Earth magnetism and the economic behavior

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Abstract

This paper provides an analysis of how the current economic crisis and the changes in the earth magnetism can be an opportunity to develop an economic system based on more balanced economic relationships. Consciousness is fundamental to achieve this. A practical example, examined in the article, to understand how consciousness and the belief systems affect the observed reality, is associated with the effect that the credibility of economic authorities and individuals' expectations have on the behavior of different economic variables. The paper examines how other fields of science such as physics and psychology offer us several elements to understand current economic relationships. Nature provides us elements that could help with the creation of a new economy reality. In particular, the paper analyzes how the fall in the intensity of the earth's magnetic field could facilitate this process.

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1. Introduction

Currently, the world is facing big changes. The pace of the changes has not comparison with any other time in history. Communications are advancing at impressive rates. The transmission of a single event can be watched simultaneously by millions of people around the world. Young people have never used a typewriter, or have sent a letter by using traditional mail, but instead communicate instantly with friends anywhere in the world. Physics and biology have progressed in their findings, as never before in history. For instance, the string theory and the progress of the human genome have provided the opportunity to see the universe, at micro and macro level, differently than to what was thought a few years ago. The changes in the various fields of science, together with the current economic crisis provide us a unique opportunity to rethink economic theory and practice. These events also raise great possibilities, which may involve significant changes both within countries and in the international economic relations. Climate changes, for example, suggest the need to evaluate consumption patterns and economic relations to maintain and increase levels of individual and social welfare.

The behavior of economic variables has not been oblivious to these changes. It appears that the economy is experiencing similar changes to those that have been observed on the climate. Earthquakes, tsunamis, hurricanes, heat and cold waves seem to move to the behavior of the global economy. Indeed, the global economy has recently shown a turnaround that is not easily comparable with any previous period. Changes in oil prices, instability in stock markets, variations in levels of inflation, variability in housing prices and exchange rates have modified traditional consumption and investment patterns.

With the increasing globalization, the chain reactions and economic spillovers between countries are becoming more frequent. Decisions and preferences of individuals, not only affect human beings reality, but can have a global impact. The relationship between humans and the impact on their daily lives, as the basis for development of regions, countries and the world in general are central in the research, which also consider that decisions and actions taken every day, for each of the 6.5 billion people inhabiting the planet, are responsible for economic results.

Based on the foregoing, it is worth noting the importance that studies on economic development consider differences among individuals, regions or countries. The human body is an example of this. Each cell of the human body works to its full potential for the good of the body. Each cell has a different function but if one of them has a problem, the whole system is affected. Economic development, in the context of globalization, should not be understood as a process of homogenization of individuals or countries, but rather as the maximum development of individual potential and global harmony. Given these changes, several questions arise, for example, where individual resources should be invested? What economic policy monetary and fiscal authorities should follow? Where to move savings?

According to quantum physics, "in the universe there are an infinite number of possibilities that overlap ... and is the focus of our consciousness that determines which of the many possibilities become reality" (Braden, 2007). Can this concept of quantum physics be used to explain the economic behavior? If so, we face a large number of possibilities to change reality and review the economic paradigms that have prevailed and have been the basis for decision making of individuals and policy makers. Applying this concept in economics, individuals would have more power but also more responsibility in creating the economic reality. Economic results would depend primarily on the changes that occur in the consciousness of individuals and in the society as a whole.

For economic agents, used to take decisions based on the principle of "rational agent", the idea that is the observer who determines the reality within an infinite number of possibilities can certainly be far from the traditional theory and from the way economic decisions have been taken so far. A key point associated with the process of change is directly related to the belief systems under which individuals act. Thus, the more people believe and accept a new reality with greater well-being, the closer we come to it. Our belief systems are the only limit to the achievement of individual and collective purposes.

Economic history gives us an insight of how the state of consciousness and beliefs of the society at any given time defines the prevailing economic systems. Taking into account that collective consciousness is essential in the configuration of economic systems, new possibilities for defining a new economic system are open. Then, with the awareness that we

are the architects of the reality and responsible for economic outcomes, our task should be focus on finding the economic system we would like to observe.

One factor that may contribute to the changing of consciousness and allow the manifestation of a more harmonious economic reality is the changing of the Planet's magnetism, which has fallen significantly in recent years. According to scientists, the Earth's magnetic field is now 10% weaker than in 1835, when German mathematician Carl Friedrich, began keeping records on it (Courtillo and Le Mouel, 1988). The fall in the earth's magnetic field have significant effects on the planet and on the behavior and health of people, which could also affect economic behavior.

This article is structured in the following way. Section 2 evaluates the impact of the beliefs system and expectations of individuals and the society on economic results, showing different empirical examples. Section 3 analyses how individual preferences can be associated with collective preferences, showing as the prisoner´s dilemma concludes, that each individual benefits more under universal cooperation that under non-cooperation. It also looks at the current economic crisis and assesses how the crisis could be an opportunity to achieve more balanced economic relationships. Section 4 explains how Earth's magnetism could affect the health and behavior of individuals and consequently economic performance. Section 5 provides some final remarks.

2. Belief systems and economic reality

In this section we examine, by using some concepts from Physics, how intentions, belief systems and expectations of individuals and society can affect the behavior of economic variables. In particular, it is analyzed how the relationship between the observer and the observed reality can affect the economic performance. The study of this relationship has been present throughout time. Leitman (2006) gives an account of these developments and recalled that in the vision of Isaac Newton, the world exists even though we were or not to perceive it. Later, Einstein suggests that if the speed of the observer is changed, there would be different images of the reality. Thus, observers with different qualities and feelings would perceive

different images of the world. A third approach considers that the observer affects the world and therefore the picture that he perceives. This approach suggests that there is a correlation between the individual and the world it perceives and the perception of reality is a combination of the attributes of the observer and the observed object's attributes. A final approach proposes that there are infinite possibilities, and is the observer, based on their attributes, who chooses which one to perceive.

Quantum physics, through the study of the relationship between the observer and the observed reality, provides us with great opportunities, but also with great responsibilities to change the reality we perceive[1]. The quantum world is an unspecified place, in which is not possible to speak about absolute properties. In fact, the general description of the relationship between the observer and the reality is made from the so-called *wave function*, which is a description of probabilities and possibilities.

Using these concepts in economics, we could say that the prevailing economic systems throughout history have pointed out this link. In fact, for economic historians, it is clear that consciousness and beliefs of society have largely influenced the different modes of production that have existed throughout history. These modes in turn change and adjust as beliefs and expectations about the economic model change. For instance, feudalism, mercantilism and capitalism have been framed in specific states of consciousness of people.

Taking into account that collective conscience has been basic for major changes in the different economic systems that have prevailed throughout history; new possibilities are open for the conception of the economic system we want to prevail. In this regard, the role of individuals and society should be focused on this system. The time to realize the new system will depend on how quickly the system is incorporated in the beliefs of individuals and society as a viable and feasible reality.

[1] Pioneers of quantum theory are Max Planck and Albert Einstein. The formal development of the theory was development by several physicists and mathematicians such us are Schrödinger, Heisenberg, Einstein, Dirac, Bohr and Von Neumann, among others.

