

PORTFOLIO ANALYSIS OF GOLD AND STOCK IN NEPAL

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RECOMMENDATION

This is to certify that the thesis

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Entitled:

PORTFOLIO ANALYSIS OF GOLD AND STOCK IN NEPAL

has been prepared as approved by this Department in the prescribed format of the Faculty of Management. This thesis is forwarded for examination.

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And found the thesis to be the original work of the student and written according to the prescribed format. We recommend the thesis to be accepted as partial fulfillment of the requirement for the degree of

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DECLARATION

I hereby declare that the work reported in this thesis entitled “**Portfolio Analysis of Gold and Stock in Nepal**” submitted to Office of the Dean, Faculty of Management, Tribhuvan University, is my original work done in the form of partial fulfillment of the requirement for the degree of Master of Business Studies (MBS) under the supervision of **Prof. Dr. Shilu Manandhar Bajracharya** of Shanker Dev Campus, T.U.

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CHAPTER-I

INTRODUCTION

1.1 Background of the Study

Gold is a precious and highly liquid element that possesses the attributes of both commodity and currency. “It has been used throughout the history as money and has been most popular metal for investment purpose” (Jaiswal and Voronina; 2012:1). According to currency characteristics, “it performs as medium of wealth, means of exchange and a unit of values” (Abken, 1980). Furthermore, gold is used for industrial purposes, as an investment and reserve assets. Over the recent decades, the demand for gold has been rising dramatically due to reasons such as world economic recession, the US Dollar depreciation and inflation rise (Goodman; 2009:12). As most commodities, the gold price is affected by supply and demand along with speculation, price of US Dollar in international market. Gold is one of the world’s most important and actively traded commodities. Demand for the gold is driven by two main factors: the Jewellery market and financial investment. In addition, gold is relatively unique as it is used both as a commodity and monetary asset. Although gold has a long history of trading in the Nepal, the majority of price formation of gold today is concentrated in the North American and European markets. Gold is the major substance that has been imported to Nepal outside India at recent times. “The recent introduction of gold futures trading in Asia has tapped into latent trading demand primarily driven by strong economic development in China and India” (Helfinhus, 2013: 244).

Nepal historically imports gold and has a natural geographical advantage. Wealth exchange is well positioned to address the demand of Nepal's trading community for the establishment of a gold spot and future contract as the regional benchmark. "Now with economic recession giving way to economic optimism, the recent years economic data in US, Europe and in emerging economies like Brazil, Russia, India and China and recovery of US Dollar, gold seems to be edging out of favour" (The Himalayan Times, Feb 8, 2014). CFX is the market for gold future as well as other commodity future contracts. The individual investors can purchase gold directly as well. The trading of gold is not much popular as financial investment in Nepal. Most householders invest in gold for making ornaments in different occasions mostly during festivals and marriages. The federation of Gold and Silver Dealers Association of Nepal is the main body which protects the rights and authorities of gold traders in Nepal. Before 2009, there was no restriction for importing the gold in Nepal. So, the dealers could import gold in unlimited quantity. Since 2009 there was a ceiling for daily gold import up to 15kg in normal season and up to 20 kg during the peak season. Here, peak season refers to those months where the demand for gold is higher especially during marriage season. Hence we can expect different correlation between gold return and stock return during pre and post restriction periods. The ceiling for gold import was imposed by NRB in order to improve adverse balance of payment situation due to excessive import of gold during the financial crisis of 2064/065 B.S. in Nepal (www.nrb.org.np).

The financial market on the other hand is the market where the financial assets or instruments are traded. Securities market is a mechanism created to facilitate the exchange of financial securities or assets by bringing together buyers and sellers of securities (Sharpe, 1998). Financial assets or securities are only the claims to the income generated by real assets. Although the certificates representing financial assets are tangible the financial assets themselves are intangible. The investment in the stock market has becoming popular in

developed as well as in developing country. Financial market facilitates the mobilization of funds from the surplus business unit to the deficit business unit in the economy. Financial market is the part of financial system that allows people to buy and sell the financial instruments quickly and in a reasonable price. In economics, a financial market is a mechanism that allows people to easily buy and sell (trade) financial securities (such as stocks, bonds etc). Financial markets and institutions are the key to the development of any economy, whether developed or developing. Developed economies usually already have a highly sophisticated financial market in place whereas developing economy usually have no or rudimentary institutions in place. They are intermediary link in the facilitating the flow of funds from savers to investors. By providing an institutional mechanism for mobilizing domestic saving and efficiency channeling them into productive investments, they lower the cost of capital to investors and accelerate economic growth of the country. This credit market enables debt financing for investments. The economic development requires the regular availability of funds, which is possible through proper financial system only. A sound financial system consists of different financial intermediaries as well as markets. They help in transformation of funds required for the economic development through sound financial system. The regulatory bodies have role even in this regard.

Security Board Nepal, an apex regulator and facilitator of capital market. The government of Nepal on June 7, 1993 as securities markets in Nepal established securities Board of Nepal (SEBON). It has been regulating, controlling and monitoring the market under the securities exchange act, 2006. Since its establishment, SEBON has been concentrating its efforts on improving the legal and statutory frameworks, which are the bases for the healthy development of the capital market. It is the organization, which works under the Ministry of finance. The government of the country executes its policy related to capital market through the organization (www.sebon.gov.np).

Nepalese Economy comprises of several sub-sectors viz. Industry, Trading, Manufacturing, Finance companies, Insurance companies etc. Some sectors are generating high return, some moderate and few at loss. Banking Industry in Nepal has proven the most efficient, transparent and successful sector. They are efficient in funds collection and disbursement (investment). Insurance companies, Finance companies, Hydropower sectors generate moderate profit. Many Industrial and Trading Organizations are suffering from successive losses. The more the organization generates profit, the more the charm that people will show towards the sectors. However, for it SEBON not alone can play vital role. The role of Nepal Stock Exchange further needs effective.

Nepal Stock Exchange, in short NEPSE, is an organized open market for buying and selling financial commodities, known as securities, such as shares or stocks, debentures, bonds, options and futures. It is also known as the stock market. We can in Nepali call the Stock Exchange, a HaatBazzar, where brokers, who are the representatives of the shareholders, come together for buying and selling their ownership or debts of companies. The stock exchange is also an authority to supervise and regulate the trading. Stock exchange plays an important role in the economy by providing place for buyers and sellers to trade stocks, bonds and other financial instruments. “The history of securities market began with the floatation of shares of Biratnagar Jute Mills Ltd, and Nepal Bank Ltd, in 1937. Introduction of Company Act in 1964 , the first issuance¹ of Government Bond in 1964 and the establishment of Securities Exchange Centre Ltd, in 1976 were other significant development relating to capital market” (Ghimire et. al.,2013).

Rational investors prefer to invest their fund into different assets rather than investing in a single asset. This combination of more than one assets hold by investor is known as portfolio. Putting or investing all money in single assets is too much riskier if the respective asset investment falls in default or liquidation. A rational investor always attempts to minimize risk and maximize

return on his/her investment. To avoid such limitation investing in two or more than two securities is known as portfolio investment. In 1952, Harry M. Markowitz developed a model that could be used to systematically operationalise the old adage- do not put all eggs in one basket. Markowitz's portfolio model is concerned with selecting optimal portfolio by risk adverse investors. According to the model risk adverse investors should select efficient portfolios, the portfolio that maximizes return at a given level of risk or minimize risk for getting given level of return, which can be formed by combining assets having correlation less than perfectly positive. Thus, the main purpose of making portfolio is to assure normal return by minimizing the level of risk. "The assets allocation is the fundamental question for the portfolio managers risk analysts and financial researchers in constructing optimal portfolio" (Markowitz, 1956). Early studies in the late 1960s and early 1970s marked the beginning of extensive literature that advocates internationally diversified portfolios on the basis of low correlation national stock markets (Goodman, 2009). The story is not different in case of correlation and interdependence between stock market return and gold return. However, in the context of Nepal such type of research and literature is very few. The investors have a real dilemma how much to invest in the stock market and how much money to sacrifice in gold for earning additional return in the future out of his/her total investable fund. Thus this research work focuses on determining optimal mix of investment in stock market and in purchasing gold by understanding the correlation between stock return and gold return. If there is less than perfectly positive correlation between stocks return and gold return it is beneficial to make portfolio for diversifying the level of risk.

1.2 Statement of the Problem

In the economy of any country, there are many business units involved in making profit. The performance of one business unit is influenced by others. In other words there may be one way or two way causation between the economic activities and transaction in the economy. Here, in Nepalese context, there is no

proper analysis of causation between gold flow and stock market capitalization. If the investors know the causation between gold flow and stock market capitalization, they will make rational investment decision. If the investors are aware about causation then there is little chance of collapsing the investment made by potential investors.

Different risk- class assets are available in the capital market for investment. It ranges from most safe investments (Treasury bills) to most speculative investments (common stocks). Similarly, in case of the real assets market there are long lists of investment alternatives including most liquid assets gold. Here, we try to find out how one investor can effectively manage his total investable wealth into common stocks and the gold.

“Rational investors prefer to invest their fund into different assets rather than investing in single assets. It means they tend to hold combination of assets. The combination of more than one asset hold by the investor is known as portfolio” (Kane; 2009:78). Making portfolio of assets for investment without analysing the respective risk and rate of return, and relationship among the assets in the portfolio is not different than putting money for gamble. The main purpose of making portfolio is diversification of risk by assuring normal return. “Since the international diversification benefits within stock markets seem to decrease with globalization, there is motivation to examine the interdependence of different assets classes.” Exploiting low correlation between different assets classes in global capital markets is the primary objectives of the international diversification” (Chaterjee, 2013). Hence the dynamics of international stock markets, bond markets and gold market are important to examine further. “It is particularly important for the portfolio managers to know if there is a safe haven asset that increase diversification benefits during extreme markets condition” (Weston & Brigham, 2007:8). Hence as per Markowitz diversification the optimal diversification benefits is possible by combining assets with correlation as low as possible. Though, lots of literatures are

available regarding the interdependence of different assets classes. There are very limited literature regarding the interdependence of stock return and gold return particularly in the developing and least developed economy like Nepal. However in the context of Nepal such type of study before making portfolio investment is very rare. This means the investors are investing unknowingly due to various reasons. The lack of education among the potential investors is one important cause; the lack of adequate budget and other facilities for research work has also significant impact for making investment unknowingly. Most importantly, potential Nepalese investors are unaware about the gold inflow and stock market capitalization relationship. They are not informed enough about the movement in macroeconomic variables and its influence in the Nepalese capital market. This research work is particularly focused on the causation and relationship between gold flow and stock market capitalization. There is not enough study regarding the movement of gold's return and stock returns so that one can make the optimal portfolio between stocks and gold in the context of Nepal. This study focuses on the causation between gold inflow and stocks market capitalization in Nepal. The study tries to understand the existing practice of allocating assets between securities and gold among potential Nepalese investors. The determination of optimal mix of gold and stocks for investment in Nepal is the main aspect of the study. To sum up this study deals with following issues;

- Is there any causation between gold flow and stock market capitalization in Nepalese context?
- Are potential Nepalese investors are making portfolio between stocks and gold? If so, are their portfolios optimal?
- What is the optimal portfolio weight between stocks return and gold return?
- Are people making portfolio investment systematically?

1.3 Objectives of the Study

This study focuses on the causation between gold inflow and stockmarket capitalization in Nepal. The study tries to understand the existing practice of allocating assets between securities and gold among potential Nepalese investors. The determination of optimal mix of gold and stocks for investment in Nepal is the main aspect of the study.

The Specific objectives are as follows;

- To undertake Granger Causality test between stock capitalization and gold inflow in Nepalese context to understand the true relationship and causation effect of gold vis a vis stock investments.
- To determine Markowitz minimum variance portfolio between gold and stocks in Nepalese capital market to help determine optimal portfolio mix.
- To analyse opinion of Nepalese Investors on their understanding and practice for portfolio management.
- To suggest and recommend measures for better portfolio management for investment.

1.4 Focus of the Study

Examining the causality between market capitalization of securities and gold flow and finding the minimum variance portfolio between gold and stocks are the main purpose and scope of the study. Many investors do not have idea about the portfolio making about the gold and securities. Though, in some cases we found the investors making portfolio between them but their rationality is missing in these cases.

Although, some investors make portfolio between securities of different companies, the portfolio between securities (paper assets) and gold (real assets) is rare. This situation is often found in the in underdeveloped financial market like Nepalese Financial Market. Thus, focal point of this study is making investors aware about gold return and stock return causation and suggesting them to make optimal portfolio between stocks and gold.

1.5 Limitations of the Study

- This study is based on only 20 years (1995-2014) data of gold imports and stock market capitalization. Due to which higher level of lag selection could not be made for running regression in Granger- Causality test.
- There is a lack of pertinent literature particularly in Nepalese context.

- The required data about gold investment is not easily available in required form and volume.
- The Markowitz minimum variance portfolio analysis is based on only year-end NEPSE index and average gold price for last 10 years (2005-2014).

1.6 Significance of the Study

In the capital market, there is the presence of unidirectional or bidirectional causation between variables and forces which general people don't know. In this research work it has been tried to find out the causality between gold flow and stock market capitalization in Nepalese context. When there is increase in gold flow in the country it will lead to increase in stock market capitalization or decrease in capitalization or will there be no influence at all? The investors will know the answer of the question after running Granger Causality test in this research work.

The investment in single assets is always risky because there is no chance of trade off as in portfolio of assets. The determination of optimal portfolio is important aspects once it is decided to go portfolio investment instead of single assets investment. The study identifies the trend of gold return and stock return over the period of study, the correlation between stock return and gold return, prevailing practice of portfolio investment in gold and stocks among potential investors in the context of Nepal. This study helps to determine the minimum variance portfolio between gold and stocks in the Nepalese investment environment. The potential investors will know whether it is beneficial to make portfolio between gold and stocks or not in the context of Nepal.

1.7 Organization of Study

This thesis is designed as per the format of Faculty of Management (FOM) of TU. Accordingly, the study is organized into five chapters. Each chapter

is devoted with the relevant topics and it also contains the required sections and analysis in order to achieve the objectives of the study.

Chapter-I: Introduction

The purpose of the first chapter is to introduce the thesis work. It includes background of the study, statement of the problem and the objectives. Similarly the limitations and significance of the study are mentioned the chapter.

Chapter-II: Review of Literature

The second chapter includes review of different literature in regards to the theoretical analysis and review of research and studies related to the study field. Therefore, it includes conceptual framework and other related studies.

Chapter-III: Research Methodology

The third chapter presents the research methodology used to carry out this research. It includes research design, population and sample, sources and techniques of data collection and method of data analysis.

Chapter-IV: Data Presentation and Analysis

The fourth chapter is the main body of the study which includes presentation of data and their interpretation. Different financial and statistical tools and models are used for the purpose of analysing the data.

Chapter-V: Summary, Conclusion and Recommendation

The fifth chapter includes summary of the study, the conclusion that has been deduced, suggestions emerging from the study. Finally, the Bibliography and Annexes are included at the end of the study.

CHAPTER-II

REVIEW OF LITERATURE

In this chapter review of the basic researches related to this study is presented. It consists of previous academic studies that have been done in the area of gold and stock markets and returns and the theoretical framework containing basic theories such as Behavioural Finance and Portfolio Theory. Regarding the review of literature, various articles and research works related with this subject are reviewed. Effort has been made to cover various aspects of the study so that adequate feedback can be obtained to broaden the base and input of the study.

