen's terms, by being evolutionary (Veblen, 1898).

## ***2. Determinism and Fundamental Uncertainty:***

According to Haggreaves-Heap and Hollis (1987) determinism is the philosophical notion according to which every event has a cause and, hence, there is a single course for history. According to the authors, this definition was rejected by Hume<sup>4</sup> using the argument that there is no such a preposition of necessary implication that links the event and its cause. Kant (2008) considered that the notion of causality was part of the mental structure with which the human being perceives the phenomena. In this way they appear to us as coherent. In both cases (Kantian and Humean) it is acknowledged that is impossible to prove logically the existence of causality. Hence, causality is more the result of a physiological characteristic at the individual level, and of consensus at the collective level. This implies that unless that logical preposition of causality can be found, its character in economics is one of consensus, so it is economic theory. Not surprisingly Hume is considered the father of institutions. They are the way in which causality is collectively agreed and built.

Shackle's main question about determinism is related to the ontological status of the future in the present Shackle (1976). This ontological status is questioned by using two arguments: First, the possibility of occurrence of novelty, and the complex interdependence of different decision makers which makes the outcome of an individual's decision dependant on the simultaneous decisions of the collectivity. Shackle's question is: what is the source of the permanent acquisition of information manifested in the occurrence of unexpected situations? Two possible answers can be considered: First, the progressive increase in knowledge; second, the permanent transformation of the phenomenon itself as perceived by the observer. Determinism would be the first; Shackle's view would be the second.

Under determinism, the cause of novelty is the lack of information or its inefficient use. The more is known about a certain phenomena, the less unexpected events may happen. The observer learns from novelty in a way that allows him to build a probability distribution, stable through time. According to Davidson (1982) the assumption that it is

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<sup>4</sup>See (Hume, 1909-14)

possible to make statistical inference regarding future events based in present and past information requires that the nature behaves according to ergodic stochastic processes. The main feature of these processes is that their statistical mean through time, tends to its temporal mean with probability one. This suggests that as time goes on, the statistical capacity of the stochastic models improves. Davidson argues that this assumption is essential for rationality (Rationality is defined by this author as the no commission of systematic errors<sup>5</sup>). This is also a consequence of the assumption of prediction. Agents can predict and have something to learn from, because the economist can predict and vice versa. The assumption of initial conditions (Fundamentals as initial endowments, Fixed utility Functions and Technology) allows this regression ad infinitum to have an end. Hence, the predictability of the model is obtained by assumption and not as a result of the analysis of the economy. The assumption of rationality is necessary in order to predict. The assumption of prediction is necessary for rationality. This is a consequence of the assumption of a particular relationship between the analyst and its object of study under determinism. This relationship assumes a scientist situated outside the phenomena that he is analyzing Shackle (1976).

In contrast, Shackle asserts that any point in time and space (i.e. an individual, the economist and/or their context) is a generator of new information; a generator of novelty. The process of analysis of context and history generates new information. This new information affects also history and context; it creates novelty. This novelty is bounded novelty; it is part context and part expectation, origination, imagination. The economist creates history, so does the phenomena that he is analyzing. Innovation must occur with coherence; it is not based in the repetition of the past, and admits the emergence of an unpredictable process, chaotic and ordered at times, and not determinable. The analysis must be creative for its framework to understand creativity. In addition, due to the epistemic character of the phenomenon (economics is about thoughts) Shackle (1976), additional knowledge about it, transforms the analyzed phenomena itself. It is an epistemic feed-back. And this epistemic feedback takes time. The pace of time implies a permanent generation of information.

According to Shackle, reality is a permanent innovation. It gives place to surprise as well as to regularities. Innovation is the rule and not the exception. Order can take many forms and can be of many kinds. Order is the exception and not the rule. The perception of historic order does not imply that there is an intrinsic order in the economic affairs. The unique course of history doesn't show why consumers, producers and government took their decisions; it doesn't show all the alternatives taken into consideration and the process of elimination of alternatives at the moment of the decision. The road not taken

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<sup>5</sup> A decision maker does not commit a systematic error if he does not repeat the same mistake in the same circumstances in different moments subject to objective comparison

is unknown. A unique course of history does not imply intrinsic order (i.e. equilibrium). The assumption of that intrinsic order discourages the economist from searching for the process by which the decision maker picked a certain course of action.

As it was shown in this section, the main issue is how to understand novelty. Two alternatives were proposed: Shackle's and Deterministic approaches. The choice between them seems to be a matter of opinion. However, whereas economic life is constantly faced with events not taken into consideration, the effectiveness of a learning process is doubtful. The statistical treatment of some economic variables assigns a weight to the occurrence of new events assuming that the list of events that may occur is complete, which is a contradiction. Therefore, although the occurrence of novelty is not completely neglected by the Determinist approach, its treatment of novelty is not coherent. Shackle's treatment of novelty and uncertainty tries to correct this failure. Therefore Shackle's approach is more accurate for dealing with uncertainty.

Shackle's notion requires abandoning an objectivist view based on a general consensus led by reason, in favor to a subjective one in which reason makes part of subjective beliefs. The consensus about conceptions of the reality is socially agreed. The activity of the scientist is also an outcome of consensus and hence is coherent with the previous statement. An evolutionary view would be useful to describe the dynamics of the considered collective views of the reality without falling back on determinism. The development of a new concept by which the individual can generate novelty or variation needs to be elaborated if it is possible to convert errors into opportunities of "positive" change.

In the following section (The Analyst and his object) I will discuss the implications of Shackle's abandonment of determinism. This will provide the basis for understanding the role of the analyst as part of the phenomenon.

### ***The Analyst and his object:***

This section is aimed to highlight three major analytical consequences of the acceptance of Shackle's epistemology that denies determinism. These three implications are present solitary moment, evolution and pragmatism. Once the role of the economist is clarified through these three consequences, we can direct our attention to the theory itself coherent with those statements.

Shackle (1976) commences his analysis by discussing what he calls The Scheme Entire of Things, which I aim to explain below.



*First*, economics is about expectations, and expectations are thoughts. Thoughts can only occur in the present moment. Hence, the frame of Economics is the present moment. Shackle, as Hume (1909-14) did, maintains that there is no logical connection in the causality relation. Although cause and effect can be experienced, they cannot be linked by a logical preposition. They are matched in our minds by our memory of the repetition of its sequence. This allows Shackle to introduce imagination in addition to reason<sup>6</sup> in the process of decision making. The past and the present are linked by our memory and interpretation. Without the missing logical preposition, how can we link the present and the future? Shackle's answer is Imagination. Economic decisions are made in some present moment based in our memory, perception and imagination<sup>7</sup> which constitute our thoughts. Knowledge cannot be predicted (Ludwig M. Lachmann quoted by Shackle (1976)). If we were to predict knowledge it wouldn't be knowledge of the future, but present knowledge. Knowledge in Shackle has the meaning of thoughts which are formed by Imagination, perception and interpretation. Past knowledge exists in our memory which is memory in the present. There is no ontological proof of the possibility of knowledge about the future. The past shows to us in the present as remembered by the individual. The only moment that exists is the present moment<sup>8</sup> in which thoughts occur. Economics is about thoughts. Value, prices, production, consumption, and other economic entities are the result of the present process of thought based in memories, imagination and perception of the present context. Hence, Economic entities belong to the analysis of the present solitary moment<sup>9</sup>. Those thoughts can only take place in a present moment.

*Second*, those economic entities are constituted by the repetition of recognizable configurations or stereotypes that follow an evolutionary approach.

