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Is the PEGY ratio better than PEG ratio to measure return premium? A case of the Indian Banking sector

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ABSTRACT
Purpose: This study is an attempt to examine whether the return premium promised by Peter Lynch using PEGY benchmark (P<1 & P>0) has any value addition to the banking sector in India over PEG benchmark. The study tests the relationship between the return premium using PEGY, PEG ratios and the Indian banking sector. This study also examines the relationship between PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking sector. Design/methodology/approach: The paper analyses all the banking companies listed on the NSE-500 for the last 20 years, from March 2000 to March 2020. The study used CAPM regressions and is carried out on each portfolio using the common "excess return" form of the single-factor model equation to examine the existence of a full sample period as well as two sub-period return premiums. Findings: The empirical findings of the study indicated that there is a statistically significant difference in PEGY and PEG benchmark returns. The results also suggest that there is a positive monthly return premium in PEGY1 sorted portfolio both in the full sample as well as two sub-sample periods. Results of this study confirmed that the PEGY sorted portfolio is better than the PEG sorted to measure the return premium in the Banking sector. This research study also claims that there is no significant relationship between the PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking sector.

Keywords – Return premium, PEGY ratio, PEG ratio, CSR, Indian Bank sector, Portfolio management, Single-factor model

1. INTRODUCTION

The selection of stock for an acceptable investment is a challenging job on the part of investors. Each investor must carry out a certain analysis before investing in securities. Analysis of the PEG ratio is amongst the most promising tools that investors have used to evaluate stocks that the investment can be made. The PEG ratio is a reasonable indicator of the valuation of the stock market. Good investment decisions may be made if the ratio is accurately measured. Business is never the same. Comparisons between certain companies that are different in terms of their goods, services, business cycle and policy. For such a case, the PEG ratio makes it possible to measure the performance of the companies as promised by Lynch (1989). Peter Lynch is America's number-one fund manager—an investment advisor to Fidelity Investments—and a former leader of the *Fidelity Financing Executive Committee*.

His investment mantra: *"Average investors can become masters in their field and can pick up winning stocks as efficiently as Wall Street practitioners by just doing a little investigation of fundamental ratios"* (Lynch, 1989). Since Lynch (1989) popularised the usefulness of the PEG matrix as a valuation instrument, there has been a continuous debate among analysts about PEG benchmark (I'Ons & Ward, 2012; Trombley, 2008).

There are different types of companies, some companies are highly growth-oriented and also young, some companies are mature and slow growth but consistently paying capital to shareholders in the form of a dividend. It is important to know, which valuation matrix can provide an appropriate solution to sort both types of stocks. Experts have indicated that it may be possible to sort those stocks by a single matrix PEGY (Price/earnings-to-growth and dividend yield) ratio (Lynch, 1989 pp. 190; Rothchild, 1994).

PEGY is a revised form of the famous PEG ratio, that accounts for dividend income. PEGY valuation matrix makes it much easier for stock investors to evaluate the returns of mature as well as newly formed high-growth firms. The PEGY valuation matrix, founded by value investor Peter Lynch, was proposed to help equity investors to predict future earnings of the stocks based on the historical performance of the companies (Lynch, 1989).

To illustrate: valuable firms can repay most of their earnings to shareholders in the form of dividends. This sometimes gives rise to the misconception that the firm is growing slowly when, in reality, investors are receiving large payments. When this happens, the PEG ratio is not sufficient to assess whether a company is properly valued. In other words, the PEG ratio may give the impression that these stocks are overvalued and should be avoided if they could deliver significant cash payments that the measure may not recognize.

There are two ways to use PEG and PEGY ratios as valuation ratio for stock selection and investment process. The first way is focusing a value investing style by sorting low PEG and PEGY stocks as value investors and the second way are focusing a growth investing style by sorting high PEG and PEGY stocks as growth investors. But this paper focuses both on values as well as growth stocks by sorting the stocks using a balanced approach. The balanced approach is also called GARP (growth at a reasonable price) approach developed by Lynch (1989) and also examined by quantitative and factor research (Rabener, 2019) as well as used by IG Index U.K. (See, https://www.ig.com/uk;Grech, 2008).

This study examines whether the return premium promised by Peter Lynch using Price/earnings-to-growth and dividend yield (PEGY) benchmark ($P<1$ & $P>0$) has any value addition to the banking sector India over PEG benchmark. This research study is intended to contribute to the academic literature with this research paper by exploring the relationship between the return premium in the context of an emerging market using PEG & PEGY ratios and the Indian banking stocks.

objective of this research study is to show the relationship between PEGY, PEG sorted portfolio returns and Corporate Social Responsibility (CSR) activities in the Indian Banking Sector. Several research studies show that the CSR and firm profitability are positively significant and also indicated that firms can enhance financial performance and return on equity by integrating CSR activities (Cai et al., 2012; Chang et al., 2018; Cheng et al., 2014). Corporate Social Responsibility (CSR) is part of effective corporate sustainability and must be adapted to socioeconomic opportunities and financial globalization (J. Zhang, 2016).

The authors also suggested that CSR is some part of the intangible assets of the companies. Daniel et al. (2001) developed a model and suggested that the excess returns should be greater for all those equities with a greater percentage of intangible assets and social activities of the companies. The authors also indicate that the value effect is found to be greater for those industries which have spent a higher proportion of intangible assets and social activities. Banko et al. (2006) suggested that the financial performance and profitability of companies are highly associated with value premium. The authors also suggest that firms with higher ROA can substantially generate a positive value premium across the majority of the industries. Several research studies claim that the financial performance and stock returns are associated with CSR activities, therefore, this research study is intended to explore the relationship between the PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking sector.

1.1 Overview of the Indian Banking sector

According to the Reserve Bank of India (RBI), the Indian banking industry is excellently profitable and well-governed. The monetary and fiscal situation in the country is much higher than any other country in the world (*https://www.ibef.org/industry*). Studies on credit, operations and financial leverage have also shown that banks in India are probably stable and have well managed to survive the global recession. The Indian banking sector has recently encountered the launch of banking services models such as deposit and commercial banks. The reforms suggested by RBI may go a long way to improve and restructure the national banking system. In addition to the state-owned banks, the Indian banking industry/sector, according to the Reserve Bank of India, has 20 public banks, 22 private commercial banks, 44 foreign banks, 44 rural banks, 1,542 cooperative banks, and 94,384 other local cooperative banks. As of 31 January 2020, the total number of ATMs in India has grown to 210,263 and is expected to grow to 407,000 by 2021 (*https://www.ibef.org/industry*).

A recent study documented by Kumar & Singh (2020) shows that the banking sector has yielded better returns as compared to other sectors as a comparative analysis of all sectoral indices. The value effect analysed by Tripathi & Aggarwal (2020) documented that the banking sector has performed higher positive excess return both in pre-and post-financial crises of 2007-08 by sorting stocks with the PB ratio. Several factors contribute to considering the banking sector as a case study. First, during the 1990s, India underwent liberalisation of the banking sector intending to improve efficiency, productivity and profitability (Ghosh, 2011). Second, the banking system underwent a major evolution, driven by the need to create an economy, sustainable economic system to boost the greater potential for capital market investment and increase economic growth (Government of India, 1998).

Why Case study on Banking sector of India to test the PEGY valuation matrix to measure the return premium.

Table-1 Comparative performance analysis of the major sectors of India data as on July-2020

Descriptive Statistics (Sectoral performance of the NSE)									
Sectors	N (Month)	Range	Minimum	Maximum	Sum	Mean (Average Monthly)		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
NIFTY_AUTO	198	62.052%	-31.470%	30.582%	264.900%	1.338%	0.563%	7.928%	0.628%
NIFTY_BANK	244	78.854%	-34.319%	44.535%	396.927%	1.627%	0.591%	9.231%	0.852%
NIFTY_COMMODITIES	198	74.174%	-32.431%	41.743%	185.762%	0.938%	0.591%	8.312%	0.691%
NIFTY_CONSUMPTION	174	40.226%	-22.340%	17.886%	182.189%	1.047%	0.439%	5.794%	0.336%
NIFTY_ENERGY	114	36.764%	-18.510%	18.254%	72.085%	0.632%	0.581%	6.199%	0.384%
NIFTY_FINANCE	198	75.181%	-31.321%	43.860%	312.397%	1.578%	0.637%	8.969%	0.804%
NIFTY_INFRA	116	42.791%	-21.611%	21.180%	13.239%	0.114%	0.635%	6.835%	0.467%
NIFTY_IT	244	128.343%	-90.128%	38.214%	134.929%	0.553%	0.718%	11.217%	1.258%
NIFTY_MEDIA	175	79.983%	-37.754%	42.230%	112.027%	0.640%	0.699%	9.247%	0.855%
NIFTY_METAL	198	90.119%	-38.997%	51.122%	214.422%	1.083%	0.794%	11.177%	1.249%
NIFTY_MNC	244	46.182%	-24.391%	21.791%	260.724%	1.069%	0.391%	6.113%	0.374%
NIFTY_PHARMA	234	54.347%	-24.380%	29.967%	293.335%	1.254%	0.420%	6.432%	0.414%
NIFTY_REALTY	116	73.019%	-37.444%	35.575%	6.725%	0.058%	1.010%	10.883%	1.184%

