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## Understanding Worldwide Inflation Rates

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### *Abstract*

This study examines the inflation rates of 215 countries in 2013. Researchers took the data from World Bank database, and fractal analysis was used to determine the hidden dimensions why countries have diverse inflation rates beyond the four identified factors. These factors are money supply, commodity prices, employment rate, and production capacity. The characteristic of inflation is the rate at which the general level of prices of goods and services increase. The result showed that there were countries that had extremely high or low inflation rates. Most of these countries that suffered extremely low inflation are in Africa, one in Europe and one in South America. World Bank established an ideal inflation rate of 2%. The majority of the countries in Europe, America and Asia, had stable inflation figures. Fractal analysis showed politics as the hidden dimension of the changes in inflation rates.

Keywords: Inflation, politics, fiscal policy, monetary policy, World Bank

### *Introduction*

Inflation is fundamental to all nations' economy. By definition, inflation is the rate at which the general level of prices of goods and services increase affecting the purchasing power and value of money. Purchasing power is the capacity of the monetary unit to buy commodities or services. The value of money refers to the perception of the buyer on the worth of goods and services acquired. Higher inflation rate means higher prices of products and services resulting in the decrease in value of money.

World Bank sets an aggregate inflation rate for 2013 at 2.33 percent. In recent years,

most developed countries have attempted to sustain an inflation rate of 2-3% (Vansteenkiste, 2009). Stability of inflation rate is one of the primary functions of central banks in different countries. Most governments and its agencies need to be strict in the formulation of their economic policies to control inflation rates. They want to stimulate growth in their economies just enough to maintain near full employment levels but not so much as to bring on inflationary pressures (Dacanay, 2011). Countries with poor economic performance experience higher inflation rates leading to currency crisis (Truman, 2003). Even if there is a common knowledge of the upward movement

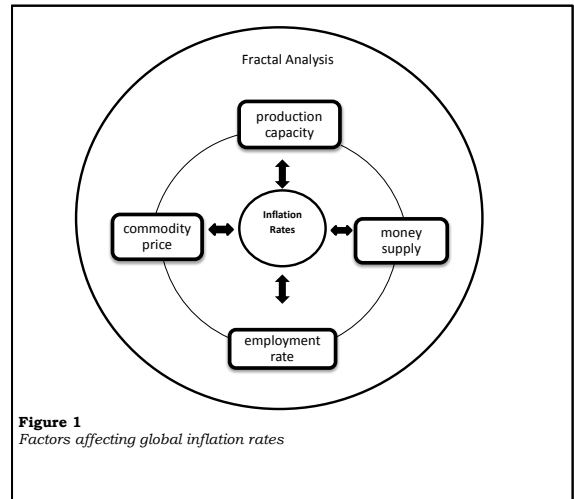
of prices of commodities and securities, people usually do not understand the forces behind inflation. In many countries, stabilizing the value of money has been a major concern. Low inflation is beneficial for the economy because it encourages consumers to buy goods and services. It also encourages individuals and firms to borrow money because interest rates are low. When inflation is already higher than 50%, economists call it hyperinflation. It is considered as one of the most destructive economic phenomena (Dem, Mihailouvici & Gao, 2001). To maintain lower inflation is an important goal for governments and central banks for its economic benefits.

Most of the studies on inflation-focused on hyperinflation that adversely affects the economy. Economists emphasize that high inflation is harmful to economic growth, but the diversity of inflationary experience was not fully explained (Aisen & Veiga, 2006). Most studies have not explored the underlying reasons beyond the factors of extremely low and extremely high inflation rates. This study aimed to find out why most countries have inflation rates that World Bank categorized as stable, while other countries had extremely higher or lower rates.

### *Conceptual Framework*

There are four factors that cause a change in inflation rates. These are money supply, commodity price, employment rates, and production capacity (Samuelson, 2001). In a dynamic economy, no single factor can lead to the change in inflation but by a combination of all or any of these factors. These factors are based on the two types of inflation which are the cost-push inflation and demand-pull inflation (Samuelson, 2001).

