INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE AND MANAGEMENT

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# AN OVERVIEW OF FINANCIAL RATIOS FROM 1900'S TILL PRESENT DAY

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**ABSTRACT**

*Ratios have evolved substantially over a period of time. Ratios are an excellent analytical tool. They help to set standards of various industries. Financial Performance Analysis can be carried out by calculating various important ratios. There has been a various studies conducted on the basis of ratios but they have not been put in any chronological order. This research paper is an attempt to trace the changes that ratios have gone through time. The study traces the movement of financial ratios from the historical perspectives till the present day. The study also shows the usage of financial ratios that where conducted abroad in the Government Sponsored Enterprises as well as Public Sector Undertakings in India. The Research paper is limited to the government sector of India as well as abroad.*

## KEY WORDS
Financial Ratio's, Government Sponsored Enterprise, Public Sector Enterprise.

## INTRODUCTION
The purpose of this research paper is to familiarize the readers with various studies and articles focusing on ratios and their usefulness in the financial analysis of an organization.
The chapter begins with the historical perspective of ratios highlighting their development over many years as well as their application in financial analysis. Subsequent sections discuss relevant literature of financial analysis in India as well as Abroad. Finally the chapter closes with the summary of the major points evident in the literature.

## HISTORICAL PERSPECTIVE
Ratios have evolved as a result of Euclid's analysis of properties of ratios in the book V of his elements in approximately 300 B.C. However, the use of ratios is of recent development.
The earliest traces of financial statement analysis are found in the last half of the nineteenth century when America was approaching industrialist maturity. At that time, corporate management were been transferred over from enterprising capabilities to the professional manager and the financial sector was becoming a more predominant force in the economy. Both of these changes were the primary causes for financial statement analysis.
There is a significant overlap in the development paths of ratio analysis for creditor's purpose and managerial purposes. Credit analysis focused on the ability to pay and managerial analysis emphasized profitability. The development of ratio's for use in credit analysis dominated the general development of ratio's analysis, so one must look primarily to credit analysis to understand the evolution of ratio analysis.
Several ratios were developed in the 1890's. During that time, the practice of comparing the current assets of an entity to its current liabilities developed. This relationship came to be known as the current ratio and has had a more significant and long-lasting impact upon financial statements analysis than any other ratio. The use of ratios in financial statement began with the advent of the current ratio.
During the period between 1900-1919, several important developments occurred. First, a rather large variety of ratios were developed. Second, absolute ratio criteria began to appear such as the 2 to 1 current ratio criterion.
In 1919, Alexander Wall conducted a study in which he compiled a large statement of financial statement. This study became the catalyst for ratio analysis development and was conducted in response to the apparent need for more types of ratios and for relative ratio criteria. Firms were stratified by industry and by geographical location in the study. Although his results would be vulnerable to criticism by today's standards, his study is significant because it was widely-read and marked departure from the customary usage of a single ratio with an absolute criterion. Wall popularized the idea of using many ratios and using empirically determined relative ratio criteria.
Another important development in managerial usage of ratios occurred at about the same time. The DuPont Company began the most important comprehensive managerial usage of ratios such as profits/total assets, profits/sales and sales/total assets. This held promise for serving as the basis for a framework where ratios could be developed in a logical fashion. However, it went unnoticed until recent times.
During the 1920's, interest in ratios increased markedly. As a result, many articles were published on the subject of ratio analysis.
Analysts of this time period were attempting to bring some level of sophistication to ratio analysis. James H.Bliss (1923) developed the first coherent system of ratios which were tied together in a logical, deductive fashion. He considered ratios to be indicators of the status of relationship with business. From this premise, he developed a model of the firm which consisted entirely of ratios. Although his model was naïve, it represented a promising beginning for the development of a theory of ratio analysis.
While the twenties were a period of great enthusiasm about ratios, it also was a period in which the first serious criticism of ratios emerged. In 1925, Stephen Gilman raised four objectives to ratios. His objections were that changes in ratios over time cannot be interpreted because the numerator and denominator both vary, they are artificial measures, they divert the analysts' attention from a comprehensive view of the firm and their reliability as indicators varied widely between ratios. Given these objections, it is obvious that Gilman was diametrically opposed to Bliss as well as any other enthusiast. The contributions of both men were acknowledged but, because neither was expanded upon, their value for furthering the development of a theory of ratio analysis was lost. Attention was given to the empirical bases of ratio.
The Overriding feature of the 1930's was the increased attention given to the empirical bases of ratio of ratio analysis. The Securities and Exchange Commission was formed at this time and quickly became an external influence that both increased the supply of financial statements and influenced their content.

