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Montenegro in the entangled world: perceiving the global crisis from a local perspective

Abstract

This paper examines the economic and political reactions of Montenegro's economy to the global financial crisis. Economies and societies of the size of Montenegro testify to the globality of our world. In offering examples from the real and financial sectors of the Montenegrin economy, I attempt to describe some general characteristics of this transitional country as 'an open university of the market economy' after its privatisation process. In the attempt, I lean on quantum mechanics to offer a way of thinking about the global financial crisis, and take a step further in developing the idea of entanglement as a new economic paradigm.

Keywords: *global financial crisis, Montenegro, quantum mechanics, entanglement*

Introduction

The scientific approach to the economy always used to rely on the dominant paradigm in the natural sciences, primarily physics. Physicists changed their vision of the real world and the universe and, soon after, economists were tempted to change their theoretical approach to the phenomena of their – economic – universe. Consequently, under the influence of research in the field of mechanics, capital was treated as a mechanical force within the economic machine. From the Newtonian approach to real world phenomena, such as the Third Law of Motion, economists perceived that every action somewhere within an economic system has a reaction inside that system. Before globalisation fully opened the gates of national markets, forming the superstructure known as the global market, economists, focused on their national economic level, were thinking about such processes in the context of the cause-and-effect principle, and were thus unable to develop the idea of interconnection from the concept of causality.

Globalisation challenges us to find a new paradigm in order to be able to explain modern world economic phenomena. A new paradigm could be formulated according to the physics of the sub-atomic world, i.e. the physics of small-scaled reality based on counter-intuitive principles. In order to accept basic notions from quantum physics, we need to abandon the causality principle that we follow in the classical (macro) world and, in place of a causality-based way of thinking, we are presented with a synchronicity-based mental matrix, where time and space distances can be reduced to an insignificant level. At that point, probability theory provides the theoretical framework on which we may rely.

To locate counter-intuitive methods driven from quantum mechanics and economic concepts, we can look at the way assets are treated in the double-entry book-keeping system – the same asset could be seen on the one side as a real asset and, on the other

side, as its financial equivalent – i.e. a liability. The financial state of economic assets could be treated as a wave, i.e. energy in the system, but the same assets in their real form could be treated as a particle, i.e. as material form. Stuart Hameroff explained it thus in the popular scientific documentary *What the Bleep!? Down the Rabbit Hole*:

> The curtain between the quantum world and the classical world is really mysterious. It is called sometimes the collapse of the wave function because, in the quantum world, everything is in superposition and has multiple possibilities while, in the classical world, these multiple possibilities seem to collapse to particular, definite choices. (Hameroff, 2006)

Just as the collapse of a wave function at sub-atomic level leads to a formation of a physical body, the transformation of financial flows into real assets leads to the collapse of a financial function – the materialisation of financial resources. At the global level, we have all experienced a collapse of the wave function, so many governments will be forced to make a particular, definite choice – to bail out their economies.

In the case of a small transitional country such as Montenegro, the intricate interplay between its economy and its politics is best evidenced in the way the country's government has chosen to intervene in the market in the aftermath of the financial crisis. From an economic standpoint, Montenegro is a useful, as well as an intriguing, case to analyse, and for a series of reasons:

- it is a small economy whose reactions are easier to track and measure (population: 670 000; GDP per capita: $4 400)
- it is a young democracy, which is slowly developing its new institutional structures (having become as independent state on 21 May 2006)
- Montenegro's currency is the euro, even though Montenegro is not a member of the European Union member (its Stabilisation and Association Agreement (SAA) was signed off by the EU on 15 October 2007)
- its economy was the fastest growing in the region over the past few years (annual growth rate was 10.2 % in 2007)
- it is an economy which is highly dependent on imports, much as are most of the economies of the region
- Montenegro's government was among the first in the region to take measures seriously to protect the national economy, and especially its banking sector (which accounts for 10 % of GDP)
- prior to the global crisis, investment in Montenegro was booming and the influx of foreign direct, as well as portfolio, investment has intensified (a net FDI inflow of €567.6m, i.e. 20 % of GDP).

Analysis of the Montenegrin economy and its reaction to the global financial crisis, as an economic counterpart to sub-atomic research in the sphere of quantum physics, can offer a new perception of economic interconnections at the global level.