Figure 1 shows the relationship of inflation to money supply, commodity price, and employment rate, and production capacity. It demonstrates how each factor influences inflation both individually and collectively.



**Figure 1**  
*Factors affecting global inflation rates*

*Figure 1.* Factors affecting global inflation rates.

When the money supply increases, aggregate demand will also increase. An increase in aggregate demand will force business and industry to increase their production capacity. The increase in production capacity requires an increase in labor requirement which is seldom met due to the limited resources. If met, the additional labor requirements and other related costs to produce raw materials propel an increase in commodity prices. In any of these factors, the law of supply and demand drives change in inflation rate.

### *Objectives*

This study aimed to:

1. Identify the countries experiencing extremely high and low inflation;
2. Examine the factors affecting inflation; and
3. Apply fractal analysis in determining the hidden dimension of inflation rates.

### *Methodology*

This study used the descriptive method to show or summarize data in a meaningful way. The inflation rate was extensively described using employment rate, production growth, commodity prices and money supply as indicators. The normal state of inflation rates in most countries is low. Because of the nature of

the data, the fractal analysis was used to look for the reasons why some countries experienced extreme inflations. This analysis used logarithm to determine which among of 215 countries downloaded from World Bank experienced extreme inflations labeled as outliers from the normal or stable rates established by the World Bank.

From normal distribution of data as shown in the histogram, data were trimmed and converted to exponential. The use of fractal analysis is limited to positive data. Because there were countries with negative inflation rates and the lowest was -3.95, 4 was added to eliminate negative figures. The ideal inflation rate changed from 2-3% to 6-7%. These data were statistically processed using Minitab as tool. The histogram was used to identify whether data were fractal or exponential. Figure 2 shows the graphed raw data of inflation rates. It appeared that the distribution of the data graphed was normal. To come up with exponential data as a requirement to use fractal analysis, the researchers eliminated nine of these data. These nine countries were extensively discussed as they were considered outliers. Figure 3 illustrates the histogram of the exponential data. The researchers, using logarithm, converted these data to fractal. Figure 4 displays the result of the conversion from exponential to fractal.

*Results and Discussions*

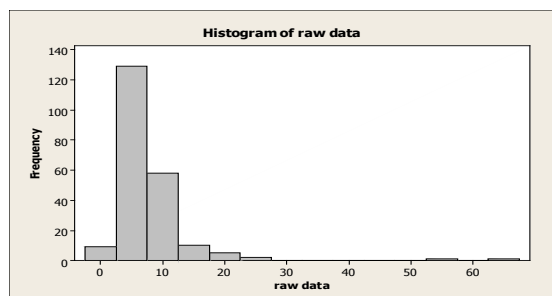


Figure 2. Histogram of the inflation rates of 215 countries in 2013.

The data presented in Figure 2 is the histogram of inflation rates taken from the World Bank Website. Table 1 showed inflation

rates of nine (9) countries that range from 0.05 to 2.5%. These are extremely low inflation rates.

Table 1. Countries with Extremely Low Inflation Rates in 2013

	Countries	Inflation Rates
1	Equatorial Guinea	0.046150511
2	Congo, Rep.	0.341761736
3	Guinea-Bissau	0.646723346
4	Brunei Darussalam	0.847087885
5	Greece	1.16286501
6	Chad	1.604368071
7	Burkina Faso	2.090849347
8	Saudi Arabia	2.09979402
9	Cyprus	2.451324873

These countries were Equatorial Guinea, Congo, Guinea-Bissau, Brunei Darussalam, Greece, Chad, Burkina Faso, Saudi Arabia, and Cyprus. Five of these countries are African, which World Bank categorized as low-income, low employment opportunities, low production, and low average annual growth rate of money. The continuing war, decrease in exportation, a decline in oil prices and failure of the government to stabilize political, military and civil unrest, caused the poor economic performance as stated in the above indicators. Greece geographically is not gifted with abundant natural resources. It is heavily dependent on the tourism industry. Local production is poor, and it is dependent on the importation of goods and oil. Greece experienced worst economic anxiety because it was directly hit by the global financial crisis in 2009. Athens failed to give a solution to its budget deficit which resulted in the decrease in economic performance by 26% in 2013. The European Union had already made several remedies to save Greece from recession, but the economy continued to move downward.