A classic example of how reality is affected by the belief systems is associated with the vision that Indians in America had at the arrival of the Spanish ships in 1492. These boats did not exist in the reality of the Indians, who lived in America, which prevented them to watch and recognized the boats. They only observed the movement of waves, which made them think that something was happening.

In economics, a practical example that allow us to understand how the belief systems affect the observed reality, is related to the effect that the credibility of the economic authorities and expectations of people have on the behavior of different economic variables. With regard to the importance of expectations in the economic results, Pesaran and Weale (2005) argue that these are an integral part of the decision process both of households and firms. Overall, expectations adjust with policy changes or other economic events and as the credibility of the economic targets determined by the authorities increases, economic agents involve these targets in their expectations and in their decisions, making targets easier to achieve. Thus, credibility is important in the formation of expectations and beliefs of individuals and these in turn are central in defining the economic reality. When the credibility of authorities is low and the expectations of individuals and society are not focused in the proposed target, this will be harder to achieve. In this context, it can be said that the behavior of economic variables is the result of the combination of belief systems and the collective consciousness, which are formed based on the preferences and expectations of individuals, and the credibility of authorities.

Given the link between expectations and observed results, is likely that in the presence of a difficult economic situation, if expectations focus on fear, losses and shortages, these feelings could trigger a process that might speed up the plight. Bank runs are an example of how panic can worsen a situation. Regardless of the actual financial situation, the perception among economic agents of the probability of a crisis may accelerate massive withdrawal of money, sparking panic. Thus, as a result of fear and loss of confidence, the crisis accelerates. Conversely, if faced with a probability of crisis, expectations and beliefs remains positive, the trend of the crisis may change direction, with different economic results.

Some empirical examples from the economic reality

This section analyzes how belief systems can influence economic results by using some practical examples of the economic reality. In particular, the behavior of inflation is examined, which may be associated with a common preference among economic agents, and the behavior of the exchange rate between two currencies, associated with heterogeneous preferences by individuals of a society.

- ***Common Preferences***

The theory and practice of inflation targeting is an example of how the credibility on the targets set by economic authorities and the widespread belief that low inflation is important for society has led to a reduction in the general level of prices of goods and services in several countries. In fact, within the widespread beliefs of economic agents, it is accepted that inflation is an important variable in the economy and reducing it should be a priority for society, for the costs this entails. In general, there is a consensus among individuals about preferences for low inflation. This constitutes an example of common preferences among members of society.

As a way to ensure the reduction of inflation, several countries established that monetary policy and inflation management would be responsibility of independent Central Banks, during the late eighties and early nineties. These measures improved the credibility of monetary authorities to reduce inflation, which, in many countries, actually showed a downward trend throughout the nineties. With the establishment of Central Bank independence, monetary authorities chose to define an annual inflation target. The fulfillment of this target was generally improving as the credibility of the authorities was increasing and individuals and society incorporate those targets into their expectations and economic decisions. In this sense, one could argue that a credible target encourages adherence to the forecasts. However, when society changes its priorities and considers, for example, that production and employment are more important, despite the credibility of economic

authorities, collective consciousness would have a major influence on the result, being more difficult to reduce inflation.

- ***Heterogeneous Preferences***

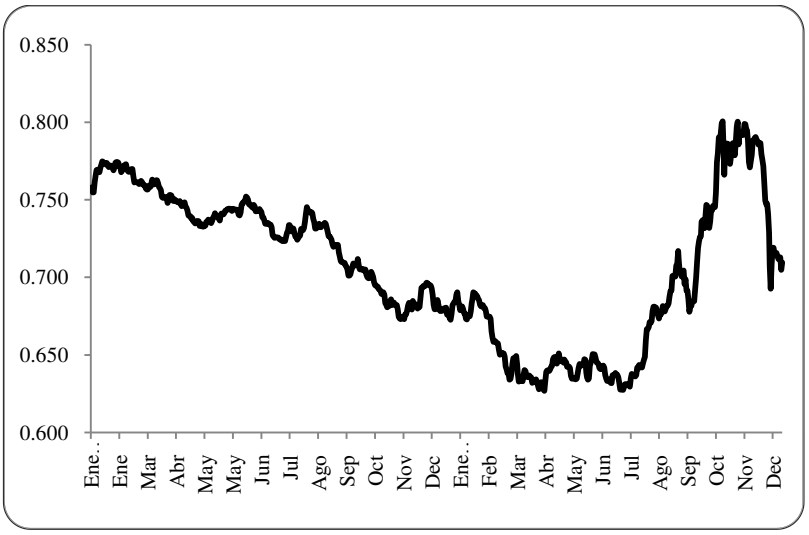
Unlike, preferences for the behavior of the exchange rate, allow us to explain what happens when expectations and preferences of members of a society are heterogeneous. For this variable, some economic agents may prefer the revaluation of the currency, for the economic advantages they can get. In this group are people who import goods and foreign currency debtors. On the other hand, part of the society may prefer the devaluation of the currency. In this group are exporters, for whom a weak local currency will improve their profitability levels.

When agents are divided on their preferences, a group of individuals prefers a revalued exchange rate and other an undervalued exchange rate, a question arises about the behavior that would have the variable. Unlike inflation, which generally has a more stable behavior, the exchange rate between currencies is characterized by significant daily fluctuations, although the long run average of the changes in the variable is generally small. Using the principles of quantum physics about the importance of the observer in the definition of reality, it could be said that the perception of reality is a combination of the attributes of the observers and the observed object's attributes. This may explain the preferences of the economic agents for the exchange rate, which usually show significant fluctuations in the short run but tend to be stable in the long run.

In particular, when analyzing the behavior of the exchange rate between U.S. dollar and the Euro, for the years 2007 and 2008, it is observed, on one side, a high volatility (see Figure 1). Indeed, the standard deviation reached $0.0475 per Euro, with a maximum value of $0.8007 and a minimum value of $0.6269. On the other side, for the two years, the daily average of the variation of the exchange rate was near zero, while the standard deviation was $0.0035 per Euro, although there were changes in a single day of $0.0193 per Euro. Exchange rate indicators show that fluctuations in the variable have occurred in both directions, reflecting

the preferences of different population groups. The fact that the standard deviation exceeds the average daily change may indicate, moreover, that although the daily fluctuations may be significant in the short term, the preferences of different groups could be compensated in the long term. Particularly, if we consider the high volatility that the exchange rate registered during 2007 and 2008, while the average daily change between the dollar and the euro was near zero.

Figure 1: Exchange Rate Dollar -Euro
January 2007- December 2008



Source: http://www.oanda.com

To analyze the behavior of economic variables, these examples advocate that when most economic agents believe in the achievement of an economic target, but also feels and perceives that the target is favorable and it is also possible, as in the inflation example, there is a high probability that the target is achieved without major difficulties. On the contrary, when society's preferences are diverse, the behavior of the variables would depend on the intentions, expectations and preferences of the different individuals. It is possible that in the short term, wide variations in the behavior of the variable are observed, depending on the strength of the intention of each group, but in the medium or long term the variable could be maintained around a stable value. Changes of trend in the long term, which in economics could correspond to structural breaks, would be accompanied by the introduction and acceptance of these in the of beliefs system and expectations of people.