There were two major developments in this decade directly related to ratio analysis. The first pertains to the determination of the most effective group of ratios. Roy A. foulke (1931) was the most successful promoter of own group of ratios. His success was mostly due to the fact that he could supply annual industry data for his group of ratios. The collection of ratios he developed quickly became the most influential and well-known industry average ratios series.

Foulke (1931) was an important figure in the development of ratio analysis because he was the father of the approach which became the essential mode of operation of ratio analysis in this country. In this approach, deductive analysis and/or empirical evidence were rarely provided in support of an author's claim that his group of ratios represented the most efficient collection for analyzing financial statements. Instead, the degree to which an analyst's group of ratios were accepted was dependent on the authority of his experience in statement analysis. This approach left the subject of ratio analysis without any –developed, testable theory.

The second significant development of this decade was that several studies, although fraught with shortcomings, were the first carefully developed attempts to use the scientific method to examine the usefulness of ratios. Winker and Smith (1935) conducted an early study of a sample of firms to assess the efficiency of ratios as predictors of business financial difficulty. Another major study of ratios and their relationship to financial difficulty was directed by Paul J. Fitzpatrick (1931).

Development of the empirical base of ratio analysis continued during the 1940's and culminated in a study by Charles L. Mervin (1942). He analyzed the trends of various ratios in "continuing" and "discontinuing" firms. This study was the first sophisticated analysis of the predictive power of ratios. The findings still appear credible today.

Another development which gained popularity during this period was the practice of using a number of ratios to describe a wide variety of a firm's characteristics. Studies of this nature provided a wealth of information about the behaviours of ratio over time and the variation of ratios between different types of organizations. A few of these studies looked at the potential for utilizing ratios in financial statement analysis. These studies supplied materials which could be used for the formulation of hypotheses in the development of a formal theory of ratio analysis. However, they were never translated into the field of ratio analysis.

Since the mid-1940's, the development of ratio analysis has taken various paths. There was increased emphasis on the role of ratios in the operations of small businesses. Ratios were also being used as variables for analyzing and describing economic activity which further widened the empirical base of ratio analysis. William H. Beaver (1967) conducted a study in which he analyzed the ability of ratios to predict the failure of firms during 1954-1964. Similar to the Merwin study, he found that certain ratios predict failure up to five years in advance. Beaver's study used more powerful statistical techniques than those used by Merwin and some of his ratios were taken from funds statement data. His study represents a landmark for future research in ratio analysis.

Another important study was conducted by Sorter and Becker (1964). They found that conservative corporations maintain higher liquidity and solvency ratios. This research would also prove to be a valuable addition to the empirical base of ratio analysis.

The other important development since the mid-1960 is the beginning of a period of more rigorous scrutiny of the nature of financial ratios as such. First, the effects on ratios of different accounting practices were examined. George C. Holdren (1964) found that different types of inventory valuation procedures changed inventory turnover ratios. A. Tom Nelson (1963) discovered that the capitalization of leases also changed a large number of ratios.

In other countries such as England, a common thread in ratio analysis has developed. The British Institute of Management has generated interest in ratios as tools for making inter-firm comparisons to help managers appraise efficiency and to make policy decisions for the future. Actually, ratio analysis has taken a more distinct management orientation in other countries in contrast with the creditor orientation in the United States.

