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Business Cycles and Capital Structure Choices: Evidence from India

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Abstract

The paper explores variations in leverage ratios of industries grouped on the basis of business cycles – as growth industry, defensive industry and cyclical industry. Leverage is measured using Total debt to Net worth ratio, Long term debt to Net worth ratio and Short term debt to Net worth ratio. The debt ratios of industries are evaluated during two time phases– Phase I (2008/09 to 2012/13) and Phase II (2013/14 to 2017/18). The sample consists of 172 companies randomly selected from the largest 500 companies in India. The results suggest significant variations in the debt ratios of industries in each of the time phases. The results also show statistically significant variations in total and long-term debt ratios between Phase I and Phase II. The study is distinct as it gives a new insight into the capital structure decisions of industries using a novel industrial classification base.

Keywords: Capital Structure, Business Cycles, Debt Ratios, Industry, India

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Introduction

Some researchers have observed that capital structure is industry specific (Abor, 2007; Abzari et al., 2012; Boquist & Moore, 1984; Bowen et al., 1982; Manjule, 2014; Panda & Nanda, 2020; Rastogi & Narwal, 2014, Schwartz & Aronson, 1967; Scott, 1972; Scott & Martin, 1975). Simultaneously, researchers also suggest that the capital structure of industries is dynamic (Liaqat et al., 2021). Industries change their gearing decisions in their endeavour to perpetually balance the cost of capital and rate of return. Thus, capital structure decision is a see-saw balancing game plan between debt and equity.

Capital structure can either be counter-cyclical or pro-cyclical (Halling et al., 2016). When a firm finances its operations through debt rather than equity during business downturns owing to shareholders' expectation of low dividends in the future, it is counter-cyclical. However, it is pro-cyclical, when a firm lowers its debt usage during a business downfall in order to improve its financial mobility (Al-zoubi et al., 2018). Thus, the downturns and upturns in an economy influence the debt capacity of a firm. However, not all industries are equally affected by the cyclical movements of an economy. Some industries succumb to pressure while others remain resilient and some thrive in the same cyclical movement (Ferreira, 2017; Halling et al., 2016). As per the business cycles, industries can be segregated into three categories- growth industries, cyclical industries and defensive industries. Growth industries are characterised by rapid growth prospects relative to other industries (Almus, 2002). They use innovative technologies to produce new products and services. Cyclical industries respond to cyclical variations in the economy. They flourish and fail according to economic crest and trough (Asinas, 2018; Bhatia & Thakur, 2017). Defensive industries by their nature get least affected by the business cyclical fluctuations (Asinas, 2018). Thus, the classification of industries on the basis of business cycles reflects the economic adjustments of industries according to the severity of cyclical movements in the economy. Cyclical fluctuations in the economy may cause variations in leverage levels of companies during different phases depicting business cycles, a phenomenon that has not been evaluated in the extant literature. Given this discussion, the present study endeavours to comprehend the cyclical behaviour of leverage ratios across industries grouped on the basis of business cycles over a period of 10 years split over 2 time phases named, Phase I (2008/09 to 2012/13) and Phase II (2013/14 to 2017/18). The study is based on a sample of 172 Indian companies, the largest in terms of market capitalisation, classified into three industrial groups as growth industries, cyclical industries and defensive industries.

The study is appropriate in the Indian context because India is the world's fastest growing emerging economy (UNCTAD report, 2021). Since the economic reforms of liberalisation and globalisation in the 1990s, India has revamped its economy. Economic openness has contributed to higher business cyclical volatility (Paul, 2010). As a result, the Indian economy too has witnessed many cyclical shifts since then (Bhatia & Thakur, 2017; Ghate et al., 2013). From 1992 to 1997, India has registered a higher level of economic growth. The growth rate in GDP expedited from a mere 1.3% in 1991-1992 to an unprecedented average of 6.7% from 1992 to 1997 (Economic Survey, 2005). Financial and trade integration fostered by reforms attracted much foreign investment to India. It escalated to \$6 billion in 1996-1997 from a negligible \$100 million in 1990-1991 (Reserve Bank of India, 2006). This was also due to India's enhanced access to international capital (Agénor, 2001). Consequently, the financing choices of managers underwent a sea change. However, after 1996-1997, the Indian economy entered into a prolonged phase of deceleration from 1997 to 2003. Its GDP plunged down to 3.98% in 2002-2003 from 7.84 % in 1996-1997 (Economic Survey, 2005). During this period, corporate deleveraging was also evinced as the average corporate debt to equity ratio declined to 67 from 75 in the earlier 5 years (Reserve Bank of India, 2008). India once again observed the phase of economic boom from 2003-2004 to 2007-2008. An average GDP growth rate of 11% was recorded during this period (Central Statistical Organisation, 2011). The corporate sector too recorded an increase in profitability as average profit after tax grew at around 47% per annum in this period as compared to 7.8% per annum during 1998-2003 (Reserve Bank of India, 2008). Again a shift in financing pattern was observed. Debt-equity ratio declined during this time (Mohan, 2008). But thereafter, the market got derailed with the global meltdown in 2008. Withdrawal of funds by foreign institutional investors worsened the situation. Reserve Bank of India undertook counter cyclical measures by reducing the interest rates to boost the economy through cheap lending (Reserve Bank of India, 2010). Hence again the financing patterns witnessed a change. In light of the preceding discussion, the current paper intends to analyse the capital structure of industries across a novel industrial classification on the basis of their tolerance towards cyclical movements. This classification deviates from the traditional approach of researchers who divide industries on the basis of the products produced, and thus opens new insights for researchers. Three debt ratios i.e. Total Debt to Net Worth ratio (TDNW), Long term Debt to Net Worth ratio (LTDNW) and Short term Debt to Net Worth ratio (STDNW) are evaluated across this new classification. Specifically, the study aims to achieve the following objectives: To analyse the differences in capital structure choices of industries classified on the basis of business cycles. To examine differences in the

capital structure of industries grouped on the basis of business cycles over different time periods.

