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Oil – The Earth’s blood, a paper on how to recover its critical declining prices by using a hedge vaccine through a leading core of countries termed as VIRUS.

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Abstract: This paper introduces the description of whom are the main concerns about the currently and critical decline of oil prices, and how this countries, named as VIRUS, could turn out to be a “vaccine” into resulting on a hedge to correct and return to economic viable prices on the commodity. It uses as methodology the acceptance of five main regions or countries as the main characters on the supply and demand of crude oil globally, using a hedge through observation of old prices through a sextic polynomial equation to determine the price to be used into an econometric equation to forecast the hedge price scenario that could help the recovery of the global oil prices at mid-term, taking also into consideration a possible decline over the shale gas demand of the USA due environment question over fracking.

Introduction

Every living being has a pulsate heart inserted with a necessary amount of blood that manage the live-being to maintain their cognitions functions alive. Earth, as a gigantic live being has being hinted among the years by several scholars, that oil is their blood.

The Oil and gas industry is one of the largest, most complex, and important global industries. The industry touches everyone’s lives with products such as transportations, heating, and electricity fuels; asphalt; lubricants; propane; and thousands of petrochemical products from carpets to eyeglasses to clothing. The industry impacts national security, elections, geopolitics, and international conflicts. The prices of crude oil and natural gas are probably the two most closely watched commodity prices in the global economy. In recent years, the industry has seen many tumultuous events, including the continuing efforts from oil-producing countries like Kazakhstan, Russia and Venezuela to exert great control over their resources. Major technological advances in deep-water drilling and shale gas; Chinese firms acquiring exploration rights at record high prices; ongoing strife in Sudan, Nigeria, Chad and the other oil-exporting nations;

continued heated discussions about global warming and nonhydrocarbon sources of energy; and huge movements up and down in crude prices. All of this comes amid predictions that the global demand for energy will increase by 30% to 40% by 2030. (INKPEN, MOFFETT; 2011, p. 3).

The current crisis has shown, more than never, that Earth, more precisely the social, political and economic global panorama depends more and more of oil, and the human-being will never stop using this commodity, even if it is destined to fail with their finite reserves at long term. It is a rational use of perhaps the most important “fuel” of global market today, that human being will continue to explore as much as they can this commodity. Though, by looking as a rational human being, inspired by the Kantian rationality, "... the individual as single subject, sole creator and ultimate goal of the rationality of their actions..." hypothesis indispensable to build a balance of theory in the classic economic models. (MIGUENS, 1958, p.15-16).

Analyzing also the information available in the International Agency Energy, I identified five great regions that impact directly over oil prices, global consumption and global production. Which I called: VIRUS.

From the World’s 15 top oil producers 63% are among those countries and regions quoted in my perspective view; only China, Brazil, Canada and Norway appears without the group. We can also consider that Brazil has a certainly correlation to the production and exports with Venezuela and Nigeria (Sub-Saharan region), while Canada is directly correlated to the USA oil cycle.

The chosen countries has, also, direct correlations to production or consumption over the results of oil global prices, this is the first indicator, together with economic and political analysis this led me to choose this VIRUS.

Figure 1. Correlation of Production and consumption between the five major regions that impact in the global oil prices

		Production					Global oil prices
		Venezuela	Inland of Hormuz	Russia	USA	Sub-Saharan Africa	
Consumption	Venezuela		0,558	0,865	0,823	0,486	0,658
	Inland of Hormuz	-0,668		0,955	0,885	0,534	0,807
	Russia	-0,458	0,654		0,948	0,337	0,895
	USA	0,566	-0,514	-0,812		-0,549	-0,686
	Sub-Saharan Africa	-0,546	0,656	0,973	0,959		0,854
	Global oil prices	-0,516	0,764	0,806	0,740	0,411	

Source: own calculations and observations based on U.S. Energy Information Administration (2015).

Notwithstanding, this chosen countries has also appeared as the major reserves in the world, from the top 15; only China, Canada and Brazil are not among them; the same patter follows for consumption and imports; which shows almost than 60% in the entire participation. In sub-Saharan case, we can see that Nigeria already has a large participation in the top 15, while Angola, South Sudan, Chad and Equatorial Guinea are increasing their productions exponentially. According to the IAE, “Sub-Saharan Africa will outstrip Russia as a global gas supplier by 2040”.

In my analysis, the use of the VIRUS name is not for bad purposes, but like any kind of disease - and the current critical decrease of prices can be seen as a disease in both political and industrial

view - starts with a virus, and can only be “cured” through the same virus, with the use of a vaccine derived from each one of the chosen regions described in this process.