3. Individual preferences vs. Collective preferences

In addition to the differences in preferences among individuals, individual preferences might differ from the preferences of society. In economics and especially in game theory, situations in which the individual desires and intentions do not coincide with those of another individual or with those of society have been studied. This situation has been studied through the so called "prisoner's dilemma", which illustrates the conflict between social incentives to cooperate and individual incentives to don´t do it and act, instead selfishly. In particular following Brown and Jackson (1995), this dilemma is explained through the following example: There are two players (A and B), no one knows what the other will do and there is no communication between them, so that there can be no negotiation between them. Each player has two strategies: cooperate with the other player, or not to cooperate. Because there are two strategies and two players, there are four possible combinations. Each strategy has an outcome associated with monetary payments, which are summarized in Table 1.

For Player 1, the best outcome would be Cell III, when he does not cooperate, and player 2 does, and the worst outcome would be cell II, when he cooperates and the other player does not. For Player 2, the best result is obtained when he does not cooperate, while player 1 does (Cell II) and its worst result is shown in Cell III, when he cooperates and the other player does not. Each player faces a dilemma. If each player takes the option of cooperating to get the best result for both (Cell I), risks that the other player adopts the strategy of not cooperating. Thus, the expected result is given in Cell IV, which is less desirable than Cell I, in which the two players would be better. The fear of being betrayed by the other player leads to this result[2].

From a collective standpoint, the expected result appears as irrational, since the two players could be better off if they cooperate with each other. Theoretically, it is said that the outcome

[2] In the classic case, the prisoner's dilemma assumed that a police arrest two suspects. There is insufficient evidence to convict them; after having separated them, the police offer the same treatment to the two suspects. If one confesses and his accomplice not, the accomplice shall be sentenced to a term of ten years and the first will be released. If one confesses and the accomplice remains silent, the first shall be sentenced to ten years and the accomplice will go free. If both remain silent, both will be imprisoned for six months for a misdemeanor charge, while if both confess, both will be sentenced to six years.

of the individual interactions is not optimal in the sense of Pareto, as there is a situation where one player could be better off (even the two players could be better) without the reduction of welfare in the other player.

Table 1: Prisoner's Dilemma

Strategies of player 2	**Strategies of player 1**	
	Cooperation	**No cooperation**
Cooperation	Cell I (3,3)	Cell II (1,4)
No cooperation	Cell III (4,1)	Cell IV (2,2)

Source: Brown and Jackson (1995)

Thus, what is good for each individual acting to maximize his individual interest is not always the best for the society as a whole. This is precisely the conflict between individual and collective rationality. In particular, Brown and Jackson (1990) states that "each individual benefits more under conditions of universal cooperation than under conditions of universal non-cooperation, but the individual always benefits more by not cooperating if others cooperate." For some, the problem of the "prisoner's dilemma could lie in the lack of communication between individuals. Nevertheless several experiments have shown that even if players communicate between them, there still exists the possibility of deception between them (Holt and Capra, 2000).

Traditional economic theory is based on the assumption that individuals are rational in the sense that they seek to maximize utility at individual level. However, as we have seen, this does not necessarily lead to greater welfare. In the case of the prisoner's dilemma, cooperation can be obtained as an equilibrium outcome. If society is better off, each individual will be better off, considering that the welfare of society affects the individual welfare and vice versa. This leads us to think that an economy based on cooperative agents would be achieved higher levels of welfare for both individuals and society in general. This would mean moving from an individual solution to a cooperative solution in the prisoner's dilemma example.

The butterfly effect in the current crisis

In addition to study the differences that may exist between individual preferences and social preferences, the prisoner's dilemma allows us to understand how individual decisions have an impact on another and in the society as a whole. Again using principles of physics, it is recognize that we are all energy and we are interconnected. Sometimes, individuals make conjectures about what the other will do and on that basis individuals take its decisions. This link may be associated with the well-known "Butterfly effect", which is associated with the idea that the flapping of a butterfly's wings can create tiny changes in the atmosphere, which could result in a tornado. In other words, small changes in initial conditions can have large long-term effects on the rest of the world.

Currently, an example that illustrates the application of this effect is associated with the economy crisis, initiated due to the housing market crisis in the United States. At first, some banks lend to a group of people considered high credit risk, this group of people having trouble responding to the loan payments, triggered a series of events that have had global impact. In particular, the crisis spread to the housing market, financial and insurance systems and to the economy in general, and not just in the country where the phenomenon began, but across several countries. If the butterfly had not flapped its wings, the storm's path has been different. If people with housing loans might not have had difficulties in paying its debt obligations, the economic system had taken a different course to that observed, not necessarily better, not necessarily worse, but different.

The intentions and preferences of individuals, then, not only affect individual´s reality, but have an impact on the reality that manifests at global level. Similarly, changes at global system also have an impact on expectations and on the reality at individual level. Taking into account that individuals' reality would affect the outcome manifested collectively and vice versa, expectations and actions taken in front of an economic crisis are fundamental for stopping or spreading the crisis.

On this subject it is worth considering a simile that nature offers us, particularly, the behavior of people facing the imminent arrival of a hurricane. The option of many is to collect the most valuable assets and try to locate them in a safer place, which will not be reached by the climatic event. With the imminent presence of an "economic storm" many acts the same, following forecasting, place assets and property where they will not be affected. This behavior, however, does not take into account that if all people run to the same place, it could be even more chaos to that of the hurricane itself. When, it was announced that a hurricane would affect the area near the city of Houston in 2006, it was a call for the city to be evacuated, which resulted in big traffic congestions and a general chaos when people tried to flee the imminent arrival of the hurricane. Finally, the hurricane diverted and did not affect the city. Nevertheless, many people were affected by the chaos caused by the evacuation of the population.

This experience that nature provides us, offers lessons for economic decisions. For instance, before making a decision, economic agents should bear in mind that predictions could fail, which are usually elaborated following the results of past experiences or the results and recommendations of theoretical models, which may be based on restrictive assumptions about reality. Besides, it is important to take into account as Stefano (2009) suggest that individuals might have nonstandard preferences, beliefs and decision making. Additionally, thoughts and emotions of economic agents involved in decision making could change over time and with the particular environment they are facing. Thus, if all agents tend to move to where forecasts suggest, the end result may be a greater chaos in compare to the chaos cause by the storm itself. Therefore, based on what was discussed earlier, this experience of nature, gives us elements to think that in a context of imminent financial risk, rather than being driven by fear and the chaos, individuals must remain positive and beware with the expectation and actions they take.

The relationship between the system of beliefs, thoughts and emotions and the observed reality is twofold. In this respect the classical economist Adam Smith in his book “Theory of Moral Sentiments”, remembered us that the state of wealth or poverty of individuals (or rather how they feels about them) affects emotions and deepest feelings of people and vice versa:

> "What can we added to the happiness of the man, who is in health, who is out of debt and has a clear conscience?. To one in this situation, all accessions of fortune may properly be said to be superfluous… This situation, however, may very well be called the natural and ordinary state of mankind. Notwithstanding the present misery and depravity of the world, so justly lamented, this really is the state of the greater part of men. The greater part of men, therefore cannot find any great difficulty in elevating themselves to all the joy which any accession to this situation can well excite in their companion… Adversity, on this account necessarily depresses the mind of the sufferer much more below its natural state, than prosperity can elevate him above it" Smith (1759).

