

A study on
THE FINANCIAL STATEMENT ANALYSIS WITH REFERENCE
TO TITAN COMPANY

Project Report

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Under the guidance of

Ms. LAKSHMI M

In partial fulfillment of the requirement for the Degree of
BACHELOR OF COMMERCE



ST. TERESA'S COLLEGE ESTD 1925

ST. TERESA'S COLLEGE (AUTONOMOUS), ERNAKULAM

COLLEGE WITH POTENTIAL FOR EXCELLENCE

Nationally Re-Accredited with A++ Grade

Affiliated to

Mahatma Gandhi University

Kottayam-686560

March-2023

ST. TERESA'S COLLEGE, ERNAKULAM (AUTONOMOUS)

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CERTIFICATE

This is to certify that the project titled "**A STUDY ON THE FINANCIAL STATEMENT ANALYSIS WITH REFERENCE TO TITAN COMPANY** " submitted to Mahatma Gandhi University in partial fulfillment of the requirement for the award of Degree of Bachelor in Commerce is a record of the original work done by , **Ms. Vishika P V , Ms. Madhavi Murali, Ms. Sreelakshmi Gopinath**, under my supervision and guidance during the academic year 2020-23.

Project Guide

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Viva Voce Examination held on....

External Examiner(s)

DECLARATION

We Ms. Vishika P V, Ms. Madhavi Murali and Ms. Sreelakshmi Gopinath, final year B.Com students, Department of Commerce (S.F.), St. Teresa's College (Autonomous) do hereby declare that the project report entitled A STUDY ON THE FINANCIAL STATEMENT ANALYSIS WITH REFERENCE TO TITAN COMPANY submitted to Mahatma Gandhi University is a bonafide record of the work done under the supervision and guidance of MS. Lakshmi M, Assistant Professor of Department of Commerce (S.F.), St. Teresa's College (Autonomous) and this work has not previously formed the basis for the award of any academic qualification, fellowship, or other similar title of any other university or board.

PLACE: ERNAKULAM

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Vishika P V

Madhavi Murali

Sreelakshmi Gopinath

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CHAPTER I
INTRODUCTION

1.1. INTRODUCTION:

Whenever we are thinking of investing in a company it is vital that we understand what it does, its market and the industry in which it operates. We should never blindly invest in a company. So company analysis is an important segment of fundamental analysis. However whenever we come to the reality – though terms like basic, obvious, plain, simple—all of these words describe fundamentals in some way. But in practice it is not so obvious or plain as it sounds.

Company analysis can also be termed as business analysis which gives the analysis of minute details of the company as well as its business processes in different dimensions. The tools of company analysis are as follows:

- Financial
- Financial Statement Analysis
- Financial Ratio Analysis
- Non-Financial
- Management
- Product or Service
- Level of Competency
- Innovation
- Productivity
- Technology
- Competitive Edge
- Promoters Holdings
- Corporate Information
- Market Share
- Expansion Plans

Here the study does the company analysis of Titan Company. Titan Company Limited (Titan), a joint venture between the Tata Group and the Tamil Nadu Industrial Development Corporation (TIDCO), commenced its operations in 1984 under the name Titan Watches Limited. Titan is the fifth largest integrated own brand watch manufacturer in the world. Over the last three decades, Titan has expanded into underpenetrated markets and created lifestyle brands across different product categories. Titan is widely known for transforming the watch and jewellery industry in India and for shaping India's retail market by pioneering experiential retail. This analysis is done with both Financial and Non financial tools like ratios and SWOT analysis.

1.2. STATEMENT OF THE PROBLEM:

For long-term wealth creation, it is extremely important to understand the company you are going to invest in. Which is the best stock to invest in for the long term? Which company will

provide high returns in the future? How to find such high-growth companies and opportunities to invest? All of these questions are answered when you analyse a company. This Study will help us select the best stock to invest in the Indian stock market. This will lay down a general path and give you a perspective of how to analyse an investment option. Here we are using financial ratios for the analysis of the statement.

1.3. SIGNIFICANCE OF THE STUDY:

Company analysis actually provides the indication of the estimated value & potential of the company along with the comprehension of its financial variables. It helps to evaluation & examination of a company, its financial health & prospects, management strategy or marketing activities & its strengths & weaknesses. To Understanding the risks and concerns about the company. It helps to Analysis the Financial Statements that is qualitative factors and quantitative factors.

1.4. OBJECTIVES OF THE STUDY:

1. To analyze the companies financial performance in terms of profitability.
2. To determine the financial position of the company.
- 3.. To determine the credit worthiness of a company.
4. To identify the financial indicators that influences the decision making of an investor in the company.

1.5. RESEARCH METHODOLOGY:

1. This study is based on Secondary Data where Audited financial statements are collected from the website of Titan Company.
2. Ratio analysis is the tool used for analysing the study.

1.6. SCOPE OF THE STUDY:

The scope of study is limited to collecting financial data published in the annual reports of the company. The analysis is done to suggest the possible solutions. The study is carried out for 1 year. The present study is confined to only Tata Company.

1.7. LIMITATIONS OF THE STUDY:

- This study is limited to time constraints.
- It is very difficult to practically use this analysis as it is based on historical data.

CHAPTER II
LITERATURE REVIEW

2.1.LITERATURE REVIEW

Rajat Deb , Mukesh Nepal and Sourav Chakraborty (2022)

The study has reviewed the literature on audit quality (AQ) in general and with reference to IFRS in particular for synthesizing the broader issues, the ongoing debates and controversies. A total of 263 papers published by eight global publishers (from June 2005 to 2020) were downloaded from the Tripura University's digital library, and after rigorous filtering, 88 sample papers were retained. Applying boundaries for screening, it has focused on the continent of studies, objectives, variables, results, publishers and year of publications of the sample cited papers to summarize the research trends. Thus, the current study can spur researchers, practitioners, and academicians to gauge the impact and implications of IFRS on AQ and chart out future research agendas.

Garfield, 2018

The study have examined the impact of price to earnings ratios, dividend yield ratio as core indicator of stock price in banking sector of Turkey. Data for monthly price of banking stock and related ratios have been explored during the time of 2008 to 2017. It is found that there exists significant association between financial ratios and stock price of banking firms in Turkey.

Musallam (2018)

The study reviewed the association between financial ratios and 26 firms, listed in the Qatar stock market during the time of 2009 to 2015. Research designed is based on the secondary data with annual observation and application of weighted least square for the price per share of stock, earning yield ratio, and dividend yield (Hussain, Salem, Rashid, & Kamarudin, 2019). It is found that key financial ratios have their significant and positive impact on the return of stock. Besides, financial ratios like market to book, return on equity, return on assets, price to earning ratios, and net profit margin have their insignificant impact on stock return of selected firms. Practical implication of the study indicates that policy makers from the government, investors and business mangers can use the findings for strategic decision.

Jothi, K. & Geethalakshmi, A. (2016)

This study tries to evaluate the profitability & financial position of selected companies of Indian automobile industry using statistical tools like, ratio analysis, mean, standard deviation, correlation.

Kumar Mohan M.S, Vasu. V. and Narayana T. (2016)

The study has been made through using different ratios , mean, standard deviation and Altman's Z score approach to study the financial health of the company. The study reveals there is a positive correlation between liquidity and profitability ratios except return on total assets as well as Z score value indicate good health of the company.

Kaur Harpreet (2016)

The author tries to examine the qualities & quantities performer of maruti Suzuki co. & how had both impact on its market share in India, For this study secondary data has been collected from annual reports, journals, report automobile sites. Result shows that MSL has been successfully leading automobile sector in India for last few years

Mingyi Hung (2016)

Accounting Standards and Value Relevance of Financial Statements: An International Analysis concluded that the use of accrual accounting (versus cash accounting) negatively affects the value relevance of financial statements in countries with weak shareholder protection. This negative effect, however, does not exist in countries with strong shareholder protection.

Krishnaveni, M. & Vidya, R. (2015)

Find that Indian automobile industry is a high flying sector these days and emerging as an export hub in wake of liberalisation and globalization. This paper revises the category wise production, sales and exports of automobile industry in India. Industry growth can be viewed in term of pre and post liberalization. As government allows 100 percent FDI, increase 15% in customs duty on cars and MUVs to encourage local manufacturer and concessional import duty on specified parts of hybrid vehicles.

Sarwade Walmik Kachru (2015)

Analyzed the effects of liberalization, government delicensing and liberal trade policies on the growth of Indian auto mobile industry .The study recommends that investing four- wheeler is going to be smart potion not only in India but all around the world.

Becker Dieter (2015)

The report shows about the current state and future prospects of the worldwide automobile industry. This survey report the manufacturer, executive and consumer views about four aspects, mobility culture, technological fit, business model readiness and market share.

Surekha B. & Krishnah K.Rama (2015)

This study reveals the prosperity of Tata motors company. It can be concluded that inner strength of company is remarkable. Company can further improve its profitability by optimum capital gearing, reduction in administration and financial expenses for the growth of company.

Maheswari, V. (2015)

Made an attempt to analyze the financial soundness of the Hero Honda motors limited have identified three factors, namely liquidity position, solvency position and profitability position based on the study of period 2002 to 2010 using ratio analysis.

Agarwal, Nidhi (2015)

The study focus on the comparative financial performance of Maruti Suzuki and Tata motors ltd. The financial data and information required for the study are drawn from the various annual reports of companies. The liquidity and leverage analysis of both the firms are done. To analyze the leverage position four ratios are considered namely, capital gearing, debt-equity, total debt and proprietary ratio. The result shows that Tata motors ltd has to increase the portion of proprietor's fund in business to improve long term solvency position.

Krishnaveni , M. & Vidya, R (2015)

Author has selected 87 companies out of 242 companies in capital line database to discuss the standard current ratio of automobile industry is matched with tractor and four sectors like engine parts, lamps, gears and ancillaries with standard norms.

Takeh Ata & Navaprabha Jubiliy (2015)

Author has made conceptual model to outline the impact of capital structure on the financial performance i.e. capital structure is independent variable that value is measured by using four ratios namely, financial debt, total debt equity, total asset debt and interest coverage ratio where as financial performance is dependent variable that value is measured by using four ratios return on assets, return on equity , operating profit margin and return on capital employed. Researcher has selected 13 major steel industries and applied various statistical tools like standard deviation, correlation matrix, anova etc are employed for testing hypothesis with help of SPSS22.

CHAPTER III
COMPANY PROFILE
AND
THEORETICAL REVIEW

3.1. COMPANY PROFILE

TITAN COMPANY



TITAN
COMPANY

"Titan Company Limited continues to grow and set new standards for innovation and quality with each new offering."

About the company:

Type - Public
Industry - Lifestyle
Founded - 1984; 39 years ago
Founder - Xerxes Desai

Headquarters - Bangalore, Karnataka, India

Area served - Worldwide

Key people - N. Muruganand

C. K. Venkataraman

Products - Watches, Jewellery, Bags, Perfumes, Belts, Wallets and Eyewear

Titan Company Limited (Titan), a joint venture between the Tata Group and the Tamil Nadu Industrial Development Corporation (TIDCO), commenced its operations in 1984 under the name Titan Watches Limited. Titan is the fifth largest integrated own brand watch manufacturer in the world. Over the last three decades, Titan has expanded into underpenetrated markets and created lifestyle brands across different product categories. Titan is widely known for transforming the watch and jewellery industry in India and for shaping India's retail market by pioneering experiential retail.