Table 1 presents the performance of the major sectors listed on National Stock Exchange India. This comparative analysis presents how the banking sector of India is different than other sectors in the term of monthly average returns. Based on the available data, the descriptive statistics of the banking sector were compared with those of other sectors. Beating the banking sector index with a particular method is not easy because the monthly average return of Nifty Bank Index is 1.627% which is higher than other sectors like Nifty Finance which is 1.578%, Nifty Auto is 1.338%, Nifty Pharma is 1.254%, Nifty MNC is 1.089%, Nifty Metal is 1.083%, Nifty consumption is 1.047% and Nifty Commodities index is 0.938% and so on, over the different observations period that is presented in Table 1. When it comes to range statistics, Nifty bank index has 78.854% which is (averagely) higher than other sectors. This is the reason choose the banking sector to test whether the PEGY ratio is better than PEG ratio in measuring the stocks return in India. If PEGY matrix can beat the Nifty Bank market index then investors can use the PEGY matrix to select the stocks for other sectors also. Moreover, using the market model to test the results of PEGY and PEG portfolios, it was also found that the results from ANOVA for the Banking sector are statistically significant at 5% level.

The structure of the paper would be arranged as follows. Unit 2 gives the overview of related literature; unit 3 gives the details of the research methodology; unit 4 presents the evidence from analysis; unit 5 discussion and provides the conclusion and remarks.

2. LITERATURE REVIEW

2.1 PEG and PEGY ratios

Value investment was associated with the principle of Benjamin Graham, the father of security analysis. It was outlined in Graham's 1949 *"The Intelligent Investor"*. One of the most famous financial ratios is the price-to-earnings (PE) ratio, where the focus was on stocks with a low price-to-earnings ratio for the selection of undervalued securities. Several research studies have suggested that PE ratio is an effective tool and strongly associated with stock valuation process (Basu, 1977; Breen, 1968; L. K. C. Chan et al., 1991; Fama & French, 1998; Haim, 1985; Peavy & Goodman, 1981; Senchack & Martin, 1987). However, the approach to stock selection based on a low price-to-earnings ratio has been questioned as to how many companies have problems with earnings growth. (Schnabel, 2009; Trombley, 2008).

The value investor Peter Lynch popularized the PEG (price/earnings-to-growth) ratio by adding earnings growth in an attempt to improve the limitation of the P/E ratio (Schnabel, 2009). This leads to a method by which business growth is integrated into the analysis (P. D. Easton, 2004). McMillan (2019) reported that the PEG ratio enables comparisons between companies with earnings growth as high growth stocks would have a higher P/E but are not fundamentally overvalued as compared to low growth stocks. In this setting, a high PEG, wherein the company might have a premium price comparative to the fundamentals, was being related to negative coefficient and lower expected future return. L. H. Chan (2019) and Jiang & Kang (2020) find that that the PEG matrix is a reasonable indicator for the share price, more adaptive and convenient, and this may be used to predict the future value of stocks as well as EPS growth.

Easton (2004) argues that a modified version of the price-to-earnings (PE) ratio is the price/earnings-to-growth (PEG). The form of the PEG ratio takes account of short-term earning's growth differences to give a higher ranking than that of the PE ratio as a valuation tool for the stock selection process (Hidayat & Hendrawan, 2017; Le et al., 2018; Wang et al., 2020). Maneesilasan (2011)documented a study on growth at a reasonable price (GARP) by buying stocks based on the price/earnings-to-growth (PEG) ratio, assuming that the rate of growth in earnings generated by the company at the end of the year was equal to the rate of change in average earnings per share of the previous year. Maneesilasan (2011) also suggested that this strategy can also produce higher returns than the P/E ratio. Sun (2001) analyzed the growth at a reasonable stock price as a balanced approach to exploring the relationship between the PEG ratio and the stock returns. The author also argues that the return on equity investment with a high or low PEG ratio generated a lower return on equity investment with the average PEG ratio as suggested by the Lynch benchmark ($P<1$ & $P>0$).

P. Easton et al. (2002) provided a model for evaluating the expected growth of the company of PEG-based returns and suggested that the excess return was substantially related to the level of the PEG ratio. They also noted that the PEG ratio was a reasonable first-line tool for estimating the expected returns. Meher & Sharma (2015) researched with the selected stocks from automobile companies from the Indian stock market and argue that the PEG ratio has generated a superior return than a simple price-to-earnings ratio. They also suggested that the PEG ratio is reliable not only for automobile companies but for other companies as well. A research study documented in Taiwan stock market from 2000 through 2010 suggested that the value investing strategy with the approach of growth at a reasonable price (GARP) as a balanced approach of investing, using PEG as valuation ratios have produced a superior return than the pure growth stock portfolios over the examination period (Hodnett & Hsieh, 2012). A research study conducted on the Thai Stock Market to determine whether the value investment approach based on the PEG ratio could be applied to stock selection and investment process. His research findings suggest that the PEG ratio produced a higher yield than the market return during the 1999 to 2010 period (Sareewiwatthana, 2012).

Lynch (1989) suggested that the criteria use of the PEG multiplier indicated that a company is fully valued while its current P/E ratio (approx.) its short-run rate of earnings growth, PEG equals 1.0 and that stocks priced at PEG less than 0.5 are more likely to be undervalued, whereas equities price with PEG more than 2.0 are probable to be overpriced. Several research studies have concluded that the PEG ratio equal to 1 or, less than 1 is intended as a benchmark for the PEG stocks, but Peters (1991) argues that to properly apply the PEG ratio as a benchmark for the determination of under-/overvalued stocks, the conventional benchmark of 1 is not sufficient, the benchmark should be customized because of the benchmark of the PEG ratio that could be different for one Industry to another Industry. Trombley (2008) and Schnabel (2009) both challenge Lynch's (1989) benchmarks and empirically demonstrated that the PEG metric can be improved by incorporating the cost of capital and other factors. Trombley (2008) also acknowledges that higher PEG matrix can be used for fairly low growth stocks that do have low operating costs or PEG = 1.0 may suitable for measuring of high growth and high-risk businesses. But this matrix cannot be used to look at the different type of business/industries.

Estrada (2005) developed a new valuation tool called the PERG ratio, that adjusts the price-to-earnings (PE) ratio by both growth and risk. His research results show that the portfolio sorted by PERG outperformed both P/E and PEG sorted portfolios. Many investors have accepted the PEG ratio as a stock valuation tools, although others point to the shortfalls in its usability. A recent survey on PEG ratio suggested that 22 out of 43 fund managers used PEG matrix as a valuation tool to select the undervalued stocks (Trombley, 2008).

The interesting facts about the PEG ratio were found in the above-mentioned literature review and this paper, it is intended to introduce the new ratio-PEGY ratio (developed by Lynch, 1989) as a valuation ratio for the Indian Bank sector. PEGY ratio represented as Price/Earnings-to-growth and dividend yield. This is an adjusted version of the PEG ratio. It works for both slow-growing companies (for example Blue-chip stocks) that provide capital to shareholders in the form of dividends and other companies record high-growth, but do not pay the dividend yield.

The formula for PEGY ratio:

P/E ratio/ (Earnings growth rate plus Dividend Yield) (Lynch, 1989 Pp. 190)

In Chapter 13 and page no 190, Peter Lynch in his book ***"One Up on Wall Street"***, Some Fabulous statistics, Peter Lynch introduced the PEGY ratio (a variant of the PEGY ratio) and suggested the benchmark as a stock with a PEGY ratio greater than 1 as a poor and a stock with PEGY ratio less than one or 1 as a reliable, measured for stock selection for value investing strategy. Peter Lynch used the tool to look for chip stocks with a PEGY ratio less than 0.5 and also mentioned that stock with a PEGY ratio less than one-third as a fantastic measurement for the stock selection process (Lynch, 1989).

Both the PEGY ratio and PEG ratio are modifications form of the P/E ratio. Lynch has also mentioned that using the PEGY ratio, investors can find undervalued and growth stocks by using the single ratio as compared to other valuation ratios such as P/E and PEG. Surprisingly, it was found after reviewing literature that there is no comprehensive study done using the PEGY ratio as a valuation tool for the stock selection process. Therefore, it is intended to test the relationship between the return premium using PEGY, PEG ratios in the Indian Banking sector.

2.2 CSR and Stock Returns

In the context of stock returns and activities of CSR, this research study also intended to explain the possible explanation to show the relationship between the stocks return using PEGY and PEG ratios and CSR activities in the Indian Banking sector. In academic research, several research studies reported that there is a significant and positive relationship between CSR contribution and firm profitability and stock returns (Hart & Ahuja, 1996; King & Lenox, 2017; Klassen & McLaughlin, 1996). A recent study reported by Antonio et al. (2018) suggested that sustainable and socially-oriented value firms produce excess returns as compared to those firms that are not involved in CSR activities.