“The ultimate indispensable permissive condition of knowledge is the repetition of recognizable configurations. These patterns or stereotypes form a hierarchy in our minds. A pattern of sense-impressions, perhaps from more than one sense, is pinned down as an object or an event. The occurrence, over and over again of similar objects or events establishes a class of objects or events, a *concept*. Such concepts themselves can then form the building-blocks of more complex and inclusive configurations. Science tells us what to count on, what to rely on.

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<sup>6</sup> Shackle defines reason as the adaptation of means to ends.

<sup>7</sup> Shackle calls this process a “Non-empty decision”. It is imagination of what is considered as possible.

<sup>8</sup> This evidently is a tautology. However, deterministic models seem not to be aware of it.

<sup>9</sup> Shackle's notion of the present solitary moment is compatible with Keynes notion of convention and equilibrium. Equilibrium in Keynes, more than a feature of the economic phenomenon, is an analytical device that shows the forces in action in certain point in time. The stability of this equilibrium is given because it is the present situation. And in any present moment, an individual can only have one perception of those forces that affect the economy. Equilibrium is more related to uniqueness and logical coherence than to gravitational laws. I understand Keynes's notion of equilibrium as a unique and logically coherent present view of the world.

But in doing so it merely imitates and refines the process by which we build, each of us for ourselves, the homely technology of everyday living. The means of its doing so is the power of survival and reappearance of types of configuration. Such classes of configurations can have as their medium of subject matter the most extreme diversity of impressions or phenomena.” (Shackle, 1976, p. 6)

Shackle attended some lectures given by Karl Popper. The relationship between the two is documented by Ford (1990). This is probably the reason for Shackle’s evolutionary approach. This approach is compatible with the notion of the present solitary moment. There are no single criteria, such as the existence of the past, by which memory or perception can be judged. Therefore the present is all that exists and the future can be imagined. The consideration of evolution in order to explain the present memory of stereotypes does not require a unique criterion as the existence of the past in order to explain the survival of present entities. This is compatible with Shackle’s assertion that the past is only in our memory; memory is part of present thoughts in which decisions are based. This is important in order to accept expectations as the building blocks of conventions and institutions<sup>10</sup>.

*Third*, according to the quoted paragraph, the adaptation of present stereotypes explains its existence as an outcome of its usefulness in “... the process by which we build, each of us for himself, the homely technology of everyday living”; our memory of its usefulness and our belief on its usefulness in the future. This link between knowledge, stereotypes, evolution, and usefulness appear also on pragmatism literature (See for example Dewey (2002)). Hence, Shackle’s notion of the present solitary moment is compatible with pragmatism. According to this philosophy, what is useful is real. The character of use involves also power; for the term use always involves aim, motive and means. Knowledge is real because it’s useful. This assertion implies that economic science, as any other expectation, is rooted in what the individual and the society consider as useful. And use takes different forms in different contexts. Hence, Economics and expectations have social explanation. Expectations and institutions are complementary in the explanation of the economic phenomena as perceived by the scientist.

### **3. Methodological Implications of the Three Principles:**

#### **3.1 The theorist as builder of future**

According to these three principles (Present solitary moment, evolution and pragmatism) the economist must have an inside view of time. If economics is to be considered

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<sup>10</sup> Institutions and conventions are the way in which the society builds the future collectively. This is opposed to the standard conception in which institutions and conventions solve information and coordination problems. See for instance (Kreeps, 2002). The standard approach is a direct consequence of the assumption of determinism.

knowledge it needs to be useful; hence it needs to evolve. If it is useful, this implies that thoughts about economics are expected by the individual to have an effect in the reality that he is analyzing. The irreversibility caused by the self-destructive experiment<sup>11</sup> implies that the role of the economist is to construct the real phenomena and evolve with it. The construction brings about novelty, and adaptation provides memory projected in the construction of concepts.

The question is: what type of economic analysis can we build in order to construct the economic phenomena in such a way that it evolves in a useful manner with the society? It needs to be one in which the economic entities are related to the social useful entities in such a way that make explicit their aims. These economic entities are the institutions that evolve with the instincts and habits that keep the society alive. This view can be found in Keynes's (1937) (i.e. his measurement of economic quantities in wage units) and Veblen's (1898) approaches<sup>12</sup>. The recognition of patterns, the repetition of process and actions are accumulation created and not only deducted.

The advantage of this type of analysis over others in which prediction is possible, is that it accepts the possibility of novelty. The occurrence of novelty is a paramount stylized fact in economics. Shackle understands and defines its implications. By assimilating novelty the economist can create knowledge that is useful for what the society defines as useful.

Under this conception some institutional arrangements prevail over logic; they sustain logical reasoning. Logic is more a tool used in accordance with the existing institutional arrangements. Logic interacts with the individual perception of the past and the present so the analyst can make a decision based on what he considers as possible. Shackle (1976) names this a "non-empty decision"<sup>13</sup>.

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<sup>11</sup> According to Shackle (Shackle G. , Epistemics and Economics, 1976), the permanent influx of thought by which the present flows, generates a cumulative process of permanent transformation of the future. This is why there is a permanent and unsolvable lack of knowledge about the future. There is a transformation of the future once knowledge is acquired. Whenever a decision maker faces a dilemma of decision, he always lacks a proposition; the one that is going to be known only when he makes his mind about the chosen alternative. This is why time is the time of the experience; the present moment.

<sup>12</sup> It is worth noting the compatibility between Veblen's implication of absent ownership and Chapter 12 of The General Theory, upon which Shackle centers his attention in his interpretation of Keynes's theories.

<sup>13</sup> Shackle (Shackle G. , Epistemics and Economics, 1976) defines the non-empty decision as that decision that takes into consideration what is possible. Imagination is hence, bounded; so it is uncertainty. The possibilities are not determined by an objective reality, but by the configuration of stereotypes (See the three principles above).

### **3.2 Theory as Decision**

Theory is essentially a decision. The analyst decides what to believe given a set of prepositions that he considers as relevant. Based on those prepositions he also takes a specific course of action which consists of the practical application of the so-called knowledge. He makes use of that knowledge.

Decision solves a conflict of individual action. In the absence of an objective criterion, the process of solution of the conflict towards action is more important than reason in the decision-making process. Likewise, creativity emphasizes the role of the individual which is in concordance with the modern conception of the society. In addition, a higher level of creativity (which can be identified with variation) increases the adaptation of the economic system when it is compatible with the development of institutions.

When the economist builds a theory, he solves a conflict concerning action. The conflict is the presence of rival courses of action which are only latent in the imagination of the scientist. They are rivals because of the self-destructive experiment. This conflict is also a social conflict when taking into account the institutions; what is socially useful (perception of institutions) is individually true and useful. Its resolution is to promote a social action. The way the society and the economist solve the conflict between rival courses of action must be compatible. The task of the economist is a permanent feedback with his social context.

The social context and history are a matter of individual perception. In the present moment, different individual perceptions interact with each other to solve this conflict. Economics must evolve with the society in this respect. There is a permanent lack of information to apply only reason to decisions. The way the society decides is not only based in reason. In order to be compatible with the social reality on its economic affairs, the economist must apply something additional to reason in his theories. This additional element which is imagination must be at the center of the explanation of formation of prices and decision about quantities, because they are affected by novelty and surprise. Reason is a logical response to the problem of decision. But when there is a conflict between courses of action, in which the rivalry is mediated by novelty and the self-destructive experiment, the resolution requires something additional to logic. Other colors of the spectrum of human behavior intervene in the process of decision.