Philosophy of the company:

The name Titan today evokes superior craftsmanship, innovative technology and trustworthy product quality.

Vision of the company:

We create elevating experiences for the people we touch and significantly impact the world we work in.

Mission of the company:

We will do this through a pioneering spirit and a caring, value-driven culture that fosters innovation, drives performance and ensures the highest global standards in everything we do.

Values of the company:

Customer first: Customers take precedence over all else, always.

People make the brand: Titanians are at the heart of our success and that is why their dreams and aspirations are at the forefront of our brand policy.

Culture and teamwork: High performance is a way of life.

Creativity and innovation: Driven by innovation and creativity, we focus on smarter approaches and newer technologies.

Passion for excellence: In all our pursuits, we ceaselessly strive for excellence.

Corporate citizenship: We ensure that a part of our resources is invested in environment and community betterment.

Promise that company gives:

Pioneering innovation, international design ethos, customer-oriented values and top-notch service have always formed the cornerstones for brand Titan.

International styling:

Titan strives to promote styles that are at par with the international standards. We bring together high quality materials and innovative technologies to give you products that are unique and exceptional.

Unparalleled post sale services:

A testimony to this notion stands in the fact that Nebula watches come with a lifetime warranty while Titan Eyeplus offers free insurance for prescriptions spectacles. This only speaks volumes about the commitment towards the customers to provide the best services and experience.

Mark of quality:

Passion for the highest standards in jewellery making and design provided an impetus for Tanishq, one of India's most trusted brands, to introduce innovations like Karatmeter which helps consumers check the purity of gold and discern the quality of the jewellery.



Titan Engineering & Automation Limited is a wholly owned subsidiary of Titan. It was formerly known as Titan-Precision Engineering Division. The company now deals in machine building, automation and component manufacturing.^[42]

Swiss watchmaker, Favre Leuba, was acquired in 2011 and incorporated as a subsidiary of Titan in 2012. The company was acquired for €2 million. Its headquarters in Solothurn, Switzerland.^[42]

Titan acquired a 62% stake in CaratLane 2016 for \$50 million.^[43]

Titan Watch Company Limited, Hong Kong, is currently a 100% subsidiary of Favre Leuba AG, Switzerland.^[42]

In 2015, Titan entered a joint venture to sell products of Swiss luxury brand Montblanc through its retail outlets. Titan's equity share in Montblanc India Retail Private Limited is 49% and Montblanc Services B.V. holds 51%.^[44]

Board of directors/senior management:

Position	Personnel^[45]
Chairman	Mr N Muruganandam
Managing director	CK Venkataraman
Vice Chairman	N N Tata
Independent director	Mrs. Hema Ravichandar
Independent director	Mrs. Ireena Vittal
Independent director	Mr. Ashwani Puri
Independent director	Mr. B. Santhanam
Independent director	Mr. Pradyumna Vyas
Independent director	Dr. Mohanasankar Sivaprakasam
Director	Bhaskar Bhat
Director	Mr. Arun Roy
Director	Ms. Kakarla Usha
Company secretary	Dinesh Shetty

AUDITORS REPORT (Data):

1. BALANCE SHEET –



TITAN COMPANY LIMITED

CIN : L74999TZ1984PLC001456

3, SIPCOT INDUSTRIAL COMPLEX, HOUSUR 635 126.

STATEMENT OF STANDALONE AUDITED FINANCIAL RESULTS FOR THE YEAR ENDED 31 MARCH 2022

BALANCE SHEET

₹ in crores

Particulars	As at 31-03-2022 (Audited)	As at 31-03-2021 (Audited)
ASSETS		
(I) Non-current assets		
(a) Property, plant and equipment	1,012	1,026
(b) Capital work-in-progress	60	17
(c) Right-of-use assets	877	854
(d) Investment property	1	24
(e) Intangible assets	35	55
(f) Intangible assets under development	11	8
(g) Financial assets		
(i) Investments	849	759
(ii) Loans receivable	40	41
(iii) Other financial assets	508	283
(h) Deferred tax assets (net)	136	105
(i) Income tax assets (net)	135	120
(j) Other non-current assets	74	67
	3,738	3,359
(II) Current assets		
(a) Inventories	12,787	7,984
(b) Financial assets		
(i) Investments	15	2,733
(ii) Trade receivables	495	291
(iii) Cash and cash equivalents	117	147
(iv) Bank balances other than (iii) above	932	365
(v) Loans receivable	419	73
(vi) Other financial assets	762	217
(c) Other current assets	852	671
	16,379	12,901
TOTAL ASSETS	20,117	15,860
EQUITY AND LIABILITIES		
Equity		
(a) Equity share capital	89	89
(b) Other equity	9,234	7,664
TOTAL EQUITY	9,323	7,753
Liabilities		
(I) Non-current liabilities		
(a) Financial liabilities		
(i) Lease liabilities	1,026	971
(b) Provisions	179	145
	1,205	1,116
(II) Current liabilities		
(a) Financial liabilities		
(i) Borrowings	225	-
(ii) Gold on loan	5,161	4,094
(iii) Lease liabilities	193	178
(iv) Trade payables		
- Total outstanding dues of micro and small enterprises	198	158
- Total outstanding dues of creditors other than micro and small enterprises	837	537
(v) Other financial liabilities	429	218
(b) Other current liabilities	2,386	1,905
(c) Provisions	30	23
(d) Current tax liabilities (net)	80	80
	9,559	7,143
TOTAL EQUITY AND LIABILITIES	20,117	15,860

2



2.PROFIT AND LOSS ACCOUNT-



TITAN COMPANY LIMITED

CIN : L74999TZ3947C001456

3, SIFCOT INDUSTRIAL COMPLEX, HOSUR 635 126.

STATEMENT OF STANDALONE AUDITED FINANCIAL RESULTS FOR THE QUARTER AND YEAR ENDED 31 MARCH 2022

PART I Particulars	₹ in crore except earnings per share				
	3 months ended			Year ended	
	31-03-2022 (Audited) ⁷	31-12-2021 (Unaudited)	31-03-2021 (Audited) ⁷	31-03-2022 (Audited)	31-03-2021 (Audited)
I. Revenue from operations					
- Sale of products/ services	6,749	9,381	6,991	25,831	19,096
- Other operating revenue (refer note 4)	527	134	144	1,379	1,556
II. Other income	76	55	34	246	281
III. Total income (I +II)	7,352	9,570	7,169	27,456	20,783
IV. Expenses:					
Cost of materials and components consumed	6,855	6,344	4,507	20,919	13,143
Purchase of stock-in-trade	1,359	1,334	868	4,187	2,462
Changes in inventories of finished goods, stock-in-trade and work-in-progress	(2,711)	(589)	236	(4,468)	164
Employee benefits expense	328	274	251	1,143	911
Finance costs	54	52	43	195	181
Depreciation and amortisation expense	88	85	82	347	331
Advertising	156	172	79	674	232
Other expenses	307	497	399	1,656	1,989
IV. Total expenses	6,839	8,252	6,897	24,672	19,413
V. Profit / (loss) before exceptional item and tax (III - IV)	714	1,317	792	2,983	1,370
VI. Exceptional item (refer note 5)	51	-	-	51	137
VII. Profit / (loss) before tax (V - VI)	665	1,317	792	2,932	1,233
VIII. Tax expense:					
Current tax	194	333	179	779	301
Deferred tax	(22)	(2)	(8)	(27)	5
VIII. Total tax	174	330	173	752	306
IX. Profit / (loss) for the period (VII-VIII)	491	987	624	2,180	927
X. Other comprehensive income					
(i) Items that will not be reclassified to the statement of profit and loss					
- Remeasurement of employee defined benefit plan	27	-	27	9	45
- Income-tax on (i) above*	(7)	-	(6)	(2)	(11)
(ii) Items that will be reclassified to the statement of profit and loss					
- Effective portion of gain or (loss) on designated portion of hedging instruments in a cash flow hedge	-	(7)	22	(14)	234
- Income-tax on (ii) above	-	-	(6)	4	(67)
X. Total other comprehensive income	20	(7)	37	(3)	226
XI. Total comprehensive income (IX-X)	511	980	661	2,177	1,153
XII. Paid up equity share capital (face value ₹ 1 per share)	89	89	89	89	89
XIII. Other equity:				9,284	7,464
XIV. Earnings/ (loss) per equity share of ₹ 1: (based on net profit/ (loss) for the period (IX)) Basic and diluted (not annualised)	5.53	11.32	5.96	24.56	9.88

See accompanying notes to the standalone audited financial results.

R



3.2.THEORETICAL REVIEW

The origin of Fundamental analysis for the share price valuation can be dated back to Yu-Hon Lui and David Mole (1998) reports on the use by foreign exchange dealers in Hong Kong of fundamental and technical analyses to form their forecasts of exchange rate movements. Thomas Oberlechner (2001) presents the findings of a questionnaire and an interview survey on the perceived importance of Technical and Fundamental analysis among foreign exchange traders and financial journalists in Frankfurt, London, Vienna and Zurich. Foreign Exchange traders confirm that, out of both the forecasting approaches, technical analysis is more prominent than the other. Doron Nissim and Stephen H. Penman (2001), this research work envisages on Financial Statement analysis and identifies that this analysis has traditionally been seen as part of the Fundamental analysis required for equity valuation. This paper outlines a financial statement analysis for use in equity valuation. Sanjay Sehgal and Meenakshi Gupta (2005) presents the survey which aims at providing insights about the way technical traders operate in the financial market and the trading strategies that they adopt. The survey covered institutional and individual technical traders with a long and active trading record for the Indian market. In this study also it is observed that the sample respondents tend to use Technical analysis along with Fundamental analysis for security selection. Jenni L., Bettman, Stephen. J. Sault, Emma J. Schultz (2008), proposes an equity valuation model integrating Fundamental and Technical analysis, they tend to recognize their potential as complements rather than as substitutes. Testing confirms the complementary nature of Fundamental and Technical analysis by showing that in spite of each performing in isolation models integrating both have superior explanatory power. From the above review of literature, it is evident that no recent study has been made to explain practically how the basic tools of fundamental and technical analysis may be applied to arrive at investment decisions in a specific sector of the Indian stock market. Another gap identified from the review of literature is the lack of integration of competitor analysis with fundamental and technical analysis.

Company Analysis:

Company analysis is the important type of case method in Research Methodology and is commonly used by the beginners of scholarly research. A case study based management research and teaching pedagogy are adopted by many business schools with the belief that it is a most powerful way to study and learn new lessons required to identify, understand, and solve the problems in the process of managing and leading the organizations. Developing a business case on various managing aspects of a company and analysing case forces students to grapple with exactly the kinds of situations, decisions, and dilemmas managers confront

every day. Company analysis is a powerful tool in developing both research case study and teaching case study in business management subject. Compared to industry analysis, company analysis gives focused and deeper insight into a company and its business in terms of challenges and opportunities. In this paper, we have discussed the procedure of writing company focussed case study based on a newly developed company analysis framework. We also recommend the Company analysis as a class of case study methodology in management research for the beginners and budding researchers as a beginning step in scholarly research.

Fundamental analysis at the company level involves analyzing basic financial variables in order to estimate the company intrinsic value. These variables include sales, profit margins, depreciation, the tax rate, sources of financing, asset utilization, and other factors. Additional analysis could involve the firm's competitive position in its industry, labor relations, technological changes, management, foreign competition, and so on. The end result of fundamental analysis at the company level is a good understanding of the company's financial variables and an assessment of the estimated value and potential of the company (Jones, 2010).