Based on the Smith´s approach and considering the relationship between the inner feelings and emotions and the observed reality, it could be said that poverty and prosperity can be associated with the system of beliefs and conciseness of people. Thus, the concepts of prosperity and poverty may change with the assessments that the collective consciousness have about them, which also may change over time. In particular, the beliefs that support the current economic system have put much attention on the fear for not archive certain level of prosperity or on the fear for lose it. The economic system has focused on the accumulation of resources, without a real concern for others who are also part of the planet. The desire to have more led us to the culture of scarcity, which always makes us feel that something is missing. The feeling that we are not complete is permanent and distressing. We are always looking forward to more to fill our emptiness. The fear of scarcity and loss makes us cling to the much or little we have. To fill this gap, we accumulate assets, with not care for the others.

4. Understanding magnetism and how it affects individuals

In addition to the importance of conciseness and beliefs system on the creation of a more balance economic reality, currently nature offer us elements that can help with this purpose. In particular, some studies have suggested that the magnetism of the earth has effects on the health, behavior and consciousness of people and consequently on the observed reality[3]. In this regard, NASA, through the study of ancient texts for different historical periods and

[3] See, for example, Kuleshova, Pulinets, Sazanova and Kharchenko (2001).

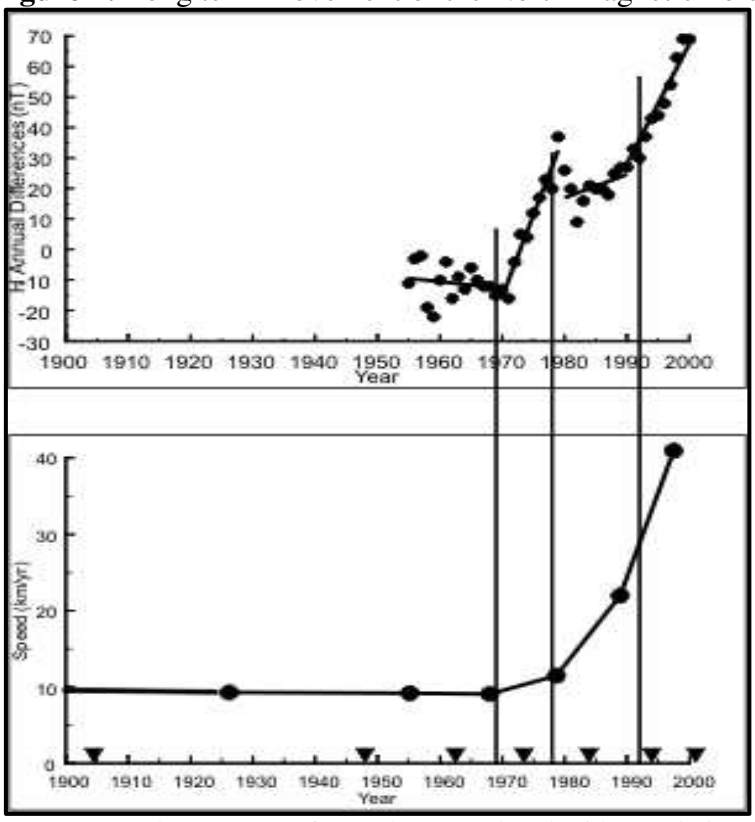
making projections into the past, found that different civilizations have been strongly influenced by the Earth's magnetic field. In general, it is found that in times of low magnetic fields there is a greater awareness of individuals; while in times of high magnetic fields, the level of awareness is lower (Neiling 2005).

It is important to mention that magnetic fields are produced by the motion of electric currents. The origin of the earth's magnetic field, initially measured by Carl Friedrich Gauss in 1835, is associated with the dynamo effect. According to the Geomagnetism Program of the United States[4], the historical information of the earth's magnetic field is preserved in magnetic fossils, due to the freezing of lava that is deposited on the surface of the earth. These fossils reveal information about the time of solidification, and suggested that the earth has had magnetic field by at least 3.5 billion years. Examination of these geological records also shows evidence that the Earth's magnetic field has reversed at intervals, with full exchange between the North and South Pole. Although, specific periodicity in the occurrence of such reversals has not been found, studies suggest that the last reversal of polarity occurred about 780,000 years ago. Likewise, researchers suggest that geomagnetic intensity has declined steadily over the past 2,000 years by about 35% (Humphreys, 2002).

Recent research has found that during the last century there have been significant changes both in the Earth's magnetic field and in the rate of change of the North Magnetic Pole (see Natural Resources of Canada, 2008). It is worth noting that changes were not uniform, but were presented in a series of steps that occurred for several years. For example, in the case of the North Magnetic field, magnetic records show that six geomagnetic jerks of global extension occurred during the last century in 1901, 1913, 1925, 1969, 1978 and 1992. The earth jerk of 1969 represents the beginning of the increase in the speed of the North Magnetic Pole and the two subsequent jerks, especially the one close to 1992, are related to further increases in speed (see Figure 2). In contrast to the current acceleration, the magnetic Pole showed little movement between 1831 and 1904 (Natural Resources of Canada, 2008).

[4] Information available at http://geomag.usgs.gov

Figure 2: Long term movement of the North Magnetic Pole



Source: Natural Resources of Canada. Reproduced with permission from the "Resources Canada 2008", courtesy of "The Geological Survey of Canada"

As a consequence of the mentioned changes, the North Magnetic Pole is moving slowly through the Canadian Arctic. In particular, information from the Natural Resources of Canada (Resolute Bay Observatory), the closest to the North Pole, shows that since 1970, changes in speed of the Magnetic Pole has increased from 9 to 41 km per year. During the last century, it has moved nearly 1,100 km. The positions of the North Magnetic Pole for 2001 and estimated positions for the years 2002-2005 can be seen in Table 2.

Table 2: Estimated North Pole Position

Año	Latitud (°N)	Longitud (°W)
2001	81.3	110.8
2002	81.6	111.6
2003	82.0	112.4
2004	82.3	113.4
2005	82.7	114.4

Source: The Geological Survey of Canada

With the fall of the magnetic field, there is a possibility that the Earth´s Magnetic Poles could reverse in the foreseeable future. In this regard, Professor Jeremy Bloxham of Harvard University argues that even the field could disappear completely in 1,500 to 2,000 years, if the rate of decline remains constant (Bloxham, 2003). Nevertheless, according to Gallet (2003), historically, the magnetic field reversals were always preceded by a weakening of the magnetic field, as at present, but not all weakening of the magnetic field has led to a reversal.