Reaching the main purpose of my paper, to show that those 5 regions are the main characters in a role play to change the current status of decrease on prices, even if some of them (like Saudi Arabia, are willing to maintain it low, and as I will explain later, it will only work temporally, like a placebo).

Methodology of the Research

The methodology used is based on observation of the main oil reserves and producers countries, how they interact through economic and political situations over the crude oil prices during the last years.

In a second part, it is indicated by inference of my own research, a name to designate them as a single character, in this cases the “VIRUS” name. As vaccine come from a virus, this core of countries is shown, through econometric equation how it can return the prices to their old and economic viable levels, confronting and declining the critic situation above its prices and the chain market involved in this entire situation.

The econometric equation used in this paper goes according with the premises of including variables used, follows the work conducted by Aiginger and Falk (2005), who set out to investigate determinants of economic growth. My paper uses this approach together with the issue of reverse causality between the oil prices and the forecast of a profitable hedge, through the use of economic correlated variables such as % of total demand, % of total production, % of total exports and % of total reserves (all aspects directly to the oil market in each of the five regions addressed in this paper) using a dynamic panel data model and estimating the parameters using the Generalized Method of Moments (GMM) techniques developed by Arellano and Bover (1995) and Blundell and Bond (1998). This technique uses instruments to provide consistent estimates of the model parameters.

Paragraph

Using this classic rationalist approach, oil still has a long way to go until it’s finish in a look for alternatives, no doubt it is important to find alternatives among the Years to surprise this “blood” with what we can call an “artificial blood”, but today, this remain the main aspect of the economic growth of the main countries.

Nevertheless, as any living being, the blood has his own deficiency to defend against some specific virus, today, the world is facing an unprecedented virus spreading through every cell of global economy due the incredible decrease on oil prices. Moreover, as every virus, it has his or her starting-point somewhere.

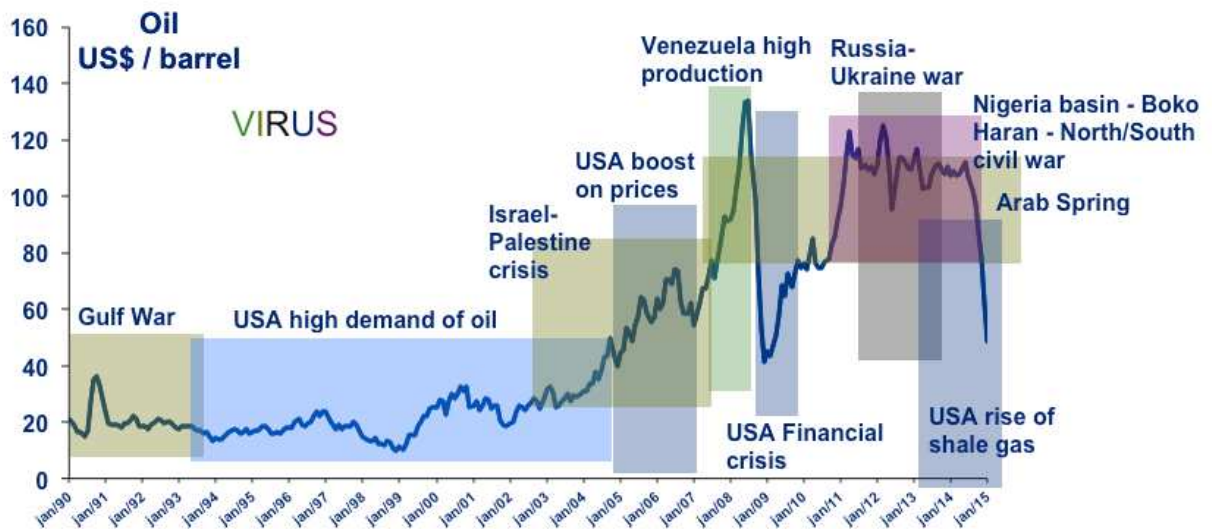
“For some years now the price of oil has been out of control. None of the great names of the industry, the production cycle or the oil market is able to intervene to decide its level or guide its progress. The oil companies, the OPEC producing countries as well the non-OPEC, the consuming countries, the consumers: not one of these has this capability”. (CAROLLO, 2011, p 3-4)

Undoubtedly, what I'm writing next is not to cause any revolution, but to show that some specific regions among the globe has a more tendency to fail to fight this virus situation into "economy's blood", notwithstanding they share the same initial of the word VIRUS.