This is better understood if we acknowledge that the act of decision, as the formulation of economic knowledge is essentially a creative act. As Shackle asserts:

*“The human psyche and the source and nature of its thought remain a profound mystery which may never be understood. The insight we can hope to gain by means of such a scheme as we have outlined consists merely in discerning some of the logical implications of our choice, if such it is, when we assume that*

*decision, an event occurring in that solitary present which is our whole experience of time, is creative and not merely a symptom or meaningless accompaniment of the working of a machine.” (Shackle G. , 1966, p. 99)*

The aim of economics as a science should be to reach a good state of mind<sup>14</sup> in conjunction with the society in order to create an economic future, which is more compatible with the democratic world in which the individuality is taken into account in the social decision process. Since the good state of mind is socially agreed in interaction with the individuality, this is not a deterministic project. Agreement does not imply causality or objective truth.

One step more is necessary in order to understand the role of the analyst. In the next section there is a brief discussion about this matter.

### **3.3 The Role of the Analyst and the concept of Time**

Shackle gives a name to his philosophical alternative in which the scientist is part of the phenomena analyzed and calls it the “inside view” of time. Here is when Shackle explains that the economic phenomena cannot be isolated from the other colors of the spectrum of human life. The scientist is no more an “objective entity”, a discoverer of the economic scene in which the scripts are already written; on the contrary he is an actor and a writer of the story that is being played.

If time is to appear in economics, its irreversibility must be demonstrated so it can be differentiated from the concept of space. Under predictive theories, time and space are co-valid, therefore time is reversible. This is opposed to the possibility of novelty and surprise. In the present section I examine arguments in favor of Shackle’s view of time. By doing this I expect to clarify for the reader what Shackle means by dynamic time. This will be important when we deal with harmony as the alternative to optimization as a criteria for decision in Economics. The construction of the future in economics implies a new scheme of thought, which is proposed right below.

According to Knudsen (2000) dynamic time is the inexorable and irreversible change that is perceived by the economist when studying the development of the economic phenomenon. This is caused not only by the irreversibility of that phenomenon but also by the irreversibility caused by the observer. It is the permanent change in knowledge brought about by one being conscious. Knowledge is not predictable and is in permanent transformation.

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<sup>14</sup> With this Shackle meant that state of mind good enough in order to compel the decision maker to make up his mind (Shackle G. , Epistemics and Economics, 1976).

Knudsen uses the Heraclitus metaphor according to which no one can enter the same river twice. He makes a contrast between **static time and Dynamic time**. In Static Time the phenomenon is ordered using preordered sets (i.e. the Cartesian plane). To each element of that set corresponds one and only one set of phenomenon in History. Applying this notion to the analysis of the future implies also the unity in history and its necessary extrapolation. As a consequence, time is not irreversible and hence the future is not to be created but discovered.

If we agree in conceiving the economic phenomena as a fundamentally uncertain one in which novelty, surprise, simultaneous decisions and the self-destructive experiment attack the eye of the observer, we can conclude that the observer needs to accept Dynamic time in the aforementioned sense. With it, he not only will accept that humanity in all its dimension needs to be considered in his analysis; by considering in this way the intelligence of the economic phenomena he will also place himself as an intelligent observer in interaction with the phenomena analyzed. It is intelligent because it is an imaginative process with aspirations of usefulness. These philosophical reflections have an impact on the practical way of doing economics; this is the entry point for Shackle's discussion and relation between potential surprises, uncertainty, time and money, which I hope to clarify in a further section.

In what follows, I will show the methodology through which decisions can be explained under uncertainty. It is necessary to depart from the individual because it is there where thoughts first occur (even the present ones!). Those thoughts, although shaped and learnt in the society for the most part, carry an element of variation; of origination. They involve novelty. In Shackle, the society enters the analysis with institutions as the explanation of the boundaries of imagination and uncertainty. Those boundaries are constituted by what is considered as possible. Hence, in Shackle's theory of decision in presence of uncertainty, novelty is taken into account while including institutions.

The main aim is to use Shackle's decision theory in order to explain how individuals build their economic future collectively. That construction takes the form of conventions and institutions. In the case of the financial markets, those conventions are not stable. They owe their instability to the individual behavior under uncertainty which will be explained below. This explanation is also compatible with Shackle's non-determinist view explained in a previous section.

#### **4. Shackle's Potential Surprise:**

*"But the second of my two kinds of economic dynamics will by many economists be denied the status of science, because it is introspective. I am myself at loss to understand why a man's sense perceptions should be scientific while his self-*

*perceptions are to be dismissed as delusory. This attitude is the opposite of Cartesian doubt, for Descartes founded his belief in the existence of something real in the cosmos on the existence of a being which had feelings and thoughts: Cogito, ergo sum.” (Shackle G. , 1967, p. 24)*

If no objective knowledge about the future can be achieved, and if we still need to form some idea of how that future is going to look like, what can we use in order to replace that lack of knowledge? Shackle’s general answer is imagination. Shackle’s specific answer is anticipation. Feelings and emotions are the way in which the Economist, the Investor, the Consumer, and other individuals confront themselves with the future and replace the lack of knowledge about it.

In more methodological terms, is it possible to have science without determinism? It seems necessary that knowledge is necessary, or at least some determinist approach, in order to be able to formulate an economic theory. This is the main point of most of the critiques against Shackle. But this is also where Shackle shows one of his main achievements; what I call his turn around point: If no knowledge about the future can be assumed, if the epistemic gap must be filled with imagination and anticipation, and if we still need to form some expectation about the future value of scalar quantities, we cannot claim general and objective knowledge, but we can state individual belief. We cannot say to what extent the individual is certain, but we can state to what extent he feels uncertain. And uncertainty is a completely open and indefinite set of possible outcomes. So it is with the future, and so it is with money. This is what potential surprise is aimed at. It relates the uncertainties faced by the individuals in the economy with the uncertainty faced by the scientist himself, and time (The present solitary moment, the time of the experience) with the individually considered social meaning of money. The certainty about uncertainty is the methodological tool of Shackle in this point.

## **Digression**

Before dealing directly with Shackle’s theory of decision, it is necessary, for the sake of the argument, to make a digression about the relationship of the different elements that is proposed in this paper.

Between the analyst and his object of study there is a relation of identity. Economics is about thoughts. Thoughts take place first at the individual level. They are framed by what is considered by the individual as possible (bounded uncertainty or bounded imagination). The scientist thinks of his science as bounded imagination when taking institutions at the center of his analysis. By doing so, he thinks of the individual as guided by bounded imagination also. The boundaries are shaped by the interaction between the individual and the society. The individual takes his decision based in a

scheme which takes into account the possibility that something unexpected may occur. This is so because of the interdependence throughout the economy. Money is a bounded infinite set of possibilities due to its institutional characteristics, required for the interdependence to take place. Hence, uncertainty, money, imagination, and anticipation are four dimensions in which the scientist is an active subject in the phenomena that he is analyzing. The perceived order in economic affairs is the outcome of a regularity built by conventions. It is not the result of an optimization process. Hence, conventions are subject to change. The explanation of the change must involve innovation and evolution. The change in a course of action must involve the occurrence of novelty. Only news can impel the decision maker to change his course of action. They also show that order is a matter of permanent choice. The resolution of a course of action is always news, because before the resolution, the decision maker lacked the additional information given by the decision taken. The world for the decision maker change after the decision is taken, and that change can only be grasped until it actually happens. Hence, the future is in permanent construction; every moment is a decisive instant. What makes the decision maker to engage in a new course of action? What makes him to confirm the current convention? Those choices are taken over monetary scalar quantities. That is the question of the potential surprise function. By answering that question, we will be able to explain, in a non-deterministic world, why there are periods of order in the economy, and why there is change. This is not explained by the deterministic and probabilistic approach, because in them, there is no space for news. Whereas for the deterministic approach, order is the outcome of a logical process, from Shackle's perspective, it is a matter of psychology. Although the scalar money values seem to impel us to use a probabilistic approach, Shackle shows that the psychological factors involved in the formation of the expectations are a better explanation than mere logics. The feelings about uncertainty (Surprise, fear, hope) explain better how a decision maker behaves when he faces a world of novelty. Whereas probability is a measure of knowledge, the potential surprise is the acceptance of the lack knowledge. And the world of novelty is a world of permanent lack of knowledge. This rather than a disadvantage is an advantage, because it gives the possibility to the individual to be able to create in any moment his course of action. And he can create it by adhering to the existing convention, creating a new one or adapting the unexpected circumstances.