The chapter has been divided further into two parts:

- Conceptual Review
- Review of Related Studies

2.1 Conceptual Review

2.1.1 Gold and Gold Market

International Gold Market

“Gold and silver are money. Everything else is credit (Morgan, 2008). For the purpose of being able to carry out the study it is essential as the first step to review main features and peculiarity of gold as financial instruments, gold market and its returns. Gold is highly liquid and precious metal that has the characteristics of both money and commodity. It has been used throughout the history as money, and has been a most popular metal for investment purpose, storage of wealth and as a source of high quality collateral. It has been used as safe investment opportunity in case of crisis. Furthermore, gold is used for industrial purpose, jewellery and the reserve assets. However, only a tiny fraction of world gold is used in industry, around 90% of the world gold is stored as reserve of wealth, as jewellery in private collection. The capacity of

having quick response to price changes and being highly liquid makes the gold different from other commodities (Lawrence, 2000:2).

All supply of gold consists of mining production recycling of gold and sales by the central banks. Annual average supply of gold over recent ten years from mine production accounted as 60% of total supply. Meanwhile, supply from recycled gold and from sales by central bank is 29% and 11% respectively (World Gold Council, 2012b).

During the last decade demand for gold increased dramatically, not just from central banks as was said above but also from other investors. Such a demand rise partly explains the current bull market. India, China, USA, Turkey, and Saudi Arabia represented over half of world demands (World Gold Council, 2012a). Liao & Chen (2008) in their research have stated that the forces behind the gold prices increase are the demand by the emergency countries, especially BRICs (Brazil, Russia, India and China). Goodman (2009) stated that from the macroeconomic viewpoint, within the last decade a rise of gold demand has been influenced by reasons of world economic crisis, the USD depreciation, inflation raise, and production diminishing. Goodman (2009) has also pointed several reasons for high demand for gold. Firstly, gold provides full security on the condition that it retained by central banks. In the light of that, the gold possesses no credit risk in contrast to sovereign debt. Another reason for high demand of gold may be due to liquidity. Gold has the property of sustaining liquidity and gold cannot turn worthless even though economic distress or crisis. The 10 years average world's gold demand flows: Jewellery about 68%, investment about 21%, and remaining about 11% to industry (World Gold Council, 2012b).

Central banks and multinational organizations such as IMF are regarded as the largest holders of gold in the world. In November 2013 the total gold held by these organizations accounted as 33608.8 tons, which is approximately 18% of

the above- ground gold (World Gold Council, 2013). Since 1989, for two decades central banks have typically been net sellers of gold to the private sector. However, in 2009 that period came to the end and the amount of proposed gold by central banks fall dramatically from 236 tons in 2008 to 30 tons in 2009. Thus, the central banking sector has become a net- buyer of gold. Particularly emerging countries being defined as the substantial buyer of gold for their reserves by reasons of rapidly growing economies of these countries especially India and China (World Gold Council, 2013). Thereby, this can also motivate the bull market in some degree.

The researcher from the “Gold Rate for Today” official websites (World Gold Council, 2012a) proposed that one of the reasons of the gold bull market, which we have being observed during the last decade, is increase in US national debt and weakening of the US dollar in relation of other currencies. Therefore, since the gold is mostly priced in priced in US dollars, the gold price is relatively correlated to the value of the US dollar. Thus, the dollar depreciation leads to gold price increase, gold becomes more attractive for international investors (Jaiswal and Voronina, 2012).

It is well known fact that investors turn to the gold during times of political and economic crisis due to the fact that gold is worldwide accepted currency and possesses no credit and liquidity risks which confirms safe haven characteristics, while the paper currency depends on the political and economic confidence of the country it represents. During last financial crisis in 2008, the US government nationalized two biggest US mortgage lenders as well as US insurer which enhanced the demand for physical gold. During the crisis, the US government also lowered the rate for T- bills down to 0.25% which stimulated the demand for gold due to investors turned to similarly low risky but more profitable assets (World Gold Council, 2012a).

Nepalese Gold Market

Nepal, historically imports gold and has geographical advantages. The price of gold in Nepal is mainly based on international gold price. Knowing the factors that affect gold price we can attempt to explain the factors that contribute the sustainable growth rate of gold (The Himalayan Times Daily, August 6, 2014). The first important factor is demand and supply of gold in the international gold market. Generally, the rule of demand and supply can explain the growth of gold price. “The price usually increases in conditions when supply does not satisfy the growing demand. It is not secret that the reserve of gold in the world is limited along with constantly increasing demand for gold” (Maharjan, 2014). The gold price in Nepalese market has gone down by Rs. 3000 in this week. The reason for sharp fall in gold price for this week is due to the shifting of investors towards the stocks in the international capital market. As there is decline in investment risks in international stock market investors shift their investment to shares which causes fall in demand in gold market. Not only gold price but also the oil price has gone down sharply this week in international market” (Kantipur Daily, 2014). It shows that gold and oil price at least in certain periods, shows similar trend of movement.

Nepal Gold and Silver Dealer’s Association (NEGOSIDA)

Nepal Gold and Silver Dealers' Association (NEGOSIDA) was formed in 1987 AD (i.e. 2044 B.S.) in Kathmandu considering the need of strong platform to safeguard and promote the rights and interests of Gold and Silver dealers community. With the passing of time, it has become an apex body of Jewellers community of the country with 32 district level branches.

NEGOSIDA is representative organization of Nepalese Jewellers. It is a non-governmental, non-political, non-profit making, autonomous and service-oriented organization. NEGOSIDA has made significant role that help strengthen the economic development of the nation.

NEGOSIDA has been active ever since its inception in achieving following objectives

- Safe guard and promote the interests, rights and privileges of its members and Jewellery community.
- Maintain professional unity and co-operation among Nepalese Jewellers.
- Strengthen national economy through local, national and International gem and jewellery trade.
- Enhance capability of its member Jewellers through providing trainings, seminars, workshops, interactions, jewellery exhibitions and observation tours.
- Hallmarking of gold and silver Jewelleries for the benefit and safeguard of customers. Also, to protect consumer trust in Nepalese gold and silver jewelleries.
- Maintain standard (Applied) Gold and silver rate all over the country every day.
- Preserve and enhance the traditional Nepalese Jewellery identity and its skill. Also expose it to international arena.
- Support to produce skill man power for jewellery industries and help promote local employment.
- Forward remarks and recommendation on the policy matters, acts and bylaws, plans and programs related to gems and jewelleries.
- Perform social and public - welfare activities ([www. negosida.com](http://www.negosida.com)).

2.1.2 Stock Market and Returns

In business term, stock is the financial instrument that facilitates the flow of fund between companies and investors, and stock market is the place where investors buy and sell stocks. Companies use stocks to generate fund for their business activities, and investors buy stock to invest their money in the finance world. Buying and selling of stocks depends upon the preference of investors as well as the financial condition of the company. “The investment objectives of the investors varies greatly depending on investable wealth of investors, age,

risk taking, investment horizon etc” (Sharpe, et.al., 1995).Some investors buy stock for regular income that they generate in the form of dividend. Whereas, some investors buy stock to generate money in the form of capital gains due to short term fluctuation of stock price.” Even if stock market is established to help corporate world, it has become the gamble place for many investors (Bhattarai; 2013:5). The NEPSE provides trading floor for the investors of securities in Nepal whereas SEBON is the regulator of capital market in Nepal. Financial market can be classified into different types based on different basis. Each market deals with particular type of financial instrument. The types of financial market can be explained into following sections;

On the basis of the life span of the securities traded, financial market can be classified as Money Market and Capital Market. Money market is the market for short term debt securities. Debt securities having maturity period less than one year are traded in the money market. The most common money market instruments are T- bills, commercial papers, certificate of deposits, banker acceptance, repurchase agreement, federal funds Eurodollar deposits etc(Sharpe et.al., 1995). However the commercial paper is not available in the Nepalese money market. In market is the market for short term, low risk and highly liquid debt securities. Money market is the dealer market and it does not have specified fixed meeting place On the other hand, capital market is that market where long term securities are traded. The main objectives of the capital market to raise huge fund (capital) for the organization. The market for the common stocks including long term bond, preferred stock etc. is the capital market.

Based on the whether the securities are traded first time or second time the security market are of two types viz primary market and secondary market. The brief introductions of these two types of market are given below Primary market is that type of market where only new financial securities are traded. The main objective of primary market is to raise the necessary capital to make

new huge investment objective through initial public offering. The issue may be a brand- new company or one that has been in business for many years. “In primary market investment banker performs the role of an expert issuing in the process of buying and selling of securities (Bhattra; 2011: 53). In the context, the investment banker is better known as issue manager. The security exchange act has provisioned the appointment of issue manager compulsory for initial public offering (IPO).Secondary market is that types of market where second hand securities are traded. The main objective of the secondary market is to provide the liquidity of the securities investedby the investors. In secondary market simply the ownership of securities is transferred between the parties but the issuer will not receive the new fund. “The new securities are traded in primary market while all the subsequent transactions are made in secondary market” (Thapa; 2013:205). Due to liquidity and speculation in the secondary market buying and selling of security is less risky. There is huge financial transaction in secondary market than primary market. There is important role of broker in the secondary market for trading of securities. The study is also based on the return of stocks calculated in the secondary market i.e. NEPSE return because we cannot get stock return from the primary market. The secondary market can be oftwo types Over the Counter Market (OTC market) and Organized Stock Exchange. The volume of the securities transaction is more in organized stock exchanges than in OTC market. NEPSE is only the organized stock exchange available in Nepal. A department of NEPSE performs the function of OTC market in Nepal.

Stock Market in Nepal

The study is also based on the return of stocks calculated in the secondary market i.e. NEPSE return because we cannot get stock return from the primary market. The secondary market can be oftwo types Over the Counter Market (OTC market) and Organized Stock Exchange. The volume of the securities transaction is more in organized stock exchanges than in OTC market. NEPSE

is only the organized stock exchange available in Nepal. A department of NEPSE performs the function of OTC market in Nepal.

The NEPSE provides trading floor for the investors of securities in Nepal whereas SEBON is the regulator of capital market in Nepal. Each market deals with particular type of financial instrument. Nepal Stock Exchange (NEPSE), established in 1994, is the only one stock exchange available in Nepal. NEPSE is established under the Company Act 2063 B.S, operating under Securities Exchange Act, 1983. The main objectives of NEPSE is to impart free marketability and liquidity to the government and corporate securities by facilitating transaction in its trading floor through member, market intermediaries such as brokers, market makers etc.

The calculation of the NEPSE index is based on the concept of the market capitalization (sum of the market capitalization of all the company listed in the Nepal Stock Exchange). If the ratio of current period market capitalization to the base period market capitalization is multiplied by the multiplier 100, we get the NEPSE index. This method of index calculation is called value weighted method. This concept can be illustrated with a hypothetical example, considering '0' as the base period and '1' as the current period.

The history of securities market began with floatation of shares by Biratnagar Jute Mills Ltd.in 1937. However, NEPSE opened its trading floor on 13 January 1994 and started to calculate the NEPSE index. It is market value index that is based on total market capitalization. The base value of NEPSE index is the value of in the Nepal Stock Exchange at the close of Jan 13, 1994, the first day of trading through the member broker. NEPSE considers all the stocks listed in the stock exchange and their closing prices to calculate the NEPSE index. NEPSE index is calculated asfollows:

Table 2.1

An example of calculating NEPSE index

Companies	Outstanding shares	Closing price		M. C. At '0' time	M. C. At '1' time
		At '0' time	At '1' time		
A	1000	40	45	40000	45000
B	1200	35	50	42000	60000
C	1500	50	55	75000	28500
Total Market Capitalization (Total market value)				157000	187500

M.C. means Market Capitalization.

O. S. means outstanding shares

NEPSE Index = (Total Market Capitalization of all the Companies Listed/Total Base Year's

Market Capitalization) *100

NEPSE Index = (187500/157000)* 100

NEPSE Index for the time period '1' is 119.43 with reference to the base period '0'(www.nepalstock.com.np).

Securities Board of Nepal

Security Board Nepal, an apex regulator and facilitator of capital market. Securities Board, Nepal was established pm May 26, 1993 under the provision of Securities Exchange Act 1983(first amendment).Securities Board of Nepal (SEBON) was established by the government of Nepal on June 7, 1993 as securities Security Board Nepal, an apex regulator and facilitator of capital market. Securities Board, Nepal was markets in Nepal (second amendment). It has been regulating, controlling and monitoring the market under the securities exchange act, 2006. Since its establishment, SEBON has been concentrating its efforts on improving the legal and statutory frameworks which are the bases or the healthy development of the capital market. As a part of its continuous efforts to build a sound system, the securities exchange act 1983 was amended the horizon of SEBON by bringing market intermediaries directly under

jurisdiction and also made it mandatory for the corporate bodies to report to SEBON annually as well as semi-annually established a direct relationship of SEBON with the market intermediaries and the listed companies supremacy in its jurisdiction yet to be established and clearly recognized. It is the organization, which works under the Ministry of finance. The government of the country executes its policy related to capital market through the organization (Ghimire, et.al. 2013).

General Objectives of SEBON

- To manage the securities market
- To render contribution to the development of capital market by making securities transaction fare healthy efficient and responsible.
- To promote and protect the interest of the investor by regulating the issuance sale and distribution of securities and purchase sale or exchange of securities.
- To supervise, look after and monitor the activities of the stock exchange and of corporate bodies carrying on securities business.

Functions of SEBON

SEBON carries out the different functions for the accomplishment of its objectives. The functions, duties and powers of SEBON as per the Act are as follows (www.sebon.gov.np)

- To offer advice to Government on matters connected with the development of the capital market.
- To register the securities of corporate bodies established with the authority to make a public issue of its securities.
- To regulate and systematize the issue, transfer, sale and exchange of registered securities.
- To give permission to operate a stock exchange to any corporate body desirous of doing so, subject to this Act or the rules and bye-rules framed under this Act.

- To supervise and monitor the functions and activities of stock exchange.
- To inspect whether or not any stock exchange is executing its functions and activities in accordance with this Act or the rules and bye-rules framed under this Act, and to suspend or cancel the license of any stock exchange which is not found to be doing so.
- To issue licenses to conduct the business of dealing in securities, subject to this Act, or the rules and the bye-rules framed under this Act, to companies or institutions desirous of conducting the business of dealing in securities.
- To supervise and monitor the functions and activities of securities-dealers.
- To grant permission to operate collective investment schemes and investment fund programs, and to supervise and monitor them.
- To approve the bye-rules concerning transactions in securities framed by stock exchanges and institutions engaged in the business of dealing in securities, and, for the purpose of making necessary provisions concerning the development of the capital market and protecting the interests of investors investing in securities, issue orders to have necessary alterations made in such bye-rules of stock exchange and institutions engaged in the business of dealing in securities.
- To systematize the task of clearing accounts related to transactions in securities.
- To supervise whether or not security dealers are behaving in the manner prescribed in this Act, or the rules and the bye-rules framed under this Act, while conducting business of dealing in securities, and suspend the license to conduct the business of dealing in securities in case any securities dealer is not found to be behaving accordingly.
- To make or ensure necessary arrangements to regulate the volume of securities transacted and the procedure of conducting such transactions in order to ensure the promotion, development and clean operation of stock exchanges.