(Just to reiterate I am not telling that they are the main problem round the world regarding the decrease of the oil prices, rather, they are the living force, which are more weakened by this virus, which indeed is the fall on prices due the discovery of new technologies or social-political situations happened among them. As more propitious to "acquire" this virus, they are more propitious to "spread" them to their outskirts, the other countries).

Figure 2. VIRUS political and economic scenarios affecting directly oil prices over the World in the last 40 years.

Monthly evolution of oil price



Source: own calculations and observations based on World Bank (2014) oil prices (Crude Oil (petroleum), Dated Brent, light blend 38 API, fob U.K., US Dollars per Barrel)

Venezuela, where it comes the V from virus is undoubtedly the main oil producer in the entire Latin America, as they are the largest oil reserve in the planet (according to OPEC). About 96% of the entire foreign revenue of the country comes from the foreign trade of crude oil. Recently, the incredible decrease in the oil prices, something I dare to say we have never seen before, neither when the Yom Kippur sanctions made the first oil crisis in the 70's.

For more than several years Venezuela has never touched or changed the oil price to produce gasoline, the first time will be now, as introduced by the oil virus, when the prices fall more than 50% after Years of stability will led president Maduro to withdrawn the subside to oil in US\$ 12 billion. This is responding negatively (and spreading) through the other Latin American countries, especially Brazil; one of the main producers of pre-salt has saw it unviable to produce due the prices being below US\$ 40 per barrel, this lead to an increase in oil taxation, leading into the increasing inflation of the country, something also happening in Venezuela (as told before), Colombia and Bolivia; as the Bolivarian countries may suffer in a short term of the fallen "Dutch

disease”, seeing their manufacture fall together with the oil industry. “The XXI century oil disease”.

The I, from VIRUS comes from the main Inland of the Persian Gulf and Hormuz; the Arab countries regards about 50% to 60% of the total produced oil globally; Iraq, Kuwait, Qatar, Oman, Libya, Egypt and the Persian Iran has reached this lower price. Something happening even with the current unstable scenario of IS in Syria, something that a less than two years ago would “sky rocket” the prices, as the Spring Revolutions did with the production prices from Egypt, Tunisia, Algeria and Bahrain.

Saudi Arabia, the main producer worldwide, has tried a way to maintain its competitiveness among the world by lowering even more the prices, they are current giving a placebos to the oil situation, in the current term it could work, but at long term, their reserves, increased by lowering demand of China and India, one the main buyers together with the USA will unconditionally causes an end to a finite product, like I told before. Further I will try to give a solution, not that I’m capable of changing the entire situation, but something I believe could be a vaccine that will react in chain in the following years, as OPEC decided to not intervene in the prices and the demand has reached its lowest level ever in 2014.

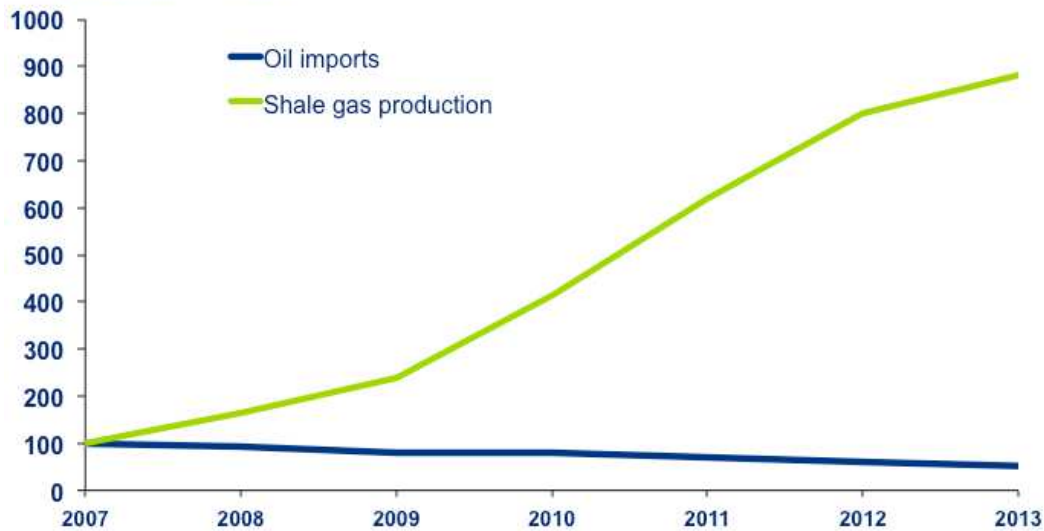
The R, come from Russia, here one of the main problematic countries led by this disease. The entire Russian economy is fomented in two things, oil and gas, with the recent discovery of the shale-gas extraction by fracking in the USA; the ruble has suffered an incredible depreciation that follows correlative to the oil prices. The main oil companies in the world, as Gazprom has suffered high decreases in their revenues, which together with the sanctions imposed by the USA en EU due the Crimea situation among the Russians and the Ukrainians have led Russia to look further for some terrible problem in their future economy and international reserves. To counter-attack this virus, the increase of the gas prices to EU, through a pipeline that would pass through Ukraine was thinking into a viable situation, but as the Arabs, a merely placebos, in my humble opinion.