Business Performance:

Understanding Performance, especially business performance itself is a level of achievement produced by a worker or a program. Meanwhile, according to experts' understanding of the performance of the business itself states that the performance of the business can be described as an output or outcome were obtained from the company (Saidi, 2012). The performance of the business is something that is produced by a company in a period regarding the standards that are set (Prasad & Program, 2017). To determine performance in a company then had to do measurements in the performance of these. Measurement of performance is one of the factors that are very important for the company because it is an attempt to map the strategy to action the achievement of targets specified (Kwon, 2008). The benefit of work measurement is that the performance measurement system can be used as an organizational control tool because performance measurement is strengthened by establishing a reward and punishment system (Dewi, 2017).

In essentially measuring the performance of the well has characteristics (Zhengfei, 2005) as follows:

1. Relate to company goals
2. Have a concern that balanced between run short and term length
3. Describe key management activities
4. Influenced by employee actions
5. Ready to be understood by employees
6. Used in the evaluation and useful for employees

7. Aims logically and is an easy measure

8. Used consistently and regularly

The purpose of measuring company performance (Sunardi, 2020) is as follows: To ensure the understanding of the executive and the size of that used for the attainment of achievement

1. Ensure the achievement of the scheme accomplishments are agreed

2. To monitor and evaluate performance by comparison between work schemes and their implementation

3. To give rewards or punishments that objectively on accomplishments implementation which has been measured, following the method of measurement that has been agreed

4. Make it a communication tool between subordinates and leaders to improve company performance

5. Identify whether customer satisfaction has been met

6. Helping the company's activities

7. To ensure that decision making has been carried out objectively

8. Indicates improvements that need to be made

9. Reveal the problems that occur.

Opinions others revealed that the benefits of measuring performance are to obtain information that is accurate and valid on the behavior and performance of members of the organization (Hiang, 2008). Performance measurement is needed to determine the achievement of the targets that have been set.

Investments:

John M. Keynes and Irving Fisher, both argued that investments are made until the present value of expected future revenues, at the margin, is equal to the opportunity cost of capital. This means that investments are made until the net present value is equal to zero. An investment is expected to generate a stream of future cash flows, $C(r)$. Since investment, represents an outlay at time 0, this can be expressed as a negative cash flow. $-C$.

As long as the expected return on investment, i , is above the opportunity cost of capital, r , investment will be worthwhile. When r the NPV=0. The return on investment, i , is equivalent to Keynes' marginal efficiency of capital and Fisher's internal rate of return. From equation (1) the PV of an investment, i , can be written as $C, Ar-g$, implying that PV/I .

Fisher referred to the discount rate as the rate of return over costs or the internal rate of return. Keynes, on the other hand, called it the marginal efficiency of capital, (Baddeley, 2003, and Alchian, 1955) Keynes (1936) argued that investments are made until "there is no

longer any class of capital assets of which the marginal efficiency exceeds the current rate of interest" (as quoted in Baddeley, 2003, p. 34). The fundamental difference between the "Keynesian view and Fisher ("Hayekian view") lies in the perception of risk and uncertainty, and how expectations are formed. Keynes did not regard investment as an adjustment process toward equilibrium. Hayek (1941) and Fisher (1930), on the other hand, regarded investment as an optimal adjustment path towards an optimal capital stock. In the Keynesian theory investment are not determined by some underlying optimal capital stock. Instead genuine or radical uncertainty takes a central position. Keynes believed that humans were "animal spirited" and that this, combined with irrational and volatile expectations, made the thought of investment as an adjustment process toward equilibrium futile.

Financial Support from Marianne and Marcus Wallenberg Foundation is gratefully acknowledged. Valuable comments on this manuscripts has been given by Ake E Andersson, Per Olof Suggren and Borje Johanss Keynes (1936) and many economats after nim argue that the crucial issue is how individual form expectations in a world of "Knightsian" uncertainty probabilities of alternative outcomes cannot be calculated. According to some economists this leads to erratic shifts in expectations which render the notion of an optimal capital stock meaningless. For a discussion of expectations, the efficient market hypothesis, and its implications for investment theory, see section 4.4 and in particular note 21.

From Keynes and Fisher modern investment theories have emerged, incorporating various aspects of Keynes and Fisher. The net present value role for investment has become a standard component of corporate finance, Jorgenson's (1963) neoclassical theory of investment basically formalizes ideas put forward by Fisher. Keynes' work on subjective probabilities foreshadowed modern probabilistic approaches, such as Markowitz (1952), which has led to the emergence of a very large literature on portfolio choice. Arguably, Keynes has also influenced the so-called accelerator theory of investment, known for its applications to business cycles by Samuelsson (1939a and b). Clearly, Keynes also inspired Tobin and Brainard in their development of Tobin's Q (Brainard and Tobin, 1968, and Tobin, 1969) to incorporate expectations. The methodology to measure marginal a developed by Mueller and Reardon (1993) also belongs to this line of thought.

Ratio Analysis:

The ratio analysis was presented by Euclid in his book 5, 'Elements' in about 300 B.C. At that time, ratio was not used as financial tool. The first time financial statement analysis was done by American industries in Nineteenth Century to comparison of financial results have two purposes. There was much overlap, the development path of ratio analysis for creditor purposes and for managerial purposes were different. Credit analysis emphasized measures of ability to pay whereas managerial analysis emphasized profitability measures. During the period prior of World War-1, some important developments in ratio analysis occurred. In 1912 Alexander Wall has used financial statement of commercial paper brokers. In 1919, Wall studied 981 to credit barometric study. At that time, the Du-Pont company used top three

ratio; ROI (profit/total assets), PMR (profit/sales) and CTR (sales/total assets) to evaluation of its operating results. In 1920, interest in ratio analysis was increased by trade associations, universities, credit agencies and individual analysts. This process was called “scientific ratio analysis”. Wall attempted to mitigate the effects of ratio proliferation by developing a ratio index. Bliss presented a models ratio analysis in 1920. (Bliss, 1923) In 1925 Gilman objected that their changes over time cannot be interpreted because the numerator and denominator, ratios are artificial measures, ratio divert the analyst’s attention from comprehensive view of the firm and their reliability as indicators varies widely between ratios. In 1930, there were two significant developments in this decade relating directly to the ratio analysis. In 1933, Foulken identified fourteen ratios for comparison of various firms or company. In 1940, ratio development was on the base of direct and indirect implementation. After 1940 to date, the development of ratio analysis in the universal has continued along various paths. In Australia, ratio-especially the current ratio- have been subjected to rigorous scrutiny in order to determine their logicity and they have been used as the basic ingredients of an application of the scientific method to financial management. (RJChambers, August, 1948) In England, on other side, a very distinct ‘common thread’ in ratio analysis has developed. The British Institute of Management has generated interest in ratio as tool for inter-firm comparisons. In general, ratio analysis in England is developing within a management orientation (R.G.H.Nelson, 1960) In France; interest in ratio was in systematic framework like British idea of exchanging information between firms. (JeanNataf, 1957)In India, there appears to have been extensive borrowing from American sources of not only types of ratio but their criteria as well. (R.K.Dalal, 1956) (N.N.Pai, 1964) In Japan, aggregate statistics of a large number of financial ratios are available by broad industry groupings and by size of firm categories. (Economic Statistics of Japan, 1963) In Russia and China, working capital turnover and return on investment ratios are used to comparisons and measurement. And after the step by step, every country has developed their ratios as interest and requirement for firm analysis. James O. Horrigan studied on financial ratio analysis. Researcher has briefly explained Liquidity Ratio, Solvency Ratio, Capital Turnover Ratio, Profit Margin Ratio and Return on Investment with illustration. (Horrigan, July-1965) James M. Patton studied on ratio analysis and efficient markets in introductory financial accounting. Researcher has presented potential contributions of ratio analysis. (Patton, July1982) Kent John Chabotar studied on Financial Ratio Analysis Comes to Non-profits.

Liquidity Ratio

Liquidity ratio is a ratio to show the company's ability to meet financial obligations with an appropriate time frame (Utami and Pardanawati, 2016). That way, if the company has a high liquidity, it means that the company is able to repay their short-term debt. The company will also be more effective in creating profits and financiers will trust the company as a place to invest in it. Companies are also able to create their current assets to meet the needs of the company, so there are not many budget funds that are not useful. Hantono (2016) states the current ratio as a comparison to determine how far current assets cover current liabilities. The greater the comparison of current assets and current debt, the higher the company's ability to cover short-term liabilities. The low current ratio is often

assumed to be able to show problems in liquidation. It is different if the current ratio is too high so that it is not considered good because it shows a large amount of idle funds and causes the company's profitability to decrease.

Current Ratio

Current Ratio is the ratio used to measure a company's ability to pay its short-term liabilities by using current assets. The low ratio means the company is unable to pay its liabilities as soon as possible, and is unable to take advantage of the cash cut or other expected matters. Whereas a high ratio means that the used money in running a company is held in a government's securities, savings, cash or other funds (Gill & Chatton, 2003, p.40). Current Ratio is an indication of a company to meet market liquidity and ability to meet the demands of the creditor (Sawir, 2005). The acceptable current ratio varies from industry to industry. If the current ratio of the company is within this range, then it is generally considered to have good short-term financial strength. If current liabilities exceed current assets where the current ratio is below 1, then the company may have problems in fulfilling its short-term liabilities. Current Ratio is too high, then the company can not efficiently use current assets or short-term financing facility. It can also point to problems in working capital management. A low ratio value (value less than 1) indicates that the company is experiencing financial difficulties in meeting its current obligations especially Short-term Liabilities.

Factors relating to liquidity stress

1. Introduction

The Basel Committee on Banking Supervision created the Research Task Force (RTF) to further the goals of the Committee through a variety of activities. One of these activities is to take on specific research projects addressing supervisory and financial stability issues. Given the importance of stress testing as a tool in developing a complete picture of an institution's liquidity risk profile, the RTF's Workgroup on Liquidity Stress Testing (RTF-LST) was mandated to draft a survey on current practices, identify gaps and – where possible – suggest ways forward. The survey is written with the broader supervisory community in mind. Many of the findings are, however, also relevant for risk managers in banks as well, given their role in measuring their institution's liquidity risk profile and enforcing risk limits. This note reviews the academic literature pertaining to liquidity stresses in more detail, compared to the review chapter in the survey (see Basel Committee Working Paper No 24). It is organised using the categories and concepts established in the Liquidity Coverage Ratio (LCR). In particular, the Workgroup reviewed the literature on: deposits, loan commitments, secured funding, wholesale funding, counterbalancing capacity, secured lending, and links with non-banks intermediaries. In addition to other parts of the abovementioned survey, this note can help to inform the design of stress tests.

2. Deposits

Both the empirical and theoretical discussions in the literature on deposits are broad and deep. This section examines the literature on various classifications of deposits while also keeping in mind those classifications established under the LCR.