The fall in the Earth's magnetic field can have significant effects on the planet and on the behavior of individuals, especially in regions where the fall of the field is greater. For instance, Bloxham (2003) argues that in the south eastern of the Atlantic Ocean, the continuous weakening of the magnetic field has hit the screen that protects the earth from natural radiation. Likewise, the author suggests that orbiting satellites can be affected when they pass near regions with significant decreases in the magnetic field. Among the satellites that have been affected is the Satellite "Danish, ironically designed to measure the magnetic field of the Earth." In Addition, the Geomagnetism Program of the United States has found that changes in magnetism have direct effects on electricity-based technology and therefore on the health of people.

Moreover, in the scientific literature there are a number of studies that linked the fluctuations in the Earth's magnetic field and geomagnetic storms with health disorders and changes in the consciousness of people. Ward and Henshaw (2008), in a survey of studies relating to changes in the Earth's magnetic and the effects on health, find that the most common problems are:

i) The disruption in the synthesis of melatonin, due to the effect that the magnetic field has on the pineal gland activity. This relationship has been studied by Bartsch H., Bartsch C, Mecke and Lippert (1994), Burch, Reif and Yost (2008); Juutilainen and Kumlin (2006) and Weydahl, Sothern, Cornelissen, and Wetterberg (2001).

ii) Increased in the suicide rate. In particular, Gordon and Berk (2003) found a significant correlation between geomagnetic storms and the increase in the number of suicides. Persinger and Psych (1995) also studied this relationship.

iii) Depression and mental disorders. Several authors have found a significant relationship between changes in magnetism and anxiety levels, sleep problems and manic-depressive illness (see for example, Kay [1994], Persinger [1987] and Raps, Stoupel, and Shimshani [1991]). It is worth mentioning that Krivelyova and Robotti (2003) found a significant relationship between high levels of geomagnetic activity and stock market returns. The results are consistent with changes in risk-taking behavior caused by depression, since geomagnetic activity has been found to increase the incidence of depression among people.

iv) Cardiovascular diseases. The relationship of these diseases with the geomagnetic activity has been studied by Belov, Kanunukov and Kiselev (1998); Chernouss, Vinogradov and Vlassov (2001), among others.

v) Light sensitivity. The study of relationship between light sensitivity and geomagnetism can be found in Cremer-Bartels, Krause, and Küchler, (1983); Thoss, Bartsch, Fritzshe, Tellschaft and Thoss (2000) and Thoss and Bartsch (2007).

vi) Finally, it has been found a relationship between the changes in the Earth's magnetic field and the number of cases of sudden infant death syndrome. This relationship has been studied by Goldwater (2003), Eckert (1992); Persinger and O'Connor (2001); Sparks and Hunsaker (1988), Sparks, Coyne, Sparks and Hunsaker (1997 and 2002); Weissbluth and Weissbluth (1994).

Given the relationship between the magnetism of the earth and the health and behavior of people, it is worth asking whether changes in the planet's magnetism, have had some impact on economic behavior. On this topic, Krivelyova and Robotti (2003) find that there is a significant negative relationship between stock markets returns and geomagnetic storms. The authors link this result with the evidence found in the literature showing that geomagnetic storms have a major impact on the behavior of individuals and in the incidence of depression among people, which in turn is relating with changes in risk taking behavior, important factor in the performance of stock markets (see, for example, Lo and Dmitry, 2001).

4.1. Magnetism and its impact over time

As mentioned, the Earth's magnetic field has registered major changes during the last century. The intensity of these changes has not been uniform in all areas of the planet. Indeed, while in Europe and Asia, the field intensity has declined to some extent or increased slightly, in America and southern Africa has registered significant decreases. According to the National Geophysical Data Center the Earth's magnetic field is described by seven parameters: declination (D); inclination (I); horizontal intensity (H); the north (X) and east (Y) components of the horizontal intensity; vertical intensity (Z), and total intensity (F). The parameters describing the magnetic field direction are the declination (D) and inclination (I). The intensity of the total field (F) is described by the horizontal (H), vertical (Z) component, and north (X) and east (Y) components of the horizontal intensity. These components can be measured in units of gauss, but usually are reported in nanoTesla (1NT * 100.000 = 1 gauss). It is worth noting that the magnetic field intensity of the planet ranges from 23.000 nT to 65.000 nT (0.25 to 0.65 gauss).

In the following analysis, the total intensity of the Earth´s magnetic field (F) is used as an indicator of magnetism of the planet, which includes information of the different components. This indicator comes from the International Association of Geomagnetism and Aeronomy, (IAGA), which is the product of a joint effort between magnetic field modellers and institutions involved in collecting and disseminating magnetic field data from satellites, observatories and surveys around the world[5]. Based on this indicator, Table 3 shows that countries near the meridian 70° W, which correspond to countries of the American continent, have registered the biggest fall in the magnetic field. The drop reaches about 6,000 nT, on average, representing a decrease of about 15% between 1905 and 2005. In addition, countries located north and around the meridian 0°, which correspond mainly to countries located in Europe and North Africa, have registered an increased in the magnetic field of 1000 nT, on average, representing an increase of about 3% in 100 years. The magnetic field of countries located in southern Africa, near the meridian 0°, has decreased by about 10%.

[5] Information about this indicator is available at: http://www.ngdc.noaa.gov/IAGA/vmod/igrf.html and http://ngdc.noaa.gov/geomagmodels/IGRFWMM.jsp

Table 3: Earth's magnetic field for different latitudes and longitudes

Longitude: 70 W					
Latitude	50 N	25 N	0	25S	50 S
1905	61,382	50,670	33,740	28,806	36,761
1930	58,938	49,456	33,927	27,803	37,268
1950	58,038	49,085	33,544	26,843	35,090
1970	58,426	47,720	32,011	25,580	33,124
1990	57,437	45,198	30,504	24,531	31,435
2000	56,545	44,021	29,691	24,006	30,655
2005	56,057	43,350	29,293	23,726	30,281
Change in nT	-5,325	-7,320	-4,447	-5,080	-6,480
Change %	-8.7	-14.4	-13.2	-17.6	-17.6
Longitude: 0					
Latitude	50 N	25 N	0	25S	50 S
1905	46,894	37,840	29,954	30,455	37,094
1930	46,340	37,220	30,373	30,403	34,671
1950	46,728	37,451	30,847	29,767	32,617
1970	47,203	37,611	30,953	29,074	30,046
1990	47,653	37,781	31,232	28,138	27,698
2000	47,867	37,896	31,408	27,630	26,689
2005	48,026	38,008	31,498	27,434	26,290
Change in nT	1,132	168	1,544	-3,021	-10,804
Change %	2.4	0.4	5.2	-9.9	-29.1
Longitude: 70E					
Latitude	50 N	25 N	0	25S	50 S
1905	53,644	42,300	37,289	42,616	49,919
1930	53,901	43,557	37,293	41,327	48,095
1950	55,049	44,919	38,507	42,243	48,381
1970	55,488	44,979	38,686	42,913	48,706
1990	55,410	44,679	38,393	42,989	48,105
2000	55,717	44,749	38,774	43,937	48,113
2005	55,953	44,969	38,999	44,446	48,251
Change in nT	2,309	2,669	1,710	1,830	-1,668
Change %	4.3	6.3	4.6	4.3	-3.3

Source: IAGA. Information available at http://ngdc.noaa.gov/geomagmodels/IGRFWMM.jsp

One of the areas of the planet where the field has registered the greatest decline is located in the South Atlantic (longitude 0°, latitude 50° south), whose field has dropped by more than 10,000 nT, representing a drop of more than 30% in 100 years. Unlike the rest of the planet, the magnetic field of the northern countries of Asia, located around the meridian 70 ° E, and countries located in the Middle East, have record important increases, especially in areas that cover countries such as India, Israel and Egypt.