Linking quantum mechanics with Montenegro's economy

For the purpose of building a conceptual framework for an analysis of the global financial crisis and its reflection on the Montenegrin economy, I am working here with a set of pertinent notions and observations from the field of quantum mechanics:

1. the role of the observer in a measurement process is of critical importance (*observers paradox*)
2. probability as a way to describe the quantum phenomenon of uncertainty (*uncertainty principle*)
3. particles may behave as waves expanding spatially and temporally (*wave/particle duality*)
4. particles may be interconnected over great distances (*entanglement*)
5. particles may be in multiple places at the same time (*superposition*)
6. particles may be unified into one quantum state – i.e. into one state (*Bose/Einstein condensates: BEC*) governed by one wave function.

The role of the observer

The role of the observer, as it is usually explained in quantum physics, is important since, during any act of observation, there is an unavoidable interaction between the observer and the object of the observation. That interaction causes a natural limitation on the precision of measurements, a limitation that is a matter of nature, but it also engages a scientist's 'natural' bias in conducting an experiment. In the preparation of an experiment, our imposition of certain assumptions, either via the choice of relevant criteria or by determining which factors to include in, or exclude from, a model, we are affecting the outcomes of that model. Therefore, the modelling of real-world phenomena emphasises the psycho-social dimension of the process in which one can not observe something without affecting it – as in the experiment in which scientists realised that their attempt to determine the location of an electron will affect its spin. We can have measurements of a quantum particle in superposition only *ex post,* i.e. after a measurement is made and after we have factored in the realisation that we have changed the measurements in the process. The problem of quantum measurement arises from the interaction between the quantum particle and the apparatus of the observer.

In pointing out the similarities between the role of the observer in the sub-atomic world and the role of the observer in the economic world, I note here that reflections of the global financial crisis on countries around the world were differently perceived and also themselves produced different responses to it. Having the financial crisis in superposition (the simultaneous existence of the same problem in multiple places) does not necessarily mean that a crisis may be observed in the same manner by economic-political entities but subsequently have different outcomes.

The intricate interplay between Montenegro's economy and its politics is evidenced in the way that the country's leadership acknowledged, observed and is dealing with the financial crisis. Trying to answer the question as to whether or not – and, if so, how – the global financial crisis was carried across into another country leads us to economically complex but also politically very unsettling observations. Admitting the effect of the global crisis on the local economic system would, in fact, directly confirm the system's vulnerability, which the leaders of this developing country would be unwilling to do. In the case of a growing society in transition, such an admission would, consequently, lead to a conclusion that the final result of the transition would be an economically unstable system, which is in tense opposition with the promises of that transition. That could present an outright negative impression of the new economic-

political system which the country is adopting and developing, making its people distrustful of the promised advantages of the transition. Conversely, observing that the global crisis would not drastically affect the given economy, though comforting and encouraging, could bear witness to the country not being socio-economically open; that is, that the economy of the country is arrested in transition, which could be a symptom of economic as well as political failure.

When an economy such as this one is in an excited state, Kondratenko points out that:

> The role of government and its interference in the economy is the barest necessity and a benefit for the whole economy. The problem lies only in the 'right' diagnosis of the economy, the 'right' time and the 'right' measures. (Kondratenko, 27)

Much like in the quantum context, the observer affects the observed which, in this economic situation, leads to intervention decisions.

Probability as a way to describe quantum phenomena

Financial instability is not an isolated event. Rather, it arises from a simultaneous combination of economic and financial imbalances, such as large increases in the prices of goods, rapid credit expansions and high levels of investment. Over the last three years, we have experienced all of them. Such a phenomenon of unpredictability was named a 'black swan' by Nassim Taleb (2007). According to him, a black swan is a highly improbable event with three principal characteristics: it is unpredictable; it carries a massive impact; and, after the fact, we concoct an explanation that makes it appear less random, and more predictable, than it was. Taleb attempts to explain why we are usually not able to recognise events of small probability which have dramatic consequences once they occur. After the stock market crash of 1987, half of America's traders braced themselves for another one every October – not taking into account that there was no antecedent for the first one. Mistaking a naive observation of the past as something definitive or representative of the future is a cause of our inability to understand the black swan effect.