## FINANCIAL PERFORMANCE ANALYSIS ABROAD

While there is a large base of literature on the subject of ratio analysis, the researcher has chosen to limit his review to studies done in city/government sector of all abroad regions. They are the Government sponsored Enterprises (GSE). Basically, the researcher has eliminated the large number of studies conducted in the private sector. It may be true that financial ratio's used in the private sector studies can, and should, be used in Public Sector analyses. However, it was decided to focus this review on studies which have been conducted in an accounting environment similar to that found in public sector undertakings. Both Government Sponsored Enterprises and Higher Educational Institutes follow fund accounting practices. This review was designed to examine the types/purposes of studies which have been conducted as well as the financial rations that are applicable in the fund accounting environment. These would seem to be the most appropriate to consider when developing a study on Public sector undertakings in India.

In recent years, several articles have been written illustrating the importance and need for ratio analysis in the public sector. Several of the articles have appeared in practitioner oriented journals which speaks to the importance of this area as a tool for the practicing business officer.

James Howard (1987) wrote an article focusing on cost management as a key to survival. He specifically points to financial ratios as a valuable tool to assist private sector financial managers in this area. Although balance sheet ratios are only indirectly related to costs, they can be as important as the actual standard cost data used for the income statement. Certain ratios measured over a period of time and compared with other companies can reveal how efficiently money is being utilized. Howard suggests that comparison should be made with industry standards for companies of similar size.

Karl Zehms (1991) encourages the development of financial ratio analysis in the public sector. Municipal statements are often extremely complex and lengthy enough to discourage careful reading. Given that fact, Zehms claim that it would be worthwhile to develop a set of financial ratios appropriate for aiding in the analysis of municipal annual financial reports. He suggests the development of national standards for the various ratios to facilitate meaningful comparisons. Zehms identifies citizen, legislators and oversight officials, investors and creditors as the major user groups of municipal financial reports. It is with the needs of these user groups in mind that we should begin the development of financial ratios.

Brent Wrasman (1993) prepared an article entitled "Using the Financial Indicators Database for Policy Analysis" in which he discussed the usefulness of the database to a Nevada school district as it prepared to enter salary arbitration. Since the negotiating points concerned the components of year-end fund balance, the district administration wanted to determine how they compared to other districts with hopes that the comparison would enhance their bargaining position. The government Finance officers Association maintains the financial database which provides three primary types of financial variables: absolute measures such as general fund operating results in dollars, relative measures such as total property tax levy per capita and composition measures such as components of long term debt. The minimum, maximum and median values are summarized for each indicator for cities falling into various size classifications. Data on fund balance is also provided as an effective means of comparison.

Ken W. Brown (1993) of Missouri State University developed the “The 10 –Point Test of Financial condition” which is an easy-to –use assessment tool for cities whereby they can compare their own condition to that of others. His self assessment worksheet contains ten financial ratios applicable to government financial statements. Cities can compare their indicator values to those of comparably sized cities and arrive at an overall point-score. The scores indicate an overall grade relative to cities in the database ranging in classification from “among the best” to “among the worst”.

The International City Management has recently published a book entitled Evaluating Financial Condition: A Handbook for Local Government. Authored by Sanford M. Groves and Maureen Godsey Valente (1986), the book represents a financial trend monitoring system for use in the public sector. Their framework consists of environmental and financial organizational factors which are monitored through the use of a series of ratio indicators associated with each factor. This appears to be an excellent management tool complete with detailed explanations of each indicator as well as descriptions of what trends might indicate and what should be analyzed if trends indicate a problem.

Lorrie DuPont (1994) states that change and the ability to adapt to it is the new challenge for higher education in the 1990’s. Faced with many new pressures, colleges and universities are reexamining their finances and their future to determine the best strategies for meeting budget demands and growth objectives. DuPont contends that in most cases, the foundation for their success is based on accurate, realistic evaluations of their institutions’ debt capacity. Debt capacity is the level of debt the entity can afford to bear prudently. Debt capacity is based on an assessment of specific factors such as cash flow, fund balance and expenditure control to name a few. An institutions’ overall debt level is a crucial components in determining credit rating on debt issued by that institution.