2.1. Insured deposits - The literature does not agree on insured deposit rates and runoffs in response to idiosyncratic institutional stress measures. While a few papers document some level of both increased rates and 1 Drafted by Pogach (Federal Deposit Insurance Corporation) and Skander van den Heuvel (Board of Governors of the Federal Reserve System) based on literature reviews drafted by Arrambide (Board of Governors of the Federal Reserve System), Bevilacqua (Bank of Italy), Bonner (Netherlands Bank), Cetina (Office of the Comptroller of the Currency), Emmel (Board of Governors of the Federal Reserve System), Heider (European Central Bank), Holthausen (European Central Bank), Liu (UK Prudential Regulation Authority), Martin (Federal Reserve Bank of New York), Pogach (Federal Deposit Insurance Corporation), Schmitz (Austrian National Bank), Schmieder (Bank for International Settlements), Souissi (Bank of Canada) and van den Heuvel (Board of Governors of the Federal Reserve System). 2 Insured deposits are generally difficult to measure in practice. Consequently, most studies, including those discussed in this report, use deposits with principal over a defined insurance limit as a proxy for insured deposits. The issue is complicated further by the multitude of deposit insurance schemes internationally and over time. Countries differ in the types of accounts 2 Literature review of factors relating to liquidity stress – extended version decreased quantities at struggling institutions, others fail to find such a result. The mixed results hold for both empirical studies and for case studies. However, the empirical evidence on insured bank runs generally focuses on developing countries. Documentation of Hamilton Bank in Davenport and McDill (2006) shows that insured deposits dropped significantly in the three quarters prior to failure. It should be noted that this bank's failure did not occur during a market wide stress. In the months prior to failure, most insured account types (ie Individual, Joint, Individual Retirement Account (IRA), Trust, and Business) experienced a runoff in the 10 to 20% range. Cook and Spellman (1994) and Park and Peristiani (1998) find statistically significant effects of banking institution risk taking (thrifts) on insured certificate of deposit rates. The former examine the question in the context of the savings and loan crisis and the insolvency of the deposit guarantor, the Federal Savings and Loan Insurance Corporation. They argue that restitution costs borne by the depositor and repudiation risk lead the market to risk price insured deposits. Park and Peristiani (1998) also study thrifts and find small, but statistically significant evidence of depositor discipline (decreased quantities, increased deposit rates) on insured time deposits. However, their result did not extend to negotiable orders of withdrawal (NOW) and interest-bearing checking accounts. Similarly, Iyer and Puri (2008) find that deposit insurance does not completely eliminate a depositor's incentive to run. Using data from India, the authors show that insured depositors also participate in bank runs, albeit less than their uninsured counterparts. Moreover, account balances correlate with the likelihood of withdrawals even below the deposit limit. Martinez Peria and Schmukler (2001) use data from Argentina, Chile and Mexico to show that not only do insured depositors run, but they

also do so at the same rate as other depositors. However, the extent to which these countries' experiences during the time period are comparable to those with more established deposit insurance systems is unclear. Like Cook and Spellman (1994), these results highlight the importance of credibility of the deposit insurer in providing stability to insured deposits. On the other hand, some studies fail to find such an effect. Anecdotally, Feldberg (2008) shows that Wachovia was able to raise \$15 billion in insured certificates of deposits (CDs) in one month a quarter prior to its acquisition by Wells Fargo and continued to raise CDs through the stresses of Lehman and Washington Mutual failures. This experience is also reflected in Jordan (2000) who shows that insured time deposits actually increase by 3% in the eight quarters leading up to failure in his sample even as overall deposits at the median decline by 11%. Transaction and savings accounts (which may include both insured and uninsured accounts), decrease by 13% and 1%, respectively. Similarly, Ben-David et al (2011) do not find evidence of deposit market discipline of low capital banks during the crisis. Indeed, the relationship between insured deposit rates and deposit flows are statistically and economically equivalent for high capital and low capital banks. They attribute this finding to the fact that low capital banks were deleveraging during their period of study.

2.2 Uninsured deposits - A common result in the literature is that uninsured depositors exert "market discipline" (ie impose higher interest rates for a fixed quantity or runoff quantities for a fixed deposit rate) on riskier banking insured (ie consumer/business, transaction/savings), the presence of supplemental private insurance systems (eg Germany), the presence of coinsurance (eg United Kingdom prior to 1 October 2007), and insurance limits. Unless otherwise indicated, this paper uses the term insured deposits to interchangeably imply the theoretical measure of deposits that are insured 100% by a public deposit insurer and deposits below the 100% insurance threshold. For links to governing statutes on current deposit insurance practices see www.iadi.org/di.aspx?id=69. Literature review of factors relating to liquidity stress – extended version 3 institutions and to a greater extent than insured depositors. This result holds both in developing and developed economies and is supported by both case studies and empirical evidence. While Davenport and McDill (2006) document significant runoffs of insured deposits, the runoff rates of uninsured depositors are generally much greater. Uninsured Individual, Joint, Trust, and Business accounts run off at approximately three times the rates of the insured counterparts. Empirical evidence of this can be found in Acharya and Mora (2012) who show increased deposit rates and decreased deposit flows at failing banks and banks with liquidity exposures. Furthermore, Park and Peristiani (1998) show large and statistically significant correlations in the expected directions between thrift failure probabilities (estimated using a failure logit model) and uninsured deposit growth rates and deposit rates. Similar results on bank risk taking and uninsured deposit rates are found in Hannan and Hanweck (1988). Furthermore, Imai and Takarabe (2011) find similar evidence of uninsured deposit outflows in Japan in 2002 as the government removed a blanket guarantee in favour of a cap. Following the removal of the guarantee, weak banks' uninsured time deposits fell and these banks were unable to compensate with increases in insured deposits, leading to a contraction in credit supply. Iyer and Puri (2008) and Martinez Peria and Schmukler (2001) find that uninsured deposits run during stress events using data from India and three Latin American countries, respectively. The first is consistent with the other literature finding that these outflows are significantly

greater for uninsured depositors, while the second differs in its finding that the two classes behave similarly. Without any systematic insurance system, asset-backed commercial paper (ABCP) programs operated like banks, transforming long term assets into short term liquid debt. Thus, the experience of ABCP programs may provide further insight into uninsured deposits, with the caveat that investors and institutions are not entirely comparable. Under this premise, Covitz et al (forthcoming) find that one third of ABCP programs were in the midst of a run at the height of the financial crisis. As might be expected with uninsured deposits, credit and liquidity exposures were related to runs in ABCP.

2.3 Retail/core versus wholesale deposits - Core deposits are not consistently defined in the literature, but are generally contrasted with wholesale deposits. Generally speaking, in studies using US data, core deposits consist of some subset of demand deposits, NOW and automatic transfer service (ATS) accounts, money market deposit accounts (MMDAs), other savings accounts, and insured CDs, though vary on their inclusion of insured brokered deposits. Due to their long realised durations and behaviour relative to macro-interest rates, core deposits are thought to be beneficial to a bank's health. Although many components of core deposits have no explicit maturity, a number of studies have found that their realised maturities are quite long. Using a small proprietary sample of financial institutions, Sheehan (2013) finds maturities of 10 to 20 years for checking (business and retail) and NOW accounts and maturities of 5 to 20 years for money market and savings accounts. Kiser (2002) finds similar durations for consumer checking and savings accounts from survey data. Furthermore, the literature generally shows (see Hannan and Berger (1991), Neumark and Sharpe (1992)) that core deposit rates fall with macroeconomic interest rates, but sluggishly adjust to increases in macroeconomic interest rates. Thus, core deposits serve as a source of bank franchise value. Hutchinson and Pennacchi (1996) use this concept and estimate deposit durations to quantify bank franchise value of retail deposits. They obtain lower estimates of durations for NOW 4 Literature review of factors relating to liquidity stress – extended version accounts and MMDAs (seven years and less than one year, respectively), but show that bank charter value deriving from retail deposit accounts amounts to 3.8% on average of total deposits. At least in the US, statutes³ limit the extent to which undercapitalised banks may raise brokered deposits. Thus, any analysis on the behaviour of brokered deposits during a stress event would need to disentangle this effect from the behaviour of brokered deposits. Nevertheless, a number of studies examine the relationship between bank stresses and core (variously defined) or brokered deposits. The FDIC (2011) study on core and brokered deposits reviews the literature on core versus brokered deposits and provides additional analysis. Among the findings are: core deposits decrease a bank's probability of failure, decrease a bank's loss-given-default (Bennett and Unal (2011)), decrease resolution costs (Osterberg and Thomson (1995)), and increase the premium paid for failed institutions (James (1991)). Furthermore, core deposits are associated with continued lending during periods of external stresses (Cornett et al (2011) and Berlin and Mester (1999)). FDIC (2011) goes on to show that these results are driven by a definition of core that excludes insured brokered deposits. Indeed, the deleterious effects of non-core deposits are experienced

equally when insured brokered funds substitute for other forms of wholesale funding. Although Shin (2009) argues that the run on Northern Rock was not primarily driven by a classic retail bank run, the data he presents suggest that retail deposits run at significant rates, even if they lag other creditors' run on the bank. Wholesale funding and retail funding drop by a similar percentage from June 2007 to December 2007. Meanwhile, Figure 7 in the article suggests that offshore accounts ran off at the highest rate among retail deposits. However, traditional branch accounts ran at a comparable rate to internet and telephone accounts (46% and 38% runoffs, respectively). No distinction was made in the article between insured and uninsured accounts, though at that time deposits in the United Kingdom were entirely insured only up to £2,000 with 90% coinsurance up to an additional £33,000.

2.4 Transactional deposits - Some theoretical and empirical literature (eg Gatev et al (2009), Kashyap et al (2002)) suggests that transactional accounts in particular mitigate liquidity stress from loan commitments. The underlying premise of these papers is that holding liquidity to meet demand deposits or commitments is costly. That banks provide both these services is efficient because commitment takedowns and depositor withdrawals are not perfectly correlated, allowing them to use the held liquidity to meet either need. To examine this claim, Gatev et al (2009) show that stock return volatility is positively correlated with unused commitments, but that this association is dampened in the presence of transaction deposits. Furthermore, they show that this deposit-lending risk management synergy is strengthened during times of tightened liquidity. They argue that this arises because the correlation between commitment takedowns and deposit withdrawals is negative during such time periods, with higher commitments associated with transactional deposit inflows. However, Pennacchi (2006) and Santos (2012) demonstrate that such a result does not necessarily hold for uninsured deposits. Rather, the correlation runs the wrong way between commitments and uninsured deposits during stress.

2.5 Bank-depositor relationships - Another finding in the literature is the role that bank-depositor relationships play in the reliability of deposits. 3 See 12 U.S.C. § 1831f and 12 C.F.R. § 337.6. Literature review of factors relating to liquidity stress – extended version 5 Iyer and Puri (2008) find that both the duration and breadth of the bank-depositor relationship decrease the probability of a withdrawal of funds during a crisis, where duration is measured on the deposit account and breadth is measured by the presence of a loan linkage. A previous loan linkage is associated with a lower withdrawal probability even if the loan was no longer outstanding at the time of bank stress. One mechanism through which relationships may operate is that upon failure, uninsured depositors can apply the full balance of outstanding loans to offset their losses. Davenport and McDill (2006) find that uninsured deposits unprotected by this offset dropped by nearly two-thirds while uninsured deposits overall dropped by half.

