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Highlights

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Discovering Thoughts, Inventing Future

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Financial Statement Analysis for Kier Group PLC

By Aso Ahmed Abdullah

Cihan University, Iraq

Abstract- The aim of this report to analysis critical evaluation of the history of development, analysis of the financial performance in last two years and critical evaluation of "Balanced Scorecard" to analyse Kier Group plc's performance. This study closely calculate financial performance for Kier group and compared with comparative company Barratt Plc during 2010 to 2011. As well as the report evaluate Balanced Scorecard. The report for Kier group plc is that the share price, revenue and dividend per share increased in the past two years resulting in increasing revenue from the construction division. Kier increased profit in the last two years and increased a dividend which is a good indication for growth in market share. However the credit crunch, current financial crisis and falling house prices have affected both the property division and have hit their competitor company Barratt plc very hard. Revenue has not increased in last two years plus stock turnover increased sharply. However Barratt Developments can't survive according to the Z analysis results from appendix 11, but Kier Group is in a better financial position, because Kier has specialised in building and civil engineering, support services, public and private house building property developments and the private finance initiative.

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I. Introduction

The main principle of this report is to prepare a critical evaluation of the history of the development of Kier Group plc and perform an analysis of the financial performance in the last two years and analyse the extent to which a balanced scorecard could be used to analyse Kier Group's performance. The report will be compared to a competitor company in same industry namely Barratt developments Plc.

The report will identify any trends in share prices, dividends, revenue, debts, inventory, finance costs, gearing ratio, etc. The movements over the past two years for the main company will then be compared to the competitor company and the general economy.

The report will consider how much the current global financial crisis (especially in the Eurozone) has affected both companies, in which way the companies have been affected such as currency downgrading, customer's confidence and marketing demand. In addition the tasks will analyse benchmarking.

a) *History and Development*

Kier Group Plc was founded in 1928. "A civil engineer from Denmark, Olaf Kier joined along with another engineer to create the contracting firm J Lotz and Kier becoming one of the earliest pioneers in reinforced concrete design and construction" (insiteatkier, 2011). During second the world war Kier had an enormous role, to engage with defence projects. By 1949 J L Kier started working overseas including major projects such as nuclear power stations and dams in Mauritius, Seychelles, Bahamas and Spain. In 1972 Marriott joined Kier, expanding the Group's commercial and building activities. This was shortly followed by the merge of J L Kier and W & C French in 1973 to become French Kier Holdings Ltd.

Then in 1992 the following takeover by Hanson plc triggered a buyout by management at Beazer, leading to the forming of the Kier Group, creating Britain's first major contractor to be employee-owned, reinforcing Kier's status as a true 'people' company (ft, 1992). After continuing long success in the past the group had one major task left, namely floatation, an in 1996 the group entered the London stock exchange as FTSE 250 company.

Kier Group plc's market is based in the UK, but also operates overseas including in China, the Caribbean and the Middle East. The most important activities include construction services, a property group specialising in building and civil engineering, support services, residential and commercial property development and infrastructure project investment. The Group employs 10,700 people worldwide and has annual revenue of £2.2bn (Annual Report 2011). The main revenue for year end 2011 is coming from construction which is counting about 66%.

Further more in 2003 the groups agreed with Sheffield City Council to provide services including repairs and general maintenance for the council houses and in 2004 Kier were nominated as one of the key partners for the government (Pesola, 2004). Then in 2009 Kier started work on a £600m outsourcing contract for North Tyneside Council. The Kier groups practices SWOT and focusing on Corporate Social Responsibility (CSR) including producing greener construction, environmental friendly and low carbon emissions. The group's visions are to build, maintain, protect and enhance the reputation among their employees, customers, supply chain and partners and investor. The group publish a CSR report annually and they have set up a target to achieve and it is boosting its status.

The group's strategic development is included in the business model supporting all four divisions, construction, support service, partnership homes and developments. Massoudi (2011) said Kier are concerned over eurozone uncertainty and its sensitivity

Author: Department of Accounting Cihan University 100 Street, Musil Road Erbil, Kurdistan-Iraq P. O. Box: 0383-23.
e-mail: aso.abdullah82@gmail.com

to confidence in the UK. Kier decided to keep operating abroad such as in Middle East and China because the regions have not been affected by the current economic crisis and thus generating a better return.

II. Financial Statement Analysis

The aim of the financial statement analysis is to determine the financial position, and therefore the long term investment potential of the company. To be able to execute the report the six main financial ratios will be applied, namely profitability, efficiency, liquidity, cash flow, gearing and investor's ratios to the financial statements for the year ended 30/06/2010 to 30/06/2011 of the main company and compare it to a competitor company. The Z-analysis ratio will be applied to the accounts (Please see appendix 1 for more details).

a) Profitability Ratio

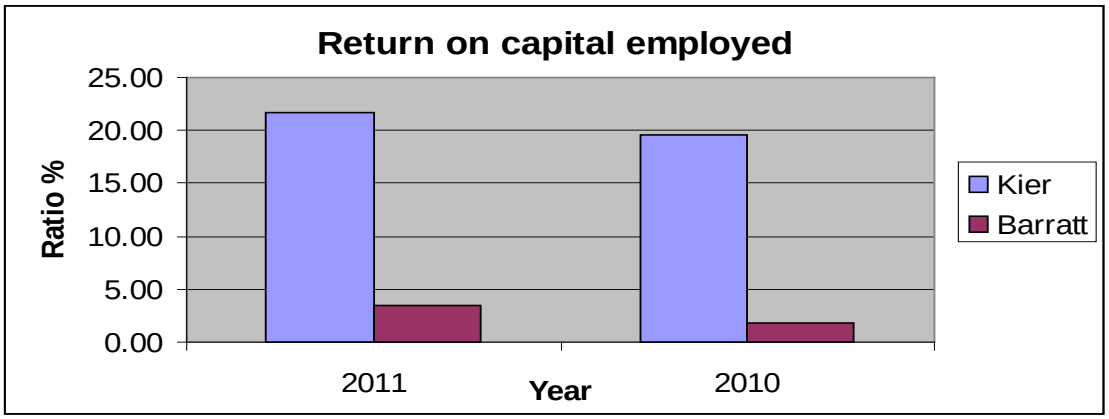
i. *Return on Capital Employed (ROCE)*

Atrill and McLaney (2008) described ROCE ratio as a "fundamental measure of business performance". This ratio expresses the relationship between the operating profit generated by the business and the long-term capital invested in the business. ROCE is calculated as follow:

$$\text{ROCE} = \frac{\text{Operating profit}}{\text{Share capital} + \text{Reserves} + \text{Non-current liabilities}} \times 100$$

Return on capital employed

	2011	2010
Kier	21.76	19.56
Barratt	3.41	1.75



The ROCE for Kier has increased in the past two years by 11%, despite operating profit increasing by 24% in 2011. This is due to an increase in trade creditors which affected ROCE and the share holders may not be convinced with the result. Nevertheless the competitor company Barratt's ROCE has increased sharply by 95% and this is due to operating profit increasing by 41% in 2011 and also non-current liabilities have reduced in 2011 by 29% due to paying off long term loans and borrowing. Overall Kier is doing much better and is more secure in terms of liquidity problems because non-current liabilities are much smaller than equity.