The recent slowdown of the magnetic field in South America and the rise in regions close to India and Tibet may be related to the information provided by Melchizedek (2007) about the transfer of the Earth's kundalini from India and Tibet to the mountains of Chile and Peru in South America. According to the author, the kundalini of the earth has two poles, one is at the center of the earth and the other is at a point on the surface, and it manifests as a spiritual energy that awakens consciousness of people who are living near this area. Changes in the economic and social situation of the place of departure and arrival of the kundalini energy of the earth could suggest an exchange of energy in these two areas of the planet. In particular, economies of China and India have grown significantly in recent years and political and social conflicts have been present in these countries (starting with the invasion of China in Tibet). On the other hand, a spiritual flourishing has been observed in America, accompanied by the transfer of spiritual groups to this area of the planet.

In the particular case of the United States, the current economic crisis foreshadows a change in the economic relations that have prevailed so far. In this country, the magnetic field is relatively high compared with other areas of the planet. However, it is also one of the areas where the magnetic field has recorded the greatest decline. For example, in the case of New York City, the indicator of the magnetic field (F) increased from 59.828 nT in 1907 to 52,763 nT in 2007, representing a decline of 11.8% during the period[6]. As shown in Figure 3, the collapse of the magnetic field was accelerated since 1975.

Colombia, a country less economically developed and with less intense magnetic field, has also registered a significant fall in the magnetic field during the last century. In particular, with reference to the city of Bogota, the field fell from 36.569 nT in 1907 to 31.668 nT in 2007, representing a decrease of 13.4%, with an acceleration of the decline since 1950 (see Figure 4). For this country, it is worth noting that the proximity to the Panama Canal may have an impact on the country, because of the breakdown that occurs from its construction that interrupts the energy flow of the continent. On this point, Melchizedek (2007) maintains that during the transfer of the kundalini of the earth from Asia to Shout America, the energy was trapped in the Panama Canal, for a period of time, creating energy imbalances in the

[6] Measures for different U.S. cities show similar indicators.

region. According to this author, many believe that this stagnation has been the source of the war and violence problems that the country has faced over the past years.

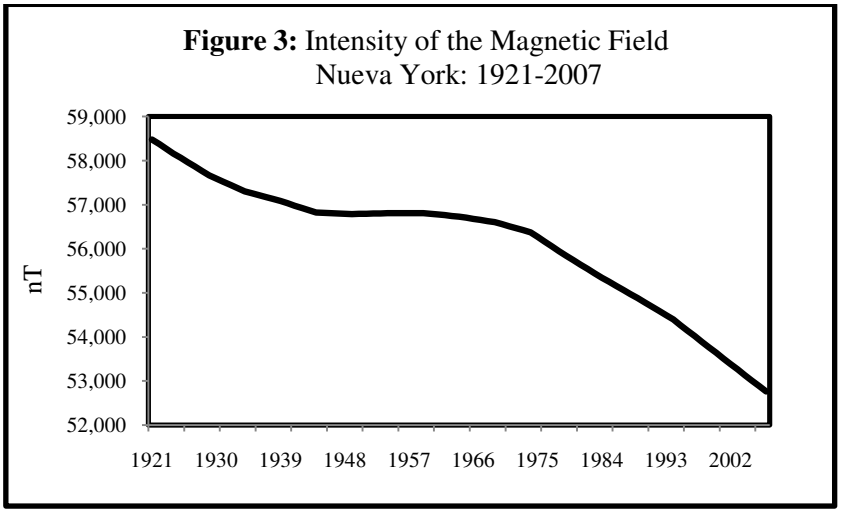


Figure 3: Intensity of the Magnetic Field
Nueva York: 1921-2007

Source: IAGA and authors' calculations.

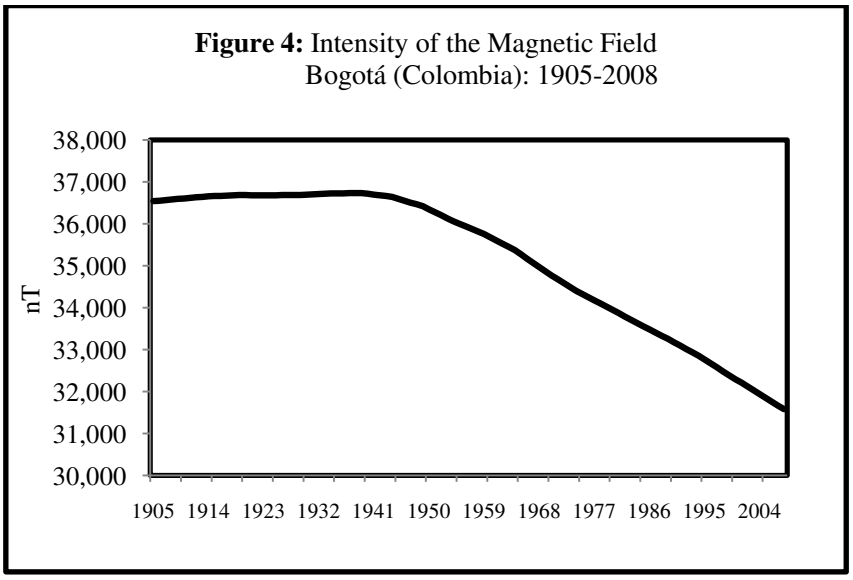


Figure 4: Intensity of the Magnetic Field
Bogotá (Colombia): 1905-2008

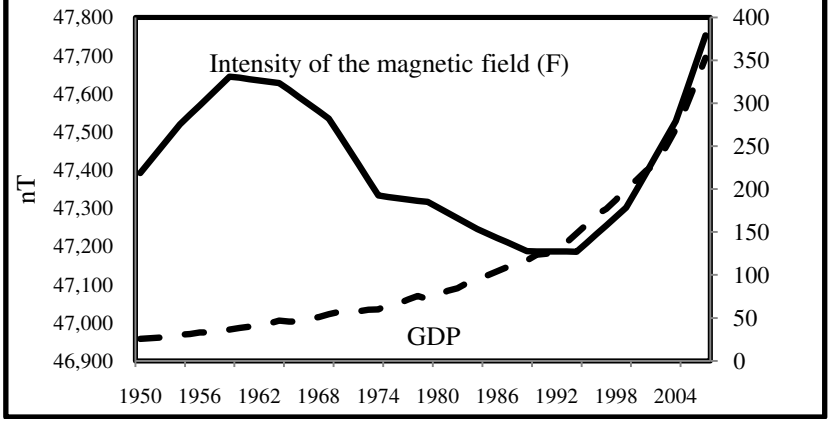
Source: IAGA and authors' calculations

Due to the change in the understanding and spiritual practice that brings the energy, this author emphasizes the great influence that the movement of the kundalini energy of the earth will have for the region and how this will have a global impact. With the arrival of this energy to South America and with the fall in the magnetic field, it might be expected a

collective awakening of consciousness, reflecting a different reality for the countries of the region and its people.