The economy in Saudi Arabia is oil-based. Its government has established a powerful control over major economic activities. Oil economy deflated in 2013 which created a major concern on the Arabian economy.

Table 2. Countries Experiencing Extremely High Inflation Rates

Country	Inflation Rates
Sudan	53.08003096
Venezuela	63.93140071

Table 2 presents those countries with extremely high inflation rates in 2013. High inflation damaged many functions of the local currency leading to the replacement of foreign currency (Berge & Borenztein, 2000). The stories of hyperinflation in Latin America especially in 1980, resulted in a worldwide lesson on better inflation targeting. One of the most affected countries on hyperinflation was Venezuela. It is the fifth largest member of Oil and Petroleum Exporting Countries (OPEC). Petroleum export contributed over 50% of its Gross Domestic Product. This oil-rich country is facing dollar shortages that stem from strict currency controls that resulted to a rapid weakening of Bolivar Currency. Venezuela has the strongest economy in South America, but its government had issues on property rights and became one of the most repressive regimes in the world. The country has been suffering from inflation for many years. From 1973 to 2014, the highest recorded inflation rate was 115.18%, and the lowest was 3.22%. The inflation rate in Venezuela had exceeded 100% in 1989 and 1996 (World Bank, 2013). Using 2012-2013 data from the World Bank, it had managed to decrease its unemployment rate by 1%. Its production had increased by 13%. Money supply moved up by 6% but prices of commodities increased by 62%. As a result of this extremely high inflation, the middle class was eliminated recognizing only the rich and the poor.

Sudan, an African country has long been suffering from civil and political unrest. There is also a conflict between Christians and Arab Muslims, a contributory problem to the continuing war apart from the issues about oil revenues and border demarcation.

Out of 215 countries included in the study, 129 countries have inflation rate ranging from

2.5% to 7.5% as shown in Figure 3. Low inflation rates are countries from Africa, Central Europe, Baltic and smaller island states from the Pacific and the Caribbean. These countries experienced inflation lower than the average set by the World Bank. Most of these countries have insurgency problems. Geographically, these countries are not attractive for business industries. Economic development of these countries is slower due to inadequate infrastructure for commerce and industry.

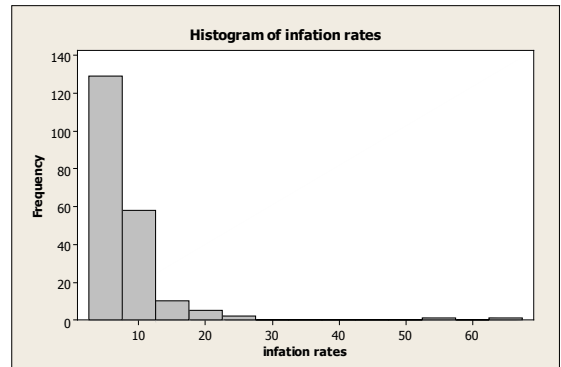


Figure 3. Exponential data on inflation rates (2013).