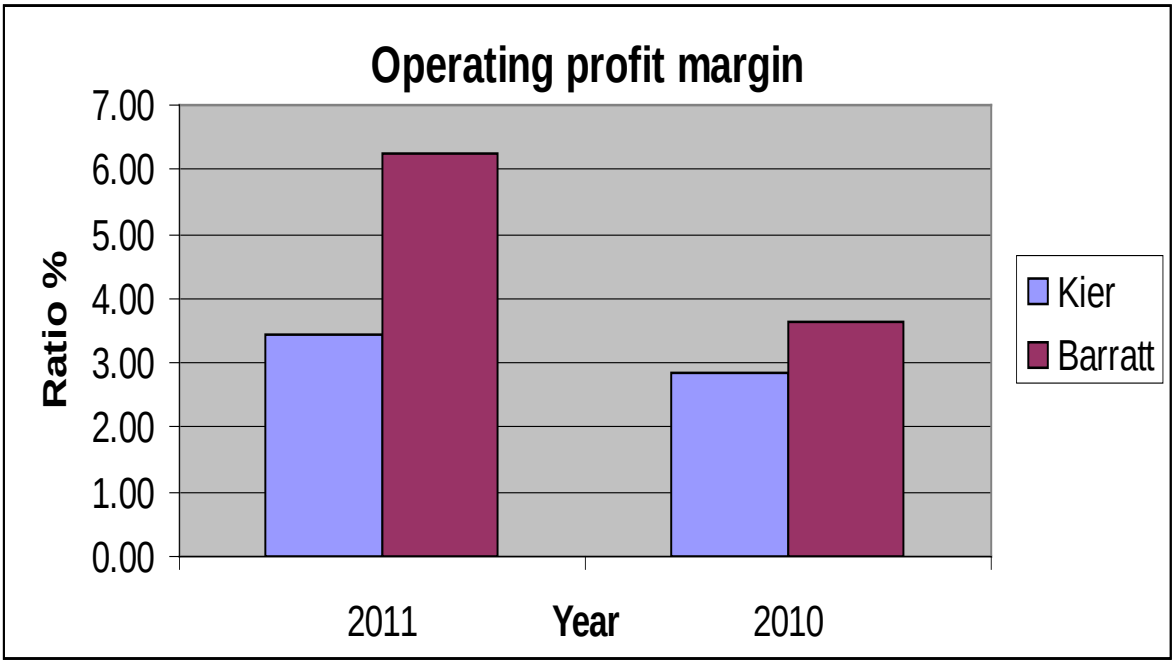
ii. *Operating profit margin (OPM)*

Atrill and McLaney (2008) examined OPM by evaluating the cost of sales or revenue, and measuring net profit before interest and tax (please see appendix 2 for more details). OPM is calculated as follow:

$$\text{OPM} = \frac{\text{Operating profit}}{\text{Sales revenue}} \times 100$$

Operating profit margin

	2011	2010
Kier	3.44	2.86
Barratt	6.25	3.65



The OPM for Kier has increased by 20% in 2011 total revenue by 3.25%. This is due to reducing cost of sales and disruptions costs. (Please see appendix 2 for more details). However OPM for Barratt increased sharply by 71% in 2011 this is due to reducing cost of sales.

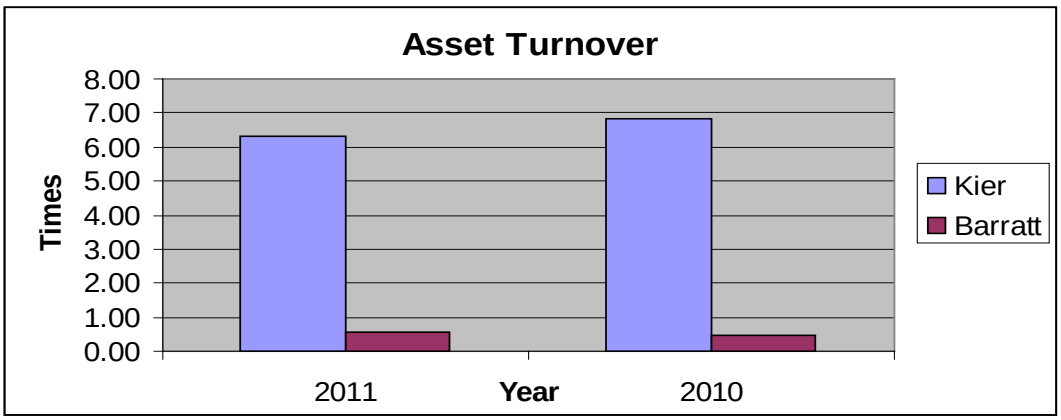
iii. *Asset turnover*

Asset turnover measures a firm's efficiency at using its assets in generating sales or revenue - the higher the number the better (please see appendix 3 for more details). Assets turnover is calculated as follow:

$$\text{Asset Turnover} = \frac{\text{Sales revenue}}{\text{Share capital} + \text{Reserves} + \text{Non-current liabilities}}$$

Asset Turnover

	2011	2010
Kier	6.33	6.85
Barratt	0.54	0.48



Despite increasing in revenue by 3.25% in 2011 asset turnover declined by 0.08 times because the value of equity has increased rapidly by 37% in 2011, and non-current liabilities has decreased by 14% in same period (please see appendix 3 for more details).

However the Barratt plc asset turnover increased by 0.12 time in 2011, it's not as good as Kier because the revenue has increased only by 0.0001% in 2011 and the equity value has declined by 2%, this would cause uncertainty amongst shareholders and

investors. Overall Kier plc is in a better position than Barratt plc.