On the other side, it is worth noting that there may be an association between the intensity of the magnetic field of India and the movement of the Earth's kundalini energy. Indeed, the field of the country begins to decline after 1960, right in the year that this energy came to the country from Tibet[7]. Since 1990 the fall in the magnetic field stopped and started to increase substantially, especially after 1995, when the kundalini energy from this area of the planet. This increase was accompanied with a significant economic growth, reflected in an increase in the country's Gross Domestic Product (see Figure 5).

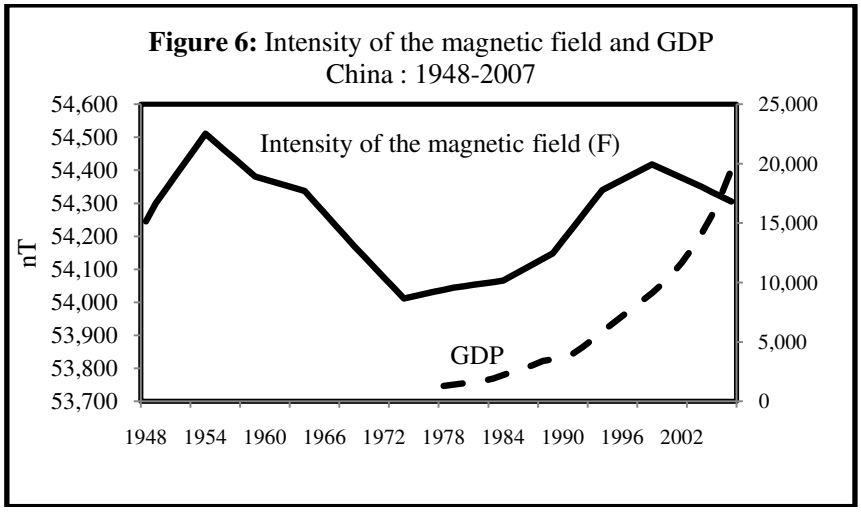
Figure 5: Intensity of the magnetic field and GDP
India: 1950-2007



Source: IAGA, International Monetary Fund (IMF) and authors' calculations

A similar situation occurs in the case of China, where the magnetic field has had an erratic pattern over the last century (as a reference Beijing). In particular, between 1925 and 1974 the field intensity increased, while between 1955 and 1974, it significantly decreases. Subsequently, the intensity of the field increased notably between 1975 and 1999, and since 2000, it has once again begun to fall. As in the case of India, with the increasing in the intensity of the magnetic field, a significant growth of the economy was observed (Figure 6).

[7] According to Melchizedek (2007), the earth's kundalini energy left Tibet in 1959 and went to India, with the departure of the Dalai Lama, then moved to America.



Source: IAGA, International Monetary Fund (IMF) and authors' calculations.

4.2. Magnetism and differences between countries

Based on the foregoing, and taking into account that the magnetic field is not uniform throughout the earth's surface[8], it might be suggested that, although the major effects of changes in the magnetism of the planet have so far been related to health and the awareness of people, economic performance has not been oblivious to changes in the planet's magnetism. In particular, Table 4 shows, for a sample of countries, the intensity and changes in the Earth's magnetic field recorded during the last century, along with the GDP per capita observed in 2007. These variables suggest that countries, with the higher magnetic field, have generally had a higher GDP per capita.

In particular, the correlation coefficient calculated between the magnetic field intensity and GDP per capita, observed in 2007, for a sample of 66 countries, is 0.67 (see Appendix 1). This result suggests a positive and significant relationship between the two variables, as shown in Figure 7. The correlation analysis was also carried out with other variables, such as the human development index and coverage rates of primary and secondary education and similar results were observed. In particular, these indicators are higher in countries with high magnetic field intensity.

[8] The magnetic field varies from less than 30,000 nT, in an area that covers most of South America and Southern Africa to more than 60,000 nT around the Magnetic Poles in Northern Canada, Southern Australia and Siberia.

Table 4: GDP per capita, intensity of the Magnetic Field and its variation

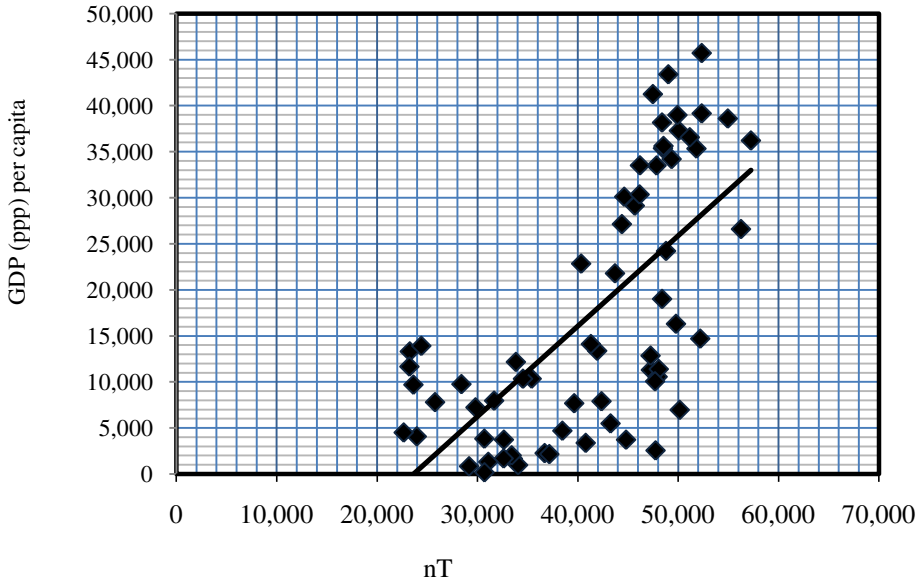
País	Field (F) 1907	Field (F) 2007	Variation % 1907-2007	GDP pc 2007
Australia	58,005	57,261	-1.3	36,226
New Zealand	56,105	54,073	-3.6	26,611
Argentina	28,469	23,265	-18.3	13,318
Brazil	26,340	23,625	-10.3	9,703
Canada	61,692	54,958	-10.9	38,614
Colombia	36,569	31,668	-13.4	7,968
Chile	30,833	24,412	-20.8	13,921
Ecuador	34,035	29,811	-12.4	7,242
Mexico	46,520	41,312	-11.2	14,120
USA	59,828	52,763	-11.8	45,725
German	47,110	49,358	4.8	34,212
Belgium	46,816	48,496	3.6	35,388
Spain	44,103	44,635	1.2	30,118
Netherlands	47,231	48,937	3.6	38,995
Italy	43,751	46,170	5.5	30,365
United Kingdom	47,243	48,549	2.8	35,634
Norway	49,153	50,931	3.6	53,152
Czech R.	46,398	48,802	5.2	24,229
Israel	40,732	44,402	9.0	27,147
Pakistan	47,143	49,946	5.9	2,525
Egypt	39,791	43,271	8.8	5,495
China	53,400	54,305	1.7	5,325
India	45,148	47,753	5.8	2,563
Japan	45,793	46,202	0.9	33,525
Thailand	40,330	42,372	5.1	7,907
Nigeria	31,381	32,610	3.9	2,028
Zimbabwe	36,665	30,706	-16.3	188
Kenya	35,379	33,533	-5.2	1,673

Source: IAGA and authors' calculations.