3. Commitments

By extending loan commitments to their clients, banks expose themselves to contingent liquidity outflows, where the risk materialises when the borrower decides to draw down the line of credit. Loan commitments are valued by firms as insurance against unexpected cash flow shortages. Similarly, entities that issue asset-backed securities (such as ABCP) usually rely on similar liquidity facilities structured to cover the face value – principal and interest – of the assets, which protects buyers from a sponsor’s inability to “roll” on its debt. As argued by Diamond and Rajan (2001) and Kashyap et al (2002) banks reap economies of scope by combining lending and deposit taking. Specifically, Kashyap et al argue that outflows of funds due to lending – in particular from loan commitments – and outflows from deposits are imperfectly correlated, so that both activities can share the cost of a common liquid asset stockpile. In fact, Gatev and Strahan (2006) present evidence that deposit inflows into the banking system tend to increase when there are liquidity disruptions or higher spreads in the commercial paper market. Thus, banks are in a unique position to offer relatively inexpensive insurance against such disruptions by extending credit lines to commercial paper programs or their sponsor, which are in fact drawn down during such episodes. In effect, banks can have a natural hedge against such market-wide liquidity shocks, as deposit inflows from institutional investors counterbalance unexpected strains on liquidity from credit line drawdowns. That said the experience of the recent financial crisis casts doubt on the notion that deposit taking and commitment lending are always a natural hedge. First, borrowers drew down on their credit lines to hold cash on their balance sheets as a precautionary measure against turbulent credit markets, or because other funding options were simply less attractive (Ivashina and Scharfstein (2010), Berrospide et al (2012), Irani (2011), Santos (2012)). Even prior to the recent crisis, Pennacchi (2006) shows using pre-FDIC data that flows on uninsured funds may exacerbate, rather than hedge against, flows on commitments during stress. Second, and arguably quantitatively more important, the ABCP market froze, resulting in funding pressures for financial institutions, either because they sponsored ABCP programs or had extended liquidity support to such programs (Acharya et al (2013), Covitz et al (forthcoming), Kacperczyk and Schnabl (2010)). Notably, the balance sheet disruptions from these ABCP liquidity and/or credit guarantees were of potentially greater magnitude than those resulting from draw-downs on “plain vanilla” credit lines to nonfinancial firms. However, it is difficult to precisely quantify the effect of ABCP market freeze on banks’ balance sheets due to data limitations; see Acharya et al (2013) for a discussion and an “upper bound” estimate of the balance sheet effects. Berrospide et al (2012) quantify the – comparatively modest – increase in drawdown rates on credit lines of nonfinancial firms during the crisis. Meanwhile, Bord and Santos (2011) demonstrate that increased funding costs through ABCP stress were also passed on to corporate customers via higher credit line fees. Third, even as firms and issuers of ABCP drew down their backup lines, deposit inflows appear to have been tempered as the crisis unfolded and concerns about the financial health of banks put into question the safe haven status of banks. Together, these events somewhat negated the natural hedge thought to be inherent in the combination of deposit taking and lending (Acharya and Mora (2012)). As access to the short term credit markets stalled or

collapsed, firms became increasingly dependent on banks for liquidity (Chava and Purnanandam (2009)).⁴ Consequently, banks became inundated with liquidity demands resulting in an unmanageable level of outflows. With no access to previously cheap short term funding and demand inflows used heavily by banks to counterbalance market disruptions, the liquidity risk crisis spread across industries and markets. Concerns over market uncertainty and bank solvency continued to stall inflows from institutional investors or other sources. Only after the provision of more extensive extraordinary government support in the fall of 2008 were banks able to attract deposit inflows to counterbalance the funding pressures.

4. Secured funding

With a total market volume of several trillion US dollars, secured funding constitutes a large and important source of short-term bank funding, particularly in the United States and Europe. The following reviews literature and available case studies on secured funding in the relevant market segments in the most recent crisis.

4.1 Procyclicality - While initially secured funding might be perceived as making banks less subject to liquidity risk by reassuring a bank's creditors as to the bankruptcy remoteness of their funding, the theoretical literature identifies secured funding as creating procyclical leverage in banks and other financial institutions through distinct four channels. These procyclical channels include: (1) securities' valuation, (2) repo haircuts, (3) collateral velocity, and (4) changes in counterparty credit risk limits (due to changes in perceived counterparty creditworthiness) in an economic downturn. Many theoretical papers have shown that secured funding transactions, such as repos, are subject to procyclical changes in the valuation of and haircuts on collateral. This strand of literature can be traced back to a paper by Geanakoplos (1997) which studies leverage, collateral and their impact on the financial system in a general equilibrium model. More recently, Brunnermeier and Pedersen (2009) show that, in crisis times, speculators that are subject to capital constraints will reduce their positions and market liquidity declines, which will then lead to higher haircuts (which are increasing in illiquidity) and a so-called liquidity spiral. In addition, Gai et al (2011) develop a model of an interbank network in which contagion arises from liquidity hoarding and changes in repo haircuts. Other papers on this topic include Jurek and Stafford (2010), Valderrama (2010), Rytchkov (2009), Geanakoplos (2010), Acharya et al (forthcoming), Heider and Hoerova (2009) and Biais et al (2012). A number of papers also point out that collateral velocity is another procyclical factor that is relevant to firms' liquidity management. Singh and Aitken (2009, 2010) estimate that the size of collateral rehypothecation in the United States declined from \$4.5 trillion at the end of 2007 to \$2.1 trillion at the end of 2009, and that the churning factor of collateral (the extent to which the collateral has been 4 As discussed by Sufi (2009) and Huang (2010), outflows can be limited due to covenants in the contract, which place certain restrictions on the borrower, eg based on cash flow or leverage restrictions, in order to use the line of credit. Literature review of factors relating to liquidity stress – extended version 7 reused) is around 4. Singh (2011) discusses the “velocity” of

collateral (the frequency at which financial collateral is re-used) and its role in the financial market, and documents significant declines in both source collateral and collateral velocity after the collapse of Lehman Brothers. Poznar and Singh (2011) look at “collateral mining” (banks receive funding through the re-use of pledged collateral “mined” from asset managers) and “reverse maturity transformation” (long-term savings are invested by asset managers into short-term liquid assets). Singh and Stella (2012) show that the reduction in the pool of assets considered acceptable as collateral resulted in a liquidity shortage and argue that relevant regulatory proposals need to bring the velocity-like characteristics into scope. Finally, recent FSB work (2012) also identifies changes in counterparty credit limits in response to changes in the perceived creditworthiness of financial institutions as a fourth possible procyclical factor affecting the stability of repo funding. Several empirical papers have confirmed the procyclical effects for segments of the repo market. Adrian and Shin (2010) showed that repo transactions have accounted for most of the procyclical adjustment of the leverage of US investment banks, ie growth in repo liabilities explains most of the growth in leverage. Gorton and Metrick (2010, 2012) found that inter-dealer bilateral repo haircuts increased dramatically as the financial crisis unfolded.

4.2 Empirical findings of relevance for liquidity stress testing - According to FSB (2012), the global repo market can be split into two segments: (1) a repo-financing segment, consisting of both bilateral and tri-party transactions; and (2) an inter-dealer repo segment which consists of mostly centrally cleared transactions though also includes some bilateral transactions. In addition, (3) collateral swaps and (4) rehypothecation by prime brokers are aspects in the securities lending market that may also play important roles in the secured funding market and are therefore of relevance for liquidity stress testing. The FSB survey also finds that the United States and the euro area have by far the largest repo markets in the world. Japan and Canada also have sizable repo markets. Separate estimates of the size of these different segments are available only in the United States where it is estimated that tri-party repo accounts for between 65% and 80% of the total US repo market. All of the empirical literature discussed is based on developments in the United States during the most recent crisis. The empirical literature on the repo market generally agrees that repurchase agreements against more risky/less liquid types of collateral was a source of liquidity stress on the dealer banks during the crisis. The empirical literature also suggests that secured funding transactions against more safe/liquid assets – in the case of the United States, Treasuries, agency debentures and agency mortgage-backed securities (MBS) – generally remained in place even for institutions under stress. Based on limited data it appears that the withdrawal of prime brokerage fund balances was also a substantial source of outflows during the crisis. Duffie (2012) provides some helpful empirical context on the relative importance of repo haircut widening on liquidity losses to US banks following Lehman’s failure. He shows that repo haircut widening resulted in a \$4 billion loss to Morgan Stanley’s liquidity pool over a two week timeframe around Lehman’s failure relative to a \$56.4 billion loss relating to prime brokerage outflows and \$85.3 billion liquidity loss at Morgan Stanley overall. Unfortunately, a lack of research in these areas hampers our ability to draw meaningful conclusions about how best to address these business activities in designing and evaluating liquidity stress tests.

4.3 Repo financing – tri-party repo - The repo financing market segment was historically used by dealers to borrow from retail banks to finance their inventories, but there is currently increasing participation from retail banks on the borrowing side (mainly European commercial banks due to funding pressures) and corporates, funds 8 Literature review of factors relating to liquidity stress – extended version (non-leveraged asset managers, not including hedge funds) and insurers on the lending side. The market provides the cash lenders a safe way to invest and the cash borrowers a cheap and stable source of funding. Trades can either be on a bilateral or a tri-party basis. In the tri-party repo market, a third party is responsible for the management of the collateral during the life of the transaction. Unlike central counterparties (CCPs), tri-party agents do not act as the counterparty to the parties involved in the trade. A tri-party agent provides a number of services including trade matching, collateral selection, settlement, collateral valuation, custody and reporting. Based on US data, Copeland et al (2012) find that haircuts and funding changed dramatically in the bilateral repo market, but stayed fairly stable in the tri-party repo market, the largest segment of the US repo market, controlling for differences in types of collateral. For the largest asset classes in tri-party repo, the data indicate that haircuts on US Treasuries, agency debentures and agency MBS minimally moved during the crisis. Copeland et al (2012) also find using their roughly \$2 trillion tri-party repo dataset during the crisis that offering Treasuries, agencies or agency MBS as collateral does not impact the haircut a dealer faces. With the notable exception of Lehman Brothers, the study finds that four other stressed dealers were able to maintain stable amounts of tri-party repo funding and haircuts even when hit with adverse events like the announcement of government assistance or poor earnings releases. In the case of Lehman, the authors find that haircuts faced by Lehman on low risk collateral were little changed. Overall haircuts barely moved until the week prior to failure and changes were largely driven by the deterioration in Lehman’s tri-party repo book towards lower quality collateral. Lehman’s volume of tri-party repo financing declined significantly but the authors note that causes for this decline in triparty funding are unclear. Possible explanations include: a pull-back by tri-party repo investors, collateral calls unrelated to tri-party repo, a run-off in Lehman’s prime brokerage accounts, a wind-down in Lehman’s matched book repo, and/or asset sales. These findings suggest that inclusion of an assumption of a material disruption in a bank’s tri-party repo funding against high quality collateral (government securities and agencies) in a liquidity stress test is a quite severe assumption. Krishnamurthy et al (2012) use data from a large sub-set of tri-party repo investors, money market mutual funds and securities lenders, which is effectively a sub-set of Copeland et al (2012) though extends back further in time. This paper finds that financing was mostly stable in the tri-party repo market although it provides evidence of a sharp reduction in the amount of non-agency ABS and MBS financed.