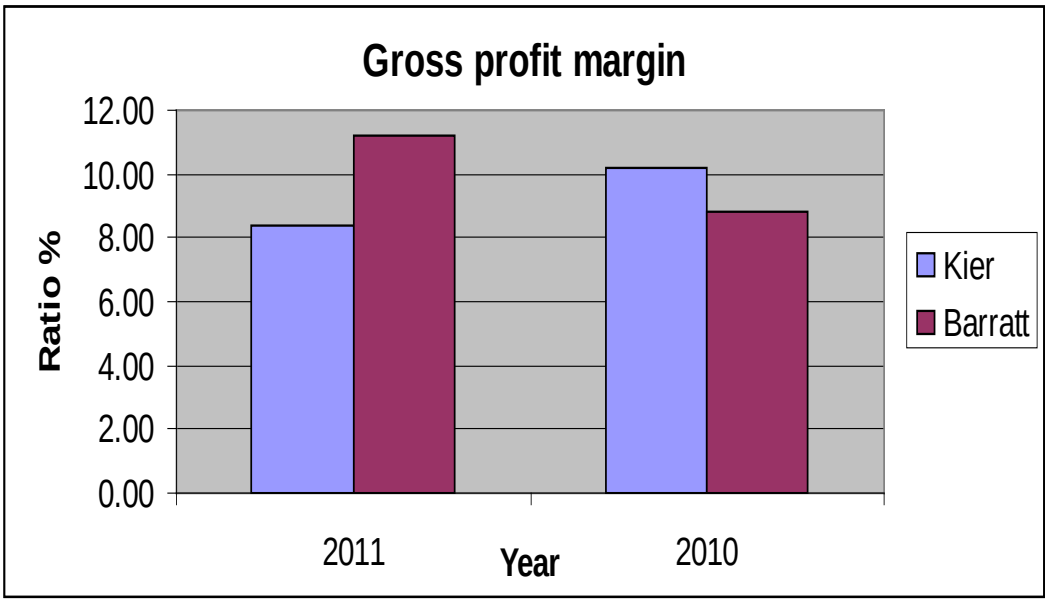
iv. *Gross profit margin (GPM)*

The gross profit margin is a measurement of a company's manufacturing and distribution efficiency during the production process (please see appendix 4 for more details). GPM is calculated as follow:

$$GPM = \frac{\text{Gross profit}}{\text{Sales revenue}} \times 100$$

Gross profit margin

	2011	2010
Kier	8.38	10.17
Barratt	11.19	8.84



The GPM for Kier plc has decreased in 2011 by 18% despite revenue increasing by 3% in 2011, but cost of sales increased by 5% which is more than the increase in revenue (please see appendix 4 for more details). But the competitor company Barratt somehow managed to increase GPM by 27% in 2011 despite no increase in revenue, instead they managed to reduce cost of sales.

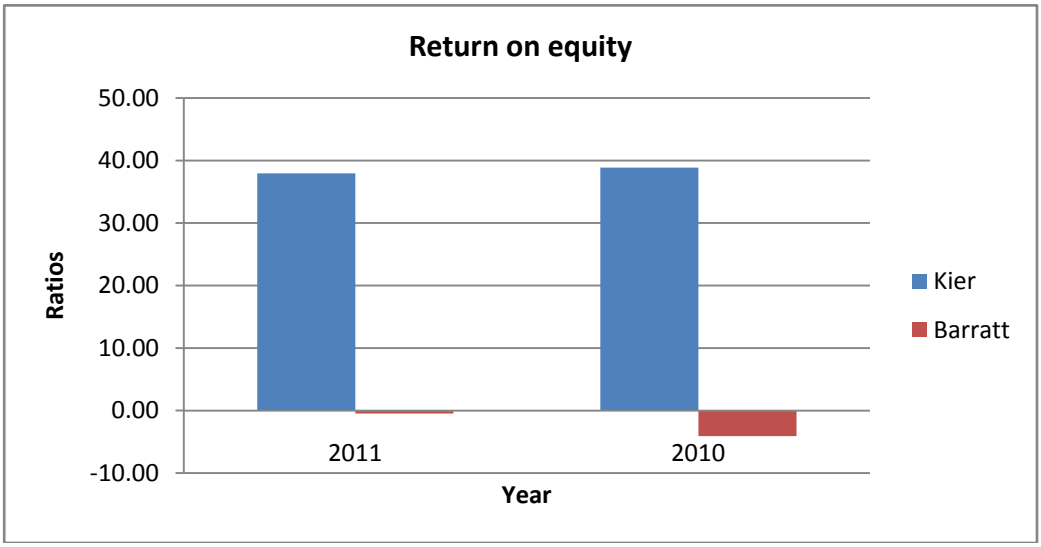
v. *Return on equity*

ROE is viewed as one of the most important financial ratios. (please see appendix 5 for more details). It is calculated as follow:

$$\text{Return on equity} = \frac{\text{Profit available to ordinary shares}}{\text{Share capital + Reserves}} \times 100$$

Return on ordinary shareholders' funds

	2011	2010
Kier	37.94	38.87
Barratt	-0.47	-4.08



The above figure shows ROE for Kier has been reduced by 2% in 2011 regardless of net profit in 2011 increasing by 35%. Also the ordinary share capital and reserves have increased in 2011 by 37% and for that reason actually ROE decreased in 2011. However the competitor company Barratt improved significantly and ROE increased by 88% this is due to reducing loss for the year from £118m to £14m.

b) Liquidity Ratio

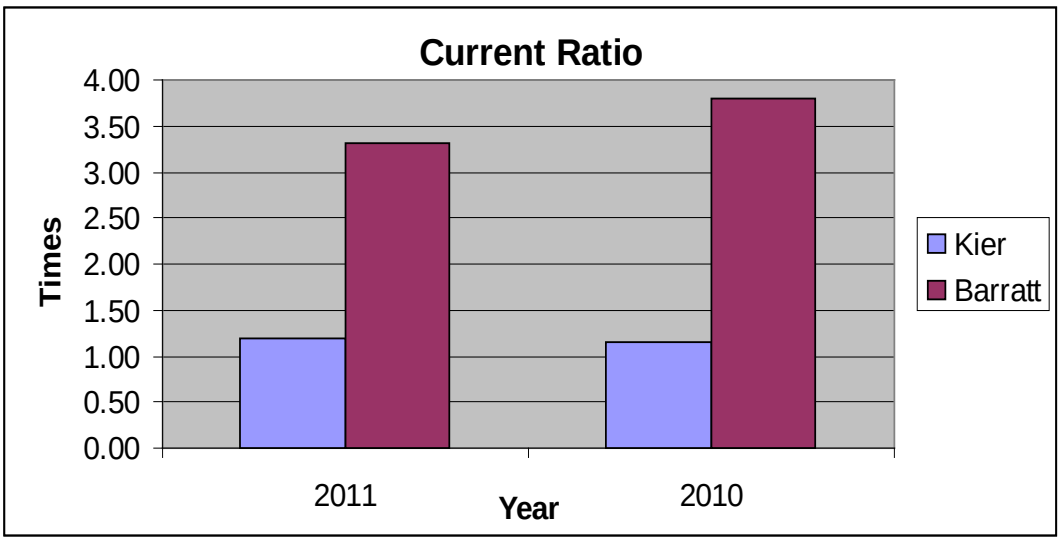
Brealey et al (2010, p.45) defined liquidity as "the ability to sell or exchange as for cash on short notice." (Please see appendix 6 for more details). It is very worthwhile to use the following ratios:

i. *Current ratio*

The ratio is mainly used to give an idea of the company's ability to pay back its short-term liabilities with its short-term assets. The higher the current ratio, the more capable the company is of paying its obligations. Current ratio is calculated as follow.