Although debt capacity is typically measured before an organization issues new debt, it can also be used as a tool for financial planning. The author suggests that the analysis begin with a routine financial ratio analysis which will clearly indicate trends in debt capacity. Changes in ratios from year to year will address pertinent issues. In addition to internal measurements, ratios should be compared to other institutions with similar characteristic according to DuPont.

The most striking aspect of the field of ratio analysis is the absence of an explicit theoretical structure. Users of ratios are required to rely upon the experience of the analyst. The bulk of the ratio analysis literature consists of instructions on the computation of ratios. However on the positive side, a need does exist for analytical tools that will enable analysts to compare financial statements between firms over time. Ratios fill that need as a simple, quick method of comparison. Available evidence also suggests that ratios do have predictive value, at least with respect to financial difficulty (Horrigan, 1968).

In ‘GFOA’s Financial Indicators Database: Benchmarking and other Uses,” Patricia Tigue (1994) provides an overview of the database and the specific types of information that are available to municipal finance officers. Included are overall operating results, several categories of fund balance information, revenue and expenditure data by type of expenditure and cash/investment data. The author notes that a set of ratios can be constructed with these data and used to measure a jurisdiction’s financial condition internally or as benchmarks in comparing its financial results with other jurisdiction. Tigue writes that with the GFOA’S database, governments have at their disposal another tool to help them manage their financial position more effectively.

Ronald Everett (1995) calls for more research to enhance the use of financial ratios in public school districts. His article describes ratio analysis and its traditional use in the private sector. He discusses specific ratios commonly used in financial analysis as well as the potential value of ratio analysis to school officials. An important part of deciding how to respond to internal and external pressures understands the financial condition of public educational organizations. Managers can use this information to improve the efficiency and the profitability of their operation. Everett calls for more research and sophistication to add reliability and credibility to ratio usage in the public school domain.

The most striking aspect of the field of ratio analysis is the absence of an explicit theoretical structure. Users of ratios are required to rely upon the experience of the analyst. The bulk of the ratio analysis literature consists of instructions on the computation of ratios. However on the positive side, a need does exist for analytical tools that will enable analysts to compare financial statements between firms over time. Ratios fill that need as a simple, quick method of comparison.

## FINANCIAL PERFORMANCE ANALYSIS IN INDIA

After a lot of research work, it was found that very few works was done on financial ratio by Indian Author. Few related work have been mentioned below.

Dash D .K (1999) titled “Case Study of Namangan Cooperative bank Jamnagar, Gujarat- Performance Analysis through Ratio Analysis. Dash carried out financial analysis of the financial statements of Namangan Cooperative Bank.

“Basics of Ratio Analysis “(2001) done by Parasuraman N.R. Rather than carrying out any ratio analysis on any financial statements, the author tried to give the rationale behind each ratio’s.

“The road beyond ratios: A. Krishnan on how to interpret financial statements.”(2002) . The author worked on a creditors look into a balance sheet for analysis of various ratios and tires to draw some conclusions. He argued that balance sheets just show the balances, but a close look into the various headings will give us a better understanding of their effects. He has taken the example of raw materials. They are meant to be converted into semi-finished goods and then to finished goods. They may be bought in bulk, especially if they are available at short notice. Unused raw materials are a drain on the company’s working capital, affecting liquidity, increasing the interest burden for the loan taken and possibly depreciating in value. What is seen in the balance sheet is merely inventory control. But when an analysis of the inventory is done many hidden truths emerge.

“Analysis of financial ratio’s commonly used by US lodging financial executives.” authored by A.J. Singh (2002) the purpose of this study was to identify commonly used ratios in the lodging industry and discover their importance level for lodging financial executives. Operating and Profitability ratios clearly stand out as the most important ratios for lodging managers. The study makes a contribution by educating managers about the range of ratios, their relative importance, and opportunities for using ratios not currently considered useful.

Mansur A. Mulla (2003) wrote an article titled “Forecasting the viability and Operational Efficiency by use of Ratio Analysis-A case Study”. This case study assesses the financial performance of a textile unit using ratio analysis as a tool to determine the financial and operational efficiency of the unit. It seeks to improve the financial health and viability of the undertaking in the years to come using ratio analysis as a diagnostic instrument to remove financial and operational maladies plaguing the company. He concluded that ratio analysis is an invaluable mechanism for highlighting areas which require attention and diagnosis. The ratio analyzed showed that managerial inefficiency let to the downfall of the textile Industry.