A good example of how to perceive economic phenomena according to quantum physics comes from Avinash Persaud. Elaborating on bank risk models, Persaud (2008) noted that, paradoxically, the observation of areas of safety in risk models creates risk, while the observation of risk creates safety. Persaud uses the analogy of Heisenberg's uncertainty principle. Was bank risk assessment software unable to signal the crisis? The answer comes from Alan Greenspan, an observer in the monetary experiment which had far-reaching consequences:

> The whole intellectual edifice, however, collapsed in the summer of last year because the data input into the risk management models generally covered only the past two decades, a period of euphoria. Had instead the models been fitted more appropriately to historic periods of stress, capital requirements would have been much higher and the financial world would be in far better shape today, in my judgment. (Greenspan, 2008)

The debate on the extent to which Montenegro is exposed to the global financial crisis has been carried out in the shadow of the first stock market crash in its history. Highly improbably, the first stock market crash in Montenegro actually happened at the very beginning of the privatisation period (2001-2002). Soon after the completion of the mass voucher privatisation process (400 enterprises and around 400 000 citizens were involved in that process), the stock market in Montenegro actually started with a crash – prices were at their lowest level ever recorded. The second stock market crash happened in 2008 (when there was an annual decline of 83 %).

Dual nature of quantum economics – cases from Montenegro

Wave-particle duality is the quantum world phenomenon according to which all matter and energy exists in the form of both wave and particle, but not simultaneously. In some circumstances, an object (an electron) has a wave form and, in others, a particle form. From Montenegro's perspective, the effect of the global financial crisis on its economy could have both wave form – as regards the effect on Montenegro's financial services industry (the banking sector) – as well as a material form – the effect on Montenegro's real sector (e.g. aluminium production).

Banking sector

For its relatively small size, Montenegro's banking sector recorded stunning growth within a short time span. Over a period of eighteen months, Montenegro experienced credit expansion of around €2bn (50 % of GDP), primarily as a result of the uncontrolled growth of credit:

> At end-2008, loans amounted to EUR 2.7 billion, or 23.3 % more in relation to end-2007. The loans/deposits ratio at end-2008 amounted to 1.42, which represents a deterioration in relation to end-2007, when it amounted to 1.07. (*Bulletin* of the Central Bank of Montenegro, 19)

After hesitation, Montenegro was officially forced to admit during 2008 that the global financial crisis was affecting Montenegro's economy.

On 22 October 2008, the Montenegrin parliament passed the Law on Measures for the Protection of the Banking System of Montenegro from the Consequences of the Global Financial Crisis. Before the law, the Deposit Protection Fund had the legal obligation to guarantee deposits up to €5 000. The Law now obliges the Deposit Protection Fund to pay deposits up to the full amount. This is the most controversial measure contained in this law, since fully covering the deposits of the retail and wholesale banking sectors, amounting to €2.35bn in late-September 2008, would have meant the government taking on a significant debt. Even with that kind of prevention, the deposit drain amounts to €510m. The country's external debt, however, is low, amounting in September 2008 to 31.6 % of 2008 GDP. That Montenegro has low levels of indebtedness is extremely favourable in the context of the current global financial crisis.

Real sector

Even though Montenegro's development strategy relies predominantly on industries such as tourism and agriculture, its metal industry, a remnant of the ex-Yugoslav economy, has a central position, however, both geographically and economically – it is concentrated near the administrative capital (Podgorica) and Lake Skadar, and is about thirty miles from the Adriatic coast. KAP (Kombinat Aluminijuma Podgorica) accounts for about 15 % of Montenegrin GDP, but the aluminium repro-chain accounts for nearly 40 % of GDP and 50 % of the country's exports.

Such a dependence on one industry poses a series of problems for Montenegro's government and its citizens. A serious decline in aluminium prices in the second half of 2008, i.e. from $3 300 to $1 300 per tonne, left KAP struggling to survive the impact of the ongoing economic crisis. The low trading price of aluminium, and expensive production costs, primarily electricity and mining costs, resulted in KAP generating daily losses of €200 000 on average. At this point, KAP almost went bankrupt, being saved only by government intervention. Consequently, a huge portion of Montenegro's GDP is endangered, with almost 4 000 people in aluminium and bauxite plants under threat of the loss of their jobs.

The concept of entanglement

The wave of the crisis that originated in the United States in 2007 spread across the globe and made people experience entanglement as a consequence of globalisation. A small country far away from the USA is entangled, interconnected over great distances, with Americans. The way Americans buy their mortgages or sell their securities can affect the current economic status of a small country on the other side of the globe.