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

	Current Ratio	
	2011	2010
Kier	1.19	1.15
Barratt	3.30	3.81



We can see the Kier current ratio has increased in the past two years by only 0.04 due to an increase in assets which indicates that the company can pay all its liabilities. Barratt's has decreased by 0.51 in the past two years and they are not in a good position financially. Moreover the company may be facing a shortage of cash in the future. Also if they are not able to pay off their trade creditors then the finance cost may increase in the future, which will threaten Barratt's liquidity.

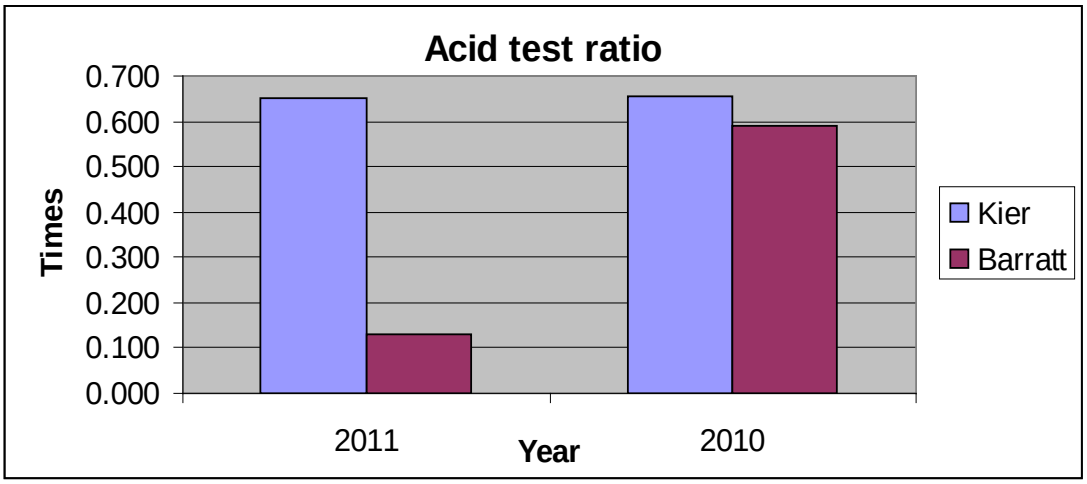
ii. *Acid test ratio*

A stringent test that indicates whether a firm has enough short-term assets to cover its immediate liabilities without selling inventory. The acid-test ratio is far more strenuous than the working capital ratio, primarily because the working capital ratio allows for the inclusion of inventory assets. The ratio expressed as:

$$\text{Acid test ratio} = \frac{\text{Current assets - stock}}{\text{Current liabilities}}$$

Acid Test Ratio

	2011	2010
Kier	0.653	0.655
Barratt	0.13	0.59



As per current ratio, this graph shows that Kier's ability to meet short-term obligations has reduced by 0.002 in the past two years due to increasing inventory in 2011. As long as current assets meet current liabilities then it ensures the business can keep running without going into liquidity problems. Although the Barratt acid test ratio decreased sharply by almost 4 times in 2011, it's due to a decrease in current liabilities in 2011 by 65% because they paid back loans and borrowings of £513m and this will improve balance sheet and profit in the future.

c) *Efficiency Analysis*

For every business regardless of the size they must monitor the ways in which different resources of the business are managed.. Dyson (2007) said Efficiency ratios measure how successfully the business operates these assets, in addition to how well it manages its liabilities. The most important ratios are as follows:

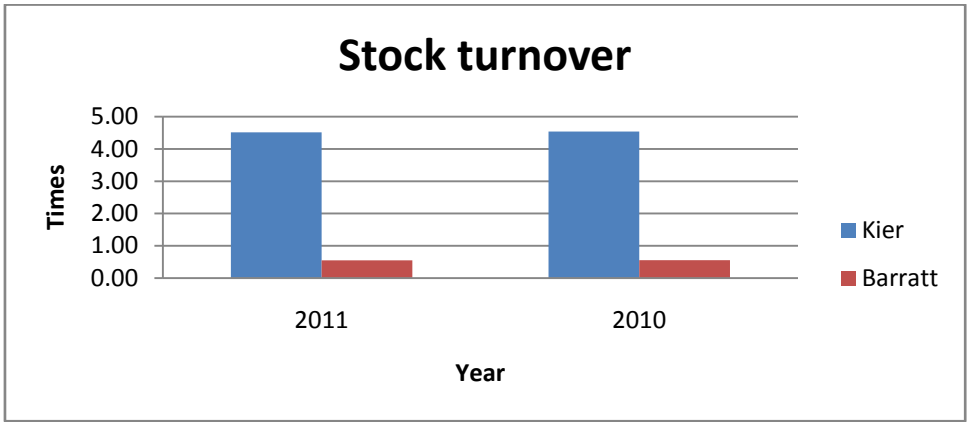
i. *Stock turnover*

This ratio shows how well inventory is managed by calculating the number of times that a business turnover (or sell) inventory during an accounting period. It is calculated as follow:

$$\text{Stock days} = \frac{\text{Cost of sales}}{\text{Average stock}}$$

Stock turnover

	2011	2010
Kier	4.51	4.54
Barratt	0.55	0.56



Here it can be seen that Kier inventory turnover falls by very small margin in 2011 by 0.006. The group's turnover improved in 2011 which indicates good stock management to keep stock levels under control. The quicker a business turns over its stocks, the better. But it is more important to do that profitably rather than sell stocks at a low gross profit margin or worse at a loss. However Barratt inventory turnover has seen a slight reduction in 2011.