With this in mind, I continue with the explanation of the implications of Shackle's theory of decision. In what follows, I hope to contextualize this theory in Shackle's framework. By doing so, I aim to offer a possible use of this theory coherent with Shackle's epistemological position presented above. The construction of the future by the analyst and the phenomena analyzed, decants in a hypothetical harmonic interaction. This harmonic interaction is offered as an alternative to the criteria of optimality given by the



determinist position. This notion of harmony shows also the possibility of useful theorizing in the face of uncertainty.

We can continue with Shackle's theory of decision.

#### **4.1 The Scale and the Form:**

Shackle's Potential Surprise obeys to the scalar character of the economic quantities and still is coherent with the possibility of novelty.

The scalar character of the economic quantities is an outcome of the homogenization provided by the monetary values. One of Shackle's main points is that scalar quantities don't reflect what is happening in the form Shackle (1976). By form he means the physical manifestation of the economic activities (i.e. the different processes, products and technologies). Those manifestations are given a value in the market. Expectations are formed concerning that value and for that reason, they are formulated in scalar quantities. However, those quantities are only projections, like the shadows in Plato's cavern, of what happens in the form. Although, what really matters is the form, in a market monetary economy, expectations are formed over the scalar quantities (i.e. profits and prices). Since the decisions taken regarding the form are affected by the scalar quantities that affect the expectations, it is necessary to analyze in what way these two spheres are related to each other. This relationship is better understood under a framework that accepts the lack of knowledge present in the analysis of the form that in turn changes the scalar quantities. Whereas the language of probability doesn't accept novelty, the potential surprise function does. This happens when we accept that the pertinence of the economic phenomena is in the form, and not only in the scalar quantities.

Shackle's theory of potential surprise has been explained elsewhere: Shackle (1949) or Ford (1994). In what follows I will point out some aspects of that theory for the development of the argument, in which Shackle's decision theory will be connected with his notion of time and expectations, and his conception of money. In these, the notion is the explanation of the relationship between the form and the scale.

#### **4.2 The Potential Surprise Function:**

Figure 1 is taken from Zongzhi (2009), although the same type of illustration can be found in Shackle (1969). The degree of surprise ( $y=y(x)$ ) measured in the vertical axis depicts the degrees of disbelief<sup>15</sup> in the occurrence of a certain value in the

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<sup>15</sup> Believing positively in the occurrence of some hypothesis would imply that the decision maker is inclined to give credibility to that hypothesis in detriment of the others and more importantly he would do this by accepting that unexpected situations might occur, which would be a contradiction. This is precisely what Shackle is avoiding by

performance<sup>16</sup> ( $x$ ), which is described in the horizontal axis. The shape of  $y(x)$  shows the psychological feature that amongst the values in “ $x$ ” there are some that, in the event of their occurrence, would not surprise the decision maker at all; for that reason they are assigned a zero degree of potential surprise. This set of values is called “inner range” and in Figure 1 are represented by the interval between  $X_L$  and  $X_H$ . Outside this interval the decision maker increases the level in which he would be surprised if “ $x$ ” occurred. These increments reach a maximum in  $X_{min}$  and  $X_{max}$ . For values higher or equal to  $X_{max}$  and lower than  $X_{min}$ , the decision maker assigns a maximum degree of surprise. This level is given by his psychology. The decision maker not only takes into account the standing of  $x$ , but also its desirability. If “ $x$ ” is, say, profits, higher values of “ $x$ ” are assigned higher desirability. There is a point  $X_E$  where the desirability is zero. The function  $\Phi$  (stimulus, ascendancy or priority function), shows the different combinations of surprise and desirability for different values of “ $x$ ”. Shackle calls focal points those values of “ $x$ ” that attract the attention of the decision maker in the highest degree (those with the highest ascendancy). The arch-shaped curves are indifference schedules that reflect the psychological characteristic according to which higher or lower values of “ $x$ ” above or below  $X_E$  would require a higher degree of surprise in order to attract the attention of the decision maker in the same degree. The focal points (The points of tangency of the pair of indifference curves that reach the maximum and minimum level of desirability given the perceived ascendancy) are the values of  $x$  for which the desirability of “ $x$ ” is the minimum and the level of surprise is the minimum (Focus loss), or that value for which the desirability is the maximum and the degree of surprise is the minimum (Focus gain). These points are represented by  $X_{\Phi_{max}(L)}$  and  $X_{\Phi_{max}(G)}$  respectively. The matter is very simple if we observe that the decision maker will feel more attracted for those values of “ $x$ ” for which the desirability is the maximum but at the same time the level of surprise is the minimum in the case of focus gain. The higher the values of “ $x$ ”, the higher the degree of surprise. The increase in desirability will overcome the increase in surprise up to a point after which the decision maker would feel less interested because the surprise assigned to those values will overcome its higher desirability. But let’s allow Shackle explain this for himself:

*“To summarize this conception, we suggest that an enterprise who is deciding whether to invest or not will place himself in imagination in the position of having actually laid out a cash sum on constructing concrete equipment, and will then weigh against each other the two elements of the immediate mental experience which position would afford him: the enjoyment by anticipation of the greatest gain whose attractiveness is not undermined by association with too high a degree of potential surprise, and the suffering, by anticipation of the greatest loss*

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the concept of disbelieve. Hence, he can consider the possibility of the occurrence of some hypothesis without discarding the alternative of assigning standing to as many alternatives as he consider it pertinent.

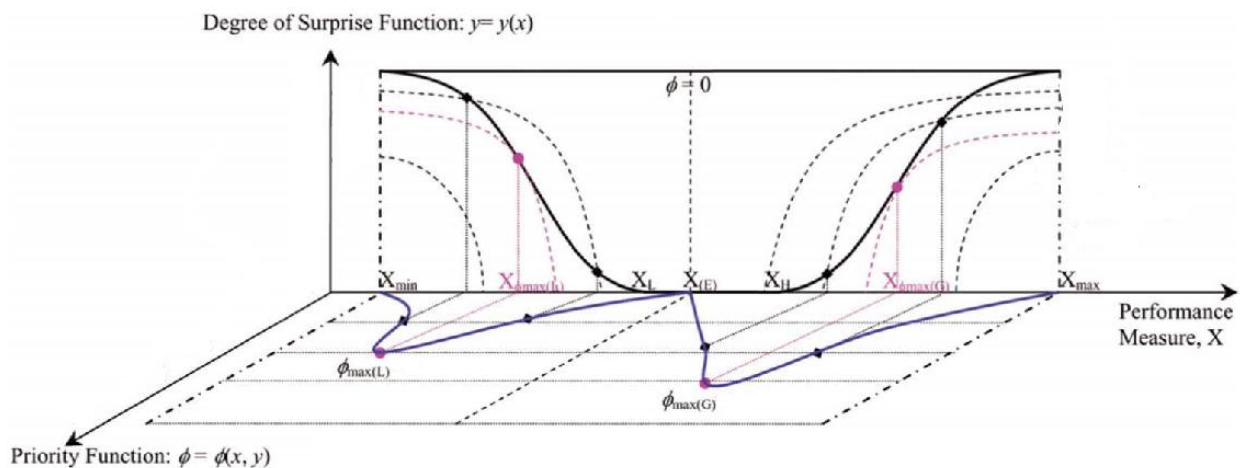
<sup>16</sup> The values of the variable in question.

whose unpleasantness is not weakened by being associated with too high a degree of potential surprise. It is these two extremes which will focus the enterpriser's attention." (Shackle G. , 1949, p. 5)

Or in even more common sense terms:

"I would like to suggest an alternative formula which the business man might use, and to ask whether in fact he does not sometimes use it, in his inmost and private thoughts: 'At best, we might make a profit of such and such, a very attractive thing; at worst we would make a loss of such and such; can we stand that? And if we can stand it, is the hope of that first-rate success worth the knowledge that we stand to lose this other amount?'" (Shackle G. , 1966, p. 167)

**Figure 1**



Now we are in capacity of explaining the advantages of the Potential Surprise function and its possible uses.