Findings of the study indicate a significant variation in the debt ratios of industries during each of the time phases considered in the study. Also, significant variation is seen in the total and long term debt ratios of industries over the two time phases. The present study significantly contributes to the literature as it substantiates the importance of business cycles in financing decisions by providing an understanding of leverage ratios of three industrial groups classified on the basis of business cycles. Prior literature overlooked this crucial issue. In fact, to the best of the knowledge of the authors, this study is the first to shed light on how a firm associated with an industry classified on the basis of business cycles adjusts its leverage in response to changing business cyclical movements. Thus the study introduces a new thought that it is not only the nature of industries that bring variations in the debt structure of industries but business cyclical variations in an economy also determine the leverage levels of firms.

The rest of the paper is organized as follows: the next section discusses the literature review and this is followed by the research methodology. The empirical findings and discussion is presented thereafter, while the last section presents the conclusion of the research with the theoretical and managerial implications of the findings and future research directions.

Review of Literature

The review of literature is divided into two sections. The first section exhibits a theoretical review and presents the implications of theories with respect to business cyclicity followed by the theoretical gap. The second section is segregated into two subsections. The first subsection discusses the empirical literature pertaining to optimal capital structure and related to industries' capital structure, and the second subsection explicates the literature concerning business cycles and capital structure, followed by the empirical gap.

Theoretical/Conceptual Literature

Divergent views have been explicated by different theorists regarding the existence of an optimum capital structure. The traditional theory of capital structure favours the existence of an optimal capital structure which can be achieved through a judicious mix of debt and equity that leads to a point where the cost of capital is the lowest and the market value of a firm is the maximum. However, Modigliani and

Miller (1958) refute the traditional theory and point out the irrelevance of capital structure under the assumptions of perfect capital markets and in the absence of corporate taxes. Since conditions of market perfections and the absence of corporate taxes are not observed in reality, Modigliani and Miller (1963) transitioned to the relevance of capital structure in maximising the firm's value in the presence of corporate taxes. The theory argues that owing to tax benefits of debt, the value of a levered firm can be more compared to an unlevered firm and thus advocates 100% debt in the capital structure of firms. Kraus and Litzenberger (1973), in their Static Trade Off theory, also endorse the concept of optimal debt structure at a point of trade off between tax shield benefits of debt and the cost of bankruptcy. However, Myers and Majluf (1984) propose a sequential order of financing through the Pecking Order Theory (POT) that advocates the preference of internal reserves over debt for financing and considers external equity at the end, under conditions of asymmetric information. Jensen (1986) advocates the use of debt, in the Free Cash Flow theory, for a firm with abundant free cash flows. Most recently, in the Market Timing Theory, Baker and Wurgler (2002) prudently argue that firms adjust their capital structure according to market timings. When the market shows an uprising trend, i.e., when the market value of equity shares is higher than the book value, then the firm issues equity shares and vice versa.

Perhaps on the same grounds, Halling et al. (2016) imply that Trade off theory asserts augmentation in debt levels of firms during the expansionary phase due to reduction in bankruptcy risks and decline in debt usage during economic downturns, thus making capital structure pro-cyclical during economic upturns and counter-cyclical during economic downturns. Free Cash Flow theory too suggests that capital structure is pro-cyclical (Ferreira, 2017). During economic expansions, firms have more free cash flows available at their disposal, so they tend to issue more debt. However, Pecking Order Theory states that capital structure is counter-cyclical as it advocates debt financing over equity financing during any business cycle phase (Ferreira, 2017). However, the Market Timing Theory, in line with Pecking Order theory, endorses the counter-cyclical capital structure patterns in firms (Akhtar, 2012). This theory suggests that the firms repurchase their equity during the contraction phase, i.e., when the market value of equity is lower compared to the book value, and issue equity rather than debt when there is an economic upturn.

From the previous discussion, it can be inferred that different theories of capital structure present different explanations regarding the leverage patterns during economic peaks and troughs. This affirms that business cycles are important

macroeconomic factors that must be considered prior to planning an optimal capital structure. Business Cycle is a time related factor (Akhtar, 2012). With change in time, the macroeconomic conditions of a country change. This influences the leverage patterns of companies. These observations of the theoretical literature suggest a research gap concerning the examination of capital structure patterns of industries classified on the basis of business cycles during different time phases.

Empirical Literature

Optimal Capital Structure

Though many theorists (Kraus & Litzenberger, 1973; Modigliani & Miller, 1963;) and researchers (Mackay & Phillips, 2005; Nasimi, 2016; Panda & Nanda, 2020; Singh & Bagga, 2019; Vātavu, 2015) demonstrate interest in the optimal capital structure a consensus on optimality is still absent. Researchers have endeavoured to identify factors that were significant in the determination of an optimal capital structure for companies or industries. Scholars (see for example, Bradley et al., 1984; Chakrabarti & Chakrabarti, 2018; Frank & Goyal, 2008; Panda & Nanda, 2020; Rajan & Zingales 1995; Ramli, 2018; Saif-Alyousfi et al., 2020; Sofat & Singh, 2017; Talberg et al., 2008; Titman & Wessels, 1988) have explored many factors as asset structure, profitability, firm size, age, growth, non-debt tax shields, tax rate, operating risks etc. that affect the choice of financing of firms. Perhaps due to the varied impact of different factors on leverage, different firms follow different debt equity ratios. It is not only the firm specific factors that impact the leverage levels of firms; industry dynamics also play an important role in the determination of adequate debt equity ratio for firms.

Therefore, in the past, many studies have undertaken sector wise analysis of capital structure and its determinants (see Table 1 for some examples). Mackay and Philips (2005), on a sample of 1051 U.S. companies categorised into 44 industries, identified the non-existence of an optimal capital structure for an industry. However, they confirmed that a firm's capital structure was linked to the capital structure of other firms operating in the same industry. Subsequently, Omran and Pointon (2009) also investigated the debt structure and its determinants across four industries in Egypt. They observed varied impacts of determinants on the debt ratios across industries.