The U, come from the USA, perhaps the most strong organism to control the oil virus, but nevertheless a prime focus of the lower prices, as the fracking of the shale-gas is maintain their economy in a good shape, something that the oil wasn’t doing due the financial crisis, this has also helped Canada, and the north sea countries, like the Scottish basin in the UK.

The use of shale-gas is fantastic, in theory, because in a more sustainable world, eventually the chemicals led by fracking the rocks will contaminate the groundwater, which could cause a severe problem regarding health and environment in the country.

Figure 3. Global crude oil imports put against the results of shale gas production of the last 7 years, using 2007 as a base index of 100.

Global crude Oil imports x shale gas production (Index 2007 = 100)



Source: own calculations based on U.S. Energy Information Administration (2015).

Finally, the S, which corresponds to the Sub-Saharan countries, led by production on Angola, Nigeria and South Sudan basins. Affected directly into their economies. But, in Africa, the situation can be more critical, with lower economies, increase of poverty, two digits inflation and weak currency, a civil war among the control of oil parts of the countries, like what can happen with Nigeria, divided into the Sharia which, not on the eye of the public, looks for a more potential into controlling the country, and for that, the oil will be need, oil that is focused in the south part of Nigeria (not controlled by the Sharia or the Boko Haram).

But, how on my humble opinion we can create a vaccine to this disease?

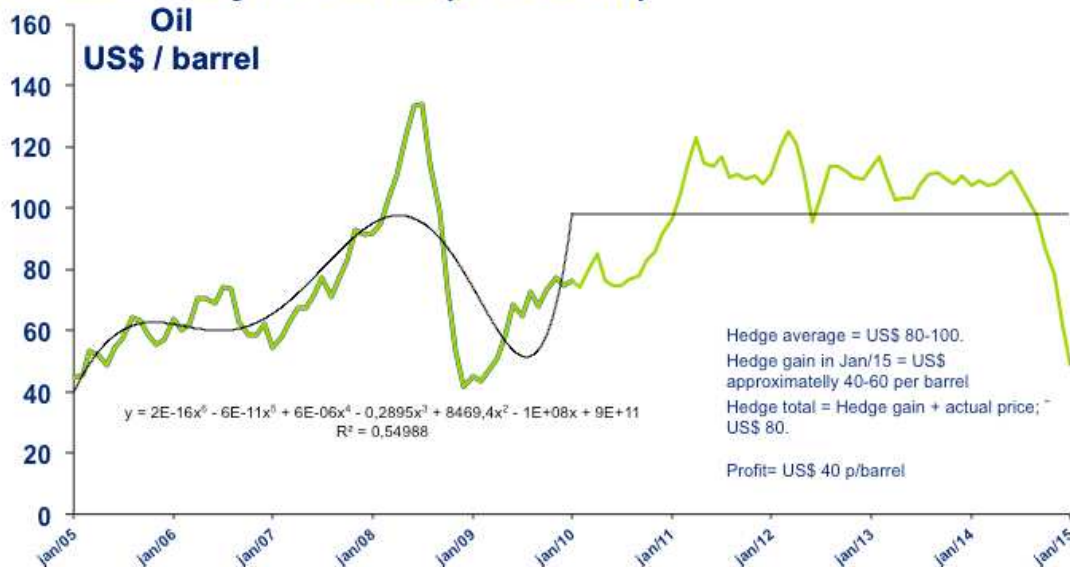
“The essence to explain oil price movements by use of the classic model of economy is ... Price = f (demand, supply)” (CAROLLO, 2011, p. 3). It might sound a quite practical, but from practical changes comes great revolutions, something that companies have being made among the Years, and even countries regarding other commodities not only oil, but with a counter-system.

First, creating a hedge of the oil prices in the next 10 years, a time, I consider the sufficient to oil recover at least US\$ 60 per barrel due the environmental problems that the fracking might cause (and even if its not proven otherwise, the speculation will decrease this type of exploration to not link companies to problems with the environment).