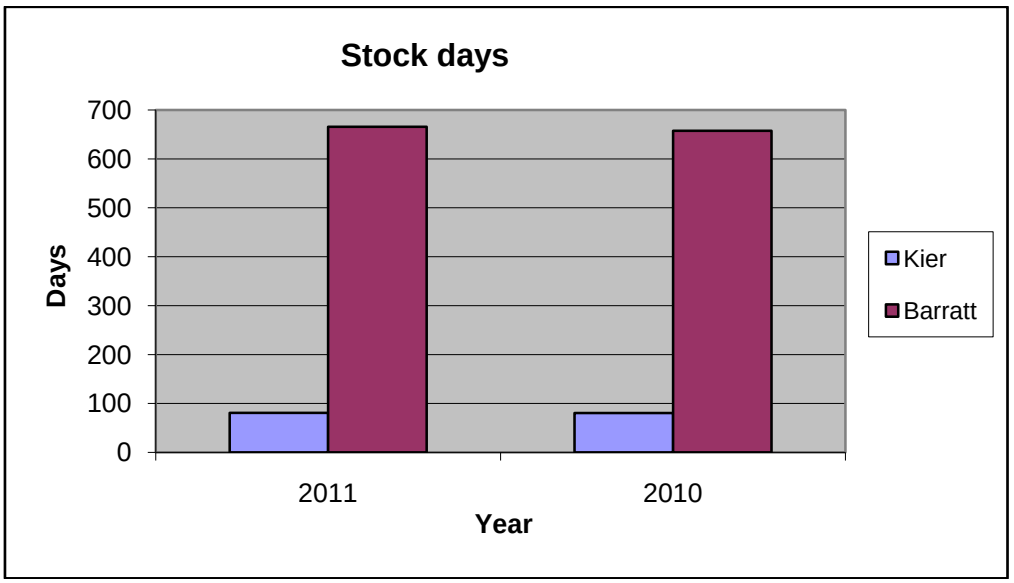
ii. *Stock days*

This measures the amount of days it takes to sell a stock item once on the company's inventory. A low figure represents greater efficiency (please see appendix 7 for more details). Stock days are calculated as follow:

$$\text{Stock days} = \frac{\text{Closing stock}}{\text{Cost of sales}} \times 365$$

Stock days

	2011	2010
Kier	81	80
Barratt	666	658



The above representations show that Kier increased by 1 day in 2011 to sell stocks. The longer the inventory period the more it will cost and opportunities to fund new projects it may be delayed and be tied up (please appendix 7 for more details).

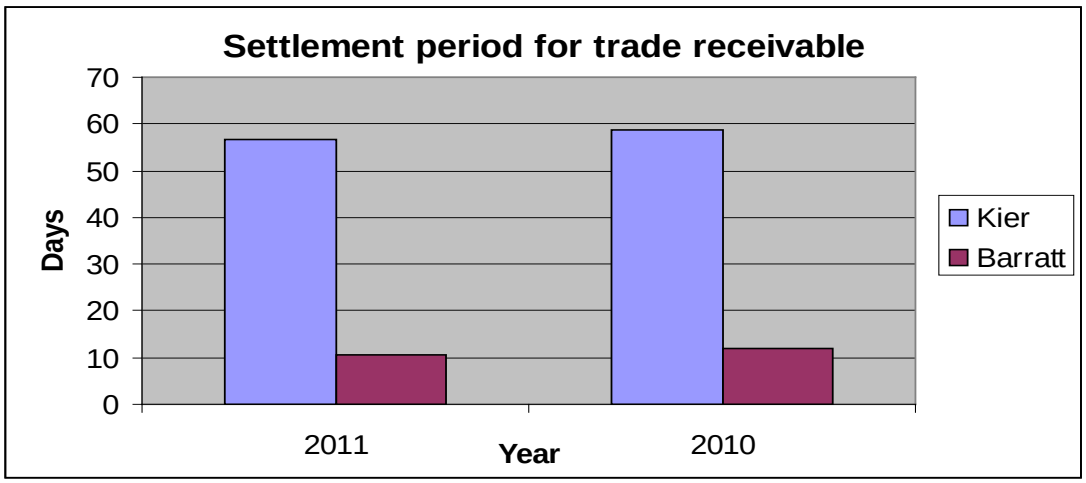
iii. *Settlement period for trade receivable*

This ratio actually measures the amount of days it takes to convert your trade receivable to cash (please see appendix 8 for more details). It is calculated as follow:

$$\text{Settlement period for trade receivable} = \frac{\text{Trade receivable}}{\text{Credit sales revenue}} \times 365$$

Settlement period for trade receivable

	2011	2010
Kier	57	59
Barratt	11	12



The trade receivable for Kier has fallen from 59 days to 57 days in 2011 which is a good indication for the business and it means they can meet their targets and it is good efficiency. Also the competitor company fell from 12 days to 11 days in 2011, this is much better than Kier they are able to convert trade receivable to cash in 11 days, it may be related to the company policy.

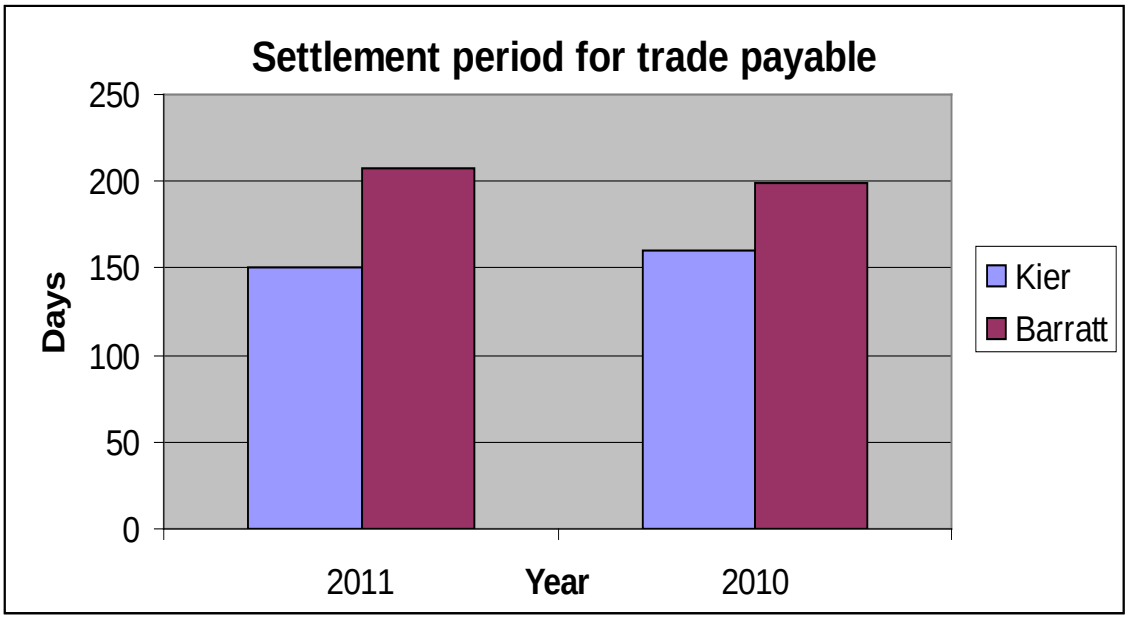
iv. *Settlement period for trade payable*