### 4.3 Implications of the Potential Surprise:

In this section I will highlight the implications of this theory of decision that are going to be important at the moment of connecting this theory with Keynes' Animal Spirits, uncertainty and money.

- 1) A language of decision based in the consideration of the occurrence of events not taken into account when formulating the hypothesis is compatible also with the notion of money in which its essential property is its liquidity; hence, money (as defined here) can be exchanged for an undeterminable set of goods and assets in the same way uncertainty represents an undermined set of events. Furthermore, if Shackle's theory is a suitable measure of uncertainty as (Ford, 1994) points out, it is asserted here that Shackle's apparatus can be used to

establish a liquidity preference theory. In the same way a decision maker has to decide between a set of alternatives in an incomplete set, all of them rival, money gives the individual the possibility of demanding an indeterminable set of goods. The choice between one good/ asset and money is the decision between one good, and an undetermined set of other goods (Marshall quoted in Hicks (1976). Whereas the conventional approach to indifference curves (Arrow- Debreu) can only depict a limited relationship, Shackle can reflect an unlimited one. Hence, decision in Shackle becomes a decision in time. Time in Shackle takes the form of money. Because of the possibility of waiting until the decision maker chooses his decision, he can keep his options open to uncertainty. And only in time it is possible to understand behavior further than a mere logical exercise. Hence, time, money, uncertainty and decision are all linked in Shackle's decision theory. The non-additive character of the Potential Surprise Function (PSF) grants money the character of liquidity in the theory, at the same time that allows for the occurrence of novelty, surprise, and in general, uncertainty. Since the decision maker is assumed to accept the possibility of occurrence of unexpected events, money in the same way represents an indeterminable set of goods due to its liquidity.

At this respect Shackle points out that:

*"...One effect of an event which causes surprise will be to heighten at first the attractiveness of liquidity, that is, of deferment of choice of a specific blueprint, and discourage the immediate construction of equipment. If a large number of investors are thus affected by the same event, the aggregate investment-flow in some period closely following this event will be lower than it would otherwise have been." (Shackle G. , 1949, p. 75)*

This means that money is inseparable from uncertainty, and uncertainty in Shackle takes the name in the psychological potential surprise.

The property of money cannot be understood using the language of probability, which is additive (the weights of each hypothesis need to sum up to 1) and it is assumed the completeness of the list of events. Shackle (1976) argues against the use of probability in order to tackle the problem of uncertainty and, hence, liquidity. According to him, it is a contradiction to assert that something unexpected might occur, and at the same time say that the list of events is complete, as in the case of probability distribution functions.

For this reason, a theory of decision based on the probability language cannot consider the possibility of fundamental novelty and, hence, cannot understand

the property of liquidity of money, nor the actual behavior of the decision makers in which the psychology plays a fundamental role. In the assumption of rational expectations, for example, the probabilities might not be objective, they could be subjective, but they still require restrictive assumptions, not coherent with the possibility of novelty. For instance, according to Harsanyi quoted by Hammond (1987), in the case of Bayesian Rationality, which is the maximization of the subjective expected utility function (The probabilities with which it is calculated are subjective<sup>17</sup>), the procedure of optimization requires the assumption of rationality with fixed and predetermined utility functions and cardinality.

Hence, the language that Shackle is proposing is more coherent with the experienced and interpreted nature of the economic phenomena in the sense aforementioned. That language depicted in the potential surprise function with its respective focal points is coherent with Shackle's methodological proposal that denies determinism. Therefore, when the scientist uses this framework in order to analyze the formation of expectations in economics, he is being creative; money exists in its fundamental form, and individual behavior in this scheme can be analyzed. Agents that accept that something unexpected may occur can demand money.

At this respect Shackle points out that:

*“In fact, rather than decide what to buy, he may elect to retain money. In theories of pure choice there is thus room for money only as a unit of account and non for money as a store of value, an asset. But all the interesting properties of money arise from its use as an asset. Thus theories of pure choice are ‘non-monetary’ theories” (Shackle G. , 1966, p. 227)*

- 2) With this theory, as Shackle asserts, it is possible to treat separately for the same individual the fear of losing and the hope of winning for each alternative. This is expressed in the focus loss and focus gain. This separation allows Shackle to apply different explanations for fear and hope. Since they may obey different factors in the human psyche, this theory corresponds with the psychological explanation of Animal Spirits. The following quote supports this point:

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<sup>17</sup> Subjective probability is a variable that distributes degrees of belief regarding the occurrence inside a set of events in which a phenomenon can develop (Good 1987)

*“The Value which a person sets on a speculative asset is essentially and logically (and not merely as a matter of mathematical convenience) the sum of two components of opposite sign: there is the positive component deriving from the hopes and the negative component springing from the fears which the possession of a speculative asset engenders. The two variables of which the value is thus a function, the hope of gain and the fear of loss, are in the general case mutually independent. Thus it is valuable to have a device which can display the separate movements of these variables of these variables, and not merely take account of their resultant effect. By these means, for example, we can classify the kinds of events which move one and not the other, which move them in opposite directions or in the same direction, and in similar or in different degrees; and this may enable us to disentangle many complexities of the movements of the market value of speculative assets.” (Shackle G. , 1949, p. 5)*

- 3) As every decision has two possible developments that change along with the psychology of the decision maker, there is an explanation for the thin division between hope and fear.

Focus loss generates the possibility to the economic decision makers, to fluctuate between two extreme states of optimism and pessimism. For each rival hypothesis, there is a hope of gain and a fear of loss, plainly compatible with the possibility that something unexpected occurs. Hence, the attention of the decision maker (say an investor), can easily be shifted from the belief in winning to the fear of losing. This makes the economy an unstable arena dependant on crowd behavior. In Shackle’s conception, the interest rate is an unstable variable in nature, because the harmonious interaction of belief is incompatible with the profit-seeking behavior based on speculation. In this case, for example, the extent of the fluctuations will be explained by the average distance of individual focus gain and losses at a certain point in time. This distance, however, changes from one moment to the other.

- 4) The difference between the potential and the actual surprise impels the change of the course of action and explains it.
- 5) By accepting the PSF, we are coherent with the interaction between the economic scientist and his object of study. The decision makers are not

automates any more. Given the indeterminacy of their scale of surprise, they show erratic behavior. Hence, an open world like this allows the scientist to interact with his object without assuming any special rationality or equilibrium. There is only interaction. New information that the scientist may come up with at any time is already considered by the decision maker in the decision maker's surprise function. The new information is assigned the maximum degree of surprise. Whereas in rational expectations this would be an occurrence of unsystematic behavior, in Shackle it cannot be called so, because how can we know what is systematic and what is not if there is novelty?