The second bar in Figure 3 shows inflation rates of 58 countries ranging from 7.5 to 12.5 percent. These countries displayed an inflation rate near the standard or ideal levels. A closer look at these nations indicated that they have viable income sources ranging from natural, agricultural, industrial and service sectors. Some of these countries were either among the richest country in their region or identified among the largest economy in the world. This group also included underdeveloped countries. International aids covered the deficiencies of these countries. Many of these countries are coastal from the continents of Africa, Asia, South America, and Europe. Regarding economic activity, these countries, with their proximity to bodies of water, have an active commerce sourced from these waters. Trade is one of the major enterprises because the waterways placed them along the regular international trade routes. Their location has also allowed tourism to flourish, adding a source of economic livelihood for the people.

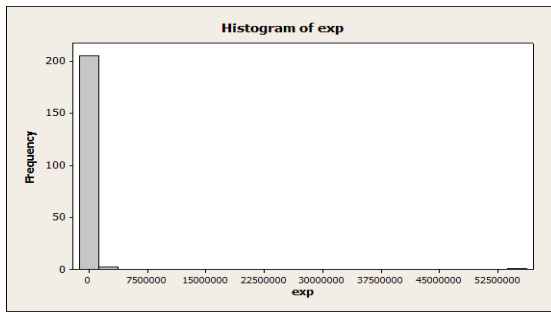


Figure 4. Fractal data on inflation rate (2013).

### Hidden Dimension

Inflation is an effect of weak economic and financial policies. Financial policies cover monetary policy and fiscal expansion. Monetary policy controls the supply of money which is one of the factors that affect inflation. The fiscal expansion includes government collection of taxes and expenditures that can directly affect production capacity and employment rate. High or low employment rate in the country is an effect of economic policies established by the government authority. If we are studying the loop of inflation, people in the government work to establish sound economic, fiscal and monetary policies. To beat inflation, government will restrict fiscal and monetary policy (IMF, 1995).

Extremely high inflation is characterized by limited monetary reserves and weaker foreign exchange rates. When inflations are low, government expenditures and salaries grow much faster (Corsetti et al, 2012).

Theoretically, factors of inflation are money supply, production capacity, employment rate, and commodity prices (Roth, 1986). Researchers and economist focus on the indicators to show the computation of inflation rates and how they affect the overall economic activities.

As the researchers delved deeper into the common characteristics of the 215 countries, they found that inflation targeting, trade policies, historical links, traditions and geography played a vital role in the inflation

rates. Also, other factors were economic, fiscal and financial policies. All these factors show politics to be crucial in the movement of inflation rates as policies are dependent on the assigned leaders in different agencies of the government. There were already literature that studied inflation rates and politics and showed they have positive relationship (Braun, 2004). However, using fractal analysis, we found out that politics plays a vital role in determining the inflation rate of a country as it goes across all four indicators mentioned and its determinants. Weak economic and financial policies, fiscal expansion, and low monetary reserves resulted because of political issues. Graft and corruption, lack of political will of leaders, lapses in the implementation and regulation of laws created an adverse effect on inflation. Corruption hinders progress and disrupts the outcomes of economic policies. Higher inflation may be a negative side effect of corruption if the government compensates under collection by increasing the rate of monetary expansion to exploit seigniorage (Hana, 2015). The literature on economic growth include the political variables such as the level of political or civil freedom, the extent of democratic political system and measures of political instability such as political violence or irregular changes of regime. There is little hope for economic progress in Africa until political structures are addressed (Deaton, 1995). Along with this progress is the attainment of a stable inflation rate.

### Implication

This study can contribute to the field of business education as a new theory in understanding worldwide inflation rates. Discussions on inflation rates should not only focus on the four indicators and indices but also should extensively discuss the effect of economic, fiscal and monetary policies and how politics can affect these policies leading to changes in inflation rates. This will give the readers a better understanding of the underlying forces of inflation rates.

## Conclusion

Political leaders dictate economic activities particularly in the creation and implementation of laws. When political leaders practice good governance, this will result in a better employment opportunities, price stability, and higher productivity. It also generates more investment opportunities. The inflation rates of most countries in Europe, America, and Asia, are within the acceptable range established by IMF because of fewer issues in graft and corruption.

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