This ratio actually measures how long the business takes to pay those who supplied goods and service (please appendix 9 for more details). It is calculated as follow:

$$\text{Settlement period for trade payable} = \frac{\text{Trade payable}}{\text{Credit purchases}} \times 365$$

Settlement period for trade payable

	2011	2010
Kier	150	160
Barratt	207	199



The trade payable for Kier plc has fallen from 160 to 150 days in 2011 and it shows signs of improvement, also the period of trade receivables is actually much less than the period of creditors and that will ensure the business can survive from liquidity problems. However Barratt plc the trade payable has increased by 8 days in 2011 which means it takes 207 days to pay suppliers and this is not good for the business. This is because they may increase finance costs which will reduce net profit. The main reason for the increase in trade payables is due to holding stock materials for long and also due to the current economic and property market causing a slowdown in sales.

d) Cash Flow Ratios

This ratio is very important in terms of avoiding lack of liquidity and it helps the finance manager be aware of shortage of cash in short-period to meet liabilities (please see appendix 10 for more details). The following ratios consider some of the more important features of resource management:

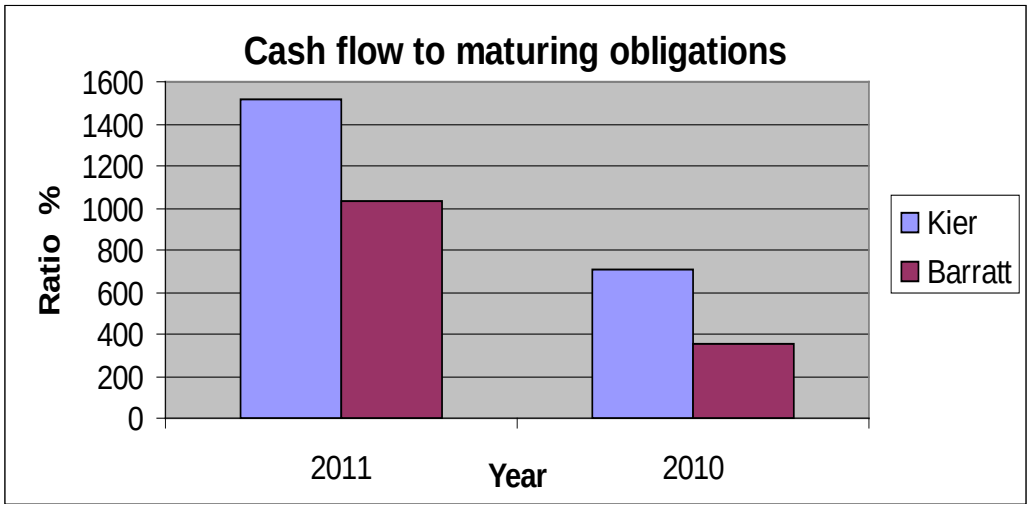
i. *Cash flow to maturing obligations*

This ratio applies to establish how well a company can meet current liabilities with operational cash flows. Cash flow to maturing obligations is calculated as follow:

$$\text{Cash flow to maturing obligations} = \frac{\text{Current liabilities}}{\text{Cash flow from operating activities}} \times 100$$

Cash flow to maturing obligations

	2011	2010
Kier	1518	711
Barratt	1036	356



The above presentations shows Kier are in serous problems to meet their current liabilities and they do not have enough cash to pay off some of their trade creditors, this may create a shortage of cash in due course (please see Z-Analysis in appendix 11). Nevertheless Barratt are also struggling with shortage of cash and both companies may face liquidity problems (please see appendix 7 for more details).

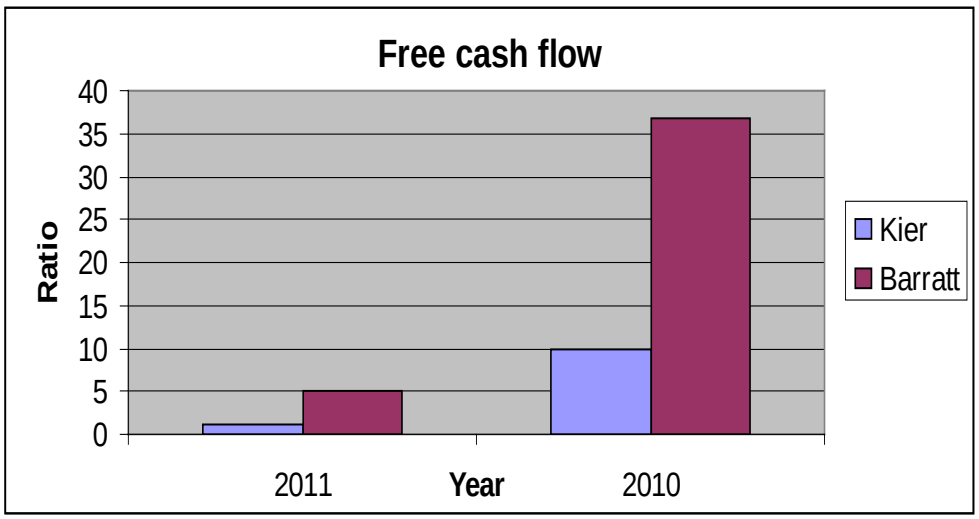
ii. *Free cash flow*

Free cash flows to a company measure of possible cash flows that can be circulated to capital providers without affecting the production capacity of the company. Free cash flow to calculate as follow:

$$\text{Free cash flow} = \frac{\text{Cash from operating activities}}{\text{Capital expenditure}}$$

Free cash flow

	2011	2010
Kier	1	10
Barratt	5	37



The above figures show Kier plc's free cash flow reduced sharply in 2011 by 90 due to an increase in capital expenditure (please see note 28b and 14 from Kier annual report) and reducing operating activities. However the competitor company's free cash flow has been reduced in 2011 because the operating activities have not increased and capital expenditure has increased (please see note 13 from Barratt annual report).