4.4 Inter-dealer repo - The inter-dealer repo market segment includes mainly repo transactions between dealers. Transactions are either for funding purposes against general collateral, or to borrow specific securities against cash. The interdealer repo market is of key importance to the liquidity of the cash market. In the United States, Europe and Japan, the

inter-dealer repo market is typically cleared by central counterparties and transactions are generally at an overnight maturity against government securities, which in the United States includes agency debentures and agency MBS. A 2012 FSB survey finds that the inter-dealer repo market has almost replaced unsecured money markets as the marginal source and use of overnight funds for global banks. Centrally cleared: Unfortunately, there is no empirical literature that examines the use of centrally cleared repo transactions as a source of funding during the crisis or to institutions experiencing stress. An advantage to central clearing is that trades are conducted on a blind basis and intermediated by a central counterparty. For example, the US Fixed Income Clearing Corporation (FICC)'s own announcements make clear that FICC continued to transact on behalf of Lehman in the days following its failure, suggesting that holding collateral eligible for centrally cleared repo services can help institutions facing very significant pressures on liquidity. In this regard, Copeland et al (2012) notes that some of the decline in Lehman's tri-party repo volume may have been funded through FICC's GCF repo service, for Literature review of factors relating to liquidity stress – extended version 9 which US Treasuries, agency debentures and agency MBS constitute eligible collateral. Nevertheless, absent additional data it is unclear whether CCP-intermediated repo constitutes a stable source of liquidity for banks experiencing liquidity stress against eligible, high quality collateral. With regards to stability of CCP haircuts against differing types of collateral, the FSB report (2012) indicates that in the euro area CCPs have increased haircuts significantly on the repo of government bonds issued by peripheral euro area sovereigns in response to widening yielding differentials in the secondary cash market. Bilaterally cleared: With regards to the smaller bilateral inter-dealer market, Gorton and Metrick (2010, 2012) use data from one US broker-dealer to show that repo haircuts increased dramatically as the financial crisis unfolded, and that the increases in haircuts are correlated with proxies for counterparty risk and collateral quality. The authors argue that the recent financial crisis can be characterised as a “run on repo”, ie short-term repo liabilities backed by “information insensitive” securities can be considered as safe and liquid instruments, but may be subject to “loss of confidence” and liquidity spirals as the collateral becomes “information sensitive” following a large enough economic shock.

4.5 Collateral swaps - Collateral swaps are a type of securities lending transaction that involves borrowing high-quality and liquid securities, such as gilts, in return for pledging relatively less liquid securities, such as RMBS. The bank may use the high-quality securities they have borrowed to raise cash in the repo market or as collateral for swap and derivative transactions. More recently, there has been increasing demand from banks to undertake collateral swaps to meet regulatory liquidity requirements (swapping risky assets for high-quality ones eligible for inclusion within the liquidity buffer). As a form of secured funding subject to margining, collateral swaps could add to procyclicality in the funding markets (see Bank of England (2011)). The FSB report (2012) also notes that banks are increasingly pledging less liquid collateral to asset managers and other counterparties in exchange for high quality securities. More data about the volume and term of these arrangements would be helpful to understand the nature and scale of the underlying risks.

4.6 Rehypothecation by prime brokers - Prime brokers are typically large investment banks or securities firms that offer financing and securities lending services to their clients, most of which are hedge funds. When providing financing to the hedge fund, the prime broker usually obtains the cash by borrowing from other market participants, collateralised by the collateral posted by the hedge fund to the prime broker. This is possible as the prime brokerage agreement gives the prime broker the right to use the assets it holds on behalf of the client. Therefore the right to re-use clients' collateral is essential to the business model of prime brokerage, a practice known as rehypothecation. In some circumstances, rehypothecation may also be used by the prime broker to fund its own business. If the prime broker becomes insolvent before the securities are returned, the client is treated as an unsecured creditor for the value of the rehypothecated securities in the prime broker's insolvency. The failure of Lehman Brothers International (Europe) (LBIE), the main Lehman Brothers UK subsidiary, highlighted the impact the failure of a major prime broker can have on clients' cash and non-cash assets. To the extent that a prime broker relies on rehypothecation to obtain funding, the impact of hedge fund withdrawals should be carefully considered in the firm's liquidity stress testing. In addition, rehypothecation can also refer more broadly to the reuse of collateral (including collateral received in repo and securities lending transactions). A number of papers (discussed earlier in Section 4.1) point out that this is key to the liquidity management by firms and our understanding of the 10 Literature review of factors relating to liquidity stress – extended version financial system. However, it is still unclear how the decline in the velocity of collateral and the ability of firms to rehypothecate them should or can be explicitly incorporated in liquidity stress tests.

4.7 Evidence from institution interviews - The typical haircuts summarised in CGFS (2010) generally confirm the findings of the empirical literature; haircuts increase during stress periods. In addition, the increases differ substantially across asset classes, credit quality levels of both collateral and counterparty, and the term of the repo. G7 government bonds constitute the most stable collateral class, followed by US Agencies and Pfandbriefe. Corporate bonds rank third behind G7 government bonds and Agency debt/Pfandbriefe. Even high yield corporate bonds are more liquid than all securitisations but AAA-rated MBS. Their haircuts are roughly comparable to that of equity. However, as haircuts in liquidity stress tests do not only reflect changes in actual repo haircuts, but also adverse price movements in the stress scenario, it is important to put the equity haircuts in perspective. G7 equity indices dropped significantly over the period June 2007 to June 2009 (EURO STOXX 50 -46%, Dow Jones Industrial Average -38%), so that the liquidity generated by pledging, say, the EURO STOXX 50 index portfolio drops by more than 50% for non-prime counterparties, considerably more than the increase in haircuts from 12% to 20%. ICMA (2012a) presents data on the total volume of the euro repo market from June 2001 and to December 2011 (gross figures, surveyed at the end of the business day). The market grew steadily from €1.9 trillion to reach a peak of €6.7 trillion before the onset of the crisis in mid-2007.5 Over the following year, market volume decreased slightly to €6.5 trillion. After the Lehman failure the market experienced a sharp contraction by about 30% to €4.5 trillion (December 2008). In

June 2010 volume reached a new peak (€6.9 trillion); after that it contracted sharply again (-15%) until December 2010. More recent data shows a slow recovery to €6.2 trillion (December 2011). ICMA (2012b) argues that haircuts were uncommon in European repos before the crisis for interdealer repo, government bond repos, short-term repo and voice broker repo. Immediately after the onset of the crisis in August 2007 the first reaction consisted of shortening tenors, a jump to 100% haircuts for MBS and structured products, and a reduction of the size of repos with individual counterparties. For collateral that faced haircuts before the onset of the crisis, the haircuts roughly tripled under stress. Haircuts on the tri-partite repo market segment are reported to remain more stable during stress. After the Lehman failure haircuts became much more common.

5. Wholesale funding

The traditional (pre-financial crisis) literature on banking argues that an interbank market improves economic efficiency: banks can use it to insure each other against unexpected liquidity shocks, thereby to economise on liquid asset holdings and enable them to invest their funds into more profitable, but less liquid (long-term) investment projects (see Allen and Gale (2000), Holmström and Tirole (1998)). However, Bhattacharya and Gale (1987) and Huang and Ratnovski (2011) point out that there may be incentives for banks to over-rely on this type of insurance, so that underinvestment in the liquid asset occurs. Another strand of literature notes that unsecured funding can play a role as disciplinary device; this argument is especially valid for short-term debt (Huberman and Repullo (2011)).⁵ This data is subject to double counting while the US tri-partite figures are not. Literature review of factors relating to liquidity stress – extended version 11

However, the experience of the financial crisis shows that the positive features of unsecured funding also has downsides. Unsecured funding can evaporate extremely quickly. This can happen because of borrower characteristics, but also because of general market developments. The following distinguishes between three different reasons for why a bank might not be able to tap unsecured wholesale funding in a crisis: borrower solvency problems, lender liquidity problems, and market freeze.

Borrower solvency problems: Allen and Gale (2000), Freixas and Holthausen (2005), and also Bruche and Suarez (2010) argue that a high level of counterparty risk would lead to high interbank interest rates for a particular bank. If these rates become too high to be sustainable, the bank would no longer be able to obtain loans, but be cut off from the interbank market. Taking into account the maturity structure of wholesale funding, Brunnermeier and Oehmke (2013) argue that if solvency of a borrower is considered problematic, creditors have incentives to shorten the maturity of their loans (in order to be the first in line if counterparty risk becomes unsustainable).

Lender liquidity problems: In times of high market distress, the lenders' characteristics may also play a role in a reduction of wholesale funding: Eisenschmidt and Taping (2009) model a lender's decision to provide interbank loans and show that lenders who face funding problems themselves or who wish to hold precautionary liquidity buffers may refrain from lending to other financial institutions.

Market freeze: Heider et al (2009) model adverse selection in the interbank market: potential lenders are uncertain about the credit quality of the potential borrowers. Here, the adverse selection problem could lead to break-down of interbank market activity, especially when either the average level of

counterparty credit risk is very high, and/or when the degree of asymmetric information is particularly pronounced. In this case, even high quality borrowers may be unable to obtain wholesale funding. Allen et al (2009) also find that a high degree of volatility of money market interest rates, possibly due to a high uncertainty about aggregate liquidity needs of the banking sector, may lead to a breakdown of the interbank market. Both studies mentioned here find that a central bank has a role in providing liquidity to markets in order to increase efficiency, similar to Holmström and Tirole (1998). Several empirical studies analyse the availability of wholesale funding during the recent financial crisis. Generally, it is found that the market did not entirely dry up, but rather that several features changed. For the euro area, Angelini et al (2011) show that the maturity of interbank market loans significantly shortened. Volumes in the overnight segments remained roughly speaking constant over time, while longer-term loans significantly declined in volumes. Moreover, the authors find that borrower characteristics started playing a much larger role in the sense that they influence both the quantities as well as the interest rates of interbank market loans. Similarly, Afonso et al (2010) find that also in the Fed Funds market in the US, the interbank market was not frozen, but that lower-quality borrowers now have to pay higher rates than borrowers of higher credit quality. Regarding the UK, Acharya and Merrouche (2013) find that precautionary motive for hoarding liquidity seemed to have played a major role in money market freezes on the worst crisis days.

Profitability Ratio

Profitability ratios also play a significant role in the financial positions of enterprises. Profitability Ratios is known as the measurement that is used by the company in order to measure the company's ability to generate the profit from the income after deducting it from

all of its costs (Rashid, 2018). Financial ratios are divided into four sections: (a) liquidity ratios, measuring the financial institution's ability to meet its obligations from cash available to it or any other assets that can be converted into cash in a relatively short period of time, (b) profitability ratios, a high profitability indicator points to higher interest rates and increased credit size and diversity of the operations of the bank and increase the volume of transactions and gains from interest rate fluctuations, (c) activity ratios, measuring the volume of activity in terms of the degree of employment of the money available and is expressed in a number of ratios such as the employment of available funds ratio, which measures the employment of bank deposits and equity investments in the loan, and (d) leverage ratios, which describes the amount of equity in comparison to debt or the amount of earnings in comparison to debt (Blaao, 2016).

Return on Assets

According to Коршунова et al. (2019), return on assets (ROA) is the ratio of the net income to total assets which also used to measure the overall effectiveness of management in generating profits with its available assets.

If the ROA rises, it indicates that the company is performing better than previously, which may benefit the business's shareholders

through larger capital gains or dividends (Atidhira & Yustina, 2017). It will entice investors to put money into the company.

Return on Invested Capital

Return on invested capital (ROIC) is a metric that may be used to assess a company's profitability as well as reveal the origins of its competitive advantages (Mauboussin & Callahan, 2014; Baldwin, 2016). The return on investment (ROI) is computed as the ratio of net operating profit to total investment.

Return on Equity

Return on Equity (ROE) is a financial metric that reveals how much stockholders profit from the money they put into the company.

When contrasted to ROIC, it represents the total return on all capital invested in an asset, whereas ROE solely evaluates the equity component (Damodaran, 2007).