While several research studies show that there is a significant link between the CSR and the firm's financial performance and stocks return (Golicic & Smith, 2013; Hart & Ahuja, 1996; King & Lenox, 2017; Klassen & McLaughlin, 1996; Michael & Paul, 1997; Statman & Glushkov, 2011), the number of experts have also shown the negative relationship between the CSR and firm's profitability and stocks return (Brammer et al., 2006; Gregory, A; Whittaker, 2013; Khanna & Damon, 1999; Wagner, 2005). Endrikat (2016) argues that this mismatch of research results can sometimes result from problems of effective validity between the various measures used to define the specified control variables, as well as the timelines, used it to conduct the econometric model.

Another empirical research shows that a significant level of commitment to CSR is related to higher returns on equity and financially strong firms (Chang et al., 2018; Karagiorgos, 2010). And another different perspective was also documented by Zhang (2016) who suggested that the relationship between financial performance, stock returns and CSR varied by sector because the CSR activities depend on the nature of the firms. Some recent research studies show that the CSR and firm profitability are positively significant and also indicated that firms can enhance financial performance and return on equity by integrating CSR activities (Cai et al., 2012; Chang et al., 2018; Cheng et al., 2014). Another perspective would be that CSR practices are beneficial to optimizing company identity, reducing borrowing rates, improving financial effectiveness, performance and contributing to sustain the firms in the long-term (Y. Zhang et al., 2020). Cumming & Zhang (2016) argued that CSR is effective corporate sustainability that must be adapted to socio-economic opportunities and financial globalisation. The authors also suggested that CSR is some part of the intangible assets of the companies.

Daniel et al. (2001) developed a model and suggested that the excess returns may be greater for all those firms with a greater percentage of intangible assets and social activities. Banko et al. (2006) suggested that the financial performance and ROE of companies are highly associated with an excess return of stocks. The authors also suggest that firms with higher ROA can substantially generate a positive value effect across the majority of the industries.

Several research studies in the above literature survey claim that the financial performance and stock returns are associated with CSR activities, therefore, this research study is intended to explore the relationship between the PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking sector.

3. RESEARCH METHODOLOGY

The objective of this study is to explore whether the return premium promised by Peter Lynch using PEGY benchmark (P<1 & P>0) has any value addition to the banking sector in India over the PEG benchmark. As the methodology, un-adjusted mean excess returns are examined over portfolios and later, to explore the return premium, CAPM regression model was applied on each portfolio using the simple "excess return" version of single-factor Market Model equation similar to Tripathi & Aggarwal (2020).

$$R_{PT}-R_{RFT} = \alpha_P+\beta_P\,(R_{MT}-R_{RFT}) + \mathcal{E}_T \qquad (1)$$

R_{PT} is the portfolio return for the period of T, R_{RFT} represents the risk-free rate of returns which is the cut-off yield on the 91-day treasury bill for the period of T, R_{MT} indicates the market index return for the period of T, α_P refers to an alpha (intercept term) which measure the excess returns of the portfolio, the sensitivity of the portfolio refers to the β_P on the market proxy return, $\mathcal{E}_T$ indicates the error term.

A recent study documented by Tripathi & Aggarwal (2020) suggested that if $\alpha_P = 0$, then the equation is reduced to the CAPM model of Black, Jensen alpha. The capital asset pricing model indicates that the abnormal return on the portfolio is fully explained by the portfolio's excess return on the market index portfolio return. Positive and statistically significant alpha (intercept) implies extra-normal gain, negative and significant alpha indicates a loss. According to the CAPM regression model theory if the CAPM is significantly positive (negative) alpha or intercept than CAPM anomaly exists. Otherwise, CAPM alpha does not measure the returns on the tested portfolio and other analysis.

3.1 Research Questions

The research questions of this paper are to test:

- Whether the PEGY ratio is better than the PEG ratio to measure the return premium in the banking sector of India?
- Whether there is a significant relationship between PEGY, PEG sorted portfolio returns and CSR activities in the Indian banking sector?

3.2 Objectives of the Study

The objectives of this research study are:

- To test the relationship between the return premium using PEGY, PEG ratios and the Indian banking sector.
- To examine whether the return premium promised by Peter Lynch using PEGY benchmark (P<1 & P>0) has any value addition to the Indian banking sector.
- To examine the relationship between PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking sector.

3.3 Research Hypothesis

This study was tested with the followings hypothesis to examine the proposed research questions.

- **H1:** There is a significant relationship between the PEGY, PEG sorted portfolios and the Indian Banking sector.
- **H2:** PEGY ratio is better than the PEG ratio to measure the positive return premium in the banking sector of India.
- **H3:** There is a significant relationship between the PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking sector.

4. DATA COLLECTION AND SAMPLE DESIGN

Data has been collected from the CMIE-Prowess IQ and ACE Equity financial database, those financial databases are a complete and insightful financial database, corporate databases of listed and non-listed firms in India kept up-to-date on the online platform every day with their financial as well as non-financial data. CMIE-Prowess IQ and ACE Equity databases are comprehensive databases that covered the firm level, industry level and business level as well by including all stocks listed on NSE (National Stock Exchange) India. The sample period of the data was from the end of March 2000 to the end of March 2020 because the period before 2000 could not be considered due to the non-accessibility of data in the public database. Reserve Bank of India (https://www.rbi.org.in/) and NSE (https://www.nseindia.com/), websites were used to obtain complete historical closing price and other data.

Other accounting data were collected yearly and the closing price data were collected monthly. For the analysis, all firms with missing data have been excluded from the sample. For the calendar year (t-1), the accounting data for all financial year endings were matched by the returns for April of year t to March of the year (t+1). This matching process ensures that the accounting details are identified before the return on stocks in the following year. This study derives the PEG1 and PEGY1 ratios from the last 1-year EPS growth rate (Trombley, 2008) and Dividend yield. The average earnings growth and dividend yield were calculated for the last 3 years and 5 years to determine PEGY3, PEG3 and PEGY5, PEG5, respectively. All required ratios such as P/E ratio of the year-end as a consolidated priority, EPS growth rate and dividend yield have been collected from the ACE Equity Financial Database.

This study has selected stocks with PEG ratio and PEGY ratio as (P<1 and P>0) below 1 and above 0 as a benchmark of growth at a reasonable price as balanced approach as suggested by Lynch (1989) and IG Index UK (See, https://www.ig.com/uk; Grech, 2008). The sample of stocks included all Indian Bank stocks with market capitalizations of more than $1 billion as similar to Rabener (2019).

To quantify the CSR activities, this paper used the total CSR expenses (*CSR Expenditure incurred as per Companies Act 2013*) spent by the companies during the financial year. Due to the limitation of data accessibility in the public database, it was collected only for last seven years (from March 2014 to march, 2020) from CMIE-Prowess IQ database to show the relationship between stocks return and CSR activities.

As a proxy for the risk-free rate of return, the implicit cut-off yield on the 91-day Treasury bill was used. The 91-day T-bill data was collected from the RBI *Monthly Official Data Handbook* website. The data handbook *(https:/www.rbi.org.in/scripts/BS_PressReleaseDisplay.aspx*) is available on the RBI website. It has rebalanced the portfolios on yearly basis with zero transaction cost strategy which is suggested by Dennis et al. (1995). The sample stocks are rebalanced in April of each year (because of all banks year-end in March of each year as per the bank regulations of India). Until the last year of our sample period, 2019, the portfolio formation process is repeated. For the benchmark index portfolio, it has used the market proxy return of Nifty Bank market (NBM) index. The monthly return was also calculated from March-2000 to March-2020. Finally, the portfolios were designed as equally weighted as suggested by Tripathi & Aggarwal (2020) and LAKONISHOK et al. (1994).

Variables identification:

- Dependent variables:
  - PEGY - (Price Earnings-to-growth and dividend Yield) sorted portfolios
  - PEG - (Price Earnings-to-growth) sorted portfolios
  - CSR Activities - As per CSR expenditure companies ACT 2013 (*Total amount spent on CSR activities during the year*)
- Independent Variable:
  - NBM – (Nifty Bank) Market index portfolio return

For the stock selection process, the valuation ratios such as PEGY and PEG were calculated as suggested by Lynch. The PEGY and PEG ratios were classified into three forms as similar to Lynch (1989), Trombley (2008) and Rabener (2019).

i. PEGY1: To calculate PEGY1, the annualised adj. EPS growth rate and dividend yield (example: for FY 2000-2001, it has used from FY 1999 to 2000) were used.

ii. PEGY3: To calculate PEGY3, the previous three years adj. average EPS growth rate and Dividend yield (example: for FY 2000-2001, it was used from FY 1997-1998 to 1999-2000) were used.

iii. PEGY5: To calculate PEGY5, the previous five years adj. average EPS growth rate and dividend yield (example: for FY 2000-2001, it was used from FY 1995-96 to 1999-2000) were used.