- To make necessary arrangements to prevent insider trading or any other offenses relating to transactions in securities in order to protect the interest of investors in securities.
- To review or make arrangement for reviewing the financial statements submitted by the corporate bodies issuing securities and security dealers, and issue directives deemed necessary in that connection to the concerned corporate body.
- To systematize and make transparent the act of acquiring the ownership of a company or gaining control over its management by purchasing its shares in a single lot or in different lots.
- To establish coordination and exchange cooperation with the appropriate agencies in order to supervise and regulate matters concerning securities or companies.
- To discharge or make arrangements for discharging such other functions as are necessary for the development of securities and the capital market (www.sebon.gov.np).

The Governing Board of SEBON is composed of seven members including one full time chairman appointed by the Government for tenure of four years. Other members of the Board include joint secretary of Ministry of Finance, joint secretary of Ministry of Law, Justice and Parliamentary Affairs, representative from Nepal Rastra Bank, representative from Institute of Chartered Accountants of Nepal, representative from Federation of Nepalese Chambers of Commerce and Industries, and one member appointed by the Government from amongst the experts pertaining to management of securities market, development of capital market, financial or economic sector.

There are seven departments and sixteen sections in the organization of SEBON. Under the Management Department, there are two divisions namely Human Resources Section and Finance Section. There are also four sections under the Planning and Development Department namely Research Section,

Training Section, Information Technology Section and International Affairs Section. There are also two sections under the Corporate Finance Department namely, Public Issue Section and Collective Investment Scheme Section. Likewise, Under the Regulation Department, there are two sections namely, Stock Exchange Regulation Section and Market Intermediaries Regulation Section. There are also four sections under the Surveillance Department namely, Stock Exchange Surveillance Section, Market Intermediaries Surveillance Section, Trading Surveillance Section and Corporate Surveillance Section. Finally, under Legal Department, there are two sections Research and Investigation Section and Enforcement Section.

The major financial sources of SEBON are the government grant, transaction fee from the stock exchange and registration fee of corporate securities. Other financing sources include registration and renewal of stock exchange and market intermediaries and the income from mobilization of its revolving fund(www.sebon.gov.np).

Guidelines to Investors in Nepal

Security buying and selling is really difficult task. Nepalese investors lack knowledge about the security market and its behaviour. They often invest without proper knowledge and information. The stock market of Nepal is showing positive indication in recent years. In this regard following may be some major guidelines to Nepalese investors;

- Company issues and sells securities to fulfil their fund demand. It provides the investment opportunities to earn profit to investors
- Securities can be bought by two ways- firstly during IPO through issue manage and secondly from the stock exchange, NEPSE in Nepal.
- The listed securities are bought and sold through stock broker. The buyer and seller must pay brokerage commission fixed by NEPSE.
- Before making investment or disinvestment decision, the investor should analyse the past performance, financial statements, annual reports, price

sensitive factors, nature of business etc. The creditworthiness of the board of directors is also other important factor to be considered.

- The price of security is determined by its demand and supply. Performance and operating result, dividend, development and future growth of the company affect the price of security by stimulating demand.
- Common stocks are profitable but risky. Preferred stock and debt securities are less profitable and less risky. So an investor should choose the securities as per his/her requirements
- Investment can also be possible collectively through special type of schemes like mutual fund. This option is better for investors who do not like to assume risk and have little knowledge about security market. But in case of Nepal the market of mutual fund is thin.
- Common stocks, preferred stock, corporate bond, government bond, mutual funds are available in Nepal for security investment.
- Common stockholders have limited responsibility in the company. Their responsibility is limited within the maximum value of their stock.
- Investor can place their grievances in NEPSE or SEBON.
- If company liquidates, common stockholders have the limited responsibility in the company. Their responsibility is limited within the maximum value of their stock.
- Investment must be made in different securities of different companies instead of investing in single securities(www.sebon.gov.np).

Fundamentals and Technical traders

The action of traders also plays an important role in price movements of stocks. Goodman (2009) used an econometric model to differentiate the effect on stock price by fundamentalist traders (based on financial ratios) and technician traders (technical analysis). Fundamental analysis and technical analysis are both powerful strategies that investors and traders can utilise to aid their trading decisions.

Technical analysis uses historical stock statistics, usually price and volume data, to forecast future prices. In layman's terms, a technical analyst finds a pattern in stock's data. The popular Resistance level etc. "Chinese individual investors lack the investment knowledge and skills in general because they have not been in business for long time. The characteristics result in the dominance of noisy traders who are essentially technicians (Mossa & Li; 2008:29).

On the other end of the trading spectrum, we find fundamental analysts. Determining the intrinsic value of the stock is the chief mission of the fundamental analysts. The fundamental traders will look at the company's profile, seeing when its latest earnings reports were released, what type of news was released from the company, and accordingly analyse if the market has correctly priced in all this information into the stock's price. Successful fundamental analysts do not shy away from financial statements. The de facto classic example of a successful fundamental analyst is world-renowned 'value investor' Warren Buffett. Mr Buffett published as the fourth richest person in 2014 by Forbes Magazine, implemented value investing essentially looking for stocks whose intrinsic value was higher than their market price, and was never afraid to place large, long term trades on these stocks (The Forbes Magazine, 2014).

2.1.3 Portfolio Investment

The developing countries use the portfolio investment as a growing tool in the economy and take some measures to encourage the use of portfolio investment. While going for liberalization and economic reforms in order to bring about the substantial and rapid economic growth, the government takes up some policies and instruments. The portfolio investment is one of the most famous financial instruments that are taken up by government to enhance the economic growth. The foreign direct investments are also encouraged by the developing countries while going for the economic reforms. Objectives of the portfolio for making combination of investment are:

1. Primary Objectives

- Minimizing the risk and maximizing the return of overall investment.
- Wealth maximization

2. Secondary Objectives

- Regular cash flow
- Easy liquidity(marketability)
- Tax benefit(tax subsidy)
- Confidence and satisfaction of investors (Thapa& Rana, 2011).

A portfolio of a company is the sum total of its business, assets and products. A perfect portfolio analysis is shaped to meet and suit the company's potency and also enable it to exploit the best opportunities available to the company. Analysis of portfolio involves deciding upon the relative importance of available business and investment opportunities by accessing the business portfolio of the company. This portfolio analysis also involves formulating strategies that would add to the business portfolio in terms of new business opportunities and products.

The best portfolio analysis takes into account the locating of the different Strategic Business Units (SBU) present in the portfolio of a company. These SBUs have business objectives and missions independent of the other business objectives of the company. An SBU can be the following three things:

- Individual brands
- Product lines
- Company division

In portfolio, investor analyses the future return of securities. The objectives of portfolio investment are to develop a combination that provides maximum return at chosen level of risk. Efficient portfolio always provides the highest possible return for any specified degree of risk and lowest possible risk for any

specific rate of return. "Portfolio management is the art of handling a pool of funds that it not only preserves its original worth but also over time period appreciate in value and yield an adequate return consistent with the level of risk assumed" (Sharpe; 1998:141).

Portfolio investment is the investment in the various securities i.e. portfolio is the combination of securities to diminish the degree of risk. The main objective of establishing a portfolio is to the diversification of risk. It is human nature to decrease risk and increase return,. Portfolio management is a selection of optimal alternative available and attainable that provides highest possible return from lowest possible risk for the specific return (Thapa, 2011).

There is common saying that "don't put all your eggs in one basket". The meaning of the proverb is "Diversification of Risk". Diversification of these eggs among various baskets will diversify degree of risk, surrounded to eggs knowingly and unknowingly. Investment in a single company denoted by a basket may have higher chances of loss. Anything harmful to the company may cause the ultimate defeat of investment. Diversification can help to reduce portfolio risk by eliminating unsystematic risk. Diversification simply means spreading investment upon different securities of different industries. The main point of diversification is to reduce risk rather than improve expected return. Diversification is the most important step to reaching long-range financial goals minimizing risk. Diversification in the investment or making portfolio in security level or in industry level protect against volatility and uncertainty at rate of return (Kane, 2009).

Investors know that there is a trade-off between risk and reward: to obtain greater expected returns on investments, one must be willing to take on greater risk. No one combination of securities is optimal for all investors. The best portfolio for any one investor depends on their own tolerance for risk. Each investment instrument has its own expected monthly return, and its own

propensity for these returns to fluctuate from month to month. However, the returns from different instruments are not in general independent. A risk management is a technique that mixes a wide variety of investment within a portfolio. The rationale behind this technique contends that a portfolio of different kinds of investments will, on average, yield higher returns and pose a lower risk than any individual investment found within the portfolio (Ghimireet.al.,2013).

Diversification strives to smooth out unsystematic risk events in a portfolio so that the positive performance of some investments will neutralize the negative performance of others. Therefore, the benefits of diversification will hold only if the securities in the portfolio are not perfectly correlated.

Simple Diversification

Simple diversification is the random selection of securities that are to be added to a portfolio. It would be also to reduce unsystematic or diversifiable risk. It simply says that not putting all eggs in one basket but it does not eliminate total risk by creating a simple diversified portfolio.It is not investing in a security form single industry.

Diversification across Industries

In this diversification, investors select securities from various industries and make investment. It is better to selecting securities form different industries to achieve better diversification than select all the securities in a portfolio from one industry.

Superfluous Diversification

It refers to the investors spreading himself in so many investments on his portfolio although it is very difficult and expensive to look after a large number of investments. In this diversification, investor select more than 15 different securities make investment. It needs high knowledge, maximum calculation

and analysis. It is selected for a portfolio, the maximum risk reduction benefits from simple diversification, has most likely been attained. It reduces risk with in categories of stock than have the same quality rating. For example, NEPSE has rated security grade "A" and so on and investor can make investment in this categories under this diversification.

Markowitz Diversification

“Markowitz Diversification is the combining of assets, which are less than perfectly correlated in order to reduce portfolio risk” (Francis, 2000). That is risk below the non-diversifiable level. Markowitz diversification is more analytical than others diversifications and considers assets correlation. “The low the correlation coefficient between assets more the Markowitz diversification will be able to reduce the portfolio risk (Weston and Brigham, 2007). It is a scientific way to manage a portfolio and its result. Since, Markowitz portfolio considers both the risk and return of dozen and hundreds of different securities simultaneously. It is a more powerful method of analysing a portfolio than using institution.

2.1.4 Review of Development of Analytical Tools

The concept of Granger Causality was first introduced to econometrics in the ground-breaking work of Granger (1969) and Sims (1972). Prof. Sir Clive W.J. Granger is the Nobel Prize Winner British Economist. Since then it has generated extensive line of research and quickly became standard topic in econometrics and time series analysis textbooks. Granger Causality tests are abundant in economics and finance. Although most Granger Causality tests in empirical application rely on parametric assumptions, most notably the discrete time vector autoregressive model, it is convenient in case of non- parametric as well Toda & Yamamoto (1995). This method has been remained as a popular method for causality analysis in time series due to its computation simplicity in spite of some notable criticism.

The Granger Causality test is statistical hypothesis test for determining whether on time series is useful in forecasting another. Ordinarily, regression reflect mere correlation, but Clive W.J. Granger argued that causality in economics could be reflected by measuring the ability of predicting the future values of a time series using past values of another time series.

In Granger causality there are always two variables. Moreover, we do not know which one is dependent variable and which one is independent. So, a time series X is said to Granger-cause Y if it can be shown, usually through a series of t-tests and F-tests on lagged values of X (and with lagged values of Y also included), that those X values provide statistically significant information about future values of Y.

2.2 Review of Related Studies

As most commodities, the price of gold is affected by market supply and demand along with speculation.” However, unlike most of commodities, saving and recycling determine gold price rather than consumption (Jaiswal and Voronina; 2012:25). Besides the world gold reserve, gold price also relates to US dollar exchange rate, Oil and other commodities prices, economic instabilities, financial crisis and other world’s events such as wars, natural disasters and hazards. Several studies have been conducted to understand the behaviour of gold’s price. Abken (1980) and Lawrence (2003) found inflation, gold demand and supply, world events and gold auction determine gold price. Similarly, Machlup (1969) found speculation as main factor influencing gold price. Recent studies such as Tully & Lucey (2007) found that US Dollar is the main, in fact, in most cases the only one, macroeconomic variable that affects gold’s return. Similarly, Lawrence (2004) confirmed that GDP and other macroeconomic factors are unrelated with the gold’s return.

Many researchers have agreed that gold plays an important beneficial role in portfolio diversification. Taking into account that gold is highly liquid assets

and therefore can be accessed any time and possesses no credit risk, investors turn gold under condition of crisis and financial distress. The low correlation coefficient between gold and stock returns makes gold as an efficient portfolio diversifier (Lawrence, 2003). In this research, (Lawrence, 2003) tested whether the main reason of having low correlation is related with other macroeconomic variables, and found that gold return is not related with them but strongly related with financial assets like stocks and bonds. Due to the difference between gold price determinant and other financial assets price determinant, gold has always considered as the portfolio diversifier especially with stock portfolio (Lawrence, 2003). Ratner Klein (2008) has confirmed that gold can play an important role in a diversified portfolio due to its return are normally independent of returns on other assets, while as individual investment, gold is quite risky. Salant & Henderson (2009) argued that gold is a strategic asset, which allows investors to hedge against inflation as well as to diversify portfolio. However, Chua & Woodward (1990) found that the correlation of gold return and US stock returns is rising over time which leads to lowering benefits of holding gold.

All of the studies discussed above about gold as portfolio diversifier are based on the overall stock exchange index and international gold price. However, few researchers have studied and analysed the relationship of gold with stocks on industries level. Ratner and Klein (2008) studied the period of 1975-2005 and calculated the correlation of gold with 10 different economic sectors of the US economy while analysing the group of 50 developed and developing countries to show the effects of gold on international portfolio. They found that gold is poor diversifier in international portfolio over the whole sample period. However, over the period 2001-2005 gold provide diversification benefit, but only up to 40% annual return. When annual return is higher, then gold makes no difference in international portfolio diversification.

Mansor H. Ibrahim (2012) student of University of Putra Malaysia, Serdang Malaysia studied Financial market risk and gold investment in an emerging market: the case of Malaysia which is published in International Journal of Islamic and Middle Eastern Finance and Management, Vol.5 Is: 1, pp 25-34. The purpose of this paper is to examine the relation between gold return and stock return and whether its relation change over time. They used GARCH and ARCH model for the study and a significant low positive correlation is found between gold return and one lagged stock return. Moreover, consecutive negative market returns do not seem to intensify the co-movement between the gold and stock markets as normally documented among national stock markets in times of financial turbulences.

Umesh Kumar Jaiswal & Victoria Voronina (2012) students of Umea University Umea School of Business conducted the research on the topic Relationship between Gold and Stock returns: Empirical evidence from BRICs. Their study set out following major objectives;

- To identify the relationship between stock return and gold return by exploring the correlation and spill over effects between international gold return and stock return of Brazil, Russia, India & China.
- To understand whether the international diversification benefits possible based on correlation between stock return and gold return.

They used the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) and Vector Auto regression (VAR) model as the research methodology. They incorporate the international gold return (2001-2010) and the return of each sector of economy of BRICs for the study.

They came up with following results and conclusions after the completion of the study;

- There is low positive correlation between stocks return and gold return.

- The result of correlation study support that gold comprises characteristics of efficient portfolio diversifier, due to its low correlation with the stock returns. However, correlation varies across countries and economic sectors, and over time.
- The second major finding was that the result confirmed a role of gold as a hedge and safe heaven.

In nutshell this study come up with the gist that gold is an opportune important financial assets which can perform the function of portfolio diversifier, hedge and safe heaven.

Other studies conducted in Nepalese perspective are reviewed hereunder; Shrestha (2004) has undertaken the study “*Optimum Portfolio Selection*”. This research is based on seven years’ period and twenty three numbers of companies: five companies from Bank, five companies from finance, five companies from insurance, four companies each from manufacturing and others.

