

6 - FORMULATION OF HYPOTHESIS

The examined theory and previous research is applied to the Indian markets. In order to verify the validity and statistical significance of the data the following hypotheses are constructed and tested and the results are discussed in Chapter 7.

6.1 - COMMODITIES AS AN ASSET CLASS

The advantages of commodities as an asset class are clear and empirically evident. Over time commodities have demonstrated a low, and in some cases negative, historic correlation of returns with stocks and bonds as well as a positive correlation with the consumer price increase (inflation rate). These characteristics imply that including commodities in a traditional stock and bond portfolio can reduce the overall portfolio risk and improve the risk-adjusted performance characteristics of the total portfolio (Bodie and Rosansky, 1980, Erb and Harvey, 2006, Gorton and Rouwenhorst, 2006, Geman and Kharoubi, 2008, Büyükkahin et al., 2010, Chong and Miffre, 2010). Historically stock and commodity returns have had a low correlation and therefore a portfolio that invested in both stocks and commodity futures has a lower level of volatility than either stocks or commodity futures separately. There is a broad consensus among academics and practitioners that commodities compared to other alternative assets can be considered—in a portfolio context—as an asset class of their own. By definition, an asset class consists of similar assets that show a homogeneous risk-return profile (a high internal correlation), and a heterogeneous risk-return profile toward other asset classes (a low external correlation) (Gorton & Rowenhorst 2005).

Commodities are fundamentally different from financial assets like bonds so it is likely that their returns should have a low correlation. Bond prices are primarily driven by longer-term economic prospects, while commodity prices are primarily determined by current economic activity (Kat and Oomen 2006).

Thus, we generate a hypothesis over here that –

Hypothesis 1: Correlation between commodities and stocks is larger than zero.

Literature shows that research papers done in US using GSCI and DJAIJ Indices find a negative or zero correlation between stocks and commodities, e.g. Gorton and Rouwenhorst (2005) and Buyuksahin, Haigh and Robe (2007). India is a country which has economy dependent on agriculture. Thus, it is assumed here that Indian economy is much more dependent on commodities market. Therefore, in contrast to previous research that has found a zero or negative correlation between commodities and US stocks, we assume there to be a positive correlation, though not very large, between commodities and Indian stocks.

6.2 - COMMODITY AND INFLATION

We establish the hypothesis that commodity futures investment can be considered as a better hedge against inflation than stock. Kurov (2009,2010) states that the Federal bank's goal is to maintain price stability and achieve sustainable growth. These two goals can only be reached by influencing the market through monetary policy like changing the interest rate. During recession, if inflation is rising, then to assure price stability, the federal bank will raise the interest rate to compensate for the inflation (Kurov, 2009). As a result of increasing interest rate, investors are demanding a higher required rate of return in their investment because investors can alternatively invest in risk-free asset. This leads to an increase of the required return, prices of equity decrease because the price of equity is the sum of the discounted future free cash flow. The discount rate goes up, so equity prices are going down as well as the return on equity (Kat & Oomen, 2006). However this reaction has only to do with the unexpected inflation, because the expected inflation has already been incorporated in the prices of equity (Kat & Oomen, 2006).

During a recession prices of commodities also rise. This is the result of an increasing demand by investors without increasing the supply of commodities (Chong & Miffre, 2006). Investors are selling their investments and are taking their losses by investing in commodities in order to earn a positive return (Chong & Miffre, 2006). Investors see

commodities as a refuge against inflation and high variability on the market. This leads to the following hypotheses:

Hypothesis 2: Commodities is a better hedge against inflation than stocks –

As this study has considered one equity index and four commodity indices, this hypothesis is divided into four parts to analyse the impact of each of the commodity index.

Comdex is a better hedge against inflation than NIFTY

Metal is a better hedge against inflation than NIFTY

Energy is a better hedge against inflation than NIFTY

Agri is a better hedge against inflation than NIFTY

To analyse these hypothesis we use similar method as used by all past researches that is comparing the correlation between the indices and find out whether the correlation between Nifty and all four commodity indices is significantly positive or not?

The results in previous researches have unanimously discovered that commodities can be considered as better hedge against inflation (Gorton & Rowenhorst 2006). Gorton & Rouwenhorst (2006) discovered that commodities have a negative correlation with assets like equity, bonds as result of their behavior during the business cycle. Equity and bonds have negative returns while commodities have positive returns during a recession (Gorton & Rouwenhorst, 2006). The attractive power of commodities depends on the state of the economy (Jensen, Johnson, & Mercer, 2000). During recession, the need for diversification is higher as a result of more volatility than during a period of economic growth. The value of equity decreases during the recession while the value of commodities rises (Hess, et al., 2008). Information about macro economy is an important source for asset pricing (Hess, et al., 2008; Jensen, et al., 2000; Vrugt, Bauer, Molenaar, & Steenkamp, 2004).

6.3 - VOLATILITY OF THE RETURNS (RISK) OF COMMODITY FUTURES FOR THE PERIOD IS BELOW THE VOLATILITY OF EQUITY RETURNS FOR THE SAME PERIOD

In this thesis we have used the optimization model that follows the Markowitz framework and models the rate of return on assets as random variables. The optimization is done by choosing the weights of each asset in the portfolio optimally as to minimize the portfolio volatility at any given rate of return on the portfolio. This hypothesis is generated to compare the volatility between stock and commodity. As it is important to find out that whether there is any significant difference between the volatility of these asset classes. This lead to following hypothesis –

Hypothesis 3: There is no significant difference in the Volatility of Commodities and equities –

Comdex volatility is similar to NIFTY

Metal volatility is lower than NIFTY

Energy volatility is lower than NIFTY

Agri volatility is lower than NIFTY

6.4 - COMMODITY FUTURES RETURN AND STOCK FUTURES RETURNS

Hypothesis 4: Commodities yield equity like returns –

Previous research suggests that long-only portfolios of commodity futures have had average returns similar to stocks, e.g. Bodie and Rosansky's (1980) and Gorton and Rouwenhorst (2005). We develop the following hypothesis to find out whether there is any significant difference between the return of commodity and stock futures.

Comdex yield NIFTY like returns

Metal yield NIFTY like returns

Energy yield NIFTY like returns

Agri yield NIFTY like returns

The main aim here is to see whether commodity returns are significantly different from equity returns. It is very important to analyse the difference in the returns as we are dealing with asset allocation where minor difference can impact the total return in a significant manner. The results are discussed in chapter 7.