

Application of Infinity Cartesian Space (I-Cartesian Space): Oil Prices from 1960 to 2010

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1. Abstract

This paper is interested to show a new data visualization tool to study economics. The new data visualization tool is called “Infinity Cartesian Space (I-Cartesian Space)”. The I-Cartesian Space can show from a different visual perspective an economic phenomenon. The study case to apply the I-Cartesian Space is the study of oil prices from 1960 to 2010. In this study case is possible to observe the oil prices behavior change dramatically after 1970’s but especially from 1990’s until 2010.

The vulnerability of oil prices can be observed clearly on the I-Cartesian Space. The vulnerability of prices is based on the changes under the same price range into the same Cartesian Space. The I-Cartesian Space shows two ranges of prices, there are stable price level and price instability level.

Keywords: Econographication, economic mathematics, economic methodology.

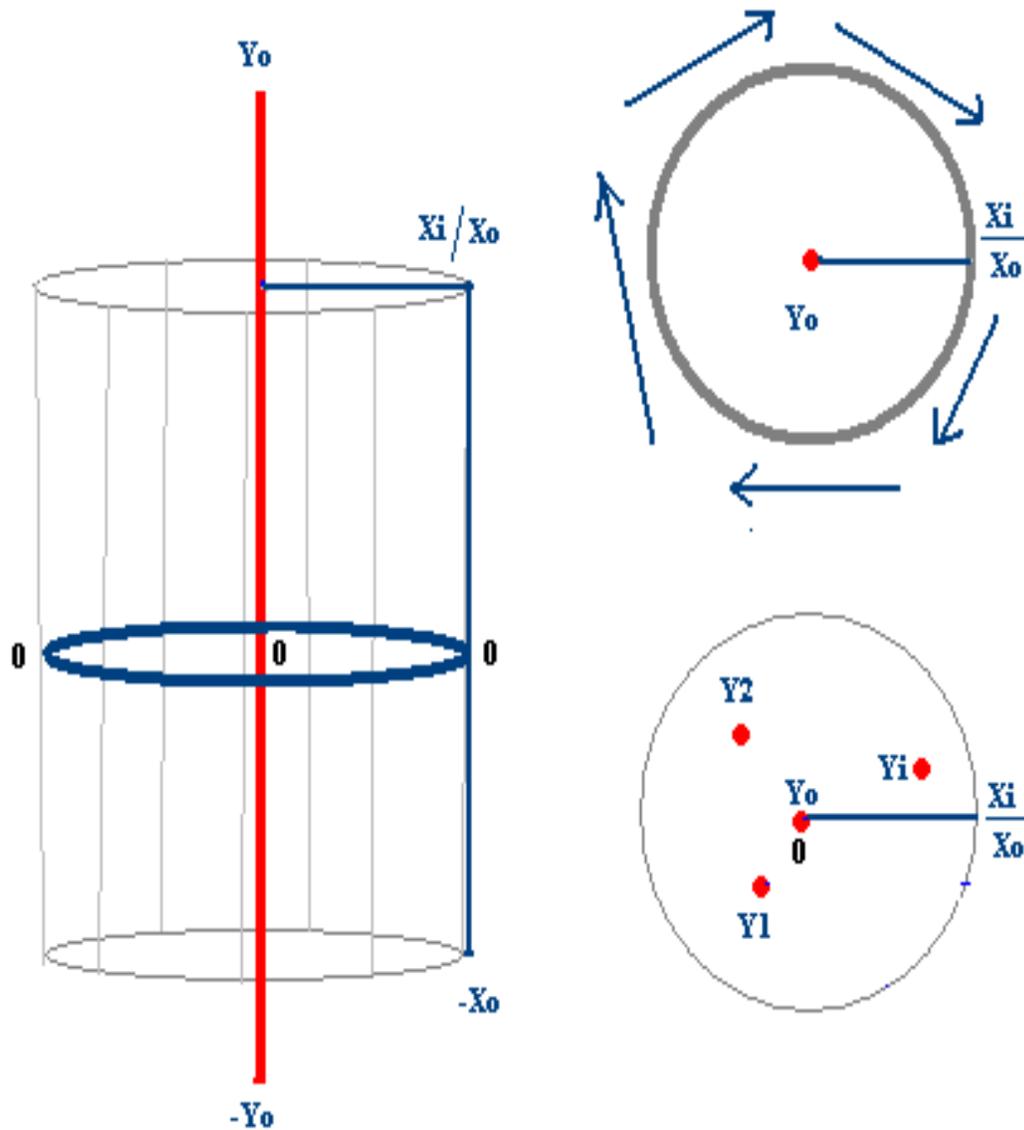
2. Infinity Dimensional Cartesian Space (I-Cartesian Space) Theoretical Framework