Researchers have also evidenced that some industries such as Metal (Das & Roy, 2007; Ilyas & Raju, 2017), Construction (Ambadkar, 2010; Manjule, 2014; Rastogi et al. 2006; Yam, 1998), Steel (Goveas, 2004), and Cement (Das & Roy, 2007) etc.

rely heavily on debt compared to other industries such as Information Technology (Abor, 2007; Manjule, 2014), Services (Rastogi et al., 2006) and Pharmaceuticals (Ilyas & Raju, 2017) that are seen to rely more on internal sources or equity capital funding. It is also established by researchers that there is dynamism in the leverage policies of industries; at different time periods, the same industry exhibits different capital structure preferences. For instance, Bradley et al. (1984) reported the Paper industry in the USA as a low levered industry during 1962 to 1981. The same was identified by Devi (1992) during 1981 to 1990 in Indian Paper industry; however, in contrast, Balkrishan (1982) found high debt levels in the case of the Indian Paper industry from 1971 to 1980. Similarly, Das and Roy (2007) reported high leverage in the Indian Paper industry in their comprehensive study covering 20 years from 1980 to 1999. Similar variations are found in other industrial groups over different time periods. Bradley et al. (1984) found lesser debt usage in the US Pharmaceutical industry during 1962-1981 and Manjule (2014) during 2007-2012 and Ilyas and Raju (2017) in 2015 validated the low leverage in the Pharmaceutical industry of India. In contrast, high total debt levels were observed in this industry with a major inclination towards short term debt by Abor (2007) in Ghanaian Small and Medium Enterprises (SMEs) over a period of 5 years from 1998 to 2003. Contradictory findings have been reported with respect to debt usage in the Textile industry as well. Devi (1992) found a lower debt burden in the Synthetic Textile and Cotton Textile industry over the decade prior to the liberalisation (1981 to 1990) of the Indian economy, but, Ramulu (1993) found high debt ratios in the Indian Textile industry from 1978 to 1989. Similarly, contrasting evidence is seen with respect to the Chemical industry: Ambedkar (2010) reported low debt usage in this industry in India during 1990-2008, but, high debt levels were observed during 1980-1999 as per a study by Das and Roy (2007).

A snapshot of the literature concerning capital structure of different industries is presented in Table 1.

Table 1: Summary of Literature on the Capital Structures of Different Industries

Authors (Year)	Sample	Country	Time Period	Measures of Capital structure	Statistical Tools Used	Findings
Balkrishan (1982)	81 firms classified into 3 industries	India	1971-1980	Long term debt/Equity	Ratio analysis	The Paper industry was observed to be highly debt dependent.

Authors (Year)	Sample	Country	Time Period	Measures of Capital structure	Statistical Tools Used	Findings
Bradley et al. (1984)	851 Firms grouped into 25 industries	USA	1962-1981	Average Long term debt ratio	Descriptive statistics, ANOVA	Paper and Pharmaceutical industries were evinced to using lower debt. Significant differences in the mean leverage ratio of firms across industry were also found.
Devi (1992)	87 Companies divided into 10 Industries	India	1981-1990	Debt equity ratio	Descriptive statistics, ANOVA	Paper, Synthetic Textile and Cotton Textile industries exhibited low debt usage. Significant differences in the debt structure of various industries were also observed during the period of the study.
Ramulu (1993)	194 PSU split into 12 industries	India	1978-1989	Debt equity ratio	Descriptive statistics, Ratio analysis, ANOVA	Drugs, Instruments, Electronics and Food industries had low leverage while Paper, Textile Mill Products, Steel, Airlines And Cement industries had consistently high leverage. Moreover, regulated industries like Telephone, Electric And Gas Utilities were among the most highly levered firms.
Goveas (2004)	3 industries	India	1993-2002	Debt-equity ratio Debt to asset ratio	Descriptive and Ratio analysis	Debt financed more than 70% of the total assets in the steel industry. However, debt financed more than 50% of the total assets in the Pharmaceutical industry which is slightly lower than in the steel industry.

Authors (Year)	Sample	Country	Time Period	Measures of Capital structure	Statistical Tools Used	Findings
Rastogi et al. (2006)	601 Companies divided into 14 industries	India	1992-2003	Total debt/ total asset, total borrowings / total asset, long term debt/ total borrowings and short term debt/ total borrowings	ANOVA and Descriptive Statistics	The Construction industry showed a greater inclination towards debt than the Services industry which showed low debt usage.
Das and Roy (2007)	12 industries	India	1980-1999	Total debt/total asset	Descriptive statistics	Metal, paper and chemical industries were seen to be highly debt oriented
Abor (2007)	150 SMEs grouped into 8 industries	Ghana	1998-2003	Short term debt ratio, Long term debt ratio, Total debt ratio	Descriptive statistics, ANOVA	The Pharmaceutical industry was seen to be highly total debt oriented with its major inclination towards short term debt. Significant differences across various industries with regard to capital structure were seen.
Ambadkar (2010)	140 Foreign Direct Investment companies divided into 11 industries	India	1991-2008	Short term debt ratio and Long term debt ratio	Descriptive statistics, ratio analysis	Chemical industry was seen to be the least debt oriented compared to the Construction industry which reported high debt levels .
Manjule (2014)	151 firms split into 13 industries	India	2007-2012	Debt/ Equity	Ratio Analysis, Descriptive Statistics	Pharmaceutical and IT industries exhibited low debt dependence in contrast to the Construction industry which showed higher debt levels.
Ilyas and Raju (2017)	20 Companies grouped	India	2007-2016	Debt equity ratio=Long term debt/ Net Worth	Ratio analysis, mean, percentiles	The Pharmaceutical industry revealed low debt ratios compared to the Metal industry

Authors (Year)	Sample	Country	Time Period	Measures of Capital structure	Statistical Tools Used	Findings
	into 4 industries				and ANOVA	which was observed to be highly debt dependent. Significant differences were observed in the capital structure of industries taken in the study.