R.Hamsalakshmi & M.Manicham (2005) worked on an article titled "Financial Performance Analysis of Selected Software Companies". The study has been undertaken to examine and understand the management of finance playing a crucial role in the growth of the selected industries. It is concerned with examining the structure of liquidity position, leverage position and profitability position of selected thirty four software companies in India quoted at BSE for a period of five years (1997-1998 to 2001-2002). The study revealed that liquidity position and the working capital were favourable during the study of the period. It also showed that the overall profitability position of selected software companies had been increasing at a moderate rate.

"Ratio Analysis and Its Use in Portfolio Diversification Using RMA's Annual Statement Studies" (2006) was written by D K Malhotra, Andy Lafond, Francis Garritt. It deals with two ways to mitigate credit risk in your loan portfolio are to diversify its composition and to set limits. The roots of a diversification effort are in a detailed analysis of the financial statements of borrowing companies -- more specifically, a look at the financial ratios. This article uses Annual Statement Studies to analyze trends in the performance of seven different industries and to show how they are correlated to various macroeconomic factors over a 15-year period (1989-2004). Industries selected include: 1. industrial machinery and equipment merchant wholesalers, 2. new-car dealers, 3. general freight ducking, long distance, truckload, 4. offices of real estate agents and brokers, 5. engineering services, 6. offices of physicians, except mental health specialists, and 7. full-service restaurants. This article also explores the relationship between macroeconomic variables -- such as interest rates, inflation, and gross domestic product -- and the liquidity, borrowings, and profitability of the seven industries.

"Financial Management in the Non-profit Sector: A Mission-Based approach to Ratio Analysis in Membership Organizations" authored by Dr. Anne Abraham (2006). The author has based her study on Non-profit Organizations (NPO's). They are melting pots combining mission and money. The author has tried to measure the financial performance by ration analysis. It helps in identifying organizational strengths and weaknesses by detecting financial anomalies and focusing attention on issues of organizational importance. Her paper discusses the centrality of mission in the use of financial ratio analysis and extends previous financial performance models to develop one that can be applied to nonprofits organizations. Thus, ensuring that financial performances analysis is not carried out in isolation from any consideration of an organization's mission, but for a specific purpose. The paper concludes by identifying the limitations of such an analysis and makes suggestion for further application of these models.

Dr. Paraschos Maniathis conducted a study titled, "Comparison of Gearing Ratio and Earnings per share in Two Branches: A Statistical Investigation" (2007) . His study was based on the study to compare the gearing ratios and the earning per share (EPS) in two relative sectors: that of the food processing industry and the food-retailing branch. For the study, the author has considered firms whose shares are quoted in the London Stock Exchange. Further, the author has tried to investigate the possible relationship of the above mentioned financial ratios within and between the two branches.

D.K.Malhotra and Rashmi Malhotra worked on an article titled," Analyzing Financial Statements using Data Envelopment Analysis." (2008). They were of the opinion that financial statements are a summary of the operating, financial and investment activities of a firm over a period of time. Financial statement analysis usually begins with financial ratios based on information in the income statement, balance sheet and statement of cash flows. Ratio analysis is designed to show the relative strengths and weaknesses of a company as compared to the other firms in the industry, leading firms and the previous year of the same firm. But ratio analysis is often criticized on the grounds of subjectivity, because an analyst must pick and choose ratios in order to assess the overall performance of a firm. In this article the author, illustrates the use of data envelopment analysis (DEA), an operations of research technique, to analyze financial statements of firms by benchmarking financial ratios of a firm against its peers as well as the industry averages. It is a powerful technique for measuring performance because its objectivity and ability to handle multiple inputs and outputs that can be measured in different units. Thus, there study focused on a new technique DEA, but believed that ratio analysis are the basis of all financial analysis.