Similarly, the PEG1, PEG3 and PEG5 for the PEG benchmark were also calculated. Only those stock that meets our benchmark (P<1 and P>0) criteria were included in the portfolios. And also, all companies with missing closing prices were removed from the sample. For market capitalization, companies with a market capitalization above $1 billion that is similar to the Rabener (2019) and also suggested by Lynch (1989) were included.

5. DATA ANALYSIS AND INTERPRETATION

5.1 Results from the Descriptive Statistics (full sample period)

Interpretation: Table-2 shows that the findings of descriptive statistics for the full sample period from April 2000 to March 2020. This table shows the equally weighted monthly returns of the PEGY and PEG portfolios. Panel A shows the portfolio results of 1-year EPS growth and dividend yield as PEGY1 and PEG1 portfolios and Nifty Bank Market (NBM) portfolio monthly average returns. PEGY1_rf, PEG1_rf and NBM_rf present the excess return of portfolios and Nifty Bank market portfolio return, after considering the risk-free rate of returns. This study presents the simple average returns, excess returns and average monthly return premiums of 240 (months) observations. The monthly return premium of PEGY1 sorted portfolio is 0.45% which was higher than PEG1 (-0.23%) sorted portfolio. From this analysis, it was found that PEGY1's sorted portfolio has provided higher average returns, excess returns and higher return premium than PEG1's sorted portfolio and market return. Graph 1 shows that PEGY1's sorted portfolio consistently outperformed PEG1's sorted portfolio and benchmark market return over the full sample period.

Moving to Panel B, it shows that the average monthly portfolio returns from 3-years (average) EPS growth and dividend yield assorted portfolios of PEGY3 and PEG3. PEGY3_rf and PEG3_rf present the excess portfolio monthly returns, after considering the risk-free rate of returns that are 1.02% and 1.09% respectively. The monthly return premium, the portfolio of PEG3 (0.02%) was higher than the portfolio of PEGY3 (-0.05%). Graph 2 also indicates that the PEG3 sorted portfolio has provided a higher return than the PEGY3 sorted portfolio, Nifty Bank market portfolio and Nifty-500 market portfolio returns over the sample period.

From Panel C, it was found that the average return of both portfolios (PEGY5 and PEG5) from 5-years (average) EPS growth and dividend yield sorted portfolios have generated fewer returns than the Nifty Bank market index returns. When the performance of the PEGY5 and PEG5 sorted portfolios were compared with the Nifty-500 market index return, these portfolios have produced higher returns for the full-sample period that are also shown in graph-3

Table-2 Results from the Descriptive Statistics

Descriptive Statistics from april 2000 to march 2020 (full sample period)									
Panel-A (1-year EPS grwoth and dividend yield)									
Portfolio	N (Month)	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
PEGY1	240	88.19%	-41.19%	47.00%	**495.25%**	**2.06%**	0.0070	0.1078	0.012
PEG1	240	87.71%	-39.83%	47.87%	**333.14%**	**1.39%**	0.0065	0.1012	0.010
NBM	240	78.85%	-34.32%	44.53%	**387.45%**	**1.61%**	0.0059	0.0919	0.008
PEGY1_rf	240	88.39%	-41.68%	46.71%	**363.19%**	**1.51%**	0.0070	0.1079	0.012
PEG1_rf	240	87.91%	-40.32%	47.59%	**201.08%**	**0.84%**	0.0065	0.1014	0.010
NBM_rf	240	79.05%	-34.80%	44.25%	**255.39%**	**1.06%**	0.0059	0.0921	0.008
R_premium PEGY1	240	45.50%	-19.59%	25.90%	**107.80%**	**0.45%**	0.0037	0.0576	0.003
R_premium PEG1	240	49.47%	-23.57%	25.90%	**-54.31%**	**-0.23%**	0.0043	0.0671	0.005
Panel-B (3-years (average) EPS growth and dividend yield)									
Portfolio	N (Month)	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
PEGY3	240	87.98%	-42.56%	45.42%	**375.80%**	**1.57%**	0.0063	0.0971	0.009
PEG3	240	87.98%	-42.56%	45.42%	**392.52%**	**1.64%**	0.0064	0.0989	0.010
BNM	240	78.85%	-34.32%	44.53%	**387.45%**	**1.61%**	0.0059	0.0919	0.008
PEGY3_rf	240	88.18%	-43.04%	45.13%	**243.75%**	**1.02%**	0.0063	0.0973	0.009
PEG3_rf	240	88.18%	-43.04%	45.13%	**260.46%**	**1.09%**	0.0064	0.0991	0.010
BNM_rf	240	79.05%	-34.80%	44.25%	**255.39%**	**1.06%**	0.0059	0.0921	0.008
R_premium PEGY3	240	41.37%	-24.22%	17.15%	**-11.65%**	**-0.05%**	0.0039	0.0603	0.004
R_premium PEG3	240	46.49%	-23.01%	23.48%	**5.07%**	**0.02%**	0.0040	0.0627	0.004
Panel-C (5-years (average) EPS growth and dividend yield)									
Portfolio	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
PEGY5	228	88.01%	-42.09%	45.92%	**284.77%**	**1.25%**	0.0063	0.0947	0.009
PEG5	228	85.85%	-42.09%	43.76%	**284.75%**	**1.25%**	0.0063	0.0949	0.009
NBM	228	78.85%	-34.32%	44.53%	**362.68%**	**1.59%**	0.0062	0.0934	0.009
PRGY5_rf	228	88.21%	-42.57%	45.64%	**159.22%**	**0.70%**	0.0063	0.0950	0.009
PRG5_rf	228	86.05%	-42.57%	43.48%	**159.20%**	**0.70%**	0.0063	0.0951	0.009
NBM_rf	228	79.05%	-34.80%	44.25%	**237.13%**	**1.04%**	0.0062	0.0936	0.009
R_premium PEGY5	228	37.36%	-23.43%	13.93%	**-77.92%**	**-0.34%**	0.0036	0.0546	0.003
R_premium PEG5	228	36.93%	-23.00%	13.93%	**-77.94%**	**-0.34%**	0.0037	0.0552	0.003

In summary, it is concluded that from Table 2, where investors and portfolio managers have to beat the Nifty Bank Market Index, PEGY1 sorted portfolio is better than PEG1 and other sorted portfolios. Because the PEGY1 portfolio has given a higher positive monthly return premium (0.45%) than PEG1 and other portfolios over the full sample period. This portfolio (PEGY1) also provided consistently higher returns than other portfolios that are also presented in graph1.

5.2 Results from Regression Analysis – using a market model

For full sample period (April-2000 to march-2020)

Table 3 shows the results from regression analysis using the market model equation when monthly excess returns of PEGY and PEG sorted portfolios exceeded the excess return of the market. That indicates the positive and significant alpha as the extra-abnormal returns for each PEGY and PEG sorted portfolio. A recent study documented by Tripathi & Aggarwal (2020) suggested that the positive and statistically significant alpha (intercept) implies extra-normal gain and negative and significant alpha indicates a loss. Applying the same assumption made by Tripathi & Aggarwal (2020) and results from below as presented in Table 3, it shows that PEGY1 sorted portfolio has positive return premium and statistically significant at 5% level. When it comes to adj. R-square value (0.714) which is greater than other sorted portfolios.

Table No 3

Regression results (Return Premium) - using market model

Full Sample period (from april-2000 to march-2020)						Sig.
Portfolio	**Alpha (α)**	**Beta (β)**	**Adj. R Square**	**Durbin-Watson**	**Result**	
PEGY1_rf	0.005	0.845	0.714	2.107	*Positive R_premium*	0.000
t-stat	1.223	24.423				
PEG1_rf	-0.001	0.764	0.581	2.114	*Negative R_premium*	0.000
t-stat	-0.135	18.250				
PEGY3_rf	0.001	0.798	0.636	1.901	*Positive R_premium*	0.000
t-stat	0.309	20.451				
PEG3_rf	0.002	0.787	0.618	1.917	*Positive R_premium*	0.000
t-stat	0.463	19.682				
PEGY5_rf	-0.002	0.832	0.692	1.816	*Negative R_premium*	0.000
t-stat	-0.514	22.588				
PEG5_rf	-0.002	0.829	0.686	1.837	*Negative R_premium*	0.000
t-stat	-0.501	22.272				

Note(s): *Significant at 5% level

This model was found to be strong to explain the return premiums. About Durbin-Watson statistics, it was found to be around 2 and less than 2 for the all portfolios so, it can be concluded that there is no negative auto-correlation between the dependent and independent variables. From the results of the full sample period, PEGY1 (0.5%) sorted portfolio was found to be highly positive monthly return premium as compared to other portfolios such as PEG1 (-0.1%), PEGY3 (0.1%), PEG3 (0.2%), PEGY5 (-0.2%), PEG5 (-0.2) so on.