Based on the afore discussed literature, it can be inferred that even in the same country and in the same industry, leverage patterns vary over different time periods. Various phases of business cycles affect the leverage decisions of industries. Some industries resort to a counter-cyclical leverage pattern, while others adopt pro-cyclical leverage.

Capital Structure and Business Cycles

In a study on U.S. firms, Korajczyk and Levy (2003) classified the firms into constrained and unconstrained firms. They reported that constrained firms adopted a pro-cyclical leverage pattern and unconstrained firms followed counter-cyclical leverage. However, Halling et al. (2016) found a counter-cyclical leverage pattern in the majority of firms sampled from 19 countries. Ferreira (2017) took a sample of non listed firms from the Eurozone and reported a counter-cyclical pattern of leverage. Further, Pattanaik and Sengupta (2018) took a sample of Indian firms and identified a counter-cyclical pattern of leverage in financially unconstrained firms. Akhtar (2012) in a study on U.S. firms argued that time variations in business cycles lead to changes in the relative pricing of assets that lead a firm to choose different debt equity ratios at different time periods. Bandyopadhyay and Barua (2016), on a sample of Indian companies, also evidenced a significant impact of macroeconomic cycles on leveraging levels of firms.

From afore discussed literature concerning the leverage ratios in different industries from different countries at different time periods, it can be concluded that debt preferences within industries change with the change in country settings or with variations in the time period. The literature concerning business cycles and leverage also points towards variations in leverage policies of companies during different phases of business cycles. Therefore, in this paper, an effort is made to examine the debt ratios of industries classified on the basis of business cycles, namely growth,

defensive and cyclical industries. Growth industries remain resilient to business downfall. During economic expansion, these industries grow at a faster pace. Cyclical industries are highly influenced by economic peaks and troughs. Defensive industries have the ability to protect themselves from economic downturns (Bhatia & Thakur, 2017; Fischer & Jordan, 2009). Given the varied responsiveness of industries to cyclical phases, the leverage patterns of these industries also vary.

Prior literature has examined the debt ratios of industries classified on the basis of product not on the basis of business cycles. However, some studies have investigated the impact of business cycles on leverage patterns of companies. In the Indian context, only studies by Bandyopadhyay and Barua (2016), and Pattanaik and Sengupta (2018) evaluated the impact of business cycles on the leverage patterns of companies. These studies, however, do not examine the leverage of industries classified on the basis of business cycles.

Based on the research gap and objectives of the study, the present study formulates two hypotheses as follows:

H₁: There is a significant difference in the mean debt ratios of Growth, Cyclical and Defensive industries

H₂: There are significant differences in the mean debt ratios of Growth, Cyclical and Defensive industries in Phase I (2008/09 to 2012/13) and in Phase II (2013/14 to 2017/18)

Research Methods

Data Collection, Sample Design and Time Period

The data for this study was gathered from secondary sources. This secondary data was extracted from the Ace equity database. Annual reports of the companies were also consulted, wherever needed. A sample was screened from Business Today (BT) 500 (dated 17th December 2017) – India's most valuable companies. These companies were first classified into 15 industry groups using the National Industrial Classification, 2008 and then further grouped into three categories on the basis of Business Cycles. This classification of industries is given in Bhatia and Thakur (2017), Fischer and Jordan (2009), and Pandian (2013). Companies belonging to the Government Sector and Financial Sector were eliminated because these companies are subject to their own acts and hence are not suitable for comparison with other industries. The industries that did not exist during the full sample period were also excluded. The final sample consisted of 172 companies after removing outliers. The outliers were detected using the boxplot method. They were removed as extreme

values affect the statistical power of a test and make it hard to detect true results (Gress et al., 2018). The study considered a period of 10 years. To capture the cyclical effect in the economy, the total time period was sub divided into two halves as 2008/09 to 2012/13 and 2013/14 to 2017/18 termed Phase I and Phase II respectively. The sample classification into industries during Phase I and Phase II is described below in Table 2.

Table 2: Classification of Industries According to Business Cycles during Phase I and Phase II

Industries as per Business Cycles	Industry Group (as per NIC code)	No. of Companies	Total	Randomised sample (No. of Companies)	
				Phase I (2008/09 to 2012/13)	Phase II (2013/14 to 2017/18)
Growth	Pharmaceutical	32	127	56	52
	Chemical	33			
	Service	44			
	Information Technology	18			
Cyclical	Non- Metallic Mineral Products	26	149	62	62
	Electric Equipment	26			
	Construction	27			
	Metal	16			
	Automotive	16			
	Consumer Goods	35			
	Agriculture	3			
Defensive	Retail/Wholesale	12	58	54	58
	Textile	12			
	Wood	2			
	Others	1			
	Power	10			
	Food-Beverages-Tobacco-Alcohol	21			
Total			334	172	172

The division into two time phases was following Das and Roy (2007) and Rastogi et al. (2006). In these studies, they have also divided the total time period into two equal halves in order to examine the debt financing decisions of Indian firms. In the current study, Phase I describes the post recessionary period when the economy was recuperating from low to high after the US recession. Phase II represents the recent time period during which India faced the consequences of stripping of the status of its legal currency through demonetisation, which brought restlessness to the economy. During the same period, some acts and laws were also reframed in the

country, such as the New Companies Act, 2013; SEBI (Prohibition of Insider Trading) Regulations, 2015; Insolvency and Bankruptcy Code, 2016 and Goods and Services Tax in 2017. All these changes were significant enough to change the cycle of the Indian economy.

Operationalisation and Measurement of Variables

Dependent Variable

In the current study, capital structure is the dependent variable. It is measured using three ratios, i.e., total debt to net worth ratio, long term debt to net worth ratio and short term debt to net worth ratio. The total debt to net worth or debt equity ratio tells us about the lenders' or creditors' contribution for each rupee of the owner's contribution. This ratio truly indicates the leverage levels of a company. The long term debt to net worth ratio explains the long term solvency position of a firm. Short term debt to net worth ratio (STDNW) was also used because short term creditors also exert some pressure on the companies. Similar to long term debt ratios, this ratio also ascertains the financial risk of firms as short term debt is a vital source of credit in developing nations (Booth et al., 2001). Therefore, it is necessary to examine the short term debt levels in Indian concerns.