The Main Objectives are:

- To analyse risk and return, market sensitivity, composition of risk and pricing status of securities.
- To find out the optimal portfolio of security trading in NEPSE.

The Major Findings are:

- NABIL and NIBL are the best alternatives for risk lover-investor and risk averter investor respectively and BOK is the most risky asset in the banking sector. NCM and YFC are best alternatives for risk lover and risk averter respectively in finance groups. EICL is the best based on risk return characterize in insurance companies and BNL is the best one in manufacturing companies as regarding to risk and return factor.

- On the basis of underlying risk factor, he concluded that there is high variation on the proportion of systematic risk and unsystematic risk among the sample companies
- Most of investors are risk lover and applying the simple diversification across industry.
- Most of the securities are highly volatile to market and they are aggressive too and
- Although insurance and finance companies' securities are providing good return not only by companies but also by industry. People still prefer banking securities.

Gautam (2012), the study entitled to "*Selection of Optimal Portfolio in NEPSE*" has

The Main Objectives are:

- To develop understanding for portfolio investment
- To find out the risk & return variables of securities
- To find out the best portfolio

Considering the overall return and risk analysis, most of all commercial banks are attractive for the investment. NBB should retain for investment due to its negative Expected Return however. Nabil is the best alternative among all.

- Almost all of the common stocks move in same direction i.e. they are positively correlated.
- The optimal portfolio is that combination of weigh is:
NABIL 62.30%, NLL 22.83%, NLIC 10.43% and BOK 4.44%

Sharma (2012), the study entitled to "*Investor's Preference in Choice of Financial Instrument in Nepal*" has;

The Main Objectives are:

- To explore the decision relating to the choice of financial instruments by independent individual investors and

- To identify the investor's preference in making the choice of financial instrument in the Nepalese context.

The Major Findings are:

- Although the Debenture and Preference share are investment alternatives, Debenture and Preference share issued in very few times. Debenture and Preferred stock did not fully subscribed in the past years where as the Debenture of Himalayan Bank was oversubscribed. This denotes that future prosperous and investor are attracting to invest in debt instrument of banks too.
- People are highly interested in corporate securities rather than government securities. Researcher left research part of investment style in according to investment.
- Research provides some basic idea on preference of individual investors concluding portfolio depends on preference of investors.

Aryal (2012), the study entitled to *“Investors Problem in Choice of Optimum Portfolio of Stock in Nepal Stock Exchange”*.

The Main Objectives are:

- To find out the major problems of investor facing in the selection of most profitable stock in NEPSE.

Researcher presented the data of 12 months, fiscal year 2000/01. The study is totally based on secondary data published in NEPSE trading report. Mr. Joshi concluded that portfolio management was new concept for the Nepalese investor.

The Major Findings are:

- Due to the lack of sufficient information, proper investment was not possible. Proper investment needed huge information internal as well as external.

- The stock market in Nepal was also in infant stage only. The only one stock exchange located in Kathmandu. Traditional cry system, limited no of security broker
- lack of opportunity to invest were reason are there, which is acting as barrier of development of NEPSE"
- Mr. Joshi had pointed some problem which is still is in the practice. Researcher had taken only those stocks which are categorized "A". This do not represents actual analysis of available alternatives to invest. Researcher had taken data of only fiscal year.
- Due to the lack of financial tools, only three stock portfolios were constructed and analysed. Researcher assumed that investor does not know in which stock to invest, how to portfolio constructed and even many stockbrokers do not give information to the investor. Investor are purchasing and selling their stock mostly on the pressure of broker and market whim.
- Due to the lack of information, the decision or purchase and sell of stock are very difficult. It needs special knowledge as well as adequate skills small change in proportion if investment may change the risk and return in very large scale. It is the right of investor to be well informed while making investment.

Researcher forgot to give remedies and sources of information. Researcher had totally based on minimum variance portfolio, which may do not represent actual portfolio itself. The conclusion is valid only for risk averter investors rather than risk lover investor.

2.3 Research Gap

In recent years the whole world has experienced the economic crisis and simultaneously the growing gold market. It is becoming increasingly difficult to ignore the role of gold in the financial market. And, it would be eventually interesting to explore the relationship of gold with stocks. At the same time,

whether gold has same kind of relationship with stocks over the time. The research to date has tended to focus on the relationship of gold return with stock testing the causality among these two returns. For causality, Granger Causality model is applied here. On the basis of literature review, the author hasn't found any research work that compares the gold return with stocks return in Nepalese context.

Barely two articles found where relationships between macroeconomic variables is examined using Granger Causality Test. Maharjan (2014) studied *the Nepal's Economic Growth, Exports and Imports: A VAR Analysis of Relationship* and found that there was bidirectional short run causality between economic growth and exports. But the result also showed that there was no causality between economic growth and imports. Similarly, Gautam (2012) studied the Nepal's GDP and Tourism: A VAR Analysis of Relationship and found that there is bidirectional short run causality between growth in Tourism and growth in Nepal's GDP. Both articles focused on the relationship between macroeconomic variables. In this way, based on the literature review a clear research gap occurred, which suggests to analyse the relationship and causation between stocks return and gold return. The research result address to be useful for researchers as well as for the investors in the following ways;

Firstly, since gold is financial instrument, most of the research works regarding gold are outdated. During the last ten years the world economic crisis and bull market of the gold are two major events for the investors of gold. The study is based on last ten years data. Since most of the research work are based on old data, so it is strongly believed that the research work with last ten years of data has valuable contribution to financial literature.

Secondly, most of the studies have been conducted in Nepalese context are about portfolio management of the pool of securities. There has been very little study about portfolio making between real assets and paper assets. This study

will make an important contribution towards portfolio managers for diversifying the composition of their assets investment in the rational and wise way in Nepalese financial market.

Thirdly, although, there are lots of research works regarding portfolio management in the dynamic financial environment in the well-developed financial market, the volume of such research is small in the context of non-developed financial market like in Nepalese context. In Nepal, there has been some research work regarding portfolio management of securities of different companies within the same industry and across the industries.

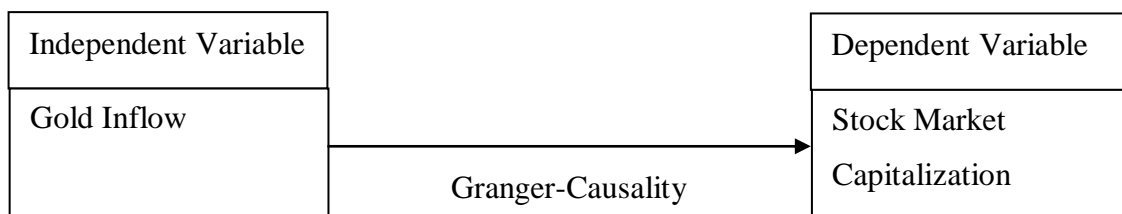
Finally, the research work intends to explore the gold market more deeply, and an outcome of the results of the study is a source for the further research. In addition, it intends to make some suggestions for further research.

2.4 Conceptual Framework

Since, there is no prior idea about which one is dependent variable and which one is independent between gold flow and stock capitalization, the simple regression is not possible to run for analysis of movement. Granger Causality test is conducted by taking one variable as a dependent variable and next as an independent variable once. The simple conceptual sketch for the methodological analysis is presented in following figure;

Figure 2.1

Conceptual Sketch of Granger-Causality



The reverse relationship will also be tested commensurate to Granger Causality approach

CHAPTER–III

RESEARCH METHODOLOGY

This chapter incorporates the overall research framework that includes research design, population and sample, sources and technique of data collection, coverage, and method of analysis. In other words, it provides in detail the methodological process being adopted to conduct this research.

3.1 Research Design

This research is conducted to examine and find out the causation of gold return and stock return and relationship among them, and also the problems and possibility of making portfolio between them is studied. In this study to satisfy the objectives, a descriptive design has been adopted. The study is based on historical data and ex-post facto research because no variables are in the control and no variables in this research is manipulated during the study. The research work has been designed as per the problem and objectives defined for the study. Granger Causality/Wald test is the main aspect of this research work. The multiple regressions have been conducted in SPSS to understand the causation between gold inflow and stock market capitalization. 20 years data of gold inflow and stock market capitalization has been taken for this purpose. Akai Information Criterion is used for lag selection. The Markowitz minimum variance portfolio analysis is used for the research. Annual holding period return of gold investment is determined by taking the annual average gold price for 10 years whereas HPR of stock investment is based on year-end NEPSE index. HPR, expected rate of return, standard deviation, Variance, coefficient of variation, portfolio risk and return, covariance, correlation coefficient are the additional financial and statistical tools used for the portfolio analysis. In addition, in order to reinforce the analysis with the perception of stakeholders, a questionnaire has been prepared and collected from among 50 respondents for the analysis of understanding and practice of portfolio investment among Nepalese investors.

3.2 Nature and Sources of Data

This study is heavily dependent on secondary data. Primary data is also used as per the need. So, the sources of data are:

a. Primary Data Source

The data collected from the field is the primary data. Primary data collected from primary sources by sample survey. During research period, direct interview and questionnaires, field visit etc held. To analyze the general understanding of Nepalese investors about portfolio investment primary data collection tools are used. Primary sources include the responses of the questionnaires, personal interview with concerned person such as experts, brokers, investors, gold traders etc. Questions related to major determinants of investment portfolio, investment strategy, systematic management of portfolio, diversification strategy, tools used for analysis risk and return, primary objective for selection of portfolio, period of portfolio revision about NEPSE and Gold and Silver Dealer's Association Nepal were included.

b. Secondary Data Source

Secondary sources of data includes annual reports of SEBON, trading report of NEPSE and reports from Gold and Silver Dealers association of Nepal, quarterly bulletins of NRB, Economic Surveys published by Finance Ministry, Government of Nepal, web-sites of NRB, statistical book of Nepal, published and unpublished documents, previous studies, dissertation, articles and foreign related journals as well. Newspaper, magazine, books and other reports such as ArthicAbhiyan, Economic Post, Kantipur, Gorkhapatra and New Business Age etc. are useful sources of secondary data. Some other important information has been collected from Internet.

3.3 Data Collection Techniques

The secondary data is collected mainly through visiting the websites of concerned organization. In addition to this, some data is collected by visiting the R & D department of respective organizations (NRB, SEBON, NEGOSIDA

etc.)Secondary data is processed as per the requirement of the study. The primary data are collected through questionnaire survey, field visit/ library research.

a. Questionnaire Method

To get information about understanding of portfolio investment among Nepalese investors and its various aspects, questionnaire method has been used. Open, closed and mixed questionnaire were used to collect the data. Yes/ No question, multiple choice question and descriptive questions were included to get the response.

b. Historical Data Record Method

It is the main sources of the data for this study. Historical data are collected from various reports,annual report of NRB, annual report of SEBON, reports of gold and silver dealers association Nepal, prospectus of companies and newspaper. Previous data, which were used by other studies, were also used for this study.

3.4 Analytical Methods and Approaches

Under this, Granger- Causality models and financial and statistical tools including Markowitz minimum variance portfolio approaches are used, as described in the following sections:

3.4.1 Granger-Causality and Regression Models

Granger Causality/ Wald test is the major methodology used for this research work. Although, regression analysis deals with the dependence of one variable on other variables, it does not necessarily imply causation. In other words, the existence of a relationship between variables does not prove causality or the direction of influence. But in regression involving time series data, the situation may be somewhat different because, as one author puts it, time does not run backward. That is if event A happens before event B then it is possible that A is

causing B. However, it is not possible that B is causing A. In other words events in past can cause events of happen today. Future events cannot (Guajarati; 1997:711). Luktpohl (2006) prefers the term precedence over causality. Francis Diebold (1998) prefers the term predictive causality. As per Granger Causality model, to identify causation between Stock market capitalization and gold inflow we need to run hypothesis testing procedure. Since idea is lacking whether there is both direction causation or unidirectional causation or no causation between these two variables, hypothesis has to be done twice taking each variable as dependent variable once.

3.4.1.1 Taking Stock market Capitalization as Dependent Variable

At first, let us assume that stock market capitalization is dependent variable and gold import as independent variable. In other words, gold import influences the stock market capitalization. Here, stock market capitalization is denoted as 'S' and gold inflow or import as 'G'. Now we have following regression equations;

Restricted regression

It is based on the idea that the current year stock market capitalization is influenced by past years stock market capitalization keeping other variables stationary. In other words, NEPSE market capitalization of current year is influenced by past years stock market capitalization if other parameters kept constant. The regression equation of this restricted regression would be as follows;

$$S_t = \alpha_0 + \alpha_1 S_{t-1} + \alpha_2 S_{t-2} + \alpha_3 S_{t-3} + \dots + \alpha_m S_{t-m} + \text{residual}$$

Where,

S_t = Estimated stock market capitalization at time t

S_{t-1} = Stock market capitalization with 1 year lag term

S_{t-2} = Stock market capitalization with 2 year lag term

S_{t-3} = Stock market capitalization with 3 years lag term

m = no of lagged terms of stock market capitalization

α = coefficient of lagged variables of stock market capitalization

Unrestricted Regression

Here, the controlled variable as per restricted model i.e. Gold inflow G is relaxed and the regression is run taking stock market capitalization as dependent and gold inflow as independent variable. The regression line would be as follows;

$$S_t = \alpha_0 + \alpha_1 S_{t-1} + \alpha_2 S_{t-2} + \alpha_3 S_{t-3} + \dots + \alpha_m S_{t-m} + \beta_1 G_t + \beta_2 G_{t-1} + \beta_3 G_{t-2} + \dots + \beta_{m+1} G_{t-m} + \text{residual}$$

Where,

S_t = Estimated stock market capitalization at time t

G_t = Gold inflow in current year

G_{t-1} = Gold inflow with 1 year lag

G_{t-2} = Gold inflow with 2 years lag

β = coefficient of lagged values of gold inflow

Meaning of all other variables is same as stated above

1. Regression is estimated for current market capitalization on all lagged capitalization terms and other variables, if any, but do not include the lagged G variables in this regression. As per the model, this is restricted regression. From this regression the restricted residual sum of squares, RSS_R is obtained.

2. Then the regression is run including lagged G terms. In the language of model this is the unrestricted regression. From this regression the unrestricted residual sum of squares, RSS_{UR} is obtained.

3. Hypothesis setting;

Null hypothesis $H_0: \sum \alpha_i = 0$, it is not the total gold inflow which Granger-cause total stock market capitalization in Nepal.

Alternative hypothesis $H: \sum \alpha_i \neq 0$ it is the total gold inflow which Granger-cause total stock market capitalization of Nepal.

To test hypothesis, F test given by the model, namely,

$$F = \frac{(RSSR - RSSUR)/m}{RSSUR/(n-k)}$$

Which follows the F distribution with m and (n-k) df. In present case, m is equal to no of lagged G terms and k is the number of parameters estimated in the unrestricted regression.

If computed F value exceeds the critical F value at the chosen level of significance, we reject null hypothesis, in which case the lagged G terms belong in the regression. This is another way of saying that Gold inflow causes Stock market capitalization.