In overall results of full sample period from April-2000 to march-2020, all six portfolios were found to be statistically significant, but only three portfolios were able to produce the extra-normal profits. In conclusion, as a benchmark (P<1 & P>0) suggested by Lynch (1989), the PEGY sorted portfolios were found to be higher returns premium and also found to be better to measure the return premiums as compared to PEG sorted portfolios in the Banking sector of India.

5.3 Results from the correlations coefficients

For a full sample period

Table 4 shows the linear correlations and describes the strong relationship between the excess returns of Nifty Bank Market index and other sorted portfolios. The 2-tailed Pearson correlations matrix shows the significance at 0.01 level for all six portfolios. Table-4 presented the findings for the full-time sample period, the main objective to run the correlations matrix is to understand the correlations between different sorted portfolios and benchmark portfolio excess returns. The new interesting fact that the PEGY1 sorted portfolio was highly correlated with market index portfolio as compared to other sorted portfolios.

Table 4

Correlations Matirx full sample period (from april-2000 to march-2020)

		PEGY1_rf	PEG1_rf	PEGY3_rf	PEG3_rf	PEGY5_rf	PEG5_rf	NBM_rf
PEGY1_rf	Pearson Correlation	1	.902**	.824**	.816**	.642**	.638**	.845**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000
	N	240	240	240	240	228	228	240
PEG1_rf	Pearson Correlation	.902**	1	.923**	.913**	.728**	.723**	.764**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000
	N	240	240	240	240	228	228	240
PEGY3_rf	Pearson Correlation	.824**	.923**	1	.991**	.828**	.828**	.796**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000
	N	240	240	240	240	228	228	240
PEG3_rf	Pearson Correlation	.816**	.913**	.991**	1	.811**	.811**	.786**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000
	N	240	240	240	240	228	228	240
PEGY5_rf	Pearson Correlation	.642**	.728**	.828**	.811**	1	.998**	.739**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000
	N	228	228	228	228	228	228	228
PEG5_rf	Pearson Correlation	.638**	.723**	.828**	.811**	.998**	1	.735**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000
	N	228	228	228	228	228	228	228
NBM_rf	Pearson Correlation	.845**	.764**	.796**	.786**	.739**	.735**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	
	N	240	240	240	240	228	228	240

**. Correlation is significant at the 0.01 level (2-tailed).

When it compared the results of different sorted portfolios from the Table 2 and Table 4, it can also be concluded that higher correlation represented the high positive monthly return premiums because the PEGY1 sorted portfolios have generated higher positive monthly return premium (see, Table 2) and substantially beating the other portfolios over the sample that are presented in graph 1. Moving to the PEG1 sorted portfolio, the performance of the PEG1 sorted portfolios also found to have a better correlation with market index performance but, less correlated as compared to PEGY1 sorted portfolio. When it comes to the relationship between the PEGY1 and PEG1 sorted portfolios, those portfolios are highly correlated each

other as compared to other sorted portfolios such as PEGY3, PEG3, PEGY5 and PEG5 (see, Table 4).

5.4 Results of the descriptive statistics (Sub-Period Analysis)

For two sub-sample periods (April-2000 to march-2009 and April-2009 to dec-2019)

A recent study documented the sub-period analyse by Fama & French (2020) suggested that the realised value premiums (excess returns) fall from the first sample sub-period to second sample sub-period. Their study also mentioned that the average monthly value premium for the largest value had reduced from 0.37 per cent per month to a modest 0.06 per cent. The smallest stocks average monthly value premium is large 0.59 per cent for 1963-1991, compared to 0.33 per cent for 1991-2019. In a recent study by Tripathi & Aggarwal (2020), they have divided the sampling period into two sub-periods, the first period from 1999 to 2009 and the second period starting from 2009 to 2017. They suggested that the portfolio returns of all six sectors generated positive and significant returns during the sub-period first half sample period. But the situation has changed after the financial crisis because in the second half sub-period only two sectors (out of six) of value premium were found to be positive and statistically significant. The concept of sub-period analysis also motivated by Tripathi & Aggarwal (2020) and Fama & French (2020). In this paper, the complete sample period was divided into two sub-periods, first sub-period (from April-2000 to march-2009, pre-financial crisis 2008-09) and second sub-period (from April-2009 to dec-2019, post-financial crisis 2008-09) as like Tripathi & Aggarwal (2020).

The results of the descriptive statistics for the two sub-periods showed some interesting findings that are presented in Table-5. From panel-A (Table-5) indicated that the results of (sub-period 1) PEGY1 and PEG1 portfolios return. The average monthly return of PEGY1 portfolio was 2.43% which was greater than PEG1 (2.39%) portfolio and NBM (1.72%) index returns. The monthly average return of PEGY1 portfolio has substantially outperformed the PEG1 and sectoral index in both sub-period that are presented in graph 4 and 7. The panel B shows the result of sub-period 2, PEGY1 and PEG1 portfolios return. The average monthly mean return of PEGY1 portfolio was 2.25% which was greater than PEG1 (1.00%) and NBM (1.90%) index portfolio returns. For the PEGY1, PEG1 and NBM portfolios, the percentage change in average monthly returns for sub-periods 1 and 2 is -7.32%, -58.26% and 10.82%, respectively. For both PEGY1 (-51.01%) and PEG1 (-235.22%) portfolios, the percentage change in return premiums for sub-periods (1 and 2) was found to be negative, but the percentage change in return premium of the PEGY1 sorted portfolio is higher than that of PEG1.

Moving to Panel C, it shows that the results of PEGY3 and PEG3 sorted portfolios monthly average returns from sub-sample period 1. Panel D also presents the results for sub-period 2 for PEGY3 and PEG3 sorted portfolios return. When it sorts the stocks with PEGY3 and PEG3 ratios, those portfolios produce the positive excess return and return premium in the sub-period 1, but sub-period 2, both portfolios produce negative excess returns and return premiums that are presented in (Table 3) Panel C and D. The percentage change in return premium for the sub-period 1 and 2 found to be negative for both PEGY3 and PEG3 portfolios, but the percentage change in sub-period of PEGY3 portfolio found to be greater

than PEG3 sorted portfolio. The relationship between the return of both PEGY3 and PEG3 sorted portfolios and market portfolio are presented in graphs 5 and 8. Graph 5 also indicates that the PEGY3 and PEG3 sorted portfolios substantially outperformed the Bank index and Nifty-500 index returns in sub-period 1. But the post-crisis period (sub-period 2), both PEGY3 and PEG3 sorted portfolios underperformed the Nifty bank index return that is presented in graph 8.

For-Panel E, it presents the average monthly returns of PEGY5 (2.04%) and PEG5 (2.05%) sorted portfolios for the sub-period 1 and Panel F, it shows the average monthly returns of PEGY5 (1.01%) and PEG5 (1.00%) sorted portfolios for the sub-period 2. The return premium of PEGY5 and PEG5 sort portfolios found to be positive for the sub-period 1 and negative for the sub-period 2. The performance of the PEG5 sorted portfolio was found to be improved as compared to PEGY5 portfolio because PEG5 portfolio outperformed the PEGY5 and market portfolios in the sub-period 1, but sub-period 2 both portfolios were underperformed the Nifty Bank market portfolio that is presented in graph 6 and 9. When it comes to returns premium of PEGY5 and PEG5 sorted portfolios, sub-period 1, both portfolios were found to be positive and statistically significant and sub-period 2, both portfolios were found to be negative statistically significant.

In summary, Table 4 concludes that if investors and portfolio managers have to beat the Nifty Bank market index and the Nifty-500 index, the PEGY1 sorted portfolios were found to be reliable, measured against the PEG1 and other sorted portfolios, both in the pre-crisis sample period and post-crisis sample period. Because the return premiums of PEGY1 sorted portfolio both sub-period 1 (0.71% p.m.) and sub-period 2 (0.35% p.m.) found to be positive and statistically significant. This portfolio also provided consistently higher average monthly returns than the other portfolios that are presented in graphs 4 and 7.