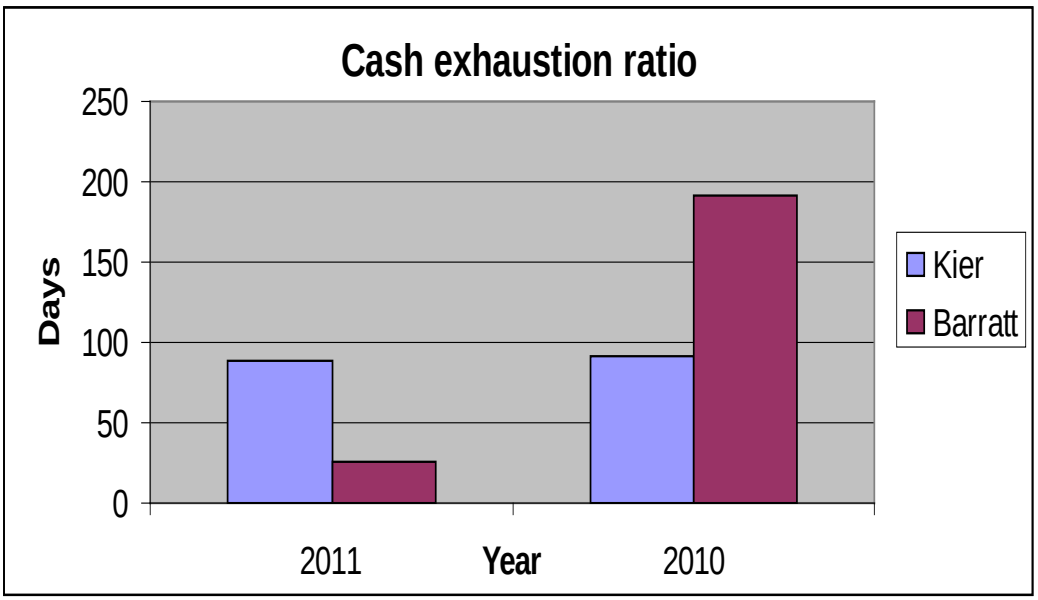
iii. *Free exhaustion ratio*

This ratio allows finance managers to analyse how many days the company can afford to pay its short-term liabilities from cash at bank. This ratio is important for those organisations that rely on the funds. The calculation is as follows:

$$\text{Cash exhaustion ratio} = \frac{\text{cash in hand}}{\text{Current liabilities}} \times 365$$

Cash exhaustion ratio

	2011	2010
Kier	88	92
Barratt	26	192



Kier plc are holding cash at a lower level due to the company's structure, the cash exhaustion in 2011 has been reduced by 4%, they may consider investing to get a better return. However Barratt plc also reduced their cash in hand sharply due to the Bank of England keep interest rates at a minimum rate of 0.05%. (Please see note 21 from Barratt annual report).

e) Financial gearing ratio

At rill and McLaney (2008) explained financial gearing happens when a business is financed by borrowing to operate (please see appendix 12). Two ratios are widely used to assess gearing:

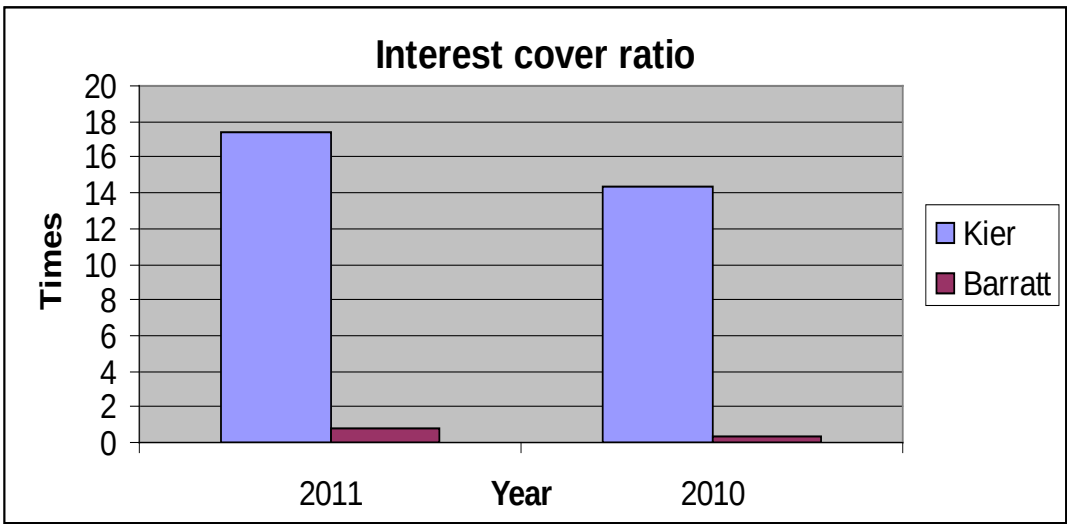
i. *Interest cover ratio*

This ratio indicates that the levels of operating profits are significantly higher than the level of interest payable (please see appendix 13). The calculation is as follows:

$$\text{Interest cover ratio} = \frac{\text{Operating profits}}{\text{Interest payable}}$$

Interest cover ratio

	2011	2010
Kier	17	14
Barratt	0.8	0.3



The Gearing Ratio for the Kier has increased by 21% times in 2011, the level of finance cost has not been reduced in 2011 despite that operating profit has increased from 58m to 73 m in 21011. However the competitor company adopted a different strategy. The operating profit has increased by 42% in 2011 and they reduced finance costs by 58%; this is really a huge improvement and it will boost operating profits in future (please see appendix 14 for more details).

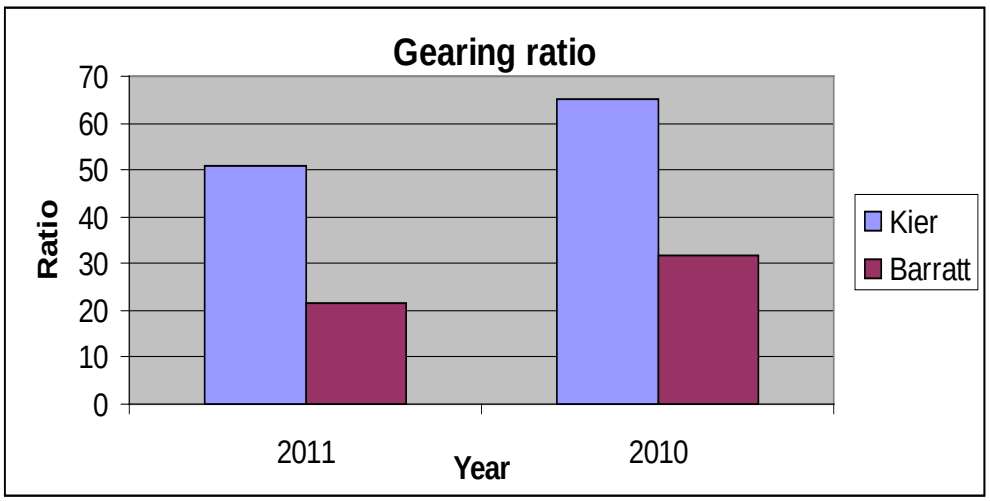
ii. *Gearing ratio*

The gearing ratio evaluates the input of long-term lenders to the long-term capital structure of a firm. The gearing ratio is calculated as follow:

$$\text{Gearing ratio} = \frac{\text{Long-term (non-current) liabilities}}{\text{Share capital + reserves + long-term (non-current) liabilities}} \times 100$$