Lag Selection Criteria

Here it is assumed that the two variables stock market capitalization S and gold inflow in Nepal G are Stationary. The number of lagged term to be introduced in causality test is an important practical question. In case of distributed lag models, we may have to use the Akai or Schwarz information criterion to make the choice. In my research the Akai Information Criterion (AIC) has been used. AIC can be calculated by using following formula;

$$AIC = \ln (RSS_{UR}/n) + 2k/n$$

Where,

AIC = Akai Information Criterion

ln = natural log

RSS_{UR} = Unrestricted Residual Sum of Squares

n = no of observations

k = no of parameters including constant

3.4.1.2 Taking Gold inflow as Dependent Variable

After this, Gold inflow in Nepal is assumed as dependent variable and stock market capitalization as independent variable. In other words, stock market capitalization Granger-causes the gold inflow in the country. Symbolically it can be expressed as (S→G). Now, the two regression equation for this causation analysis exists as:

Restricted Regression

It is based on the idea that the current year Gold imports is influenced by past years Gold imports keeping other variables stationary. In other words, we could say that present year gold inflow in Nepal depends upon its past years history of inflows keeping other variable constant. The general regression equation of this restricted regression is as follows;

$$G_t = \beta_0 + \beta_1 G_{t-1} + \beta_2 G_{t-2} + \beta_3 G_{t-3} + \dots + \beta_m G_{t-m} + \text{residual}$$

Unrestricted Regression

Here, the controlled variable as per restricted model i.e. stock market capitalization S is relaxed and the regression is run taking stock market capitalization independent and gold inflow as dependent variable. The general regression equation is as follows;

$$G_t = \beta_0 + \beta_1 G_{t-1} + \beta_2 G_{t-2} + \beta_3 G_{t-3} + \dots + \beta_m S_{t-m} + \alpha_1 S_t + \alpha_2 S_{t-1} + \alpha_3 S_{t-2} + \dots + \alpha_{m+1} S_{t-m} + \text{residual}$$

Where,

Meaning of all variables in this regression is same as stated above

The linear regression of current gold inflow on all lagged gold inflow terms and other variables is run without including the lagged S variables in this regression. As per the model, this is restricted regression. From this regression the restricted sum of squares, RSS_R is obtained.

The regression including lagged S term is run. In the language of model this is the unrestricted regression. From this regression, the unrestricted residual sum of squares, RSS_{UR} is obtained.

Hypothesis Setting

Null hypothesis $H_0: \sum \beta_i = 0$, it is not the stock market capitalization which Granger-cause gold inflow in the country.

Alternative hypothesis $H_1: \sum \beta_i \neq 0$ it is the stock market capitalization that Granger-cause gold inflow in the country.

To test hypothesis, we apply the F test is applied, namely,

$$F = \frac{(RSSR - RSSUR)/m}{RSSUR/(n-k)}$$

Which follows the F distribution with m and (n-k) df. In present case, m is equal to no of lagged G terms and 'k' is the number of parameters estimated in the unrestricted regression.

If computed F value exceeds the critical F value at the chosen level of significance, the null hypothesis is rejected, in which case the lagged S terms belong in the regression. This is another way of saying that Stock market capitalization Granger-cause Gold inflow in Nepal.

Lag Selection Criteria

Here it is assumed that the two variables stock market capitalization S and gold inflow in Nepal G are Stationary. The number of lagged term to be introduced to in causality test is an important practical question. In case of distributed lag models, Akai or Schwarz information criterion will have to be used to make the choice. In this research the Akai Information Criterion (AIC) has been used.

AIC can be calculated by using following formula;

$$AIC = \ln(RSS_{UR}/n) + 2k/n$$

As per the model, the lagged term to be introduced in the in the causality test is that m term where the AIC value is minimum provided that the degree of freedom should be sufficient to explain the causation.

3.4.2 Financial Tools

Single period return is known as holding period return. A holding period or single period return is simply the total return an investor would earn during the period of holding assets. The holding period yield for securities consists of capital gain yield and dividend yield but in case of gold investment holding period return consists of capital gain only.

For stocks,

$$\text{HRP} = \frac{\text{EndingNepseIndex} - \text{BeginningNepseIndex}}{\text{BeginningNepseIndex}}$$

Where,

HPR= Holding Period Rate of Return

Ending NEPSE Index = Periodic ending market index at NEPSE

Beginning NEPSE Index= Periodic beginning market index at NEPSE

For gold investment,

$$\text{HPR} = \frac{\text{Endingpriceofgold} - \text{beginingpriceofgold}}{\text{beginingpriceofgold}}$$

Where,

HPR= Holding Period return of gold

Ending price= price of gold at the end of the year

Beginning gold price = price of gold at the beginning of the year

a. Expected Rate of Return

Expected return is average or weighted average return of an investment alternative during an investment period. Therefore expected rate of return is

also considered as standard return. A hypothetical rate of return expected by the investment based on future calculation is expected rate of return. It assumed that history repeats itself. The future cash flow based on the historical cash flow. The expected return will be the average of historical rate of return. In term of holding period return, the expected rate of return for any specific securities is the expected rate of return taken from its historical return. The expected rate of return for gold and stocks is determined by the arithmetic mean of their respective holding period return as follows;

For stocks,

$$\text{Stocks return, } \bar{R}_s = \frac{\sum \text{HPR}_s}{n}$$

Where,

\bar{R}_s = Expected rate of return of stocks

HPR_s = Annual holding period return of stocks

n = Number of investment horizon

Similarly,

For gold,

$$\text{Gold return, } \bar{R}_g = \frac{\sum \text{HPR}_g}{n}$$

Where,

\bar{R}_g = Expected rate of return of gold

HPR_g = Annual holding period return of gold

n = Number of investment horizon

b. Risk on Stocks Investment

Risk is the deviation between actual and expected performance and outcomes.

Risk is product of uncertainty in the return of the stock. Risk measured in term of standard deviation and variance.

Symbolically,

$$\text{Standard Deviation of stocks investment } (\delta_s) = \sqrt{\frac{\sum (R_s - \bar{R}_s)^2}{n-1}}$$

$$\text{Variance of } (\text{Var}_s) = \delta_s^2$$

Where,

R_s = Stocks Rate of Return

\bar{R}_s = Expected Stocks return

n = No of years

The most common measure of risk in finance is variance. Standard deviation and variance are equally used equivalent quantitative measure of risk.

c. Risk on Gold Investment

Risk is the deviation between actual and expected performance and outcomes in gold investment. Risk is product of uncertainty in the return of the gold. Risk measured in term of standard deviation and variance.

Symbolically,

$$\text{Standard Deviation of gold investment } (\delta_g) = \sqrt{\frac{\sum (R_g - \bar{R}_g)^2}{n-1}}$$

$$\text{Variance of gold investment} = \delta_g^2$$

Where,

R_g = Market Rate of Return

\bar{R}_g = Expected Market Return

n = No of years

The most common measure of risk in finance is variance. Standard deviation and variance are equally used equivalent quantitative measure of risk.

d. Portfolio Return

Return of portfolio is weighted average rate of expected returns of individual assets involved in portfolio. Weights are the proportion of investment made in individual assets by total wealth. In another word, it is obtained from portfolio.

Symbolically,

$$\text{Portfolio Return } (R_p) = W_s \overline{R_s} + W_g \overline{R_g}$$

Where,

R_p = Return for the portfolio

n = No of assets held in t Portfolio

$E(R_j)$ = Expected Rate of Return of assets J

w_j = Portfolio weight for the assets J

Similarly,

For portfolio between gold and stocks

$$\text{Portfolio Return } (R_p) = W_s \overline{R_s} + W_g \overline{R_g}$$

Where,

W_s = proportion of wealth investment in stocks

W_g = proportion of wealth investment in gold

e. Portfolio Risk

Risk of portfolio is weighted average individual risk and combined risk of individual assets involved in portfolio. It is denoted by either covariance or correlation. Portfolio risk is the function of individual standard deviation of assets investment, respective weight and correlation between assets. The portfolio risk for the two assets portfolio will be as follows:

$$\text{Portfolio Risk } (\delta_p) = \sqrt{\delta_s^2 w_s^2 + \delta_g^2 w_g^2 + 2r_{sg} \delta_s \delta_g w_s w_g}$$

Variance of portfolio risk (Var_p) = δ_p^2

Where,

δ_p = Portfolio Standard Deviation

3.4.3 Statistical Tools

a. Standard Deviation and Variance

Standard Deviation is a statistical tool that measures risk from expected rate of returns. The standard deviation represents dispersion of return. It is taken the square root of deviation taken from actual mean of the distribution in sample and variance is square of standard deviation.

Symbolically,

Standard Deviation of stocks investment (δ_s) = $\sqrt{\frac{\sum (R_s - \bar{R}_s)^2}{n-1}}$

Standard Deviation of stocks investment (δ_g) = $\sqrt{\frac{\sum (R_g - \bar{R}_g)^2}{n-1}}$

Similarly,

Variance of gold return (Var_g) = δ_g^2

Variance of stocks return (Var_s) = δ_s^2

b. Coefficient of Variation

The coefficient of variation represents the ratio of the standard deviation to the mean, and it is a useful statistic for comparing the degree of variation from one data series to another, even if the means are drastically different from each other. The relative measure of dispersion based on the standard deviation is known as the coefficient of standard deviation.

Coefficient of Variation (CV) = $\frac{\text{Standard Deviation}}{\text{Mean}} = \frac{\delta}{\bar{X}}$

Two distributions better compared by CV. Less the Coefficient of Variation more will be the uniformity, consistency in distribution and high the Coefficient less the uniformity or consistency in distribution of return.

c. Covariance

Covariance is a measure of how much two variables change together. If two variables tend to vary together (that is, when one of them is above its expected value, then the other variable tends to be above its expected value too), then the covariance between the two variables will be positive. On the other hand, when one of them is above its expected value the other variable tends to below its expected value, then the covariance between the two variables will be negative. If two variables are independent, their covariance will zero.

Symbolically,

$$COV_{gs} = \frac{\sum(HPR_s - \bar{R}_s)(HPR_g - \bar{R}_g)}{n-1}$$

Where,

COV_{gs} = covariance between gold return and stocks return

$(HPR_s - \bar{R}_s)(HPR_g - \bar{R}_g)$ = product of variation of return of gold and stocks from their respective mean return

n = no of observations

Status of other variables same as stated as above

d. Correlation Coefficient

Correlation Coefficient is a measure of the relative association between two variables; it describes how much linear co-movement exists between two variables. Correlation between gold return and stocks return can be computed as;

Symbolically,

$$\text{Correlation coefficient } (r_{gs}) = \frac{COV_{gs}}{\delta_s \delta_g}$$

Decision Parameter

- When Correlation is perfectly positive, risk cannot be diversified.
- When Correlation is positive but less than +1 risk can be minimized to some extent
- When Correlation is perfectly negative, all risk or high degree of risk can be minimized.

Markowitz Minimum Variance Portfolio

The minimum variance portfolio gives a suggestion about what is the best combination of two assets. A portfolio that has the lowest level of variance (risk) is referred to the optimal portfolio. A risk-averse investor will have a trade-off between risk and return. We can use the following formula for estimating minimum variance weights of investment in gold and stocks.

As per Markowitz model,

$$\text{Optimal proportion of investment in gold (W}_g) = \frac{\delta_s^2 - \text{COV}_{gs}}{\delta_g^2 + \delta_s^2 - 2\text{COV}_{gs}}$$

$$\text{Optimal weight of investment in stocks (W}_s) = \frac{\delta_g^2 - \text{COV}_{gs}}{\delta_g^2 + \delta_s^2 - 2\text{COV}_{gs}} \text{ or } 1 - W_g$$

Description of Variables

The Stock market capitalization refers to the value of total shares listed in NEPSE. NEPSE publishes the market capitalization on daily basis. This research is based on the year-end value of stock market capitalization for 20 years (1995-2014). Gold flow or gold imports or gold inflow refers to the value of total gold which is imported in Nepal per year. NRB publishes the value of gold imports per year in the country in its quarterly bulletins annual reports etc. This work is based on the 20 years (1995- 2014) gold imports in Nepal.

NEPSE Index means the value weighted index of all the listed Securities in NEPSE. Ten years index has been used for this research. Annual average gold price is the daily average of gold price in Nepal. NEGOSIDA publishes the

annual average gold price. Ten years annual average gold price has been taken for the study. GDP refers to the Gross Domestic Product of Nepal. This study is based on the 20 years (1995-2014) GDP of Nepal published by NRB. Year-end data represent end of fiscal year in Nepal (last of Ashad).

CHAPTER-IV

DATA PRESENTATION AND ANALYSIS

This chapter makes systematic presentation and analysis of data. Analysis is based on the data obtained from both primary and secondary sources. Primary source includes mainly the responses to questionnaires and personal interview with investors, experts, officials and other resourceful persons. Similarly, the secondary sources include available annual reports and publication of SEBON, NRB, NEPSE, NEGOSIDA etc. Appropriate statistical as well financial tools as described in the research+ methodology chapter have been used in order to derive results from the analysis of data. Analysis is directed towards attaining the objectives defined in the study.

This chapter consists of two subsets:

- Data Presentation and Analysis
- Major Findings of the Study

4.1 Data Presentation and Analysis of Secondary Data

In order to make Granger-causality test between stock market capitalization and gold import and its lag selection criteria, Granger-causality between GDP and gold flow and its respective lag selection criteria, secondary data are used from quarterly report of NRB, report of SEBON NEPSE etc. are used. The identification of lag length analysis of Granger-causation between the variables are analysed in respective orders.

Similarly, analysis of Markowitz minimum variance portfolio between gold return and Stock return is also based on secondary data. Year-end gold price and year-end NEPSE index have been taken as secondary data for this objective. The annual holding period return of each of investments (gold and stocks), respective expected rate of return, respective risk level measured by

SD and variance, respective CV, covariance between them, correlation between them, minimum variance portfolio weight and minimum variance portfolio return and risk are analysed in respective orders.

4.1.1 Analysis of Gold Flow, Stock market Capitalization GDP in recent years

The position of gold flow, stock market capitalization and GDP of Nepal for recent 10 years is analysed here. The gold flow, stock market capitalization and GDP situation of Nepal are analysed in the following table;

Table 4.1

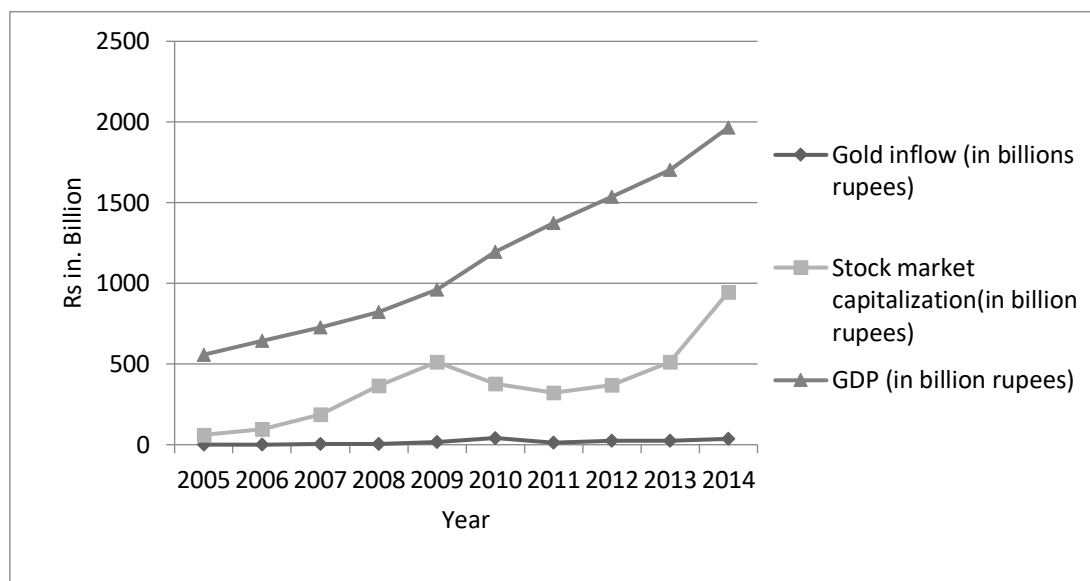
Status of Gold Flow, Stock Market Capitalization and Nepal (2005-2014)

Year	Gold inflow (in billions rupees)	Stock market capitalization(in billion rupees)	GDP (in billion rupees)
2005	0.005	61.366	557.87
2006	0.003	96.764	645.055
2007	3.520	186.301	727.689
2008	3.750	366.248	820.814
2009	16.866	512.94	960.011
2010	41.636	376.87	1193.68
2011	11.357	323.484	1374.95
2012	25.770	368.262	1536
2013	26.144	514.492	1701.194
2014	35.460	946.432	1965.37

In table 4.1, the gross domestic product of the country has increased gradually from 557.87 billion rupees in year 2005 to 1935 billion rupees during the mid-2014.