To evaluate the first hedge price of this seasonable period, I used a polynomial sextic equation, with a coefficient of 9E+11 taking into account an R² of -60%, a number which I consider sufficient to indicate a trend into a market so volatile to politics, technologies and economics scenarios through time.

Figure 4. Monthly evolution of oil price, with the use of a 5 years series (2005-2010) observation, to find a 60% of correlation regarding prices and the time series, leading to the creation of a sextic polynomial equation which lead to a possible hedge in the time period, to further use in the econometric equation.

Monthly evolution of oil price - With hedge and forecast of 5 year series (2005-2010)



Source: own calculations and observations based on World Bank (2014) oil prices (Crude Oil (petroleum), Dated Brent, light blend 38 API, fob U.K., US Dollars per Barrel)

In the good scenario, the hedge will payback the amount superior to the US\$ 40-60 per barrel, and even if it decline further, with the protection of the hedge, the countries will gain the difference of the price and the chosen value of the future hedge. The virus is controlled in their prices.

Using an econometric analysis through the Arellano-Bover/Blundell-Bond estimator you can find future variation on oil prices that can be used as hedge if some ne crisis or technology arises during this period, prevent from the further decrease on the price level.

$$[(\log(Oilprice))]it = \alpha + \beta1 (\log(Oilprices) it_{-1} + \beta2 \log(PriceHedge) + xit\theta + \gamma t + ai + \epsilon it + \lambda \epsilon it_{-1}$$

Where $x_{i,t}$ includes: \ln (% global production); \ln (% global demand); \ln (% global reserves); from the five regions studied.

Y_t represents dummy variables for each year in the dataset (excluding the base year).

The model was estimating using the system GMM method over the period 2005-2013.

The error terms and are assumed to be independent and identically distributed over i and t .

The issue of reverse causality between oil prices and the oil production, demand and reserves of the VIRUS is addressed by specifying a dynamic panel data model and estimating the parameters using the Generalized Method of Moments (GMM) techniques developed by Arellano and Bover (1995) and Blundell and Bond (1998).

To provide consistent estimates of the model parameters, and allows for the inclusion of a lagged dependent variable to accommodate the decay-effects of increased levels of oil prices. Standard panel data estimators such as the fixed or random effects methods will be inconsistent if

advertising is endogenous. This will be further compounded due to the lagged dependent variable, which is correlated with the country-specific effect by construction. The system GMM methods allow for these issues.

Time-dummy variables are included in the model in order to capture the region movement that directly influences the oil prices at short term.

But, what regarding the production? The production depends directly on price. Storage, yes, storage, continue to produce oil even with lower prices, a suddenly stop into the production and manufacturing will also create an even worst situation regarding social, political problems as well as prices in a short term, it will also reduce the global economic activity, and will led some countries to several governmental and foreign deficit problems, due the only focus in this commodity, causing a key chain reaction perpetuating to the main buyers.

Conclusion

Yes, the demand is low, but because the supply is low regarding the prices. Increase the supply, economy 1-1, the invisible hand, continues to produces oil at lower prices and crate a stock of the product, at some point the prices will rise again, as this VIRUS (Venezuela; Inland of Persian Gulf and Hormuz; Russia; USA and Sub-Saharan Africa) suffering countries will rely even more in a symbiotic among the blood, the vaccine and the virus itself to recover the global economy. We have seen this before, in a small scale in the 70's, we have also seen the storage, in the 1929 stock market crisis in the USA, which the storage of Money, and the inflow of the monetary market helped the country.

Using this first hedge as an indicator in how an econometric scenario could influence into future hedge prices

This oil virus can be controlled, and only by their patient one, the five crucial regions I quoted before, but not by using emergencies, like placebos, but thinking in a long term, in a status quo that will overcome the prices, the hedge, and the supply offer using stocked products.

China will not stop buying, India will not stop buying, and the increase of prices slowly will help Brazil with pre-salt production, which could lead to an increase on the supply. This will help Africa with undersea basins to be found next Equatorial Guinea and inland basins in South Sudan. It will also help the increase of prices with more unstable political scenarios, yes, the instability of the world, main be their own cure, if it is used this vaccine seeking in a long term.

This five regions has the major power inside the oil global market, they are the only ones who can change the current situation. In my analysis, the use of a hedge price methodology might maintain a profit at long term. Without sparing their production and without closing industries and factories. Maintaining a high demand even with a low offer, through stocks, also dictating this rhythm with any new technology advance, and the political scenarios, as the only ones who can manage to dictate new prices when the situation will be disrupted, and it will be, as it already happened in the 70's (even if today in a larger scale).

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