Table-5 Results from the Descriptive Statistics

Descriptive Statistics *(from april-2000 to march- 2009)*									Descriptive Statistics *(from april-2009 to dec- 2019)*							*Change in sub-period - 1 & 2 (pre & post crisis)*					
Panel-A Pre-crisis Sample preiod - 1 (1-year EPS grwoth and dividend yield)									*Panel-B Post-crisis preiod - 2 (1-year EPS grwoth & dividend yield)*												
	N (month)	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Range	Minimum	Maximum	Sum	Mean	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
PEGY1	108	55.76%	-25.54%	30.22%	**262.71%**	**2.43%**	0.0101	0.1051	129	72.31%	-25.32%	47.00%	**290.83%**	**2.25%**	0.0091	0.1038	29.69%	-0.87%	55.50%	**10.70%**	**-7.32%**	-9.60%
PEG1	108	56.11%	-25.54%	30.57%	**258.10%**	**2.39%**	0.0098	0.1015	129	62.18%	-14.31%	47.87%	**128.69%**	**1.00%**	0.0083	0.0944	10.83%	-43.97%	56.60%	**-50.14%**	**-58.26%**	-14.90%
NBM	108	50.72%	-26.66%	24.05%	**185.64%**	**1.72%**	0.0095	0.0985	129	58.80%	-14.27%	44.53%	**245.73%**	**1.90%**	0.0071	0.0811	15.94%	-46.48%	85.15%	**32.37%**	**10.82%**	-24.68%
PEGY1_rf	108	55.96%	-26.11%	29.85%	**205.78%**	**1.91%**	0.0101	0.1053	129	72.57%	-25.86%	46.71%	**217.16%**	**1.68%**	0.0091	0.1039	29.69%	-0.97%	56.51%	**5.53%**	**-11.65%**	-9.71%
PEG1_rf	108	56.31%	-26.11%	30.19%	**201.17%**	**1.86%**	0.0098	0.1017	129	62.44%	-14.85%	47.59%	**55.02%**	**0.43%**	0.0083	0.0947	10.90%	-43.12%	57.62%	**-72.65%**	**-77.10%**	-14.85%
NBM_rf	108	50.74%	-27.06%	23.68%	**128.70%**	**1.19%**	0.0095	0.0987	129	59.22%	-14.97%	44.25%	**172.06%**	**1.33%**	0.0072	0.0813	16.72%	-44.67%	86.90%	**33.69%**	**11.92%**	-24.60%
R_permium PEGY1	108	30.29%	-11.68%	18.61%	**77.07%**	**0.71%**	0.0057	0.0588	129	45.50%	-19.59%	25.90%	**45.10%**	**0.35%**	0.0050	0.0567	50.21%	67.73%	39.22%	**-41.49%**	**-51.01%**	-11.79%
R_permium PEG1	108	43.96%	-23.57%	20.39%	**72.46%**	**0.67%**	0.0067	0.0696	129	49.03%	-23.12%	25.90%	**-117.04%**	**-0.91%**	0.0057	0.0645	11.52%	-1.90%	27.03%	**-261.51%**	**-235.22%**	-15.28%
Panel - C Pre-crisis Sample preiod - 1 (3-years (average) EPS grwoth and dividend yield)									*Panel - D Post-crisis preiod - 2 (3-years (average) EPS grwoth & dividend yield)*							*Change in sub-period -1 & 2 (pre & post crisis)*					
	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Range	Minimum	Maximum	Sum	Mean	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
PEGY3	108	53.48%	-23.98%	29.50%	**251.57%**	**2.33%**	0.0095	0.0990	129	60.19%	-14.78%	45.42%	**177.31%**	**1.37%**	0.0077	0.0880	12.55%	-38.38%	53.94%	**-29.52%**	**-40.99%**	-18.67%
PEG3	108	54.65%	-23.98%	30.67%	**254.31%**	**2.35%**	0.0095	0.0989	129	60.32%	-14.90%	45.42%	**191.29%**	**1.48%**	0.0081	0.0917	10.37%	-37.85%	48.07%	**-24.78%**	**-37.03%**	-15.13%
PEGY3_rf	108	53.50%	-24.38%	29.13%	**194.64%**	**1.80%**	0.0095	0.0992	129	60.65%	-15.51%	45.13%	**103.64%**	**0.80%**	0.0078	0.0883	13.35%	-36.36%	54.96%	**-46.75%**	**-55.42%**	-18.55%
PEG3_rf	108	54.68%	-24.38%	30.30%	**197.37%**	**1.83%**	0.0095	0.0990	129	60.77%	-15.64%	45.13%	**117.62%**	**0.91%**	0.0081	0.0920	11.16%	-35.84%	48.97%	**-40.41%**	**-50.11%**	-15.02%
R_premium PEGY3	108	41.37%	-24.22%	17.15%	**65.93%**	**0.61%**	0.0057	0.0596	129	39.36%	-22.98%	16.38%	**-68.42%**	**-0.53%**	0.0054	0.0608	-4.85%	-5.11%	-4.48%	**-203.77%**	**-186.87%**	-6.69%
R_premium PEG3	108	40.22%	-22.93%	17.29%	**68.67%**	**0.64%**	0.0057	0.0590	129	46.49%	-23.01%	23.48%	**-54.44%**	**-0.42%**	0.0058	0.0656	15.58%	0.35%	35.77%	**-179.28%**	**-166.37%**	1.76%
Panel - E Pre-crisis Sample preiod - 1 (5-years (average) EPS grwoth and dividend yield)									*Panel - F Post-crisis preiod - 2 (5-years (average) EPS grwoth & dividend yield)*							*Change in sub-period - 1 & 2 (pre & post crisis)*					
	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	N	Range	Minimum	Maximum	Sum	Mean		Std. Deviation	Range	Minimum	Maximum	Sum	Mean	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
PEGY5	108	55.80%	-24.33%	31.47%	**220.15%**	**2.04%**	0.0092	0.0954	117	61.70%	-15.78%	45.92%	**118.32%**	**1.01%**	0.0079	0.0858	10.57%	-35.15%	45.92%	**-46.26%**	**-50.39%**	-13.65%
PEG5	108	55.80%	-24.33%	31.47%	**221.16%**	**2.05%**	0.0092	0.0957	117	59.54%	-15.78%	43.76%	**117.29%**	**1.00%**	0.0079	0.0858	6.70%	-35.15%	39.07%	**-46.97%**	**-51.05%**	-13.88%
PEGY5_rf	108	55.82%	-24.73%	31.09%	**163.21%**	**1.51%**	0.0092	0.0956	117	62.08%	-16.44%	45.64%	**51.15%**	**0.44%**	0.0080	0.0861	11.20%	-33.53%	46.78%	**-68.66%**	**-71.07%**	-13.52%
PEG5_rf	108	55.82%	-24.73%	31.09%	**164.22%**	**1.52%**	0.0092	0.0959	117	59.76%	-16.29%	43.48%	**50.12%**	**0.43%**	0.0080	0.0861	7.06%	-34.15%	39.84%	**-69.48%**	**-71.83%**	-13.76%
R_premium PEGY5	108	37.36%	-23.43%	13.93%	**34.51%**	**0.32%**	0.0051	0.0526	117	32.67%	-23.09%	9.57%	**-102.64%**	**-0.88%**	0.0052	0.0559	-12.56%	-1.44%	-31.26%	**-397.46%**	**-374.58%**	2.17%
R_premium PEG5	108	36.81%	-22.88%	13.93%	**35.52%**	**0.33%**	0.0051	0.0526	117	34.57%	-23.00%	11.57%	**-103.67%**	**-0.89%**	0.0053	0.0571	-6.07%	0.54%	-16.92%	**-391.89%**	**-369.44%**	4.11%

5.5 Results from Regression Analysis – using a market model

For two sub-sample periods (April-2000 to march-2009 and April-2009 to dec-2019)

The market model regression results for two sample sub-periods deliver interesting findings and is presented in Table-6. All portfolios of the PEGY and PEG benchmarks of the banking sector generated positive return premiums and statistically significant at 5% level in the pre-2009 period (sub-period 1). All six portfolios sorted with PEGY and PEG ratios have generated approximately same return premiums, but PEGY sorted portfolios have higher adjusted R square value as compared with PEG sorted portfolios. The Durbin-Watson statistics are supported for all portfolios that are sorted with both PEGY and PEG benchmark for both sub-sample periods.

Moving to sub-sample period 2 (post-financial crisis), it was found that all six portfolios are statistically significant, but only PEGY1 sorted portfolios of banking sector generated positive monthly return premiums and also statistically significant at 5% level. As a result, PEG's sorted portfolio generated a poor monthly return premium post the global financial crisis period. The percentage change in monthly return premium of PEGY1 sorted portfolio (from sub-period 1 to sub-period 2) is approximately -51%, this indicates that the monthly return premium has declined dramatically from sub-period 1 to sub-period 2.