Figure 4.1

Status of Gold Flow, Stock Market Capitalization and Nepal (2005-2014)



From above table and figure, we can see that the gold inflow in the country during this period is not consistent. The gold flow in the country increases in first six years from 0.005 billion rupees in year 2005 to 41.64 billion rupees in year 2010 which is the highest imports of gold during the period of 10 years. The gold import decreases in year 2011 to 11.38 billion rupees from year 2010. There after the gold inflow in the country increases gradually.

The stock market capitalization of NEPSE was 61.37 billion rupees in 2005. The stock market capitalization is most volatile among the three variables during the period due to fluctuations in the price of stocks rather than the fluctuations in new issues. The main cause of inconsistency is due to volatile stock market in this period. The recession of 2008 has adverse impact on the Nepalese financial market as well. So the stock market capitalization was least during that period. The potential Nepalese investors withdraw their money from capital market and invest in safe alternative that is gold which leads to the increased gold inflow in the country.

4.1.2 Granger-Causality between Stock Capitalization and Gold Flow

As it is not known which one is dependent variable and which one is independent, let's suppose one variable dependent at a time and run the hypotheses testing as motioned in Chapter III. In each case, the optimal lag term is taken using AIC.

4.1.2.1 Stock Capitalization as Dependent Variable

Now, stock market capitalization is dependent variable and gold inflow in the country is independent variable. After running regression and hypothesis test if alternative hypothesis is accepted we could say gold flow Granger cause stock market capitalisation otherwise not.

Lag Selection Criteria

The lag length selection is the first practical problem for running Granger-causality test. For lag selection criteria, all variables should be stationary after taking first differencing. Here G and S are kept constant after making first differencing. The table for lag selection criteria is shown below;

Table 4.2

Lag term selection criteria (Sample 1995-2014)

	2k/n	RSS_{UR}	ln(RSS_{UR}/n)	AIC	Df
0	$(2 \times 2)/20 = .2$	973840	10.79	10.99	18
1	$(2 \times 4)/20 = .4$	209335	9.9.26	9.66	15
2	$(2 \times 6)/20 = .6$	111943	8.63	9.23	12
3	$(2 \times 8)/20 = .8$	41262	7.63	8.43*	9

** indicates lag term selected by the criterion*

Here, we can see the value of 2k/n is increasing as increase in number of lag term. It is due to the fact that k i.e. number of parameters including constant increases as increase in lag term. However, RSS_{UR} and its respective ln (RSS_{UR}/n) decrease as increase in lag due to less error with increase in samples. The AIC, sum of 2k/n and ln (RSS_{UR}/n) also decreases as increase in lag term. The minimum AIC is found at 3 lag in the table. However, we couldn't run 4

lag terms could not be run due to the inadequacy of data. Hence, lag 3 would be the lag length for causality analysis between gold flow and stock market capitalization.

Regression Analysis

Now, as per methodology regression, both restricted and unrestricted taking lag term 3 in SPSS were run. The valuable information resulted while running multiple regressions in SPSS were is summarised in the following regression table;

Table 4.3

Regression Table taking stock market capitalization as dependent variable

Variables	Restricted regression results	Unrestricted regression results
Constant	7.430 (0.212)	-12.655 (- 0.314)
St ₋₁	2.023* (5.761)	3.585* (7.795)
St ₋₂	-1.626** (-2.748)	-3.783* (-5.005)
St ₋₃	0.834*** (2.087)	1.667* (3.356)
G _t		-12.387** (-2.859)
G _{t-1}		10.404** (2.672)
G _{t-2}		2.159 (.823)
G _{t-3}		-3.511*** (-1.399)
df& n	13 & 20	9 & 20
F- value	29.83*	31.73*
R ²	0.873 or 87.30%	0.961 or 96.10%
RSS	134395	41262

Note;

Figures in the parenthesis indicates the t-value

** Significant at 0.01 level*

***Significant at 0.05 level*

**** Significant at 0.10 level*

Where,

S_{t-1} =stocks capitalization with 1 year lag

S_{t-2} = stock capitalization with lag term 2

S_{t-3} =stocks capitalization with 3

G_t = current year gold flow

G_{t-1} = gold flow with 1 years lag

G_{t-2} = gold flow with 2 years lag

G_{t-3} = gold flow with 3 years lag

R^2 = coefficient of determination

RSS = residual sum of squares

df = degree of freedom

n = no of observations

In table 4.3 the result of restricted and unrestricted regression is summarised.

Restricted Regression

As per the table, the coefficients of constant, $S_{t-1}, S_{t-2}, S_{t-3}$ are 7.430, 2.023, -1.626 and 0.834 respectively. All the lag variables ($S_{t-1}, S_{t-2},$ and S_{t-3}) of stock market capitalization are significant at different levels (1%, 5%, and 10%) of significance. Most importantly, the F- value of restricted regression is also significant at 1% level of significance. The coefficient of determination is 87%. It means 87% of the variation in current year's stock market capitalization is explained by the variations of lag values of stock market capitalization included in the model.

Unrestricted Regression

As per table, the coefficients of constant, $S_{t-1}, S_{t-2}, S_{t-3}, G_t, S_{t-3}, G_{t-1}, G_{t-2},$ and G_{t-3} are -12.66, 3.56, -3.78, 1.67, -12.39, 10.40, 2.16 and -3.51 respectively. Most of the independent variables are significant at different level of significance. Most importantly, the F-value is significant at 1% level of significance. The coefficient of determination is 96.10%. It means 96.10% variations in the stock market capitalization of current is explained by variations of the independent

variables (past years stock capitalization, current year gold flow and past years gold flow) as included in the model.

Test Statistics,

$$F_{(m, n-k)} = \frac{(RSSR - RSSUR)/m}{RSSUR/(n-k)}$$

$$F_{(3, 20-8)} = \frac{(134395 - 41262)/3}{41262/(20-8)}$$

$$F_{(3, 12)} = 9.03$$

Since, the calculated value (9.03) is greater than tabulated value or critical value (5.95) at 1% significance, the alternative hypothesis is accepted. It implies that the gold flow or import of gold in Nepal Granger cause the stock market capitalization of Nepal.

It means when the gold inflow in the country increases, the ornament making industries increase, this causes more employment opportunities in the country, the income level of the people increases, the income thus generated are consumed to some extent and the remaining income they invest in stock market at small volume which increases the stock market capitalization in the country. Thus, gold imports do influence stock market capitalization in negative way meaning that bearish trend or decline in stock market capitalization will lead to enhanced gold import.

4.1.2.2 Gold Inflow as Dependent Variable

Now, gold inflow is taken as dependent variable and stock market capitalization as independent variable. As in methodology the same procedure should be followed to analyse the causation between gold flow and stock market capitalization.

Lag Selection Criteria

Table 4.4

Lag term selection criteria (Sample 1995-2014)

Lag	2k/n	RSS_{UR}	ln(RSS_{UR}/n)	AIC	Df
0	(2×2)/20= .2	3132.00	5.05	5.25	18
1	(2×4)/20= .4	1266.58	4.15	4.55	15
2	(2×6)/20= .6	325.06	2.79	3.39	12
3	(2×8)/20= .8	128.00	1.86	2.66*	9

** indicates lag term selected by the criterion*

Here, it can be seen that the value of $2k/n$ is increasing as increase in number of lag term. It is due to the fact that k i.e. number of parameters including constant increases as increase in lag term. However, RSS_{UR} and its respective $\ln(RSS_{UR}/n)$ decrease as increase in lag due to less error with increase in samples. The AIC, sum of $2k/n$ and $\ln(RSS_{UR}/n)$ also decreases as increase in lag term. The minimum AIC is found at 3 lag in the table. However, 4 lag terms cannot be run as data were inadequate. Hence, lag 3 would be the lag length for causality analysis between gold flow and stock market capitalization.

Regression Analysis

Now, as per methodology, both restricted and unrestricted regression were run taking lag term 3 in SPSS. The valuable information resulted while running multiple regressions in SPSS is summarised in the following causality table;

Table 4.5

Regression Table taking gold flow as dependent variable

Variables	Restricted regression results	Unrestricted regression results
Constant	4.664 (1.084)	-3.346 (- 1.707)
Gt ₁	0.507*** (1.786)	0.298(1.09)
Gt ₂	0.288 (.723)	0.257*** (2.053)
Gt ₃	-0.110****(-1.400)	0.034. (0.202)
St		0.038** (-2.859)
St ₁		0.182*(4.854)
St ₂		-0.143*** (-2.151)
St ₃		0.047**** (1.427)
df& n	13 & 20	9 & 20
F-value	3.29*	26.53*
R ²	0.55	0.95
RSS	1813	128

*Note;**** represents significant at 0.2*

Figures in the parenthesis indicates the t-value

** Significant at 0.01 level*

***Significant at 0.05 level*

**** Significant at 0.10 level*

Restricted Regression

As per table, the coefficients of constant, Gt₁,Gt₂,Gt₃ are 4.66, 0.51, 0.29, and -0.11 respectively. Majority of the lag variables (Gt₁,Gt₂,and Gt₃) of gold flow are significant at different levels (10%, and 20%) of significance. Most importantly, the F- value of restricted regression is also significant at 1% level of significance. The coefficient of determination is 55%. It means 55% of the variation in current year's gold flow is explained by the variations of lag values of gold flow included in the model.

Unrestricted Regression

As per the table, the coefficients of constant,Gt₁,Gt₂, Gt₃, St, St₁,St₂,and St₃ are -3.346, 0.298, 0.257, 0.034,0.038, 0.182, -0.143 and 0.047 respectively.

Most of the independent variables are significant at different level of significance. Most importantly, the F-value is significant at 1% level of significance. The coefficient of determination is 95%. It means 95% variations in the gold flow of current is explained by variations of the independent variables (past years gold flow, current year stock market capitalization and past years stock market capitalization) as included in the model.

Test Statistics,

$$F_{(m, n-k)} = \frac{(RSSR-RSSUR)/m}{RSSUR/(n-k)}$$

$$F_{(3, 20-8)} = \frac{(1813-128)/3}{128/(20-8)}$$

$$F_{(3, 12)} = 52.66$$

Since, the calculated value (52.66) is greater than tabulated value or critical value (5.95) at 1% level of significance, the alternative hypothesis is accepted. It means the stock market capitalization of Nepal Granger causes increased gold inflow in the country.

Whenever the stock market capitalization increases or whenever the share market is in peak, people earn money from share market. After collecting such small gain from stocks investments people invest in the gold market for earning more return or they invest in the luxurious goods like jewellery. Thus, the stock market capitalization causes the gold in the country.

Hence, there is bidirectional causation between gold inflow and stock market capitalization in Nepal.

4.1.3 Granger-Causality between GDP and Gold Flow

Now, to analyse the causation more precisely, the Granger Causality test between gold Inflow and GDP of Nepal is conducted.

4.1.3.1 Gold Flow as Dependent Variable

Now, gold flow is taken as dependent variable and GDP of Nepal as independent variable. After running causality test if null hypothesis is rejected, we could say GDP Granger causes gold flow otherwise not.

Lag Selection Criteria

Table 4.6

Lag term selection criteria (Sample 1995-2014)

Lag	2k/n	RSS_{UR}	ln(RSS_{UR}/n)	AIC	Df
0	$(2 \times 2)/20 = .2$	3281	5.10	5.30	18
1	$(2 \times 4)/20 = .4$	1340	4.20	4.60	15
2	$(2 \times 6)/20 = .6$	516	3.25	3.85	12
3	$(2 \times 8)/20 = .8$	214	2.37	3.17*	9

** indicates lag term selected by the criterion.*

Here, it can be seen that the value of $2k/n$ is increasing as increase in number of lag term. It is due to the fact that k i.e. number of parameters including constant increases as increase in lag term. However, RSS_{UR} and its respective $\ln(RSS_{UR}/n)$ decrease as increase in lag due to less error with increase in samples. The AIC, sum of $2k/n$ and $\ln(RSS_{UR}/n)$ also decreases as increase in lag term. The minimum AIC is found at 3 lag in the table. However, 4 lag terms cannot be run as data were inadequate. Hence, lag 3 would be the lag length for causality analysis between gold flow and stock market capitalization.

Regression Analysis

Table 4.7

Regression Table taking Gold Inflow as dependent variable

Variable	Restricted Regression results	Unrestricted Regression results
Constant	4.664 (1.084)	-9.161 (- 2.596)
G _{t-1}	0.507*** (1.786)	0.019 (0.090)
G _{t-2}	0.288 (.723)	0.264**** (1.639)
G _{t-3}	-0.110**** (-1.400)	0.293**** (1.552)
GDP _t		0.265* (5.977)
GDP _{t-1}		-0.418* (-4.156)
GDP _{t-2}		0.159 (1.154)
GDP _{t-3} ,		-0.003 (-0.037)
df & n	13 & 20	9 & 20
F-value	3.29*	15.37*
R ²	0.55	0.92
RSS	1813	214

Notes;**** significant at 0.2

Figures in the parenthesis indicates the t-value

* Significant at 0.01 level

**Significant at 0.05 level

*** Significant at 0.10 level

Where,

GDP_{t-1}= Gross Domestic Product at one year lag term

GDP_{t-2}= Gross Domestic Product at 2 years lag term

GDP_{t-3} = Gross Domestic Product at 3 years lag term

Other variables are same as stated above

Restricted Regression

As per table, the coefficients of constant, G_{t-1},G_{t-2},G_{t-3} are 4.66, 0.51, 0.29, and -0.11 respectively. Majority of the lag variables (G_{t-1},G_{t-2},and G_{t-3}) of gold flow are significant at different levels (10%, and 20%) of significance. Most importantly, the F- value of restricted regression is also significant at 1% level

of significance. The coefficient of determination is 55%. It means 55% of the variation in current year's gold flow is explained by the variations of lag values of gold flow included in the model.

Unrestricted Regression

As per table, the coefficients of constant, G_{t-1} , G_{t-2} , G_{t-3} , GDP_t , GDP_{t-1} , GDP_{t-2} , and GDP_{t-3} are 9.16, 0.019, 0.264, 0.293, 0.265, -0.418, 0.159 and -0.003 respectively. Most of the independent variables are significant at different level of significance. Most importantly, the F-value is significant at 1% level of significance. The coefficient of determination is 92%. It means 92% variations in the gold flow of current year is explained by variations of the independent variables (past years gold inflow, current year GDP and past years GDP) as included in the model.