The Infinity Cartesian Space (I-Cartesian Space) will be an alternative Cartesian Space to visualize different type of graphs from different perspective. The I-Cartesian Space is formed by n independent variables ($x_1, x_2, x_3...x_n$; $n = 1...+\infty$) and one dependent variable that is “ y ”. But “ y ” can have positive and negative values. The new modality of “ y ” is that this variable can be located in different positions into the circle parametric of the infinity Cartesian Space. The circle parametric is formed by join all x_i ($x_1, x_2, x_3...x_n$) until to create a cylinder. We assume that “ y ” has high mobility into the circle parametric. The position of “ y ” in the circle parametric is depends on the analysis we are interested to develop or demonstrate. We can observe that the final graph is a cylinder with different levels of dimension in the time and space. The graphs in the I-Cartesian Space can generate

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different figures, but the analysis of this type of graphs is based on the criteria of the researcher and application interested to demonstrate (See Figure 1). The Function of the I-Cartesian Space is follow by $y = f(x_1, x_2, x_3, \dots, x_n); n=1, \dots, +\infty$. The Infinity Cartesian Space is following by the next characteristics: First, Researchers can input any quantity of dependent variables in the I-Cartesian Space. Second, the dependent variable (y) can be located in different positions into the I-Cartesian Space and last, the generation of new type of graphs in different dimensions in the time and space (Ruiz,2005).

Figure 1:
Infinity Cartesian Space

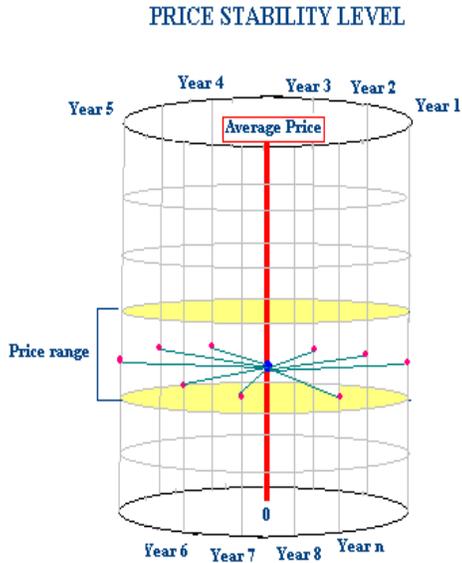


3. Application of the Infinity Cartesian Space:

The Infinity Cartesian Space shows the behavior of different prices into the same Cartesian Space from a new graphic view, at the same time, the average price in the same period of time. The Infinity Cartesian Space can show two scenarios are:

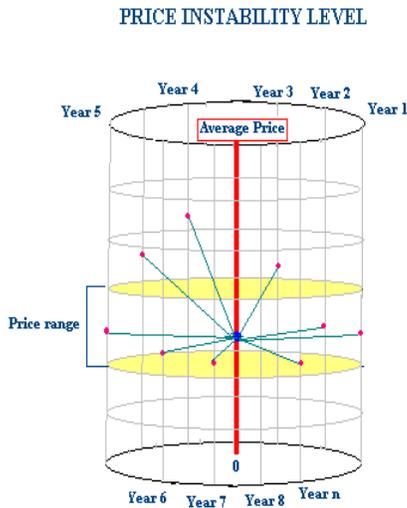
Stable Price Level:

All prices values are located in the same price range



Price Instability Level:

Some prices are located inside and outside of the price range

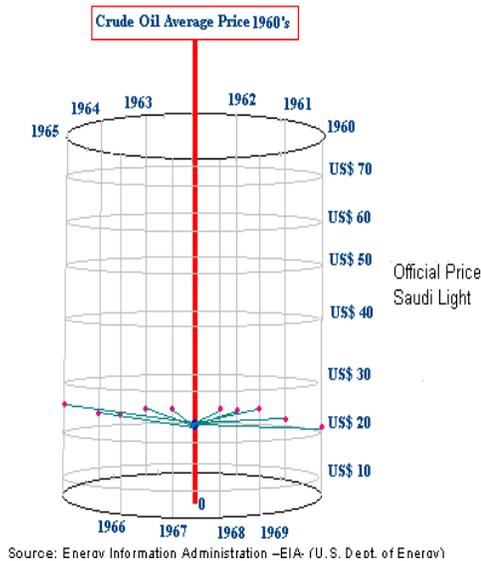


4. Study Case: Oil Prices from 1960 to 2010

The Infinity Cartesian Space (I-Cartesian Space) can show clearly the behavior of different prices into the same Cartesian Space from a different graphic view. The I-Cartesian Space permit to observe large amount of data into the same Cartesian Space, at the same time, we can located the average price in the same period of time. The application of I-Cartesian Space is focused to study the behavior of world oil prices from 1960 to 2010. The oil prices in analysis are based on official price Saudi Light. The evaluation of world oil prices can help to observe the changes of prices from a different graphical view.