According to Коршунова et al. (2019), ROE is used to measure the ability of the company to generate profits for its shareholders, both common and preferred stocks, which means it affects stock prices; when the value of ROE is high, the stock prices also tend to be high.

Gross Margin Percentage

Gross Margin Percentage is a metric for determining a company's profitability that expresses the connection between gross profit and net sales as a percentage (Tulsian, 2014). It displays how much money a company has left over after paying all of its direct

costs for producing a product or providing services. The formula of gross margin percentage can be written as:

Net Profit Margin

The profitability of a company's overall sales after all expenses and income taxes is known as the net profit margin (Khamidah et al., 2016). One of the most crucial indications of a company's overall financial health is its cash flow.

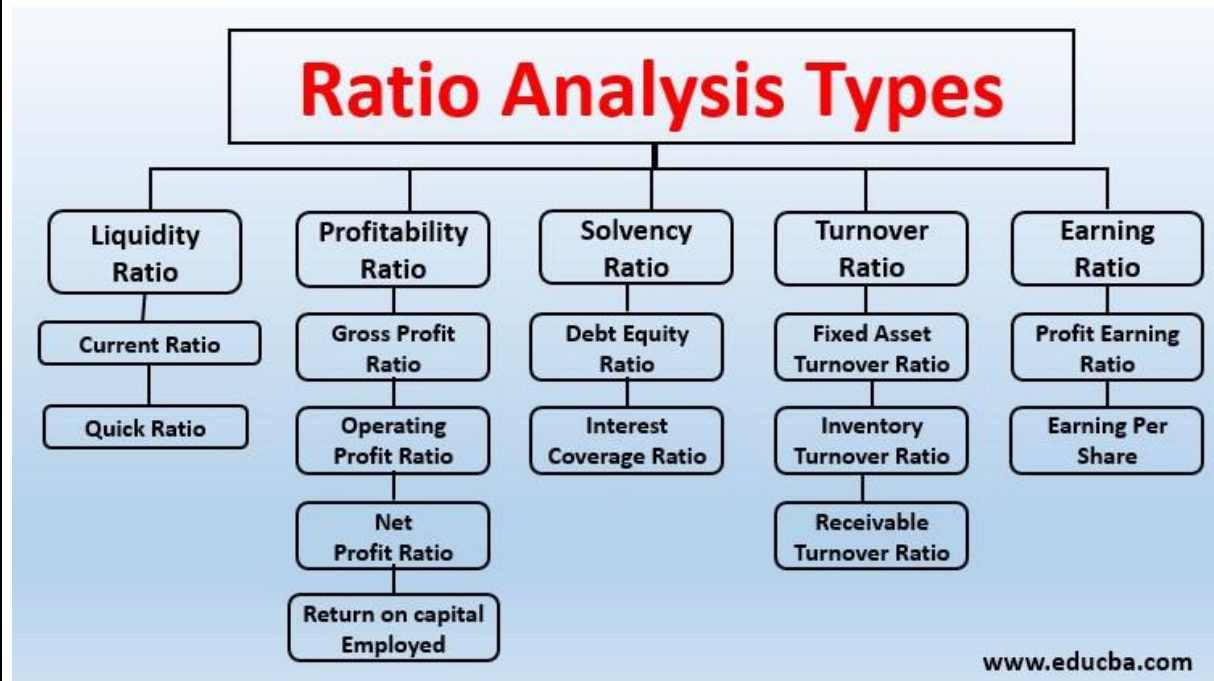
Relationship between liquidity and profitability

For the relationship between liquidity and profitability, a lot of researches mentions the trade-off between them. Due to the modern portfolio theory proposed by Markowitz (1985). The return of one financial instruments is determined by its risk, in other words, the higher the

risk it bears, the higher profitability it will gain, there is a positive relationship between risk and profitability. While the liquidity of one company influences negatively on the risk, as we mentioned before, efficient liquidity management enhances the efficiency of investments and other business operations, reduces extra cost caused by lack of liquidity, thus reduces liquidity directly and other risk like default risk. By discussing the role of risk on profitability and the relationship between risk and liquidity, we connect the concept of liquidity and profitability. It can be assumed that there exists a negative relationship between them, the high liquidity will result in low profitability. Although trade-off theory is well accepted by most researchers, some researches argue that profitability can be enhanced by efficient liquidity management, which shows the positive relationship between them. Although current assets are less profitable than fixed assets, holding proper liquidity may prevent companies from other extra cost, thus improve the profitability through this way. For example, promising investment opportunities requiring in-time money inputs can be seized by banks with adequate liquidity reserves, sudden financial needs due to mismatch of cash outflows and inflow can be met through enough liquidity reserves, otherwise the company will face risk of default and other costs from generating liquidity. Bordeleau and Graham (2010), discusses the relationship between bank liquidity and profitability by comparing US and Canada banks, indicates that although liquidity assets tend to gain less profit, the behaviour of banks increasing liquidity assets against default or bankruptcy may lower the cost produced due to mismatching of assets and liabilities and offset the profit loss caused by owing more liquidity assets, hence there is a positive relationship between bank liquidity and profitability to some extent. But when the liquidity assets banks hold exceeds the threshold, too much liquidity may cause idle use of bank funds, which leads to inefficiency of financial operations and investment management, and in this circumstance the relationship of liquidity and profitability becomes negative. As researched by Bordeleau & Graham, which partly suggests the positive impact of liquidity on profitability. While the whole conclusion of this research is both too high liquidity will deter the bank's pursuit for wealth maximization, there exists one threshold of liquidity level which could achieve wealth maximization and bank stability in the same time, this research also reminds us the importance of achieving proper liquidity level to balance liquidity and profitability. When connecting this research with the current regulations, the new Basel Accord puts forward global rules for commercial banks to regulate liquidity. Central banks also regulate the minimum liquidity reserves to protect banks from financial crisis and economic shock, while research by Bordeleau & Graham mentions the disadvantage of holding too much liquidity assets. Thus, it's also needs to be considered by banks to avoid using too much liquidity when they try to obey the rules set by BCBS and central banks. That's also one big issue for financial managers to figure out the threshold of liquidity holding of their own companies to achieve wealth maximization.

CHAPTER IV
DATA ANALYSIS AND INTERPRETATION

4.1.Computation of ratios:



1.Current ratio

The current ratio is a liquidity ratios that measures a company's ability to pay short-term obligations or those due within one year. It tells investors and analysts how a company can maximize the current assets. on its balance sheet to satisfy its current debt and other payables. Current ratio explains the relationship between current assets and current liabilities. It measures whether a firm has enough resources to meet its short-term obligations.

Current ratio= current assets/current liabilities

$$= 16379/9559$$

$$= 1.71$$

Interpretation:

Current ratio is an indicator of short term solvency of the firm. It helps to analyse the efficient management of its working capital. It represents the margin of safety available to creditors and other current liabilities. The ideal ratio is supposed to be 2:1. It means that current assets of a business should be atleast, twice of its current liabilities. High current ratio indicates better short term solvency position and gives more protection to short-term creditors. But a very high ratio indicates poor investment policies of the management. Lower current ratio indicates lack of liquidity and shortage of working capital.

2.Liquid ratio

Liquidity ratios are an important class of financial metrics used to determine a debtor's ability to pay off current debt obligations without raising external capital. Common liquidity ratios include the quick ratio, current ratio, and days sales outstanding. Liquidity means the firms ability to meet its current obligations out of current resources or assets. Liquidity ratios measure the short-term financial strength and weakness of a firm.

Liquid ratio= liquid assets/current liabilities

$$= 3592/9559$$

$$= 0.37$$

Interpretation:

Quick ratio is considered as best test of short-term financial position of a concern because it gives more importance on immediate conversion of assets into cash than the current ratio does. The ideal ratio is 1:1 which means for every rupee of current liabilities, there should atleast be one rupee of liquid assets. High quick ratio indicates that firm has good liquidity position and lower quick ratio indicates that firm has poor liquidity position.

3.Debt-equity ratio

The debt-to-equity ratio (D/E ratio) shows how much debt a company has compared to its assets. It is found by dividing a company's total debt by total shareholder equity. A higher

D/E ratio means the company may have a harder time covering its liabilities. Debt-equity ratio indicates the proportion of debt fund in relation to equity or owners fund. It is also known as debt-net worth ratio or external-internal equity ratio.

Debt-equity ratio= total debt/shareholders fund

$$= 1205/9373$$

$$= 0.12$$

Interpretation:

Debt-Equity ratio is used to evaluate company's financial leverage. It measures the extent to which debt financing has been used in the business. Higher ratio is favourable to shareholders as it magnifies their earnings. It is unfavourable to the firm as it is difficult to get credit for high debt companies. It is also unfavourable to the long term creditors. Lower ratio is unfavourable to shareholders as it does not magnify their earnings. It is favourable to the firm to get credit and it is favourable to long term creditors because a high proportion of owners fund provides a larger margin of safety for them. The ideal ratio is 2:1.

4.Fixed assets ratio

Fixed asset ratios analyze the performance of a company relative to its asset base. This ratio establishes the relationship between fixed assets and long term

funds. It is also called long term funds to fixed assets ratio. The purpose of this ratio is to indicate the proportion of long term funds invested in fixed assets,

Fixed assets ratio= net fixed assets/total long term funds

$$= 1996/9373$$

$$= 0.21$$

Interpretation:

Higher ratio means net fixed assets are more than the long term fund which indicates that the company has brought some of its fixed asset with the help of long term funds. This depicts operational inefficiency. Lower ratio means long term fund are more than net fixed assets. It is desirable to some extent as it means that a company has sufficient long term funds to cover

its fixed assets. As there is no ideal ratio, ratio can be compared with industry ratio or past ratio for framing conclusion. But the generally accepted ratio is 1:1 (100%),

which means it is better if the total of fixed assets is equal to total long term fund.

5. Proprietary ratio

Proprietary ratio is a type of solvency ratio that is useful for determining the amount or contribution of shareholders or proprietors towards the total assets of the business. It is also known as equity ratio or shareholder equity ratio or net worth ratio.

$$\begin{aligned}\text{Proprietary ratio} &= \text{Shareholders fund} / \text{Total tangible assets} \\ &= 9373 \text{ cr.} / 1889 \text{ cr.} \\ &= 4.96: 1\end{aligned}$$

Interpretation:

This ratio shows the financial strength of the company. It helps the bank to find out the proportion of shareholders fund to the total assets before granting loans. Higher ratio indicates a secured position to the lender and Vice-Versa. It also indicates the long term solvency of the firm.

6. Interest coverage ratio

The interest coverage ratio is a debt and profitability ratio used to determine how easily a company can pay interest on its outstanding debt. The interest coverage ratio is calculated by dividing a

company's earnings before interest and taxes (EBIT) by its interest expense during a given period.

$$\begin{aligned}\text{Interest coverage ratio} &= \text{EBIT} / \text{Fixed interest Charges} \\ &= 3127 / 195 \\ &= 16.04 \text{ times}\end{aligned}$$

Interpretation:

The ratio indicates how many times the interest charges are covered by the net profit available to pay interest charges. High ratio is favourable to longterm lenders and the company's risk is lesser as it is in a better position to pay off interest. Lower ratio is unfavourable to long term lenders and to the company as there is nothing to pay as dividend to shareholders. The ratio 6 or 7 times is considered as most appropriate.