Test Statistics,

$$F_{(m, n-k)} = \frac{(RSSR - RSSUR)/m}{RSSUR/(n-k)}$$

$$F_{(3, 20-8)} = \frac{(1813-214)/3}{214/(20-8)}$$

$$F_{(3, 12)} = 29.89$$

Since, the calculated value (29.8) is greater than tabulated value or critical value (5.95) at 1% level of significance, the alternative hypothesis is accepted. It means the GDP of Nepal Granger causes gold imports in Nepal.

As is hypothesized in the methodology, the result corroborates that whenever the GDP of the country increases, the income level of people increases, which means purchasing capacity of people, is enhanced. Not only the purchasing habit but also investing habit changes. People start to invest in luxurious goods like jewellery, cars, bikes etc. These activities in aggregate leads to increased demand for gold investment in the country resulting to increased gold inflow in the country. Thus, the GDP Granger-cause the gold flow in the country.

Furthermore, to conform whether there is bidirectional causation, conducted same procedure has been followed as in stock market capitalization taking GDP as dependent variable.

4.1.3.2 GDP as Dependent Variable

Now, GDP is taken as dependent variable and gold inflow as independent variable. As in methodology the same procedure should be followed to analyse the causality between GDP and gold inflow.

Lag Selection Criteria

Table 4.8
Lag term selection criteria (Sample 1995-2014)

Lag	$2k/n$	RSS_{UR}	$\ln(RSS_{UR}/n)$	AIC	df
0	$(2 \times 2)/20 = .2$	4323198	12.28	12.48	18
1	$(2 \times 4)/20 = .4$	16385	6.71	7.11	15
2	$(2 \times 6)/20 = .6$	5060	5.53	6.13	12
3	$(2 \times 8)/20 = .8$	2430	4.80	5.6*	9

* indicates lag term selected by the criterion

The optimal lag term as shown in the above table would be 3 as it has minimum AIC value among them.

Regression Analysis

Now, as per methodology, regression, both restricted and unrestricted were run taking lag term 3 in SPSS. The valuable information resulted while running multiple regressions in SPSS is summarised in the following causality table;

Table 4.9
Regression Table taking GDP as dependent variable

Variable	Restricted Regression results	Unrestricted Regression results
Constant	- 5.054 (-0.291)	28.88 (2.32)
GDP _{t-1}	1.819*(6.965)	1.590*(6.832)
GDP _{t-2}	-1.138** (-2.251)	-0.629**** (-1.394)
GDP _{t-3}	0.412 (1.197)	0.045(0.168)
G _t		3.014* (5.977)
G _{t-1}		0.020(0.027)
G _{t-2}		-0.857**** (-1.564)
G _{t-3}		0.839**** (-1.635)
df&n	13 & 20	9 & 20
F-value	1401.60	2206.3
R ²	0.997	0.999
RSS	12861	2430

*Notes;****significant at 0.2 level*

Figures in the parenthesis indicates the t-value

** Significant at 0.01 level*

***Significant at 0.05 level*

**** Significant at 0.10 level*

Where,

The description of all the variables are same as stated above

Restricted Regression

As per table, the coefficients of constant, GDP_{t-1},GDP_{t-2}&GDP_{t-3} are -5.054,1.819,-1.138, and0.412 respectively. Most of the lag variables of GDP are significant at different levels of significance. Most importantly, the F- value of restricted regression is also significant at 1% level of significance. The coefficient of determination is 99.7%. It means 99.7% of the variation in current year's GDP is explained by the variations of lag values of GDP included in the model.

Unrestricted Regression

As per table, the coefficients of constant, GDP_{t-1} , GDP_{t-2} & GDP_{t-3} , G_t , G_{t-1} , G_{t-2} , and G_{t-3} are 28.88, 1.59, -0.629, 0.045, 3.014, 0.020, -0.875 and 0.839 respectively. Most of the independent variables are significant at different level of significance. Most importantly, the F-value is significant at 1% level of significance. The coefficient of determination is 99.99%. It means 99.99% variations in current GDP are explained by variations of the independent variables (past years GDP, current year gold flow and past years gold flow) as included in the model.

Test Statistics,

$$F_{(m, n-k)} = \frac{(RSSR - RSSUR)/m}{RSSUR/(n-k)}$$

$$F_{(3, 20-8)} = \frac{(12861 - 2430)/3}{2430/(20-8)}$$

$$F_{(3, 12)} = 17.17$$

Since, the calculated value (17.17) is greater than tabulated value or critical value (5.95) 1% significance level, the null hypothesis is rejected. It means the gold flow or import of gold in Nepal Granger-cause the GDP of Nepal.

It means when there is increase in gold import in the country; the number of the ornaments making industries grows. In addition to that, the other parallel industries related jewellery flourishes. All of these activities leads to more investment, more employment opportunities in the country, increased income level etc. resulting in the increased level of GDP. Thus, the gold inflow in the country causes the GDP of that country as has been hypothesized previously.

Hence, there is again bidirectional causation between gold flow and GDP of a country. It means both of the variables Granger causes one another.

4.1.4 Analysis of Markowitz Minimum Variance Portfolio

4.1.4.1 Holding Period Return of Gold and Stocks

The annual holding period return of gold and stocks from year 2005 to 2014 can be shown in following table as per the methodology in Chapter III;

Table 4.10
Holding Period Return of Gold and Stocks

Year	NEPSE index	Average gold price per 10gm in Rs.	HPR of Stocks	HPR of Gold
2004	222	9840		-
2005	287	9597	29.28%	(2.47)%
2006	387	15422-	34.84	60.70
2007	684	13897	76.74	(9.89)
2008	963	21318	40.79	53.40
2009	749	22798	(22.22)	6.94
2010	478	28887	(36.18)	26.71
2011	363	36280	(24.06)	25.59
2012	390	43968	7.44	21.19
2013	518	39087	32.82	(11.10)
2014	987	42675	90.54	9.18
Total			243.99	180.25

In this table, it can be seen that the annual holding period returns of both of the investment alternatives are not consistent. The HPR of stocks varies from -36.18% to 90.54% within the period. The story is not unique in case of gold investment as well. The HPR of gold varies -11.10% to 53.40% in this period. However, the variation in stocks return is more than the variation of gold return.

4.1.4.2 Expected Return of Gold and Stocks

The arithmetic mean return of gold investment and stocks investment can be determined as follows;

For stocks,

$$\bar{R}_s = \frac{\sum HPR_s}{n}$$

$$\begin{aligned} &= \frac{243.99}{10} \\ &= 23.40\% \end{aligned}$$

For gold

$$\begin{aligned} \overline{R}_g &= \frac{\sum HPR_g}{n} \\ &= \frac{180.25}{10} \\ &= 18.03\% \end{aligned}$$

Here, the average holding period return of stocks is 23.43% and that of gold is 18.30%. Hence one can expect such level of return by making investment in the respective assets. The return expected return from stock investment is slightly more than gold investment in Nepal.

4.1.4.3 Risk of the Assets

As mentioned in methodology, the risk is measured by S.D. and variance. To analyse the risk per unit of return for these two investment alternative, CV is also calculated. I have calculated these risk parameters (S.D, variance, CV) with the help of the table below;

Table 4.11
Table for SD, variance & CV

Year	HPR _s	HPR _g	$(HPR_s - \overline{R}_s)^2$	$(HPR_g - \overline{R}_g)^2$	$(HPR_s - \overline{R}_s)$ $(HPR_g - \overline{R}_g)$
2005	29.28%	(2.47)%	34.57	110.04	(72.32)
2006	34.84	60.70	130.87	1821.58	2114.79
2007	76.74	(9.89)	2845.16	776.18	755.12
2008	40.79	53.40	302.41	1251.74	2178.19
2009	(22.22)	6.94	2081.81	122.77	(154.21)
2010	(36.18)	26.71	3549.78	75.52	(966.37)
2011	(24.06)	25.59	2252.45	57.30	(615.70)
2012	7.44	21.19	254.72	10.05	157.65
2013	32.82	(11.10)	88.74	847.97	(364.30)
2014	90.54	9.18	4507.78	78.15	831.16
Total			16048.29	5151.30	3864.01

For stocks,

$$\begin{aligned}\text{Standard Deviation of stocks return } (\delta_s) &= \sqrt{\frac{\sum (R_s - \bar{R}_s)^2}{n-1}} \\ &= \sqrt{\frac{16048.29}{10-1}} \\ &= 42.23\%\end{aligned}$$

$$\begin{aligned}\text{Variance of stocks return } (\delta_s^2) &= 42.23^2 \\ &= 1783.37\end{aligned}$$

$$\begin{aligned}\text{Coefficient of Variation } (CV_s) &= \frac{\delta_s}{\bar{R}_s} \\ &= \frac{42.23}{23.40} \\ &= 1.80 \text{ or } 180\%\end{aligned}$$

For gold,

$$\begin{aligned}\text{Standard Deviation of gold return } (\delta_g) &= \sqrt{\frac{\sum (R_g - \bar{R}_g)^2}{n-1}} \\ &= \sqrt{\frac{5151.30}{10-1}} \\ &= 23.92\%\end{aligned}$$

$$\begin{aligned}\text{Variance of gold return } (\delta_g^2) &= 23.92^2 \\ &= 572.17\end{aligned}$$

$$\begin{aligned}\text{Coefficient of Variation } (CV_g) &= \frac{\delta_g}{\bar{R}_g} \\ &= \frac{23.92}{18.03} \\ &= 1.327 \text{ or } 132.7\%\end{aligned}$$

From above calculation, the SD and variance of stock return is more than gold return. So, we can infer that stock investment is riskier than gold investment in Nepalese capital market. The coefficient of variation of stock investment is 180% whereas CV of gold investment is 132.7%. It means the risk per unit of return is more in case of stock investment than gold investment. So, for two investors with same utility level the gold investment proves to be better. However, in real investment environment utilities among investors are varying.

4.1.4.4 Relationship between Return of Two Assets

Covariance between gold return and stocks return (COV_{gs})

$$\begin{aligned} &= \frac{\sum(HPR_s - \bar{R}_s)(HPR_g - \bar{R}_g)}{n-1} \\ &= \frac{3864}{10-1} \\ &= 429.33 \end{aligned}$$

$$\begin{aligned} \text{Correlation coefficient } (r_{sg}) &= \frac{COV_{gs}}{\delta_s \delta_g} \\ &= \frac{429.33}{42.23 \times 23.92} \\ &= 0.425 \end{aligned}$$

Here, the correlation coefficient between gold return and stock return is 0.425. It means there is positive correlation coefficient between gold return and stock return. However, the correlation coefficient is less than perfectly positive (+1). So, Markowitz diversification is possible by making portfolio between gold and stocks.

4.1.4.5 Markowitz Minimum Variance Portfolio Weight

As per methodology, since there is no perfect positive correlation between gold return and stock return risk diversification can be done by making portfolio between them. In other words, since correlation coefficient between gold return and stock return (0.425) is less than +1 the Markowitz minimum variance

portfolio can be made by making optimal investment in stocks and gold. The optimal weights of investment in gold and stocks can be calculated as mentioned in methodology as follows;

$$\begin{aligned} \text{Optimal proportion of investment in gold (W}_g\text{)} &= \frac{\delta_s^2 - \text{COV}_{gs}}{\delta_g^2 + \delta_s^2 - 2\text{COV}_{gs}} \\ &= \frac{1783.37 - 429.33}{572.17 + 1783.37 - 2 \times 429.33} \\ &= 0.90 \end{aligned}$$

$$\begin{aligned} \text{Optimal proportion of investment in stocks} &= 1 - W_g \\ &= 1 - 0.90 \\ &= 0.10 \end{aligned}$$

As per calculation, the optimal proportions of investment in gold stocks are 0.90 or 90% and 0.10 or 10% respectively. It means if an investor invests his/her total investable fund in gold and stocks in the ratio of 9:1, the portfolio risk will be minimum among the infinite numbers of possible investment alternatives. The minimum variance portfolio return and the minimum variance are calculated as;

Portfolio Return

As per methodology, the portfolio return of the minimum variance portfolio or optimal portfolio can be identified as;

$$\begin{aligned} \text{Portfolio Return (R}_p\text{)} &= W_s \overline{R}_s + W_g \overline{R}_g \\ &= 0.1 \times 23.40 + 0.9 \times 18.01 \\ &= 18.57\% \end{aligned}$$

Portfolio Risk

The portfolio risk of the minimum variance portfolio is identified as mentioned in the research methodology as;

$$\begin{aligned}
\text{Portfolio Risk } (\delta_p) &= \sqrt{\delta_s^2 w_s^2 + \delta_g^2 w_g^2 + 2r_{sg} \delta_s \delta_g w_s w_g} \\
&= \sqrt{1783.37 \times 0.1 \times 0.1 + 572.17 \times 0.9 \times 0.9 + 2 \times 429.33} \\
&= 23.63\%
\end{aligned}$$

Portfolio Variance

Hence the optimal portfolio SD between gold and stocks return would be 23.63%. This portfolio SD is less than the SD of either of the assets.

Coefficient of Variation

The coefficient of variation of the minimum variance portfolio can be obtained as follows:

$$\begin{aligned}
\text{Coefficient of Variation } (CV_p) &= \frac{\delta_p}{(R_p)} \times 100 \\
&= \frac{23.63}{18.57} \times 100 \\
&= 127.25\%
\end{aligned}$$

The coefficient of variation of the minimum variance portfolio is 127.25%. It means that the SD of the portfolio per unit return would be 1.273. In other words, the standard variation in the return of the portfolio would be 127% per 100% return.

Hence the Markowitz minimum variance portfolio between gold and stocks can be obtained by investing total investable fund in the proportion of 9:1 in gold and stocks. The optimal portfolio return, optimal portfolio SD is 18.57%, 23.63% respectively.

4.2 Primary Data Analysis

4.2.1 Determinant of Investment Portfolio

Every investment entails some degree of risk. So it is called a rational process. That is why an investor should go through the analysis of investment

determinants while making investment. The determinants of investment may vary according to individual perception. Regarding the determinants of investment in portfolio, respondents were asked about these key determinants. Responses of investment determinants are as followings;

Table 4.12
Determinant of Investment Portfolio

S.N	Determinants	Marked	Percentage
1	Risk and Return	50	100%
2	Demand and supply	50	100%
3	Market Trend	48	96%
4	Investment objectives	45	90%
5	Time horizon	37	74%
6	Investment strategies	35	70%
7	Confidence	28	56%
8	Income	19	38%
9	Liquidity	12	24%
10	Taxes and Total Wealth	6	12%

Source: Appendix

The response in table 4.12 clearly shows that risk & return and demand & supply are the measure determinants agreed by 100% respondents. Market trend, investment objectives, time horizon and investment strategies are the other key determinants. Majority of investors take these determinants in consideration while making investment portfolio and rest are general determinants of investment portfolio.

4.2.2 Investment Strategy

To know the investors' strategy on their investment a number of questions were asked. The responses of respondents are as below:

Table 4.13

Investment Strategy

Investment Strategy	Marked	Percentage
Passive	6	12%
Active	44	88%
Sample Size	50	100%

Source: Appendix

Table 4.13 shows that only 6 respondents are supported to passive strategy and the majority of people attracted in active strategy. About 88% respondents are maintaining active strategy in their investment portfolio.