- 6) A theory is also an expectation and can be operated using the framework of the Potential Surprise Function if it is dealing with scalar quantities. The potential surprise function of the scientist interacts with the expectations of the rest of the economy

In the following section I will provide a possible way in which Shackle's notion of surprise can be connected with this idea of conventions and institutions in a scalar-type economy, where the scalar quantities are mere projections of the hyper-multidimensional world of the form where innovation can take place.

#### ***4.4. Economic Interaction In the context of Potential Surprise:***

Conventional beliefs can be defined in the context of potential surprise as the harmonious interlock of individual subjective functions of potential surprise. They don't need to be equal. At a certain present moment, they interact with each other in such a way that the actual behavior of each agent reinforces the belief (or rather disbelief) in a certain course of events. If the conventional belief is such that the focus gains prevail over the focus losses of said expected profits, the economy shows a compatible behavior. This compatibility remains until a novelty hits the economy. Then, there is a confusing moment of transition, until the necessary habit-framed new convention arises. This is what Shackle called a kaleidic economy. Under this notion, which is only possible in the scalar quantitative world provided by money, the technical relations that emerge from the market are variable and unpredictable; they are based on the prevailing convention.

The observed extreme behavior during the crisis, showing sudden changes from optimism and pessimism, can be explained with Shackle's framework of focal points. Hence, the stage is set for Animal Spirits.

Before entering directly in the matter, in the next section I will propose the concepts of Synergy and Harmony. Although vaguely defined, those concepts show themselves as the alternative to prediction in economics. They make compatible the scalar context of the monetary economy with the originative character in the form sphere. They occur in the context of this interaction of focal points. This will give an idea of the approach of the rest of the present analysis based on dynamic time and also will sketch the guidance for a further research.

#### ***4.5 Synergy and Harmony:***

The eventual ordered behavior is also explained under a context of fundamental uncertainty. There must be a definition for synergy. Although innovations are unpredictable, they might be reflected with some fluctuation properties (statistical or mathematical) in the scalar variables because innovations part from the combination of existing entities. The element that combines them is the new one. There might be something in music, some composition principle that would make the next score harmonic with the past structure and at the same time new and compatible with a future creative plan of the composer. The scalar character of the scores through frequency sounds might show this property. If this property existed, it would not predict the next score in economics (the next novelty) but it might give a hypothetic range as the potential surprise function, according to which the economy is being built. However, it might be simpler to take a look at the productive structure of the economy and at its institutions in order to understand the process. However, the existence of financial markets as an apparent condition for the function of the economy makes necessary a scalar analysis. The reliance of short-run investors on scalar quantities as the interest rate that affects forms (productive structure) makes necessary this relationship. This would give alternative criteria to optimality that allows for unpredictability and novelty while keeping a notion of economic coherence. Therefore, there is not a unique path for interest rates but a set of infinite choices. To accomplish this, the monetary policy must be itself innovative in a harmonic way. This policy must be originative, rather than reactive.

The formulation of hypothesis under originative<sup>18</sup> choice must be such that in any present moment a set of harmonic scalar values are taken into account inside the Shacklean inner range. If the new developments occur inside this range, they should add to the current state of expected harmony. However, if a surprise occurs, there must be a sudden rearrange of expectations such that a new harmonic set is defined. It must be something like neural nets in which a new situation, in spite of being an outcome of

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<sup>18</sup> Shackle (Shackle G. , Epistemics and Economics, 1976) defined originative as the imaginative element that is brought by inspiration and generates new information to the system.



the past, opens up a set of totally different possibilities from the set available before. Or even more, as it will be seen in a further section, Keynes's conception of equilibrium as convention and as analytical tool opens the possibility for the introduction of Shackle's notion of economics as a classificatory science Shackle (1965). Although every moment is different, and the sequence from one moment to another cannot be predicted, its conventional character gives the possibility of diagnosis based in the present perception of a set of circumstances previously experienced in the aforementioned sense. The present configurations of output unemployment and inflation, for example, don't necessary imply a causal analysis; they are not useful for prediction, but for identification of the pathology of the economy at a certain present moment. These variables can show erratic behaviors, and the economist can collect the different ways of configurations and classify them. This is Shackle's perception of understanding economics.

Now it is necessary to explain how new information affects the PSF and the interaction of individuals previously described, so the description of the theory of decision be completed.

#### ***4.6 Novelty in the context of interaction of individual potential surprise***

Novelty must occur in continuous time. There is an infinite distance between continuity and discrete analysis. The latter can reflect as small variations as the economist desires, however never reaching infinitesimal continuous changes. According to Shackle, the economic scene is continuous, and the innovation occurs in the continuous flow of dynamic time. In the infinitely small continuous flow of time, the variety of small novelties is infinite.

Time is continuous, every attempt to cause an impact in the economic context at certain point started as a very small origination of information. Every present moment is full of those little transformations. The difference between them is the speed with which they spread out. This is only known ex-post.

At this respect Shackle asserts that:

*“And since the range of values carrying nil potential surprise will ordinarily merge **imperceptibly** into those carrying some positive degree, there is likely to be some range of values immediately above the upper extreme of the inner range, and another immediately below the lower extreme, over which the increase of*

*“y”<sup>19</sup> with increasing remoteness from the inner range will itself increase.”*  
(Shackle G. , 1949, p. 13)

When the economist realizes that an orientation<sup>20</sup> has taken place, it has already occurred. The interpretation is not as in chaos theory, where tiny variations cause great impacts. Every novelty is small at the beginning. It is not possible to keep track of all the very small orientations that are existent in every present moment. They select each other, they evolve and adapt. Complex systems do not have a sensible point through which a small change can generate big changes in the future. This is an ex-post view. If an actor such as the government wants to generate such a change, it needs to originate big amounts of little pieces of information (as big as the system does), so that they are known by the government, and, to a certain extent, controlled by the government, and in this way it would be easier to identify in a faster way which of them is the one that is taking place; because the originator (the government) is the first in producing those variations. These small variations should be reflected in the potential surprise functions of investors. Because it is in the expectations of the investors where those variations start small and then grow up and spread to other investors with feed-back between them. A different concept for generation of innovation and its spread that shows no prediction is necessary. It cannot be based on a distribution function. It needs to show a certain level of compatibility with the creative process (Innovation and surprise). It might cause coherence. This is what I consider as harmonious and synergic.

Now we can start the explanation of the use of the Shackle’s theory in terms of economic policy.

## **5. Animal Spirits**

The aim of this section is to offer an explanation of the role played by Animal Spirits in Keynes’s theory. I will also show that Shackle’s theory of focal points (The hope of winning and the fear of losing) can be related with the optimism and pessimism waves. A more concrete explanation of how could these two theories may be connected will be a topic of a further research. However, these ideas can be taken as a first approximation.

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<sup>19</sup> See Figure 1

<sup>20</sup> Shackle defines an orientation as the different stages of production in which different products are located in the present moment, and that suggests the course that each of them may take in the future as defined by the final product and the process in which they are involved.

### **5.1 Keynes, Animal Spirits and Shackle:**

Without the possibility of cognitive status of the future, it is necessary to find alternative criteria in order to prescribe the behavior of the fiscal and monetary policies. In the present section I introduce Animal Spirits as the explanation for collective behavior under uncertainty as compatible with Shackle's methodology.