For a long time spiritual development has been linked with a sacrifice at economic level, the spirituality that is emerging, however, emphasizes the importance of prosperity for all human beings. This prosperity is accompanied by a different consciousness, which covers all aspects of being human, such us happiness, health, family and financial resources. For this reason the spiritual awakening that is emerging in America before being accompanied by shortages, can manifest with prosperity.

Thus, although countries with higher intensity in the magnetic field have had far greater economic development, consciousness of people, accompanied by the collapse of the magnetic field could change this trend. In general, it appears that countries with high spiritual tradition have increased both its magnetic field intensity and its economic growth. In addition, the planet is undergoing a period of change in different science fields, including economic relations. Most likely the current economic crisis will allow us a shift in consciousness that will lead to economic relations with different foundations and bases with emphasis in cooperation and prosperity for all.

Figure 7: Correlacion betwwen GDP percapita and the intensity of the magnetic field



Source: IAGA, International Monetary Fund (IMF) and authors' calculations

5. Final Remarks

To understand the process of how we affect reality, and thus have a greater impact on our lives, it is important to consider, as Laitman (2006) and Berg (2008) remember us, that humans beings only perceive part of the reality that surrounds us. They argue that external situations are perceived according to the internal state of individuals, to the point that if we have nothing in common with the environment is not seen nothing of it. Thus, the more we

progress in the understanding of ourselves, the more we understand that the perception of reality and reality itself depends on it.

An important aspect in the manifestation of reality is the clarity about what we really want, which is sometimes the hardest to clarify (Berg, 2004). It is common that we want "something" but do not know exactly what and usually happens that once our desires begin to manifest, the desire for that decreases and then we want new things. Thus, in the human nature, obtaining a wish, make us wish that twice as strong. If someone has $100 wants $200, if has $200 wants $400 and so on. Nevertheless, once the goal is achieved, the emptiness and dissatisfaction return, and again we want more. Laitman (2006) argues that currently, the sense of absence is the greatest degree of suffering, leading us to believe that the fullness and happiness are beyond the material world. With wishes and thoughts occur the same.

Human nature leads us to rethink economic behavior in terms of utility functions and welfare, traditionally based on income and consumption. As several economists have suggested, higher incomes and higher levels of consumption, not necessarily lead to higher levels of happiness and welfare[9]. For example, John Stuart Mill (1806-1876), argued that “society should aim to maximize the total utility of individuals, aiming for the greatest happiness for the greatest number of people". In his book "Utilitarianism", Mill argued that “cultural, intellectual and spiritual pleasures are of greater value than mere physical pleasure”.

As mentioned, sharing is part of human nature. On this subject, Laitman (2006) and Berg (2008) remind us that personal fulfillment and happiness depend on the ability that we have to share with others. In this sense, the more we share, the more we get not only financial resources but also and most importantly happiness. Thus, the emptiness that occurs when we satisfy our desires with a merely selfish interest, it becomes accomplishment; and our task will be to achieve more, to share more. In this regard, Chopra (1994) argues that "in giving and receiving, the most important is the intention. The intention should always be to create happiness to the giver and to the receiver, because happiness supports and sustains life and,

[9] On this topic see Blanchflower and Oswald (2007), Oswald (1997), Oswald and Powdthavee (2005), Oswald and Powdthavee (2007).

therefore, generates prosperity". Based on the foregoing, we can say that the patterns of giving and receiving are directly associated with happiness and prosperity.

The feelings involved in human nature are therefore important in economic exchange and individual and social welfare. Adam Smith emphasizes this link and the natural concern that individuals have for the welfare of others. In particular, the author states that “How selfish soever man may be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it except the pleasure of seeing it” Smith (ed. 1759). Recently, Amartya Sen (1999) emphasizes the importance of the feeling of sympathy in Smith's work and recalled that the foundation of the economy turns around the ability to interact with each other, depend on each other and depends on the ability to do things for others.

The main obstacle to the achievement of an economic system based on sharing and happiness is related to the belief system that prevails and that makes us think that this is not possible. Our nature, based on these, says that if we give and share we will have less and the other will have more. Many of the ideas that have discussed are basic and simple principals, which have been with us for a long time, but we have ignored them. Now, it is the time to recover and internalize these principles. The current economic crisis and time of fear of loss and scarcity is a great opportunity to see other options and consciously accept that we can be happy and fulfilled as individuals and as society.

Appendix 1: Magnetic field and GDP per capita: 2007

Country	Magnetic field	GDP	Country	Magnetic field	GDP
Argentina	23265	13318	Italia	46170	30365
Brazil	23625	9703	Jamaica	39649	7688
Germany	49358	34212	Japan	46201	33525
Arabia S.	40341	22852	Kenya	33533	1673
Australia	57261	36226	Madagascar	34057	979
Austria	48404	38181	Malaysia	41937	13385
Bélgica	48496	35388	México	41312	14120
Bolivia	23960	4084	Mozambique	29174	843
Bulgaria	47291	11311	Nigeria	33415	2028
Canadá	54958	38614	Nueva Z.	56272	26611
Chile	24412	13921	Panamá	34541	10351
Colombia	31669	7968	Paraguay	22658	4510
Congo	32640	3733	Perú	25782	7809
Costa R	35410	10358	Pilipinas	40798	3383
Dinamarca	50081	37295	Polinia	49793	16316
Dubái	36702	2274	Portugal	43715	21799
Ecuador	29811	7242	Rep. Checa	48802	24229
Egipto	43271	5495	Rumania	48075	11401
España	44635	30118	Rusia	52211	14705
Finlandia	51833	35349	Senegal	32618	1692
Francia	47856	33509	Serbia	47708	10071
Grecia	45689	29146	Sudan	37171	2167
Guatemala	38470	4702	Suecia	51168	36578
Guayanas	30696	3841	Suiza	47491	41265
Holanda	49937	38995	Sur África	28410	9767
Hungría	48407	19020	Tailandia	42372	7907
India	47756	2563	Turquía	47261	12858
Indonesia	44816	3728	Ucrania	50165	6968
Inglaterra	48549	35634	Uruguay	23228	11674
Irán	47963	10570	USA	52358	45725
Irlanda	49031	43414	Venezuela	33836	12176
Islandia	52357	39168	Zambia	31087	1323
Israel	44402	27147	Zimbabue	30706	188

Source: For Earth´s magnetism data, National Geophysical Data Center, based on the IGRF model; information available at http://www.ngdc.noaa.gov/geomagmodels/struts/calcIGRFWMM. For GDP per capita, International Monetary Fund.
Note: The magnetic field is calculated based on the location of the capital of each country.

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