7.Inventory turnover ratio

Inventory turnover is a financial ratio showing how many times a company turned over its inventory relative to its cost of goods sold (COGS) in a given period. A company can then divide the days in the period, typically a fiscal year, by the inventory turnover ratio to calculate how many days it takes, on average, to sell its inventory.

$$\begin{aligned}\text{Inventory turnover ratio} &= \text{Cost of goods sold/ Avg. Inventory} \\ &= 23931 / 10385.5 \\ &= 2.30 \text{ times}\end{aligned}$$

Interpretation:

This ratio indicates the number of times stock is turned into sales during the accounting period. Higher the ratio indicates that more sales are being made by a rupee of investment in stocks. So, higher the ratio it indicates efficiency and profitability.

8.Fixed Asset turnover ratio

The fixed asset turnover ratio reveals how efficient a company is at generating sales from its existing fixed assets. The fixed asset turnover ratio is calculated by dividing net sales by the average balance in fixed assets. A higher ratio implies that management is using its fixed assets more effectively.

$$\begin{aligned}\text{Fixed Asset turnover ratio} &= \text{Cost of goods sold/ Fixed assets} \\ &= 23931 / 1996 \\ &= 11.98 \text{ times}\end{aligned}$$

Interpretation:

It indicates the number of times the working capital is converted into sales. A higher ratio shows efficient use of working capital and quick turnover of current assets. But a very high ratio is a sign of over trading, ie, shortage of working capital for doing business. A lower ratio indicates under-utilisation of working capital. A very low ratio is a sign of under-trading ie, working capital is excess of the requirements of business. This ratio is considered as better than stock turnover ratio as this shows the utilisation of total current assets than stock only.

9. Working capital turnover ratio

Working capital turnover is a ratio that measures how efficiently a company is using its working capital to support sales and growth. Also known as net sales to working capital, working capital turnover measures the relationship between the funds used to finance a company's operations and the revenues a company generates to continue operations and turn a profit.

Working capital turnover ratio = COGS / Working Capital

$$= 23931 / 13277$$

$$= 1.80 \text{ times}$$

Interpretation:

This ratio helps to measure the efficiency and effective utilisation of fixed assets. Higher ratio indicates effective utilisation of fixed assets. Lower ratio indicates under utilisation of fixed assets.

10. Gross profit ratio

Gross Profit Margin Ratio, sometimes also referred to as gross margin, is a type of profitability ratio. It helps to measure how much profit a company makes from the sale of goods and services

after deducting the direct costs. In simple words, it is a simple metric to measure the company's profitability. Also, it helps to evaluate how efficiently the company is using its labour and raw materials during the production process.

Gross profit = gross / revenue from operation (net sales)* 100

$$\begin{aligned} &= 3279\text{cr} / 25831\text{cr} * 100 \\ &= 12.69\% \end{aligned}$$

Interpretation:

Higher rate implies better profitability of the business once Lower rate implies poor profitability position of the business meets. Its margin of profit available on sales. It should be adequate to cover all operating as well as non-operating expenses

11.Net profit ratio

Net Profit Ratio, also referred to as the Net Profit Margin Ratio, is a profitability ratio that measures the company's profits to the total amount of money brought into the business. In other words, the net profit margin ratio depicts the relationship between the net profit after taxes and net sales taking place in a business.

Net profit ratio = net profit after tax / net sales * 100

$$\begin{aligned} &= 2180\text{cr} / 25831\text{cr} * 100 \\ &= 8.44\% \end{aligned}$$

Interpretation:

Higher the ratio means better the profitability and lower the ratio indicates poor Financial efficiency.

12.Operating ratio

The operating ratio shows the efficiency of a company's management by comparing the total operating expense (OPEX) of a company to net sales. The operating ratio shows how efficient a company's management is at keeping costs low while generating revenue or sales. The smaller the ratio, the more efficient the company is at generating revenue vs. total expenses.

Operating ratio = operating cost / net sales *100

$$\begin{aligned} &= 2944.734 / 25831 \text{cr} * 100 \\ &= 11.4 \% \end{aligned}$$

Interpretation:

It measures the operational efficiency of the business. It indicates the extent of revenue from operation that is absorbed by the operating cost Lower ratio indicates better position and high margin of profit and vice versa.

13.Return on investment

Return on investment (ROI) is a performance measure used to evaluate the efficiency or profitability of an investment or compare the efficiency of a number of different investments. ROI tries to directly measure the amount of return on a particular investment, relative to the investment's cost.

Return on investment = net profit before interest, tax & dividend / capital employed * 100

$$\begin{aligned} &= 2932/ 9613 *100 \\ &= 30.5\% \end{aligned}$$

Interpretation:

This ratio shows the overall utilisation of funds by a business enterprise. Higher the ratio, better will be the position and vice versa.

14.Return on shareholder` s fund

Return on equity is a ratio, usually expressed as a percentage, that measures the profitability of a business in relation to the equity that shareholders have

invested in the company. It shows how well the company's management has been able to utilize its equity to create profits.

Return on shareholder`s fund = net profit before interest & tax / shareholder`s fund * 100

$$= 2932\text{cr} / 9338\text{cr} * 100$$

$$= 31.40 \%$$

Interpretation:

It helps the shareholder and potential investors judge the earning of the company In relation to the funds invested by them. Higher the rate her the financial position and vice versa

15.Earnings per share

Earnings per share (EPS) is calculated as a company's profit divided by the outstanding shares of its common stock. The resulting number serves as an indicator of a company's profitability. It is common for a company to report EPS that is adjusted for extraordinary items and potential share dilution.

Earnings per share = Earnings after interest tax and dividend/

Number of equity shares

$$= 2180 / 89.02$$

$$= \text{Rs.}24.49 \text{ per share}$$

Interpretation:It shows the capacity of business to pay dividend to its equity shareholders, and also helps in determining the market price of the equity share.

16.Price earnings ratio

Price to Earnings Ratio or Price to Earnings Multiple is the ratio of share price of a stock to its earnings per share (EPS). PE ratio is one of the most popular valuation metric of stocks. It provides indication whether a stock at its current market price is expensive or cheap.

Price earnings ratio = Market price per share / EPS

$$= 2510 / 24.49$$

$$= 102.49 \text{ times}$$

Interpretation:

It shows how many times is the market price of a share in comparison to its earning It helps to know the market price. This ratio helps the investor in deciding whether buy or not to buy the shares of a company at a particular market price. Higher P/E ratio is better for the Equity shareholders.

CHAPTER V
FINDINGS, SUGGESTIONS AND CONCLUSIONS

5.1. FINDINGS

1.The ideal current ratio is 2:1 which sure that the company is able to pay off its short term debts. As titan company has 1.71:1 as current ratio. The company has low current ratio and therefore has short term solvency.

2.Liquid ratio measures short-term financial position. The ideal liquid ratio is 1:1 which means for every rupee of current liabilities, there should at least be one rupee of liquid assets. As this ratio of titan company is 0.37:1, the company do not have enough liquid assets to pay of debt.

3.The debt-equity ratio is used to evaluate company is financial leverage. The company is utilising debtors compared to equity for running the business. The ideal debt-equity ratio is 2:1. A higher debt-to-equity ratio indicates that a company has higher debt, while a lower debt-to-equity ratio signals fewer debts. As this ratio of titan company is 0.12:1, which is lower than the ideal ratio the, it is good for the company as the company does not have higher debts.

4.The fixed assets ratio is the relationship between fixed assets and long term funds. The higher ratio means net fixed assets are more than the long term fund which indicates the company has brought some of its fixed assets with the help of long term funds. There is no ideal ratio but the generally accepted ratio is 1:1. As this ratio of titan company is 0.21:1, the total of fixed assets is less as compared to total long term fund.

5.The ideal Proprietary Ratio greater than 0.5, which indicates that the company has more than half of the capital as equity. As titan company has 4.96:1 as proprietary ratio , it has higher ratio which means the company is in secured position and has long term solvency.

6.An interest coverage ratio of 1.5 is considered as healthy for a business. In general, a higher interest coverage ratio means that a company is earning sufficient money in order to pay off the interests due on long term loans, which indicates that there is a very less chance of a financial default. Here as the company as acquired higher ratio of 16.04 it is good for the company.

7. For most industries, the ideal inventory turnover ratio will be between 5 and 10 , meaning the company will sell and restock inventory roughly every one to two months. As this ratio of

titan company is 2.30 times, it has a lower ratio which means the concern is not selling the stock quickly.

8.The fixed asset turnover ratio reveals how efficient a company is at generating sales from its existing fixed assets. If the ratio is greater than 1, it's always good. Because that means the company can generate enough revenue for itself. As this ratio of Titan company is more than 1 it means that the company is efficiently utilizing its fixed assets.

9. Generally, a working capital ratio of less than one is taken as indicative of potential future liquidity problems, while a ratio of 1.5 to two is interpreted as indicating a company is on the solid financial ground in terms of liquidity. Here titan company has a working capital ratio of 1.80 times and it is considered good as it is in-between the ideal ratio.

10.Gross profit ratio – Higher gross profit ratio implies better profitability of the business concerns. Lower ratio implies poor profitability position of the business concerns. As the Titan Company has higher gross profit ratio it should be adequate to cover all operating as well as non- operating expenses.

11.Net profit ratio – Higher the net profit ratio means better the profitability. Lower the net profit ratio indicates poor financial efficiency. As the titian company as higher net profit ratio which means that a company is more efficient at converting sales into actual profit.

12.Operating ratio – it measures the operational efficiency of the business. It indicates the extent of revenue from operation that is absorbed by the operating cost. As the titian company has low operating ratio which indicates that the company has better position.

13.Return on investment – this ratio shows the overall utilization of fund by a business enterprise. Higher the ratio which indicates better position and vice versa. As the titian company has higher the ratio, better will be the position.

14.Return on shareholder`s fund- it helps the shareholders and potential investors to judge the earnings of the company in relation to the fund invested by them. Higher the ratio which, better the financial position and vice versa. The titian company has higher the ratio which indicates better the financial position.

15.When deciding where to invest your money, there are different ratios you can use to find the right companies to back. One of them is earnings per share (EPS), which is one way to measure a company's profitability. The higher this number, the more profitable a company is likely to be. Therefore as EPS is 24.49, ie, higher the ratio more profitable is the company.

16.Ultimately, there's no hard-and-fast rule for what a good P/E ratio is. But in general, many value investors consider a lower P/E ratio better. To give you some sense of what average for the market is, though, many value investors would refer to 20 to 25 as the average P/E ratio range. And again, like golf, the lower the P/E ratio a company has, the better an investment the metric is saying it is. As titan has more P/E ratio , this is good for the company while is bad for those investing in the company.

5.2. SUGGESTIONS

1.As the company has a lower quick ratio and current ratio it is advised to do the following:

- Paying off and restructuring debts.
- Negotiate for better payment terms.
- Reduce unnecessary costs
- Increase customer satisfaction by various sales techniques.
- Also try raising prices of the product.

2.The company should also start selling the stocks quickly as the inventory turnover ratio is low by doing the following:

- Improve demand forecasting accuracy.
- Use – up excess inventory by redistributing stock.
- Smarter Reorder of inventory.

5.3. CONCLUSIONS

Study of the financial analysis of Titan Limited reveals the performance of the company in terms of financial aspects. It is found that the company is good in earning profit. It is also observed that the current ratio as well as liquid ratio is not satisfactory, i.e., short term solvency is low. Net working capital ratio, proprietary ratio, interest coverage ratio stays stable. Total debt is also low, which again maintains financial stability.

Further the company performance and efficiency can be improved by above mentioned points in the suggestion.

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