According to the synchronicity-based way of thinking, in which time and space can be reduced to an insignificant level, we can draw some examples of entanglement between USA and Montenegro. Two of them are as follows:

- Ponzi schemes. Much in the fashion of Bernard Madoff, the former non-executive board member of NASDAQ, a couple of Ponzi schemes were running in former Yugoslavia (Montenegro was a part of Yugoslavia at the time) in the early nineties. The Montenegrin government took it upon itself to return deposits to all those small investors who gave their savings up to Jugoskandik and Dafiment Bank
- stock market decline. The annual stock market decline on Wall Street during the Great Depression of 1929-33 amounted to around 83 %, the same percentage decline that the Montenegro stock market recorded during 2008.

A different example, drawn from the political sphere, is that the first country in the world which officially recognised Montenegrin independence was Iceland. If, along with this, we take into account that the equally-small state of Iceland was the first country in the world that went bankrupt because of the global financial crisis, the concept of entanglement can, in this case, stir up serious levels of anxiety – the connection between Iceland and Montenegro is, in that sense, highly unsettling. The overly-determined dependence of Montenegro's economy on a single major aluminium company and on Prva banka is putting Montenegro in a precarious position which could tie its economic perspectives to those of Iceland.

Superposition of economic phenomena

As an example of superposition – the possibility that particles may be in multiple places at the same time – I want to point to the superposing roles adopted by the central monetary authorities in the USA and in Montenegro as a means of finding a potential solution to the high levels of illiquidity and insolvency in their economic systems.

What is a lender's last resort role in such circumstances? In order to find an appropriate solution for illiquid, but solvent, financial institutions almost 135 years ago, Walter Bagehot formulated his famous doctrine: central banks should lend money freely to illiquid entities but at sound collateral and higher interest rates. This doctrine sounds very clear and easy to understand, but it is hard to implement. The practical problem with it is that, during times of crises, the prices of financial instruments are unstable and it is hard properly to estimate the market value of the borrower's assets. That is why central banks make mistakes in evaluating commercial bank assets and in distinguishing between institutions that are insolvent and those that are merely illiquid. Consequently, central banks are compelled to implement discount lending policies which are based on discretionary evaluations and incomplete information. That point of implementation is the critical point where the lender of last resort usually becomes the buyer of last resort. After that, it is obvious that the crisis is as rampant as a hurricane (Martinez and Popović, 2008).

From the Montenegrin perspective, the use of reserve requirement funds is the measure that serves the purpose of servicing the short-term liabilities of the banks (Law on Measures for the Protection of the Banking System of Montenegro from the Consequences of the Global Financial Crisis, Article 8). Bearing in mind its expected long-term effect, this measure does not have a relatively high importance for banks in the Montenegrin banking sector: it is a simple mechanism with a short-term impact. Due to the limitations contained in the Law on Banks, it is impossible to demobilise the reserve requirement funds of commercial banks in the short-term and, since the representatives of the Central Bank have not accepted this measure as justified because it might increase risks in the system, the solution that has been found lies in the issuance of short-term government securities (T-bills). Commercial banks in Montenegro were able to use the funds allocated for the required reserve to buy such bills. Remembering the success of the placement of the issue (75 %), i.e. that, out of the allocated 40 million, 30.2 million were given to commercial banks, it is clear that the de-mobilisation of liquid funds in the system is not an easy thing to carry out, even at the current level of need.

Likewise, the weighted annual interest rate of 3.98 % achieved in the auction of such bills is a negative rate, i.e. it was lower than the rate of inflation. The maturity of the bills is 182 days, so the placement of the funds raised by the government for the banking sector for the purpose of alleviating the consequences of the global crisis put banks' money in a monetary superposition – the same money in different locations at the same time.

BEC – a new way of moving altogether

The current global crisis is also a global BEC (*Bose/Einstein condensate*), which has unified countries all around the world via the slowdown in economic activities. With the spillover of the financial crisis, quantum terminology seems already to have entered the language of everyday economics and politics. Our language betrays our awareness of the transmission of energy (finances are a form of the manifestation of energy and energy exchange) in the form of waves ─ the wave of globalisation; the wave of decentralisation; the wave of privatisation; the wave of integration; etc. These terms, we understand, do not refer to a phenomenon specific to a single country but, rather, they string together a series of countries to form a multi-country phenomenon governed by a single wave function. The emitters of such waves are the large economic-political structures, while recipients are usually unified within the same field, based on the similar positions they occupy; the similar processes they are undergoing; or the similar status they have gained. Consequently, we have 'emerging countries', 'countries in transition', 'NATO countries', etc.