4.2.3 Systematic Management of Portfolio Investment

Investment is a scientific as well as systematic way of value maximizing. So, in this research, Researcher tried to find out the investor rationalities in scientific management in their portfolio investment. Regarding the systematic management of portfolio following response obtained from the respondents. Responses were tabulated as below:

Table 4.14

Systematic Management of Portfolio Investment

Response	Marked	Percentage
Yes	43	86%
No	3	6%
Do not know	4	8%
Sample Size	50	100%

Source: Appendix

The figure of table clearly shows that, most of the respondents are systematically managing their portfolio and they believe their investment is systematic and they are serious on their portfolio investment. Out of 50 respondents, 3 & 4 respondents answered 'No' & 'do not know' respectively. Some of them replied that they don't manage their portfolio systematically and some of them don't know about what is mean by systematic management.

4.2.4 Diversification Strategy

Diversification of portfolio helps to minimize the risk from the investment. In this survey, researcher tried to find out what type of diversification there is used by the investors. Answers of respondents are tabulated below:

Table 4.15
Strategy of Diversification

S.No.	Diversification Strategy	Marked	Percentage
1	No diversification	4	8%
2	Simple diversification	26	52%
3	Superfluous diversification	8	16%
4	Diversification across industries	6	12%
5	Superfluous diversification across Quality rating	-	-
6	Diversification between gold and stocks	4	8%
7	Markowitz diversification	2	4%
	Sample Size	50	100%

Source: Appendix

Table 4.15 clearly shows that most of investors or majority of the investors are attracted in simple diversification rather than other methods of diversification. Out of 50 respondents, 30 i.e.60% respondents are supported for this diversification. And 4 respondents i.e. 8% are not diversifying their investment, 8 i.e. 16% prefer superfluous diversification, 6 i.e. 12% believe diversification across industry and 2 i.e. 4% are using Markowitz diversification.

4.2.5 Approaches of Security Analysis

To make investment on portfolio, an investor should know their base to select the securities? Regarding this research, following questions are asked and Response is summarized below:

Table 4.16**Approaches of security analysis**

S.No.	Diversification Strategy	Marked	Percentage
1	Fundamental Analysis	28	56%
2	Technical Analysis	6	12%
3	According to market whim	14	28%
4	According to suggestion of broker	2	4%
	Sample Size	50	100%

Source: Appendix

According to the table 4.16, it is clear that most of the investors are selecting their portfolio by using fundamental analysis. It mean out of 50 respondents, 28 i.e. 56% use fundamental analysis, 14 i.e. 28 % believe on market whim. The 6 i.e. 12% bases technical analysis for making investment and rest 2 i.e. 4% analysing their investment according to the suggestion of brokers. It represents that fundamental knowledge is the major factor of investment in Nepal.

4.2.6 Pricing of Gold and Stocks

Regarding the research about the pricing of gold and stocks, respondents are asked about the correctness of price of stocks and gold. The responses given by the respondents are summarized in the following table.

Table 4.17**Analysis of Pricing of Assets**

S.No.	State of Pricing	Marked	Percentage
1	No idea	7	14%
2	Correctly priced	3	6%
3	Over priced	34	68%
4	Under priced	6	12%
	Sample	50	100%

Source: Appendix

As per table 4.17, the majority of investors think that the securities and the gold are overpriced in the Nepalese financial market and gold market. A few about 14% respondents have no idea about the pricing of assets.

4.2.7 Primary Objective

Regarding the research variable, primary objectives of portfolio investment respondents are requested to answer. The responses of this research variable are below:

Table 4.18
Primary Objective for Portfolio Investment

S.No.	Primary Objective	Marked	Percentage
1	Portfolio rate of return	42	84%
2	Portfolio risk	6	16%
	Sample Size	50	100%

Source: Appendix

The response in table 4.18 shows that investors are highly returned oriented and risk averter. 84% of them are preferred portfolio rate of return while investing on the securities and only 16% of them give priority to risk of portfolio. It shows that they can bear risk but they expect compensation for bearing risk.

4.2.8 Required Rate of Return

Required rate of return for an investor in his/her portfolio investment is the major factor which highly influences the investment. Investment is the sacrifice of current benefit for the sake of future uncertainty i.e. uncertain profit. How much return they require from their portfolio investment is the main thing. Question asked regarding the survey research variable expected rate of return. Following result or expectations are found:

Table 4.19
Require Rate of Return

S.N	Range of Return (%)	Marked	Percentage
1	5 to 10	-	-
2	10 to 20	4	8%
3	20 to 30	25	50%
4	30 to 40	9	18%
5	40 to 50	9	18%
6	Above 50	3	6%
	Sample Size	50	100%

Source: Appendix

This survey of table 4.26 shows half of the investors require moderate rate of return from their investment portfolio. It means 25 respondents i.e. 50% demanded in the range of 20 to 30%. And only 3 i.e. 6% investors demanded high i.e. above 50% return from their investment because they may be the risk lover investors and they may bear high risk to get such high return. 5 to 10% rate of return is demanded by no one. 10 to 20% is demanded by 4 respondents, 30 to 40% & 40 to 50% is demanded by 9 respondents. These all required rate of returns are not good returns whereas market return is 43.14%.

4.2.9 Expected Risk

Risk of any investment of an investor is the key determinant. In this survey, investors have expected the following range of risk which is tabulated below:

Table 4.20
Expected Risk

S.N	Range of Risk (%)	Marked	Percentage
1	5 to 10	12	24%
2	10 to 20	6	12%
3	20 to 30	14	28%
4	30 to 40	10	20%
5	40 to 50	8	16%
6	Above 50		0%
	Sample Size	50	100%

Source: Appendix

This report shows that most of the investors are risk averter. 12 respondents i.e.24% wants to bear only 5 to 10% risk from their investment. Majority of the investors, 14 respondents i.e. 28% investors are ready to bear 20 to 30% risk in their investment portfolio. Only 12% want to bear 10 to 20%, 20% be ready to take 30 to 50%, 16% are ready to bear 40 to 50% risk in their portfolio investment and no one is ready to bear above 50% risk from their investment.

4.2.10 Investment Revision

The time of revision of portfolio investment is the research variable of this survey. The responses of this question tabulated as below:

Table 4.21
Investment Revision

Investment Horizon (Month)	0 to 6	6 to 12	12 to 18	Above 24	Number	Percentage
Yes	6	32	8		46	92%
No					4	8%
Total Sample					50	100%

Source: Appendix

According to table among 50 respondents, 46 i.e. 92% are revising their portfolio. 6 of them revising their portfolio within 6 month, 32 of them are

revising their portfolio within 12 months i.e. 1 Year, 8 of them revising their portfolio within one and half year. And rest only 4 i.e. 8% don't revise their portfolio investment. It means they just make investment and sell the securities and they prefer passive strategy.

4.3 Discussions of the Results

In the nutshell, there is bidirectional causality between gold flow and stock market capitalization. It means that when there is increase in gold flow the investment in ornament making industries in the country increases which induces the economic factors like employment, production, and income level of general people. The people get richer and invest in stock market to become much richer again. On the other hand, increase in share market means increase in income and saving of people. After being richer people start purchasing luxurious goods like gold which causes the increase in demand of gold in the country and the gold inflow in the country will increase. This confirms to the study by Lawrence (2003) which found low positive correlation coefficient between gold and stock returns makes gold as an efficient portfolio diversifier. There is bidirectional causality between gold inflow and GDP. It means when there is increase in gold flow in the country the ornament making industries increase in the country. When industries increase employment, production, income level etc. increase. Positive changes in these macroeconomic factors lead to increased GDP. On the other hand GDP growth means increase in income level of general people. When people become richer they start to make expenditure and investment in luxurious goods like gold, vehicle etc. and the demand of gold in the country will increase. Unlike to the study by Lawrence (2004), which found GDP and other macro-economic factors are unrelated with gold return, there is bidirectional causality between gold inflow and GDP of Nepal.

The correlation coefficient between gold return and stock return is positive but not perfect positive, so, Markowitz diversification is possible to some extent.

Investors can reduce their risk by investing most of their investable fund in the gold and small portion of their investable fund in stocks. However, for risk seeker investors the stock investment in Nepal is far better than gold investment. On the other hand, for risks avert investors the portfolio investment with most of investment in gold and minimum investment in stock is the better option.

Although, all of the Nepalese investors consider both risk and return as important factors for investment decision, only two third of the investors are practising portfolio diversification. It means most of the investors prefer stock investment to gold investment due to their perceived higher level of income in stock investment than gold investment. This logic can be drawn from the fact that majority of portfolio investors are making their portfolio investment for getting higher return than for reducing the risk factor.

CHAPTER-V

SUMMARY, CONCLUSION & RECOMMENDATIONS

The main aim of this chapter is to draw the conclusion of the current research work (paper) and provide recommendations for further research. So, this chapter has three sub chapters of Summary, Conclusion and Recommendation. Research is summarized in summary part, findings and interpretations in conclusion part and necessary remedies are provided for the betterment about the optimal portfolio investment between gold and stocks in Nepalese capital market in recommendation part.

5.1 Summary

The research work on the topic Portfolio Analysis of Gold and Stocks in Nepal is mainly based on three objectives. The answering on first two objectives (Causation analysis and Markowitz minimum variance portfolio analysis) is based on the secondary source of data. The first whereas the analysis on the understanding level of Nepalese investors about portfolio investment is based on primary way such as questionnaire, interview of investors, brokers, gold traders, capital market analysts etc.

The first purpose of this research work is to find the causation between gold inflow and stock market capitalization in Nepalese capital market. Attempts have been made to answer this question by running Granger-causality/ Wald test between these two variables. Akai Information Criterion is taken as lag selection criteria for my research. The year-end values of stock market capitalization of NEPSE and annual gold inflow in Nepal for 20 years (1995-2014) were used for this purpose. Moreover, causality test between gold flow and GDP of Nepal has been conducted by taking data of the same period.

The regression analysis is the heart of the methodology (Granger-causality test) in my research work. Regressions were used both restricted and

unrestricted, taking one variable dependent and next independent, in SPSS for identifying the causality between gold flow and stock market capitalization. As hypothesised in methodology, there is bidirectional causation between gold flow and stock market capitalization in Nepalese financial market. Similarly, the causality between gold import and the GDP is also bidirectional in nature. It means when there is increase in gold flow in the country, the number of industries related to gold making increases which leads to increase level of employment income level, and other economic variables. After making consumption, the saving thus obtained go to the share market and the stock market capitalization increases. On the other hand, stock market capitalization flourishes the investors in security market earn higher return by which their income level increases. They start to diversify their investment to gold market which results increase in demand of gold inflow in the country.

The second purpose of this research work is to determine the Markowitz minimum variance portfolio between gold return and stocks return. This question is answered by calculating annual holding period return of each investment alternative (gold and stocks), expected rate of return, standard deviation, and variance, coefficient of variation, covariance, correlation coefficient, minimum variance portfolio weight, minimum variance portfolio return, and minimum variance portfolio risk. For this purpose the year end NEPSE index and average price of gold per 10 gram for 10 years (2005-2014) is taken as the sample data. The quarterly bulletins of NRB and the annual report of Association of Gold and Silver Dealers in Nepali is the vital source of data for this purpose.

The annual holding period returns for both the investment alternatives are not consistent. The expected rate of return based on 10 years holding period return is more for stock investment than gold investment. The risk on the other hand is more for stock investment than gold investment. So, it is not non-uniform to the higher return higher risk principal of investment. The correlation coefficient

between gold return and stock return is low positive, as stated in review of literature. However, Markowitz risk diversification is possible between these two risky investment alternatives. The investors could minimize the risk by dividing their investable fund into gold and stocks in the ratio 9:1. At minimum variance portfolio investment the minimum variance return and SD would be 18.57% and 23.63% respectively. Moreover, by dividing the fund into two assets the investors can earn same level of return by bearing low level of risk. It is because the coefficient of variation, risk per unit of return, in case of portfolio investment is less than CVs of either of the investment alternative.

The third objective, analysis of understanding of Nepalese investors about portfolio investment is mainly based on the response of respondents in the questionnaire which is distributed among investors, brokers, gold traders, capital market analysts etc. Investment is the sacrifice of current rupee or benefit or dollar or resource for the sake of future uncertain benefit or resource. It is an assurance of money that expects to produce additional money. Investment is a systematic and scientific way of using saving bearing lower level of risk. Sample survey were organized to explore the investors' preference developing the research variable scientific management, determinant of portfolio investment, investment strategy, diversification of risk, analysis tools, primary objectives, time horizon and many more.

Investors do not invest in the entire investment alternatives which are available in the market. Investment rationalities are investment objectives, time horizon, and risk and return analysis, demand and supply in the market, price situation of a security, tax, income, liquidity, investment strategy, bull and bear market analysis and others. Investor should be aware of risk and return. This study helps them to find out risk and return of gold and stocks and the portfolio between them.

5.2 Conclusion

There is bidirectional causation between gold inflow and stock market capitalization in Nepalese capital market. It means both the variables influence one another. When gold flow in the country increases, gold trading within the country increases, ornaments and jewellery making industries will grow, new employment is generated. The level of income of the people will also increase. People start to purchase shares by sacrificing some part of their income for getting higher return in the future. All these activities signal to bullish trend in the stock market and stock market capitalization increases. On the other hand if there is increase in stock market capitalization, the people who invest in the share market earn capital gain return or earn excess or abnormal profit. The saving of the people will grow which influence them to invest in the luxurious and stable assets like gold. These activities cause the increased demand in the gold market and results in increase level of gold flow in the country. There is bidirectional causality between gold inflow and GDP. It means when there is increase in gold flow in the country the ornament making industries increase in the country. When industries increase employment, production, income level etc. increase. Positive changes in these macroeconomic factors lead to increased GDP. On the other hand GDP grow means increase in income level of general people. When people become richer they start to make expenditure and investment in luxurious goods like gold, vehicle etc. and the demand of gold in the country increases. Thus, this study shows that there is bidirectional causality between gold and stock and gold and GDP in Nepal.

Both the risk and return in stocks investment is more than gold investment in Nepalese capital market. The coefficient of variation of stock return is more than gold return. So, it seems gold investment is better investment alternative than stocks investment. However, due to low positive correlation coefficient between stock and gold return, the risk can be diversified to some extent. The Markowitz minimum variance portfolio (optimal portfolio) can be obtained by dividing total investable fund between gold and stocks in the ratio 9:1.

From this it can be inferred that people are making investment in stocks due to their perceived higher income in the stock market than in gold market.

Risk & return, demand & supply, market trend and investment objectives are the major determinants for the investment. Almost all investors apply the active strategy and managing his or her portfolio investment. More than half of the investors are applying simple diversification and the rest are using superfluous diversification, across industry, Markowitz diversification. Most importantly, Nepalese investors are almost unknown about diversification between gold and stocks. Most of the investors applying ad hoc analysis and market whim for the selection of the securities and almost all investors are return oriented. Only a few investors are giving priority to the risk factor.

5.3 Recommendations

- Information that is really needed to the investors is not sufficient and reliable. Most of the investors are investing according to the market whim and suggestions of stockbrokers, or others such as friends and relatives etc. It is recommended to concerned organizations (SEBON, NRB, and NEGOSIDA, companies) to provide sufficient and reliable information in time and ensure that listed companies deliver adequate and timely information.
- The risk seeker investors are recommended to invest in stock market in Nepal and risk averters are recommended to invest in gold market. The investors who want to minimize the risk are suggested to make the portfolio investment in 9:1 ratio that will yield more secured returns to the investors.
- Investors are recommended to analyse both aspect of investment (return and risk) before making portfolio investment.

- Investors are suggested to invest in stock market when there are positive signals in the capital market and to invest in gold market as safe haven in case of unfavourable environment in the capital market.