Independent Variable

Macroeconomic conditions of economic boom and busts affect the financing pattern of a firm to a large extent. Business cycles refer to periods of economic growth followed by periods of economic downfall. Cyclical fluctuations in an economy go through four phases – growth, peak, contraction, and recovery. Growth is a phase when an economy is steadily growing. During this phase, demand is increasing, unemployment is low and stock markets are performing well. Peak is a phase where demand/ production is at its maximum levels. The expansion has reached its limit. Following peak is the contraction phase, where the market suffers from recession. Demand and supply are very low. Stock markets enter into their bearish phase etc. Last is the recovery phase when the economy starts rebounding to expansion (Sichel, 1994).

During different phases of business cycles, industries respond in different ways. For instance, Growth industries get least influenced by the cyclical fluctuations in an economy (Fischer & Jordan, 2009; Pandian, 2013). However, some industries are highly responsive to cyclical variations in the economy and are referred to as cyclical industries (Indian Institute of Banking and Finance, 2011; Berman & Pfleeger, 1997). Further, there are some industries that have the ability to defend

themselves from economic ups and downs; these are referred to as defensive industries (Berman & Pflieger, 1997; Indian Institute of Banking and Finance, 2011; Pandya, 2013). Since economic cycles influence leverage levels, the debt ratios of these industries may or may not vary. Therefore, this study uses the industrial classification on the basis of the business cycle as an independent variable. This classification of industries is given in (Fischer & Jordan, 2009; Pandya, 2013). This industry variable is categorical in nature with three categories, namely, growth, cyclical and defensive industries. The measurements and supporting literature of dependent and independent variables are given in Table 3 below:

Table 3: Variable Measurement and Supporting Literature

Variable	Measurement	Supporting literature
Dependent Variable (Capital Structure)		
1. Total debt to net worth ratio	This ratio is formulated as- Total Debt/Net Worth ratio where, Total Debt= Long term Debt+ Current Liabilities and Net Worth ratio= Share Capital+ Share Warrant+ Total Reserves- Miscellaneous Expenses not Written off.	Belkaoui (1975); Devi (1992); Goveas (2004); Manjule (2014); Omran and Pointon (2009);Panda and Nanda (2020); Ramulu (1993); Sofat and Singh (2017)
2. Long term debt to net worth ratio	This ratio is formulated as- Long term Debt/ Net Worth ratio where, Long term Debt= Secured Loans+ Unsecured Loans.	Ilyas and Raju (2017); Khan and Jain (2018)
3. Short term debt to net worth ratio	This ratio is formulated as- Current Liabilities/Net Worth ratio.	Agarwal and Mohtadi (2004)
Independent variable (Industries classified on the basis of business cycles)		
Growth industries	Companies from Pharmaceutical, Chemical, Service, and Information Technology fall into the category of growth industries.	Fischer and Jordan (2009); Pandian (2013)
Cyclical industries	Companies belonging to Non- Metallic Mineral Products, Electric Equipment, Construction, Metal, Automotive, Consumer Goods, Agriculture industries fall into this category.	Berman and Pflieger (1997); Indian Institute of Banking and Finance (2011)
Defensive industries	Companies from Retail/Wholesale, Textile, Wood, Others, Power, Food-Beverages-Tobacco- Alcohol are included in this category.	Berman and Pflieger (1997); Pandya (2013); Indian Institute of Banking and Finance, (2011)

Method of Analysis

This study employed ANOVA to achieve the first objective i.e. to determine whether significant differences exist in the mean of different categories of industries (Bhatia & Kumari, 2022; Bhatia & Kumari, 2021; Das & Roy, 2007; Omran & Pointon, 2009; Pinková & Riederova, 2013; Rastogi et al., 2006). This statistical tool is subject to assumptions of normality, no significant outliers, and independence of observations and homogeneity of variance. However, when the homogeneity of variance condition is not satisfied, Welch ANOVA is used to examine the significant differences across groups' mean (Liu, 2015). ANOVA was performed to test the hypothesis of no significant difference between the mean leverage ratios of growth, cyclical and defensive industries.

Further, in order to minutely examine pairwise differences, post hoc tests were applied. The first test is the Tukey post hoc test that assumes equal variances among groups and it was applied as a post hoc test for ANOVA (Abdi & Williams, 2010).

The formula for the Tukey test is as follows:

$$t = q \cdot \sqrt{MSE/N} \quad (1)$$

where q is the critical value in the Q table, MSE is the mean square error that is obtained from ANOVA output and N is the Number of items in one sample.

When the condition of homogeneity of variance is not met, the Games Howell post hoc test is employed after Welch ANOVA results (De Muth, 2014; Sarmiento & Costa, 2017; Sauder & DeMars, 2019). The basic formula for Games Howell post hoc test is as follows:

$$\bar{X}_i - \bar{X}_j > q_{\sigma, k, df} \quad (2)$$

where $\bar{X}_i - \bar{X}_j$ is the mean difference of each group, σ is equal to the standard error, k is the number of groups and the degree of freedom is calculated from Welch correction.

In order to achieve the second objective, a Paired t test was employed that compares the means of two groups of observations (Hsu & Lachenbruch, 2014; Rastogi et al., 2006; Shabbir & Wisdom, 2020). This test is employed after adhering to the assumptions of normality and deletion of significant outliers. In the current study, this test was applied to test the null hypothesis of no significant differences in the mean debt ratios between the two time periods in each of the industries classified on the basis of business cycles.

Results

Debt Ratio Differences Across Industries Classified on the Basis of Business Cycles

The capital structure adopted by various industries classified on the basis of business cycles is presented across the two time phases in Table 4.