Table-6

Regression results (Return Premium) - using market model

Sub Sample period - 1 (from april-2000 to march-2009)						Sig.	*Sub Sample period - 2 (from april-2009 to Dec-2019)*						Sig.
Portfolio	Alpha (α)	Beta (β)	Adj. R Square	Durbin-Watson	Result		Portfolio	Alpha (α)	Beta (β)	Adj. R Square	Durbin-Watson	Result	
PEGY1_rf	0.008	0.836	0.696	2.393	*Positive R_premium*	0.000	PEGY1_rf	0.003	0.840	0.703	1.884	*Positive R_premium*	0.000
t-stat	1.496	15.667					t-stat	0.498	17.445				
PEG1_rf	0.009	0.759	0.572	2.212	*Positive R_premium*	0.000	PEG1_rf	-0.007	0.742	0.546	2.123	*Negative R_premium*	0.000
t-stat	1.442	11.998					t-stat	-1.274	12.455				
PEGY3_rf	0.008	0.818	0.667	1.996	*Positive R_premium*	0.000	PEGY3_rf	-0.003	0.746	0.553	1.884	*Negative R_premium*	0.000
t-stat	1.482	14.662					t-stat	-0.525	12.618				
PEG3_rf	0.008	0.822	0.672	2.018	*Positive R_premium*	0.000	PEG3_rf	-0.002	0.719	0.514	1.896	*Negative R_premium*	0.000
t-stat	1.537	14.846					t-stat	-0.303	11.674				
PEGY5_rf	0.005	0.854	0.727	1.800	*Positive R_premium*	0.000	PEGY5_rf	-0.006	0.783	0.609	1.873	*Negative R_premium*	0.000
t-stat	1.084	16.896					t-stat	-1.240	13.488				
PEG5_rf	0.005	0.854	0.727	1.823	*Positive R_premium*	0.000	PEG5_rf	-0.006	0.783	0.609	1.888	*Negative R_premium*	0.000
t-stat	1.094	16.896					t-stat	-1.240	13.488				

*Note(s): *Significant at 5% level*

In summary, the regression results for two sub-periods, 2000-2009 to 2009-2019, the monthly return premium falls by -51% and -235.22% when sorted the portfolio with PEGY1 and PEG1 benchmark respectively. This result was found to be similar to the result of Fama & French (2020) in the United States. From the results, it is also concluded that if investors and portfolio managers have to beat the Nifty Bank market index and the Nifty-500 index, the PEGY1 sorted portfolios found to be reliable, measured against the PEG1 and other sorted portfolios, both sample period of pre-and post-crisis. Because the monthly return premiums of PEGY1 sorted portfolios both pre-crisis period and post-crisis period are 0.71% and 0.35% respectively. In case of three years average EPS growth and a dividend yield of PEGY3 and PEG3 sorted portfolios, PEG3 sorted portfolio has given higher return as compare with PEGY3 sorted portfolio both full as well as two-sub period analysis (see, Table no 2 and 5). The interesting fact, when it sorts the stock with PEGY5 and PEG5, it was found the same results over the different sample period (full sample period and two sub-period).

5.6 Results from the correlations coefficients

For two sub-period results

Table-7 shows the results in two sample sub-period analysis, this correlations matrix has shown similar results as compared to the full sample period analysis. All six portfolios were found to be statistically significant pre- and post-sample periods at the 0.01 level. Results presented in table 3 and table 7, indicate that higher monthly return premiums present a higher correlation with the benchmark index return. Based on the performance of the individual portfolio that shows the correlations with the benchmark portfolio performance. In conclusion, there is a statistically significant positive relationship between different factor sorted portfolio excess returns and market index return.

Table-7

Results from the correlations coefficients

Correlations Matirx (sub period-1 from april-2000 to march-2009)

		PEGY1_rf	PEG1_rf	PEGY3_rf	PEG3_rf	PEGY5_rf	PEG5_rf	NBM_rf
PEGY1_rf	Pearson Correlation	1	.929**	.868**	.868**	.818**	.817**	.835**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000
	N	108	108	108	108	108	108	108
PEG1_rf	Pearson Correlation	.929**	1	.935**	.935**	.881**	.878**	.761**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000
	N	108	108	108	108	108	108	108
PEGY3_rf	Pearson Correlation	.868**	.935**	1	.997**	.940**	.940**	.820**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000
	N	108	108	108	108	108	108	108
PEG3_rf	Pearson Correlation	.868**	.935**	.997**	1	.942**	.942**	.822**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000
	N	108	108	108	108	108	108	108
PEGY5_rf	Pearson Correlation	.818**	.881**	.940**	.942**	1	.999**	.851**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000
	N	108	108	108	108	108	108	108
PEG5_rf	Pearson Correlation	.817**	.878**	.940**	.942**	.999**	1	.853**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000
	N	108	108	108	108	108	108	108
NBM_rf	Pearson Correlation	.835**	.761**	.820**	.822**	.851**	.853**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	
	N	108	108	108	108	108	108	108

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations Marix (sub period-2 from april-2009 to dec-2019)

		PEGY1_rf	PEG1_rf	PEGY3_rf	PEG3_rf	PEGY5_rf	PEG5_rf	NBM_rf
PEGY1_rf	Pearson Correlation	1	.869**	.755**	.739**	.723**	.715**	.675**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.000	0.000
	N	129	129	129	129	117	117	129
PEG1_rf	Pearson Correlation	.869**	1	.897**	.876**	.870**	.861**	.599**
	Sig. (2-tailed)	0.000		0.000	0.000	0.000	0.000	0.000
	N	129	129	129	129	117	117	129
PEGY3_rf	Pearson Correlation	.755**	.897**	1	.984**	.930**	.930**	.629**
	Sig. (2-tailed)	0.000	0.000		0.000	0.000	0.000	0.000
	N	129	129	129	129	117	117	129
PEG3_rf	Pearson Correlation	.739**	.876**	.984**	1	.884**	.886**	.611**
	Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000	0.000
	N	129	129	129	129	117	117	129
PEGY5_rf	Pearson Correlation	.723**	.870**	.930**	.884**	1	.997**	.782**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000
	N	117	117	117	117	117	117	117
PEG5_rf	Pearson Correlation	.715**	.861**	.930**	.886**	.997**	1	.770**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000		0.000
	N	117	117	117	117	117	117	117
NBM_rf	Pearson Correlation	.675**	.599**	.629**	.611**	.782**	.770**	1
	Sig. (2-tailed)	0.000	0.000	0.000	0.000	0.000	0.000	
	N	129	129	129	129	117	117	129

**. Correlation is significant at the 0.01 level (2-tailed).

5.7 Results from the correlation coefficients for the analysis of CSR activities and stock returns

Table 8 shows the results from correlation coefficients to examine the relationship between the PEGY, PEG sorted portfolio returns and CSR activities. In this table, it was shown that PEGY1, PEG1 sorted portfolio annualized returns and CSR activities. This analysis indicated that there is no significant relationship between the PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking Sector. This analysis has not included other sorted portfolios such as PEGY3, PEG3, PEGY5 and PEG5 because data is not available before the march-2014 and after march-2014 those sorted portfolios did not generate the excess returns (see, Table 5) so they have been eliminated from the analysis. This research study has generated the same conclusion as the relationship between the stock returns and CSR activities which was made by different academic research studies (Brammer et al., 2006; Gregory, A; Whittaker, 2013; Khanna & Damon, 1999; Wagner, 2005).

Table-8

The Relationship between the PEGY, PEG sorted portfolio returns and CSR Activities

Results from correlation coefficients (The relationship between the PEGY, PEG sorted portfolio returns and CSR Activities)

		Market Capitalization	Mean value of PEGY1 ratio	Mean value of PEG1 ratio	Median value of PEGY1 ratio	Median value of PEG1ratio	Annualized return of PEGY1	Annualized return of PEG1	Annualized return of NBM Index	Annualized return of Nifty 500	Mean value of Spent on CSR Activities	Total amount Spent on CSR Activities
Market Capitalization	Pearson Correlation	1	-0.144	-0.188	-0.211	-0.098	-0.309	-0.302	-0.394	-0.555	**.826***	**.827***
	Sig. (2-tailed)		0.758	0.686	0.650	0.835	0.500	0.510	0.382	0.196	0.022	0.022
	N	7	7	7	7	7	7	7	7	7	7	7
Mean value of PEGY1 ratio	Pearson Correlation	-0.144	1	**.944****	**.936****	**.860***	0.194	-0.074	-0.032	0.203	-0.064	0.097
	Sig. (2-tailed)	0.758		0.001	0.002	0.013	0.676	0.875	0.946	0.663	0.892	0.836
	N	7	7	7	7	7	7	7	7	7	7	7
Mean value of PEG1 ratio	Pearson Correlation	-0.188	**.944****	1	**.904****	**.962****	0.434	0.174	0.240	0.450	-0.220	-0.050
	Sig. (2-tailed)	0.686	0.001		0.005	0.001	0.330	0.709	0.604	0.310	0.635	0.916
	N	7	7	7	7	7	7	7	7	7	7	7
Median value of PEGY1 ratio	Pearson Correlation	-0.211	**.936****	**.904****	1	**.890****	0.394	0.173	0.183	0.396	-0.247	-0.083
	Sig. (2-tailed)	0.650	0.002	0.005		0.007	0.381	0.711	0.695	0.379	0.593	0.860
	N	7	7	7	7	7	7	7	7	7	7	7
Median value of PEG1 ratio	Pearson Correlation	-0.098	**.860***	**.962****	**.890****	1	0.559	0.365	0.416	0.577	-0.231	-0.065
	Sig. (2-tailed)	0.835	0.013	0.001	0.007		0.192	0.420	0.354	0.175	0.618	0.889
	N	7	7	7	7	7	7	7	7	7	7	7
Annualized return of PEGY1 sorted	Pearson Correlation	-0.309	0.194	0.434	0.394	0.559	1	0.695	0.745	**.836***	-0.736	-0.534
	Sig. (2-tailed)	0.500	0.676	0.330	0.381	0.192		0.083	0.055	0.019	0.059	0.217
	N	7	7	7	7	7	7	7	7	7	7	7
Annualized return of PEG1 sorted portfolio	Pearson Correlation	-0.302	-0.074	0.174	0.173	0.365	0.695	1	**.973****	**.874***	-0.618	-0.685
	Sig. (2-tailed)	0.510	0.875	0.709	0.711	0.420	0.083		0.000	0.010	0.139	0.089
	N	7	7	7	7	7	7	7	7	7	7	7
Annualized return of NBM Index	Pearson Correlation	-0.394	-0.032	0.240	0.183	0.416	0.745	**.973****	1	**.944****	-0.662	-0.690
	Sig. (2-tailed)	0.382	0.946	0.604	0.695	0.354	0.055	0.000		0.001	0.105	0.086
	N	7	7	7	7	7	7	7	7	7	7	7
Annualized return of Nifty 500 Index	Pearson Correlation	-0.555	0.203	0.450	0.396	0.577	**.836***	**.874***	**.944****	1	**-.775***	-0.713
	Sig. (2-tailed)	0.196	0.663	0.310	0.379	0.175	0.019	0.010	0.001		0.041	0.072
	N	7	7	7	7	7	7	7	7	7	7	7
Mean value of total Spent on CSR activities	Pearson Correlation	**.826***	-0.064	-0.220	-0.247	-0.231	-0.736	-0.618	-0.662	-.775*	1	**.933****
	Sig. (2-tailed)	0.022	0.892	0.635	0.593	0.618	0.059	0.139	0.105	0.041		0.002
	N	7	7	7	7	7	7	7	7	7	7	7
Total Spent on CSR activities	Pearson Correlation	**.827***	0.097	-0.050	-0.083	-0.065	-0.534	-0.685	-0.690	-0.713	**.933****	1
	Sig. (2-tailed)	0.022	0.836	0.916	0.860	0.889	0.217	0.089	0.086	0.072	0.002	
	N	7	7	7	7	7	7	7	7	7	7	7