At this respect Ford (1994) after referring to the subjective and non additive character of Shackle's decision in comparison with Keynes and pointing out the agreement between the two, asserts that:

*"Keynes was aware of this, and it is more than likely that this was responsible for his reliance on the famous notion of 'animal spirits' as the determinants of investment decisions by businessmen in the General Theory(1936)" (Ford, 1994, p. 149)*

Animal Spirits are concepts as broad as their imagination. They are as vague as the notion of uncertainty. Investors prefer action rather than inaction. However, the direction of those actions is as unpredictable as their imagination can be. In the same way the inclusion of uncertainty allows Shackle to include fear and hope in his analysis of Potential Surprise, Animal Spirits are the answer of human behavior in the collective level to the problem of uncertainty. They are the manifestation of fear and hope at the individual level. To assume that investment can be pulled in a determinate direction is the same as to assume that its rationality can be predicted; that would be determinism. It is not possible to push Animal Spirits in a determinate direction as it is not useful to talk about the degree of belief of a proposition in the face of uncertainty. An investor also would prefer to analyze the possible outcomes of his strategies by being coherent with the occurrence of novelty.

We require a scheme of thought in which fiscal and monetary policies take out the obstacles for investment rather than to produce a determinate outcome. Keynes' theory of Animal Spirits complements Shackle's and Chick's (1983) approaches to this task. It doesn't require notions of equilibrium or predictability.

### **5.2. Animal Spirits in Keynes and Economic Policy:**

*"All we can do is to study as best we may what unsatisfied desires and discontents have come into being, through the spread of knowledge and ideas and of acquaintance with varied ways of life, or by the experienced worsening of economic or political conditions, in each society at each succeeding epoch, and to imagine the possible outcomes of a release of that rig." (Shackle G. , 1966, p. 114)*

A brief comment on Keynes's methodology and its relationship with Shackle is necessary. As any expectation, the formulation of economic theory is a present thought. This allows the scientist to make a statement about the economy. In Keynes, these statements sometimes take the form of equilibrium. But they are not a fact of the phenomena. They are analytical structures. At this respect, Shackle (1968) asserts the following:

*"The high paradox of the General Theory took many years to declare itself to me. This book in fact uses a partial equilibrium method for a whole-system non-equilibrium purpose. There is partial equilibrium. Since something is held constant for the sake of the argument which cannot be constant in life. In Marshall, that thing was the prices of other goods and the incomes of individuals. In Keynes, it is expectations. And it is the inconsistency of expectations which provides the whole meaning of the argument."* (Shackle, 1968, p. xxiv)

Shackle complements the argument quoting Joan Robinson<sup>21</sup> who shows how Keynes solved the paradox in the General Theory that tries to make a static analysis of a dynamic economy:

*'Short-period analysis is concerned with the equilibrium of a system with a given stock of capital and with given expectations about the future. Past history is thus put into the initial conditions, so that the analysis is static in itself, and yet is part of a dynamic theory.'* (Shackle G. , 1966, p. 265)

For Keynes the notion of equilibrium<sup>22</sup> and convention is interrelated. Equilibrium is the logical configuration of expected future events given the perception of past and present contexts. As expectation, equilibrium is the conventional belief based in reason. This does not imply that things are going to remain equal, or that a determinist view has been taken in consideration. The uniqueness of the present view is what maintains the equilibrium as a logical alternative of analysis. In every present moment for each individual there is only one spectrum of rival courses of actions and hypothesis; this uniqueness is on which equilibrium is based as an analytical tool. Logic is a human instinct necessary for the, up to now, successful coordination of activities. Hence, more than showing the truth, logic along with expectations is a tool of human coordination. With this caveat, the present section shows a logical way of formulating a scientific expectation about economic policy coherent with Shackle's notion of uncertainty.

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<sup>21</sup> "The Rate of Interest and Other Essays (London: Macmillan, 1952)

<sup>22</sup> Although there is a big literature regarding this topic, I make my assertions based my understanding of the General Theory. A further revision of those works is worth a further research. My understanding is also compatible with Shackle's approach.

### 5.3 Animal Spirits and the Marginal Efficiency of Investment (MEI):

Keynes pointed out that the entrepreneurial investment decision was affected by two facets of the business man: The rational one<sup>23</sup> compares the market interest rate with the marginal efficiency of investment (internal rate of return). He compares the expected return of the investment during the life time of the machinery with the one earned by more liquid assets. The irrational facet is related with the adventurer spirit of the entrepreneur, which consists in taking risk. In trying to grasp some knowledge about the future he makes a non-empty decision. It is an expectation bounded by what he considers as possible. For Keynes, this second facet is the one that plays the bigger role in the decision making process of the entrepreneur. Keynes bases his explanation of the economic cycles on that adventurer spirit. Economic cycles according to him are explained by stages of optimism and pessimism of entrepreneurs, more than as errors on the rational part of the expectation. The rational part of the investment is part of the logic generated by the market; it is part of a convention and in any case is a prediction.

In the business world, inaction is also action, as the businessman's context is in permanent transformation. The market requires Government intervention in order to:

- 1- Avoid the irrational facet of expectations to affect negatively the investment impulses generated by the rationed conventional part of expectations.
- 2- Reestablish the coordination between short and long-run expectations.

If it is in this case that occurs an increase in the enthusiasm by investors in such a way that causes a stimulus in the animal spirits aimed to increase investment (improvement in long run expectations), this causes an increase in the demand for loanable funds. This in turn causes an increment in the interest rate if the money supply remains constant. The increased enthusiasm *ceteris paribus* causes also an increase in the price of capital goods in the short run.

The potential investors perceive an increase in their marginal efficiency of investment because of the improvements in the expected returns, but opposed to it, they experience an increase in the cost of finance to the increase in the interest rate.

Investors may act in accordance with an eventual coordination (Optimistic animal spirits or hope of gain), or they can be at odds with the convention of eventual coordination (Pessimistic animal spirits or fear of loss)<sup>24</sup>. In the first case the marginal efficiency of investment (MEI) tends to increase in spite of the increase in the interest rate.

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<sup>23</sup> This concept of rationality is used by Keynes to denote the calculation part of the expectation.

<sup>24</sup> i.e. Informality or autarchy

The increase in the MEI on the part of the producers of capital goods causes increase in the demand for loanable funds additional to the one caused by the producers of consumption goods.

There is an increase in the interest rate due to the increase in the demand for finance and a generalized optimism. This optimism will not materialize if the interest rate increases above the increase in the expected MEI. If this was the case, the investors would not have the funds required for their investments. This is so because of the liquidity allocated for speculation that is caused by the expectation of the increase in the interest rate. This analysis can only take place in an economy with a certain level of development in its capital market.

The better expectations in the bonds market make the speculators keep their liquidity because they expect the price of bonds to decrease due to an expected increase in the interest rate. Hence, optimism moves in opposed directions with the bonds market and the capital goods market (short-run and long-run expectations respectively). Whereas the first wants to speculate, the second one needs the liquidity for long run-investment. Both types of expectations may agree that a generalized economic growth is going to take place. However, short-run expectations prevail if the liquidity remains constant.

When facing an optimistic wave, the government policy must increase the liquidity so it can avoid the scarcity of finance as the motive for speculation, which would restrain the optimistic animal spirits in its desire to invest.

This increase in liquidity must be done by an increase in public expenditure rather than through the increase of liquidity to banks. For in the latter alternative speculators may keep the increase in liquidity. The increase in public expenditure, on the other hand, can ensure that more liquidity is going to produce an increase in the aggregate demand through its effect in reducing the interest rate in relation to the MEI.

If there is an initial increase in the demand before the increase in liquidity, banks would perceive better expectations through the increase in enterprise profits. This would be an additional motive to dedicate liquidity to financing enterprise investment rather than to dedicate it to speculation.

It is worth noting that Keynes did not require a predictive model in order to formulate his theory of the interest rate. The use of the present moment is important when analyzing the effect that present expectations have over the interest rate, and the effect that this one has over the future development of investment animal spirits. There are animal spirits because expectations about the future are imagination.