Table 4: Capital Structure of Industries Classified on the basis of Business Cycles

Industrial Classification	Industry Group	TDNW ratio (Mean %)		LTDNW ratio (Mean %)		STDNW ratio (Mean %)	
		Phase I (2008/09 to 2012/13)	Phase II (2013/14 to 2017/18)	Phase I (2008/09 to 2012/13)	Phase II (2013/14 to 2017/18)	Phase I (2008/09 to 2012/13)	Phase II (2013-14 to 2017/18)
Growth Industry	Pharmaceutical	77.23	57.15	20.58	13.17	56.984	44.11
	Chemicals	98.66	92.46	40.25	26.08	58.57	66.29
	Information Technology	22.16	27.00	3.83	9.50	18.33	18.5
	Service	105.38	67.88	68.27	30.13	37.05	37.63
Average		85.35	65.12	38.68	20.94	46.80	44.28
Cyclical industry	Construction	127.50	121.79	50.76	28.50	76.61	93.00
	Non-Metallic Mineral Products	139.90	93.71	65.00	37.33	75.00	56.11
	Electrical Equipment	128.80	92.14	19.28	12.29	109.7	80.00
	Automotive	135.80	77.71	62.28	17.29	73.71	60.57
	Consumer Goods	156.20	117.95	50.68	28.28	105.50	89.79
	Metal	137.40	126.25	50.30	44.00	87.15	82.25
	Agriculture	154.00	86.50	107.5	26.00	46.50	63.00
Average		140.40	106.58	53.05	27.83	87.35	78.78
Defensive industry	Power	144.70	150.90	100.00	89.10	43.90	61.70
	Food-Beverages-Tobacco-Alcohol	104.50	117.86	40.20	36.00	64.32	81.76
	Textile	209.09	165.42	115.63	65.50	93.54	100.00

Industrial Classification	Industry Group	TDNW ratio (Mean %)		LTDNW ratio (Mean %)		STDNW ratio (Mean %)	
		Phase I (2008/09 to 2012/13)	Phase II (2013/14 to 2017/18)	Phase I (2008/09 to 2012/13)	Phase II (2013/14 to 2017/18)	Phase I (2008/09 to 2012/13)	Phase II (2013-14 to 2017/18)
	Retail/Wholesale	96.16	88.93	34.31	21.92	62.68	66.85
	Wood	199.00	132.50	82.50	32.50	116.50	99.00
	Miscellaneous	144.00	161.00	8.00	31.00	135.00	130.00
	Average	135.65	128.66	66.45	48.14	69.37	80.42

As depicted in Table 4, during Phase I (2008/09 to 2012/13), the Cyclical industry has the highest average of 140.40% of TDNW, followed by the Defensive industry with an average of 135.65% and last stands the Growth industry with an average TDNW of only 85.35%. However with respect to the LTDNW ratio the Defensive industry utilises maximum debt with an average LTDNW of 66.45%, followed by the Cyclical industry at an average of 53.05% and the Growth industry using minimum debt with an average LTDNW of 38.68%. A preference similar to TDNW is witnessed for Short term debt with the Cyclical industry utilising maximum short term debt with an average of 87.35% followed by the Defensive industry at an average of 69.37% and the Growth industry being the least debt oriented stands at the lowest average of STDNW at 46.8%.

However, in Phase II (2013/14 to 2017/18), the maximum average of TDNW ratio is that of the Defensive industry at 128.66%, followed by the Cyclical industry with an average TDNW of 106.58%, and last the Growth industry with an average of 65.12%. The same sequence of preference for debt is seen for both LTDNW and STDNW. Average LTDNW is 48.14%, 27.83% and 20.94% for Defensive, Cyclical and Growth industries respectively. The average STDNW is 80.42%, 78.78% and 44.28% for the three industries respectively.

ANOVA and Welch ANOVA – Investigation of Significant Differences in Debt Ratios Across Industries

Our results indicate that the choice of capital structure is affected by the nature of the industries in both phases. To test whether the Capital structure choice of industries varies, One way ANOVA during Phase I and Welch ANOVA in Phase II were applied for all the debt ratios. The results are presented in Table 5.

Table 5: ANOVA and Welch ANOVA During Phases I and II

Phase I (ANOVA results)						
		Sum of Squares	df	Mean Square	F	p
TDNW	Between Groups	10.608	2	5.304	7.018	0.001
	Within Groups	127.724	169	0.756		
	Total	138.333	171			
LTDNW	Between Groups	2.122	2	1.061	3.793	0.024
	Within Groups	47.270	169	0.280		
	Total	49.392	171			
STDNW	Between Groups	4.844	2	2.422	7.452	0.001
	Within Groups	54.930	169	0.325		
	Total	59.774	171			

Phase II (Welch ANOVA results)					
Welch	Statistic	df1	df2	p	
TDNW	11.224	2	109.454	0.000	
LTDNW	6.105	2	105.845	0.003	
STDNW	10.157	2	110.777	0.000	

From Table 5, it is evident that there is a significant difference in the capital structure choices of various industries during Phase I as TDNW, LTDNW and STDNW are significant at 5% level. In Phase II also it is evident that at least one of the industry's capital structures is different from that of other industries. These findings lead to the acceptance of Hypothesis 1 in each time period.

Tukey and Games Howell Post Hoc Tests: Pair Wise Comparison

As differences exist between the capital structures of various industries both in Phase I and Phase II, to determine which particular industry varies from other industries, the Tukey post hoc test was applied in Phase I and the Games Howell post hoc test in Phase II. Table 6 presents the results.

According to Table 6, the Growth industry category has significant differences from the Cyclical and Defensive industries at 5% level of significance with respect to TDNW ratio during Phase I. Further, the results show that the Growth industries use lesser total debt as compared to the Cyclical and Defensive industries during Phase I. The results further indicate that Defensive industries are significantly different from Growth industries in the case of LTDNW ratio at 5% level of significance with Defensive industries using more long-term debt compared to

Growth industries. As far as the STDNW ratio is concerned, Growth industries are different from the Cyclical industries at 5% level of significance, with Cyclical industries using more short-term debt compared to the Growth industries.