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

In conclusion, the H3 got rejected. Another fact that the relationship between the market capitalization of firms and CSR activities are found to be significant at 5% level. The relationship between the CSR activities and Market index benchmark return was found to be statistically significant at 1% level, so this study also concluded that apart from the banking sector other sectors may be significant as the relationship between stocks return and CSR activities. These results also support to the conclusion made by Zhang (2016) who suggested that the relationship between financial performance, stock returns and CSR activities are varied by sector because the CSR activities depend on the nature of the firms.

6. DISCUSSION, CONCLUSION AND IMPLICATION OF RESEARCH STUDY

6.1 Discussion

The goal of this research study is to explore whether the return premium promised by Peter Lynch using PEGY benchmark (P<1 & P>0) has any value addition to the banking sector in

India over the PEG benchmark. The return premium of PEGY1 sorted portfolio was 0.45% p.m. was higher than other sorted portfolios such as PEG1 (-0.23%), PEGY3 (-0.05%), PEG3 (0.02%), PEGY5 (-0.34%) and PEG5 (-0.34%) over the full sample period of April-2000 to march-2020 (see, Table 2). In two sub-period analysis, PEGY1 sorted portfolio has positive return premium both in sub-period 1 was 0.71% p.m. and sub-period 2 was 0.35% p.m. Both sub-periods, from 2000-2009 and 2009-2019, PEGY1 sorted portfolio has higher return premium than other sorted portfolios. The two sub-period analysis also indicates that the return premium has declined from 2000-2009 to 2009-2019 (see, Table 3) as a similar conclusion made by Fama & French (2020). These results justify that the *PEGY sorted portfolio is better than PEG sorted portfolio to measure the positive return premium in Banking sector of India.*

A recent study documented by Tripathi & Aggarwal (2020) recommended that if CAPM alpha generates positive and statistically significant values (intercept) imply extra-normal gain, negative and significant alpha indicates a loss. Applying the same assumption which made by Tripathi & Aggarwal (2020), results from the Table 4 and 5, indicated that the *PEGY1 sorted portfolio has positive return premium and statistically significant at 5% level*. When it comes to adjusted R square value (0.714) for PEGY1 sorted portfolio, it was greater than other sorted portfolios. The proposed model was found to be strong to explain the return premiums. Durbin-Watson statistics was found be around 2 and less than 2 for the all portfolios so, it can be concluded that there is no negative auto-correlation between the selected variables. The correlation matrix also shows that there is a significant positive relationship between different sorted portfolio returns and market index returns (see, Table 6 and 7). These results also justify that *there is a statistically significant relationship between PEGY, PEG sorted portfolio returns and Nifty Bank Market (NBM) returns.*

Results from the regression analysis using a market model equation for the full sample period from April-2000 to March-2020, all six portfolios were found to be statistically significant, but only three portfolios able to produce the extra-normal profits. In conclusion, as a benchmark ($P<1$ & $P>0$) suggested by Lynch (1989), the PEGY1 sorted portfolios were found to positive and with higher monthly return premiums and also statistically significant at 5% level. Results from the two sub-period, all portfolios of the PEGY and PEG benchmarks of the banking sector generated positive return premiums and statistically significant at 5% level for pre-2009 sample period (sub-period 1 – pre-financial crisis-2008). Moving to sub-sample period 2 (post-financial crisis-2008), it was found that all six portfolios are statistically significant, but only PEGY1 sorted portfolios have generated positive monthly return premiums and also statistically significant at 5% level. As a result, PEG's sorted portfolio generated a weak monthly return premium after the global financial crisis.

Another objective of this research study is to show the relationship between PEGY, PEG sorted portfolio returns and CSR activities in the Indian Banking Sector. Several academic research studies show that the relationship between financial performance, stock returns are associated with CSR activities (Golicic & Smith, 2013; Hart & Ahuja, 1996; King & Lenox, 2017; Klassen & McLaughlin, 1996; Michael & Paul, 1997; Statman & Glushkov, 2011). But this research study concluded that there is no significant relationship between stock returns using PEGY and PEG ratios and CSR activities in the Indian Banking sector, therefore, H3

got rejected. This research study strongly supported to those academic research studies which documented as that there is no positive relationship between the stock returns and CSR activities (Brammer et al., 2006; Gregory, A; Whittaker, 2013; Khanna & Damon, 1999; Wagner, 2005). These results also support the conclusion made by Zhang (2016) who suggested that the relationship between financial performance, stock returns and CSR are varied by sector because the CSR activities may be varied by sector.

6.2 Conclusion

From the results, it can be concluded that if retail investors and portfolio managers have to beat the Nifty Bank market index and Nifty-500 index, the PEGY1 sorted portfolios were found to be reliable, measured against the PEG1 and other sorted portfolios such as PEGY3, PEGY5, PEG3, and PEG5 both in full and two sub-sample periods such as a pre-and post-crisis period. Because the monthly average return premium of PEGY1 sorted portfolio was 0.45% for the sample of a full period and two sub-period, pre-and post-crisis periods were 0.71% and 0.35% respectively. These results justify that the PEGY sorted portfolio is better than PEG sorted portfolio to measure the positive return premium in the banking sector of India. The correlation matrix also shows that there is a significant positive relationship between different sorted portfolio returns and market index returns (see, Table 6 and 7). These results also explore that there is a statistically significant relationship between PEGY, PEG sorted portfolio returns and Nifty Bank Market (NBM) returns. The Hypothesis H3 got rejected, so it also concludes that the relationship between the PEGY and PEG sorted portfolio returns are not statistically significantly associated with CSR activities in the Indian Banking sector (see Table 8).

6.3 Practical implication and Originality of the research study

Following the PEGY and PEG benchmark as a balanced approach of stock investment as suggested by Peter Lynch, this study has a significant effect on retail investors and Portfolio Managers. The retail investors and Portfolio Managers can strategically construct the portfolios to focus on PEGY1 benchmark to measure the return premium especially in the Banking sector of India. The contribution of this study is that this is the first study that examines the relationship between the return premium using PEGY and PEG ratios in the Indian Banking sector. This research study also examined the relationship between stock returns using PEGY and PEG ratio and CSR activities in the Indian Banking sector. The research study contributes knowledge to individual investors, value investors, portfolio managers as well as asset pricing literature for the banking sector and emerging market.

6.4. Limitation and Future research

This research study is not free of some limitations. Firstly, the period before 2000 could not be considered because data is not publicly available. Secondly, only an Indian banking sector data has used in the study. Also, this research study focused only on NSE-500 listed banks. Thirdly, the period before March 2014 could not be considered for analysis of CSR activities and stock returns due to unavailability of data in the databases and future studies may include a long period of data set in a longitudinal study covering 15 years and also consider all banks listed on BSE and NSE India. Future studies may also test the appropriate variables which can strongly determine the CSR activities and stock returns using a PEGY matrix to justify the statistically significant relationship between the stocks return and CSR activities.

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