Not only are large groups of countries simultaneously affected by such economic-political wave movements, consequently coalescing into groups defined by those waves; but also a single country can be simultaneously moving in multiple directions. The 'integration BEC' brings Montenegro to the implementation of a range of actions that have accelerated its integration processes into different economic-political communities.

Following the example of other countries that have completed the transition process, Montenegro focused its EU integration process in 2008 mostly in three different directions:

- towards European integration – Montenegro submitted its membership application to the European Union in the middle of December 2008. The commitment to the consistent enforcement of the European agenda was thereby confirmed, which was intended to continue via working on and responding to the requirements of the European Commission
- towards Atlantic integration – the process of advancing towards NATO continued through the submission of the MAP application, whereby Montenegro became a candidate for pre-accession membership of the North Atlantic Alliance
- Montenegro intensified and completed its activities toward joining the World Trade Organization (WTO) in 2008. According to a recent publication by the Government of Montenegro:

> The obligations that arise from the preparatory process, and then from WTO membership, will favourably impact not only the trade system in Montenegro, but also the overall ambience for the improvement of the system of services. (*Montenegro Economic and Fiscal Programme 2008-2011*, 4)

Negative and positive charge of the global financial crisis

The academic literature is flooded with analyses of the negative aspects of the global financial crisis. In the spirit of quantum physics, which reminds us to think of multiple possibilities, I would like to offer the following ideas for seeing that the crisis has a positive side:

- thanks to the global financial crisis, we have begun to be aware of how entangled our world is. In regular economic circumstances, people do not have a clear vision of our interconnectedness because, during those times, our economic activities are performed through synapses of economic flows. But, in a time of crisis, we are all in the same (BEC) state, where wave functions are collapsing all over the world
- the crisis has brought about the realisation that economic life is in a constant state of movement and vibration – and that is the only constant thing about it. From Long Term Capital Management to Lehman Brothers; from the Great Depression of 1929-33 to the Great Recession of 2007-; from neo-liberalism to Keynesianism; from best order execution to best standard avoidance – vibration is the only constant in the system
- from a banking perspective, the crisis has reminded us of the importance of the role of managers in dealing with risk assessment models. It is managers who have the human task of feeding sophisticated risk assessment software and managers who are responsible for the quality of inputs in order to obtain satisfactory outputs. Once again, the role of observers needs to be re-thought in the sense that the GIGO effect (garbage in, garbage out) can result in something that people did not take into account
- the crisis has made us realise that safety lies in one's perception of risk
- the global financial crisis has changed the role of the central monetary authorities and put stress on the role of taxpayers in tough times
- an awareness that the transfer from personal to institutional responsibility is extremely dangerous in the course of trying to find an appropriate explanation for the causes of the global financial crisis. The political elite has its own levels of responsibility and has to be called out as regards its accountability and to bear the consequential repercussions in the democratic context
- following the logic of quantum mechanics, which allows us to turn back from the present to the past, we understand that, when we worry about economic crisis, we are usually worrying too late. Going back, we need to reposition things, e.g. the Sarbanes-Oxley Law before the collapse of Enron; the Marshall Plan before World War II; etc.
- the global financial crisis has given the opportunity to transitional countries firmly to tackle their labour force surplus, i.e. the hidden unemployment they have inherited from previous socio-economic systems. Employment will be monitored from the perspective of economic efficiency, not from the perspective of political desirability. The example here is that the terrible times of World War II brought about the mass emancipation of the female labour force.

Concluding remarks

In explaining the current state of the Montenegrin economy and the ways it has been affected by the global financial crisis, I have offered up concepts and observations from quantum physics to be of relevance to an examination not only of the Montenegrin situation but also, through it, of the global financial situation. Those concepts and observations became a point of departure for conceptualising quantum economics, whereby I was able to take a look at the way in which a significant number of economic entities are behaving much like energy in the quantum world – sometimes as physical particles and sometimes as waves. The useful correlation between the realms of physics and economics can be a starting point not only from which to examine and understand the crisis but also one from which we can build confidence, through that understanding, in finding new ways to cope with the crisis.

Montenegro's particular economic state and its reaction to the global crisis in the context of quantum mechanics can best be described by Fred Alan Wolf's explanation of a quantum entity:

> Big energy in little space and a little piece of time. (Wolf, 2006)

This small transitional state has become a point of clash for accelerated particles (i.e. global players, such as Russian capital, US foreign politics and EU integrative measures) which have produced an enormous amount of energy and which can lead to uncontrolled processes.

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