Hence, the relationship between ex-ante and ex-post aggregate investment does not explain the effect of investment and saving over the interest rate. The equilibrium

between those aggregate variables does not explain the variation in the interest rate. The relationship between the demand of finance generated by the animal spirits and their supply guided by the way in which consumers, investors and banks want to use their liquidity through their speculation, precaution and transaction motives, explains the investment of the economy in assets with different levels of liquidity.

This is a relationship between expectations. The better conditions of employment depend on the coordination of those expectations in such a way that the society confirms those animal spirits and reaches sustainable levels of confidence through time.

This confidence is reached by the enforcement of a convention that generates regular changes that allow the acquired debts to be paid with the profits obtained with the entrepreneurial use of the loans. This generates confidence in future loans.

Hence, Keynes understands the economy as a set of present moments, in which expectations have an influence in the present behavior. The period considered is so short that some configurations are expected to remain constant. Hence, it is possible for a contingent relationship between expectations and interest rate. They are unstable conventions which form the bases for expectations.

An explanation of this type of methodology is given by the following quotation:

*“Thus we can, perhaps, allow ourselves a short-term predictive dynamics of the economy as a whole. Two distinct logical bases on which such an analysis might be built seem to present themselves. On one hand, we could abstract from the possibility of ‘new thoughts’, we could assume that everything which enters the minds of individuals within a certain interval has sprung in an explainable way from what their minds contained at some initial moment and from the events which those initial decisions have directly or, via subsequent determinate and therefore empty ‘decisions’, have directly led to. Or on the other hand we could appeal in some fashion to the ‘law of the large numbers’ and to the fact that a decision, however ultimately momentous, will require some time to produce its visible effects, and that during this period of incubation, or of the marshalling and progressive engagement of resources in the early stages of the action-scheme. The economy’s affairs will be carried on according to pre-existing plans.”*  
(Shackle G. , 1967, p. 27)

A suitable economic policy is one which allows the development of optimistic animal spirits in the case they appear. An economy in boom is one in which optimistic animal spirits appear and they have an environment in which to develop.

The conditions that allow optimistic animal spirits are diverse. Among them are the characteristics of the economy regarding productive chains, the horizontal structure

culture, institutions, history, etc. There are two that must be considered the most important ones: First, the consolidation and development of markets through regular interchanges and space for the entrance of new products (market dynamics based in the conventions formed in the economy and by the innovative and adaptative character of the entrepreneurs). Second, the operation of the financial markets and the economic policy. Shackle (1969)

According to Keynes (1937), the financial markets are gambling places to which the development of a country should not be trusted to. According to Shackle (1969) in the financial markets there is speculation over the interest rate. It fluctuates permanently without any equilibrium position. It is a variable inherently unstable.

The coordination between financial markets and the development of optimistic animal spirits is not automatic. The fluctuations in the interest rate do not avoid the gridlocks of those spirits because there is no objective judgment about the future behavior of the interest rate. It is not useful to establish a probability distribution function of the interest rate due to the permanent insufficiency of knowledge.

The interest rate is expectation. It is not possible to predict future expectations. The bond market has its own conventions (Shackle would call these Superstitions), the same way entrepreneurial animal spirits do. Their low transaction costs make reversible the decisions for the individual, in spite of the fact that it is irreversible for the rest of the economy.

The problem is how to make compatible the activities in the financial market with the eventual apparition of optimistic animal spirits in the entrepreneurial sector. Whereas optimism in the financial markets is linked to the interaction of expectations, the optimism in the entrepreneurial sector guides them to generate demand in the economy through investment. Hence, whereas optimism in the entrepreneurial sector leads to a productive activity, the speculation in the financial sector represents the trust in the realization of the expected profits. For this reason, Keynes calls the speculative motive inactive demand of money, and the liquidity requirements for investment active demand for money.

The higher the interest rate is with respect to the EMI, the lower the quantity of viable projects in the present. Therefore, the rational expectation on the part of entrepreneurs regarding the future that led them to develop a productive activity sees itself reduced with respect to the viable projects of investment. The cause of this is the speculation over high gains in the financial markets. This opposition is caused by the absence of objective criteria for the formulation of expectations. That criterion does not exist because it makes reference to the future.



#### **5.4 The rule of Fiscal-Monetary policy<sup>25</sup>:**

One remedy for the opposed forces in the financial and entrepreneurial markets is that the government shows to the economy that to part with liquidity in the future is not going to be better a payoff as if done in the present<sup>26</sup>. This can be done by increasing liquidity. Then optimism develops in such a way that will cause a constant flow of liquidity because there are going to be additional profits due to the increase in employment that didn't exist before. It is a trust vote on the part of the government in the animal spirits.

Once the increase in the interest rate due to the speculation in the financial market is stopped, the actual development of the optimistic animal spirits (in the sense of generating profits) depends on the articulation of new projects of investment with the existing market. This will depend also on the adaptation of the new convention to the existing one (market structure or general management policies).

The problem of each enterprise in particular is to adapt to the convention. However, this is not up to the policy maker. The problem of the policy maker is to not generate too much expansion that every project of investment is able to be financed, nor to cause such a small increase that is not sufficient to counteract the self destructive character of the animal spirits.

It is not possible to stimulate the emergence of animal spirits with monetary policy or public expenditure, because they appear spontaneously and their explanation is in the history, culture, customs, and the eventual common view about the future that would led to create it.

As monetary policy is not effective by itself in order to pull the economy out of the recession, it also needs fiscal policy.

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<sup>25</sup> Although some far similarity can be found with (Akerlof, 2009), the following research is in great part based on my undergraduate thesis in (Cantillo, 2004).

<sup>26</sup> Under rational expectations this would be a problem of credibility. However, the absence of an objective criterion for formation of expectations makes it impossible to conclude that in the long run the effects of an expansionary economic policy on the aggregate product will be neutral. The potential product is a variable that is to be created and is subject to novelty. The question is in what way the dynamics of innovation can be understood, so they can be compatible with the dynamics of the short-run expectations. How can synergy be defined operationally?

## **CONCLUSIONS**

The occurrence of unexpected economic events is a key phenomenon in Economics. Shackle's explanation of it is a better approach than determinism. Hence, Shackle's theory of decision that takes into account its occurrence captures better the key factors of human psychology when facing an economic decision in presence of uncertainty. This is useful in order to understand Keynes' Animal Spirits.

The inside view of time explained in Shackle's theories implies that the Analyst participates in the generation of information that he is analyzing. Under this view, it is necessary to replace the criteria of optimality in the process of decision making. Two alternatives are the inclusion of Harmony and Synergy. Although no detailed explanation was provided, the intuition is clear: If economic decisions under uncertainty are to be creative, the option is to interact harmonically with the context in which the decision is made. This harmony, in a scalar context, may be a very useful tool in order to set monetary and fiscal policies. In the micro level, this criterion may be also useful in order to interact in the financial markets. The potential surprise would be the framework to formulate harmony in more concrete terms.

Although scalar quantities are only the Plato's shadows of what is happening in the economic forms, and hence cannot be used as the confirmation of the completeness of preposition, they affect economic behavior and can be used to grasp what is happening in the world of the form. Creativity generates innovation in the world of the forms. This creativity, although not graspable with probability distribution functions, manifests its shadow in the scalar world. We can take advantage of that interaction between the shadows and the outside world in order to set ourselves (economists, consumers, investors and government) as creators of our economic future.

The way Shackle is including psychology in the potential surprise function would allow the scientist to build a useful theory coherent with Keynes's Animal Spirits and his view of money. An analytical description of this relationship was proposed here. Action is the process of creating a new; it is the process of origination. In a world of novelty, public policy can keep the economy at full employment.

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