Table 6: Results of Tukey and Games Howell Post-Hoc Tests during Phase I and II

Capital Structure ratios	(I) Industry	(J) Industry	Mean Difference (I-J)	<i>p</i>
Phase I (Tukey post hoc results)				
TDNW	Growth	Cyclical	-0.550447	0.002
		Defensive	-0.503007	0.008
LTDNW	Growth	Defensive	-0.277670	0.018
STDNW	Growth	Cyclical	-0.405502	0.000
Phase II (Games Howell post hoc results)				
TDNW	Growth	Cyclical	-0.41461	0.001
		Defensive	-0.63539	0.000
LTDNW	Defensive	Growth	0.27198	0.002
		Cyclical	0.20309	0.027
STDNW	Growth	Cyclical	-0.34505	0.001
		Defensive	-0.36138	0.001

During Phase II, the Growth industry category shows significant differences from the Cyclical and Defensive industries at 5% level of significance with respect to the TDNW ratio. The results also indicate that Growth industries use lesser total debt compared to Cyclical and Defensive industries during this phase. The results further indicate that Defensive industries are significantly different from Growth and Cyclical industries in terms of LTDNW ratio with the Defensive industries using more long-term debt compared to Growth and Cyclical industries. In the case of the STDNW ratio, Growth industries are different from the Cyclical and Defensive industries at 5% level of significance. They are using less short-term debt compared to both Defensive and Cyclical industries.

Debt Ratios: Differences in Industries Between the Two Time Periods

Within the industry categories, mean debt ratios show a variation between the two time periods considered in the study. To test the significance of variations in the three gearing ratios between Phase I and Phase II within each category of industries classified on the basis of business cycles, the Paired *t*- test was employed at 5% level of significance. The results are reported in Table 7.

Table 7 reports statistically significant differences in the mean total debt ratios between Phase I and Phase II in the case of Growth, Cyclical and Defensive industries. The mean long term debt ratio is also seen to be significantly different between Phase I and Phase II in the case of Cyclical industries. These significant differences confirm the acceptance of Hypothesis 2. These significant variations across the two time periods show that, over time, there is variation in the leverage levels within categories of industries classified on the basis of business cycles. However, Hypothesis 2 is not accepted in the case of short term debt ratios because no significant differences in the short term debt ratios are exhibited between the two time periods in any of the three industry groups.

Discussion

In this study Phase I was a post-recessionary period where the economy was recovering from low to high. The mood of the economy is evident in the debt structure of the industries. Cyclical industries which are sensitive to business cycles (Asinas, 2018) seemed to have geared up their total debt content through a greater orientation towards raising short term debt (Gertler & Gilchrist, 1993). They are reluctant to get into long term debt to escape from any encumbrances arising out of revenue loss due to volatility in their earnings and slump in demand due to contraction of discretionary income with people during economic downswings. Even banks are unwilling to lend to such organisations for a longer period due to the inherent risks attached to these industries (Becker & Ivashina, 2014). However, Growth industries as per their nature prefer to use other sources of finance, i.e., equity, as there are no redemption pressures in the case of these sources of finance such as equity (Pandey, 2015).

During Phase II, the Indian economy witnessed macro upheavals in the shape of the sudden demonetisation of the Indian currency in November 2016 and the enforcement of GST in July 2017. These created many teething problems in terms of declining GDP and plunging the Indian rupee against the US dollar from its previous levels (Tyagi et al., 2019). Therefore, the Cyclical industry reduced its debt usage in anticipation of the cyclical movement of the economy (Sikveland & Zhang, 2020). The Defensive industry which caters to necessities and has inelastic demand remains least affected by these tremors (Asinas, 2018). Due to lesser business bankruptcy risks and steady earnings in this industry, banks and financial institutions are also willing to finance them for a longer period (Asinas, 2018). Therefore, they have used the cheaper source of debt in their capital structure. Growth industries once again are not sure of their revenues and avoid using risky sources such as debt which have fixed repayment schedules. Longer gestation time in growth industries restricts their use of debt in all economic conditions (Gaver & Gaver, 1993).

Table 7: Results of Paired Sample *t*-test

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		<i>t</i>	df	<i>p</i> (2-tailed)
				Lower	Upper			
Growth industries								
Pair 1 (TDNW Phase I – TDNW Phase II)	0.13063	0.42861	0.05779	0.01476	0.24650	2.260	54	0.028
Pair 2 (LTDNW Phase I – LTDNW Phase II)	-0.07675	1.41175	0.19036	-0.45840	0.30490	-0.403	54	0.688
Pair 3 (STDNW Phase I – STDNW Phase II)	-0.02497	0.38851	0.05239	-0.13000	0.08006	-0.477	54	0.635
Cyclical industries								
Pair 1 (TDNW Phase I – TDNW Phase II)	0.23285	0.43258	0.05494	0.12300	0.34271	4.239	61	0.000
Pair 2 (LTDNW Phase I – LTDNW Phase II)	0.30161	0.67110	0.08523	0.13118	0.47204	3.539	61	0.001
Pair 3 (STDNW Phase I – STDNW Phase II)	0.06847	0.44451	0.05645	-0.04442	0.18135	1.213	61	0.230
Defensive industries								
Pair 1 (TDNW Phase I – TDNW Phase II)	0.23785	0.40375	0.05494	0.12765	0.34805	4.329	53	0.000
Pair 2 (LTDNW Phase I – LTDNW Phase II)	0.20267	0.74209	0.11099	0.00012	0.40522	2.007	53	0.050
Pair 3 (STDNW Phase I – STDNW Phase II)	-0.03263	0.48020	0.06535	-0.16370	0.09844	-0.499	53	0.620

Another noticeable finding is that during Phase I all debt ratios are higher as compared to Phase II with a marginal difference in Phase II with respect to the Defensive industry only. It definitely highlights that time is a big factor. During Phase I, the economy was resuscitated from the ill effects of the recession. New Companies Act, 2013 also strengthened the debt market in the country by incorporating rigorous provisions concerning the protection of creditor rights (Hazarika, 2014). Therefore industries preferred to use the cheaper source of finance, i.e., debt, during this phase. But in Phase II, economic upheavals in the form of demonetisation in 2016 and GST implementation in 2017 created indecisiveness and uncertainty in the economy leading to low levels of debt. Banks too became vigilant with the changes in times. They decelerated their lending due to an uncertain business environment fearing even rising non-performing assets. Also, in emerging economies like India, investment by institutional investors such as insurance and pension funds in long term debt, which is a key to the development of the bond market, is much smaller as a proportion of GDP (Turner, 2002). Therefore, these institutional deficiencies in terms of underdeveloped bond markets too seem to be the reason behind corporate deleveraging (Chauhan, 2017). Given these reasons, a decline in debt ratios is observed during Phase II.