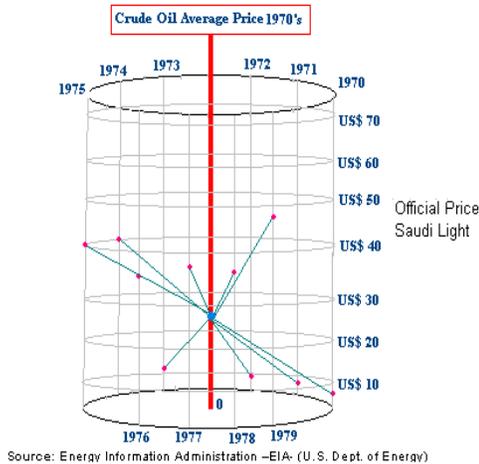
Decade of 1960's

In the 1960's the average crude oil price was US\$ 23 per barrel. The world oil price was highly stable during this period. All oil prices were kept within the same price range between US\$ 10 and US\$ 20.



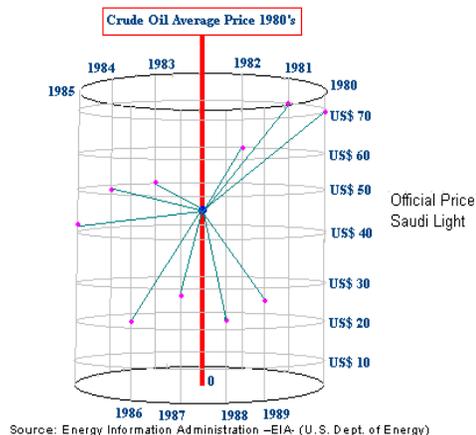
Decade of 1970's

In the 1970's the average price of crude oil was US\$ 27 per barrel. Between 1973 and 1974 the crude oil price increased from US\$ 11 to US\$40 per barrel. Such a shift in oil price was originated by the Arab Oil Embargo in 1973. In fact, the 1970's started to witness instability in crude oil prices, with prices in certain years located outside the price range.



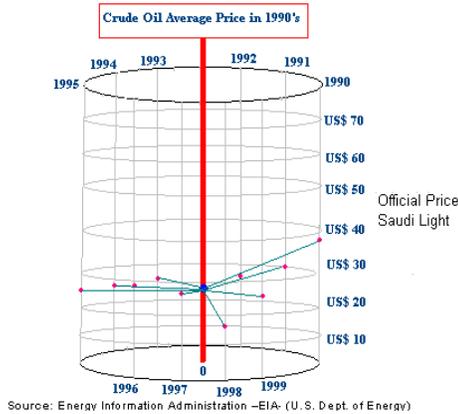
Decade of 1980's

In the 1980's the average price of crude oil was US\$26 per barrel. However, we can observe that between 1980 and 1981, the price was at a disparate US\$ 70 per barrel. Indeed, this decade witnessed the highest level of instability in crude oil prices. The hike and instability of crude oil prices during this period were caused by the Iran-Iraq War and the Iranian Revolution (1980-1988).



Decade of 1990's

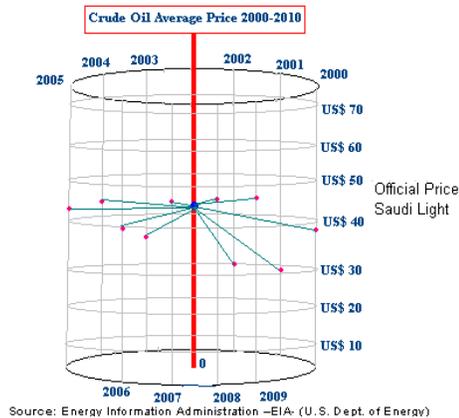
Compared to the 1970's and 1980's, in the 1990's crude oil prices were less unstable. On the Cartesian Space, the average crude oil price in this decade can be seen to be located on US\$ 26 per barrel. Prices in most years during this period are located in the same price range that is between US\$ 20 and US\$ 30.



Decade of 2000-2010

Between 2000 and 2010, the average crude oil price is US\$ 45 per barrel. This is the highest average price of crude oil so far. There is actually an upward shift in the price range in this decade. Four reasons involve at the price instability level in this decade, there are:

- The terrorist attack in September 11, 2001 on U.S.
- U.S. - Afghanistan War
- U.S. - Iraq War
- Fast growth and expansion of Chinese economy and international trade



5. Conclusion

The Infinity Cartesian Space (I-Infinity Cartesian Space) can show clearly how between 1970's and 1980's the Oil prices have high price instability compare 1960's ad 1990's. But from 2000 until today the price of oil is raising faster than 1970's and 1980's. The high price of Oil in this period (2000-2010) is originated by the terrorism war, Middle East political and ideological instability and the fast expansion of Chinese economy.

6. References

Energy Information Administration, Official Energy Statistics from the U.S.A. Government (2005): <http://www.eia.doe.gov/>

Ruiz Estrada, M. A. (2005) "Introduction to Econographication", Working Papers FEA, 2005-9, pp. 1-20.