"Sachiko Corporation: A case in International Financial Statement Analysis." By Mahendra R Gujarathi (2008). The author does a comparative study within an International context. Upon reviewing the financial statements and relevant foot-notes of Sachiko corporation, a Japanese Company, and U.S.- based Radiance Inc., the author has used financial ratio analysis to compare and evaluate whether the revised ratio's are consistent with each company's strategy and business environment and subsequently, to recommend the better investment prospect. The article is useful for us to examine the role of environmental differences (cultural, institutional, business and financial reporting) in interpreting the risk and profitability ratios in an international context.

## CONCLUSION

From the above it can be summarized that ratio analysis has evolved substantially over time and has grown in importance as an analytical tool. There has been numerous studies in Government sponsored Enterprises, although most of those focus on predicting fiscal distress, assessment of financial condition and self-assessment. There is an absence of explicit theoretical structure for ratio analysis. All studies give wider importance to instructions of how to calculate the structure rather than a theory base of the ratios. The public sector has seen relatively little in the way of financial ratio analysis. One recent study was cited which illustrates the use of ratios as a tool for municipalities to conduct self assessment of their financial conditions.

This research paper is concluded on the studies based by many scholars in the various aspects of the financial analysis made by Indian authors. It can be summed up by stating that works have been carried out on financial analysis with the use of Ratio Analysis. But no literature was found on analysis of the financial statements on Public Sector Undertakings of India. Various other literature reviews that have been included in this research paper are stated below, to give an idea what work has been carried out till date.

Dash D .K analyzed the statements of Namangan Cooperative Bank, with the help of Ratios. Parasuraman N.R. carried out research work on the rationale of each ratio's. The author did not analyze any financial statements but gave an understanding & explained the significance of each ratio's. "The road beyond ratios: A. Krishnan on how to interpret financial statements." This study also explains the various rationales behind each ratio's rather than analyze any statement. A.J. Singh worked on an article titled "Analysis of financial ratio's commonly used by US lodging financial executives."

This study also is based upon private sector. The author listed out the most significant ratios in the lodging sector. Mansur A. Mulla wrote an article titled Forecasting the viability and Operational Efficiency by use of Ratio Analysis. He carried out a case study on textile mills & analyzed their profitability, liquidity, solvency position by using Ratio's. R.Hamsalakshmi M.Manicham worked on an article titled "Financial Performance

Analysis of Selected Software Companies. They used regression analysis and correlation to view the statements of software companies. This study is the closet to the project that I am working on. They analyzed the financial position of Software companies while I am attempting to analyze position of five Public Sector Undertakings.
"Ratio Analysis and Its Use in Portfolio Diversification Using RMA's Annual Statement Studies" was written by D K Malhotra, Andy Lafond, and Francis Garritt. This study compares seven different businesses for a period of fifteen years with the help of Ratio Analysis. Another study was carried out by Dr. Anne Abraham titled "Financial Management in the Non-profit Sector: A Mission-Based approach to Ratio Analysis in Membership Organizations" The author used Ratio Analysis in analyzing statements of Non-profit organization. Dr. Paraschos Maniathis conducted a study titled, "Comparison of Gearing Ratio and Earnings per share in Two Branches: A Statistical Investigation". The author used ratio analysis to compare two different kinds of industries which are food processing industry and the food-retailing branch. D.K.Malhotra and Rashmi Malhotra worked on an article titled," Analyzing Financial Statements using Data Envelopment Analysis." The author tried to use a new research technique, to analyze financial statements of firms by benchmarking financial ratios of a firm against its peers as well as the industry averages. It is a powerful technique for measuring performance by using number of financial ratios and putting it through development analysis test.
Sachiko Corporation: A case in International Financial Statement Analysis." By Mahendra R Gujarathi. The author worked on an article which compared the Japanese accounting system with the American. He tried to compare both the systems with the help of financial ratio Analysis.
It may be concluded that various authors have worked on various subject matter keeping Ratio Analysis as their base of studies. Major work has been done in the private sector, non-profit organization as well as comparison between two different accounting systems.

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