On the whole, both Defensive and Cyclical industries in India are seen to be debt oriented in both phases. They imply that these industries prefer to raise funds through debt over equity. Pecking Order Theory (POT) by Myers and Majluf (1984) also affirms the preference of external debt over external equity for financing investments. Therefore, POT seems to be applicable in the case of these industries. Our results are commensurate with studies by Ramulu (1993) in the Indian context, Bowen et al. (1982) and Bradley et al. (1984) in the US context as these studies evidenced greater leverage in the case of Defensive industries namely the 'Textile and Power' industry. The results with respect to Defensive industries are also in line with Goveas (2004) that witnessed a greater inclination towards debt in the case of the 'Food-Beverages-Tobacco-Alcohol' industry. However, these results are in contrast to Belkaoui (1975) who witnessed a low debt ratio in the 'Food' industry. Similarly, the results with respect to Cyclical industries also coincide with the findings of Ambadkar (2010), Manjule (2014), Rastogi et al. (2006), and Yam (1998) with respect to the construction industry, which is a Cyclical industry. Das and Roy (2007) also endorsed our findings while working on the cement industry, one of the Cyclical industries. Low debt ratios in the Growth industries are consistent with Myers (1977) because underinvestment by equity shareholders makes new issues of debt more expensive. This increase in the purchase price of debt is a sort of agency cost of debt which

lowers the proportion of debt in the capital structure of firms. Low leverage ratios in the case of Growth firms corroborate with the findings of the study by Abor (2007) and Manjule (2014) who worked on the IT industry in India. The findings of Rastogi et al. (2006) in the case of the Services industry and Ilyas and Raju (2017) for the Pharmaceutical industry too are in line with our results. The results of Gaver and Gaver (1993) on US firms and Akhtar and Oliver (2009) on Japanese firms also corroborate our findings with low leverage in Growth industries.

Conclusion

The current study adds to the literature by providing a novel understanding of capital structure decisions by employing a new approach. The study substantiates the importance of business cycles in capital structure decisions by providing an understanding of the leverage ratios of three industrial groups classified on the basis of business cycles. Prior literature overlooked this crucial issue and mainly emphasized the examination of leverage ratios of industries grouped on the basis of their product types (Devi, 1992; Ramulu, 1993; Rastogi et al, 2006; Das and Roy, 2007; Manjule, 2014; Ilyas and Raju, 2017). As economic conditions such as boom and recession have a bearing on the leverage levels of firms, the current study analysed and compared the leverage ratios at a more aggregate level of categories based on business cycles. The findings indicate significant variations in various debt ratios of the industries classified based on business cycles during each phase considered in this study with Cyclical industries favouring debt over equity in Phase I and Defensive industries favouring debt over equity in Phase II. More debt usage as compared to equity in the case of Defensive and Cyclical industries exhibits the applicability of the Pecking Order Theory in these industries. Disparities in total and long term debt ratios in these industries during both the time phases mark the importance of the time factor in leverage decisions

Managerial Implications

This has some important theoretical and managerial implications. First, significant variations in the debt ratios of Growth, Defensive and Cyclical industries in India suggest that the decisions pertaining to capital structure should be made considering the business cycles in the economy. The traditional rules of thumb may not hold steadfast in the changing business environment. A firm must plan its capital structure considering the dynamic business environment. Leverage should be used as a tool to counter business environmental fluctuations not as a standard or norm to follow. Secondly, the findings reveal varied debt ratios of three industrial groups

during different time periods. The deceleration of leverage ratios in Phase II as compared to Phase I reaffirms that firms while deciding their capital structure scrutinise the changes in environmental forces during different time periods. Therefore, in order to stimulate growth of the corporate sector, the government must keep its eye on the economic expansion and downfalls and plan its monetary and fiscal policies accordingly. For instance, by reducing interest rates in its monetary policy, the government may make the availability of cheaper debt to the corporate sector. This may encourage investments in high valued projects by the corporate sector which increases firm value. Thirdly, when making financial decisions, corporate managers and industrialists should not only consider the nature of the product but also take into account changes in the business environment that bring cyclical fluctuations. Leverage is a double-edged sword and must be considered prudently considering whether the industry is a growth/cyclical or defensive industry. Fourthly, managers are advised not to follow the same capital structure patterns at all times. Instead, they should proactively make leveraging decisions to sustain in changing business environments. Finally, the Government should formulate its policies in a way that ensures enough availability of debt capital to all industries during changing business environments. This requires reinforcement of the bond market in the country that can be achieved by creating awareness about the debt instruments among investors and also by taking relevant steps for ameliorating the creditor rights in the country.

Limitations and Scope for Future Research

The current study evaluates the leverage ratios adopted by three groups of industries classified based on business cycles in India. Since each country has its unique business as well as institutional environment, the results of our study may not be applicable to industries from other nations as well. Therefore, similar work can be extended to the industries from other developed and developing nations. The empirical analysis in this study is restricted to the calculation of debt ratios only. Future work may be carried out to identify the causes of varied leverage levels of these industries by examining factors determining the debt structure of these industries. Even with the above limitations, this study in its current form significantly contributes to the extant literature.

Declaration of Conflicting Interests

The authors declared no potential conflict of interest with respect to the research, authorship, and publication of this article.

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