Gearing ratio

	2011	2010
Kier	51	65
Barratt	22	32



The gearing level for Kier plc has been reduced by 22% in 2011, this is due to paying off long-term borrowing, (please see note 23 from Kier annual report). Also Barratt managed to reduce long-term borrowings in 2011 by more than 50%. A high gearing ratio will create liquidity problems (please see appendix 14 for more details) and have a impact on finance costs.

f) Investment ratios

These ratios indicate the relationships of the companies' share prices to dividends and earnings (please see appendix 15 for more details). The following ratios are designed to help investors to have a better understanding of their returns.

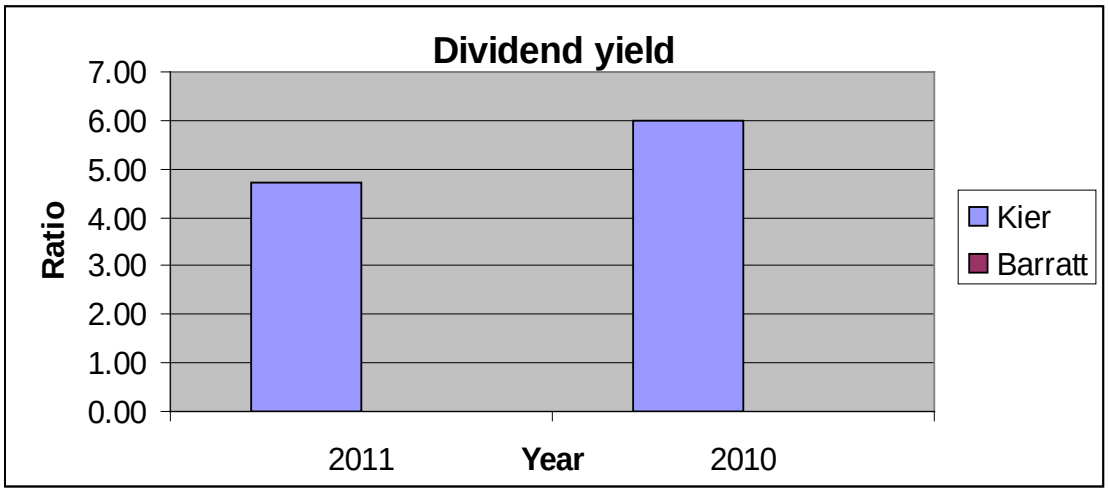
i. *Dividend yield*

The dividend yield ratio indicates the return that investors are obtaining on their investment in the form of dividends. This yield is usually fairly low as the investors are also receiving capital growth on their investment in the form of an increased share price. The ratio is calculated as follows:

$$\text{Dividend yield} = \frac{\text{Dividend per share}}{\text{Market value per share}} \times 100$$

Dividend yield

	2011	2010
Kier	4.71	5.99
Barratt	0.00	0.00



The dividend yield for Kier has been reduced by 21% in 2011 as the market value per share increased from 967.50p at 30/06/2010 to 1360p at 30/06/2011 (please see appendix 6 for more details). This is a good significant result and the company also increased its dividend payments from 58p to 64p in 2011. However the Directors of Barratt plc decided not pay dividends for the second year, which ended 30 June 2011, despite increasing market value per share (please see appendix 16 for more details). The Board is committed to reinstating the payment of dividends and will, when it becomes appropriate to do so.

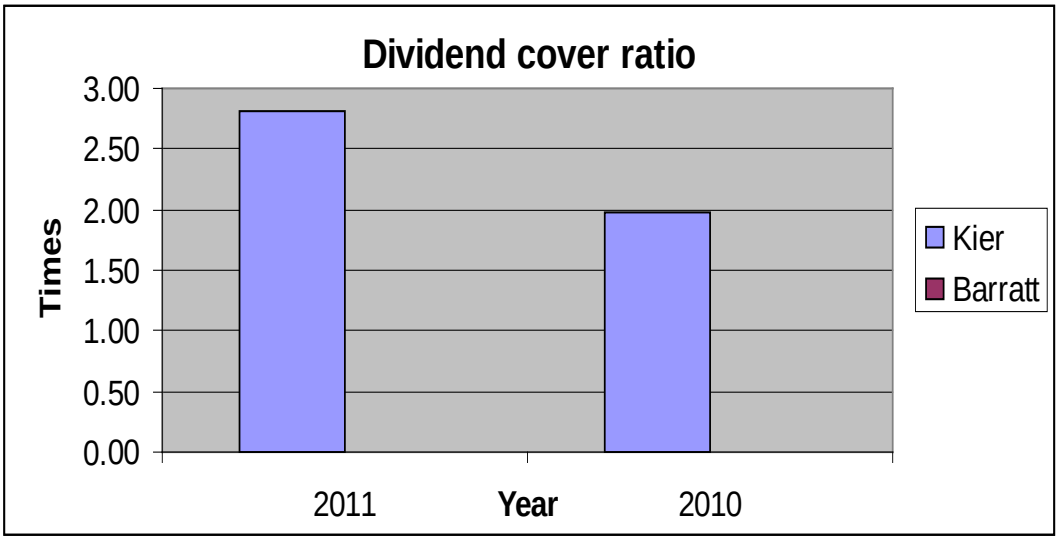
ii. *Dividend cover ratio*

This ratio measures the extent of earnings that are being paid out in the form of dividends. This means, how many times will the dividends paid be covered by earnings. The ratio is calculated as follows:

$$\text{Dividend cover ratio} = \frac{\text{Earning}}{\text{Dividends}}$$

Dividend cover ratio

	2011	2010
Kier	2.82	1.99
Barratt	0.00	0.00



The dividend cover for the Kier plc has increased 0.83 times in 2011. This is good as the profit after tax increased by 54% in 2011, but the company only increased the final dividend payment by 10%. The board of directors may have a different strategy to investing returns elsewhere which gives the company higher returns. The competitor company have not paid any dividend due to making a loss at the end of the financial year.

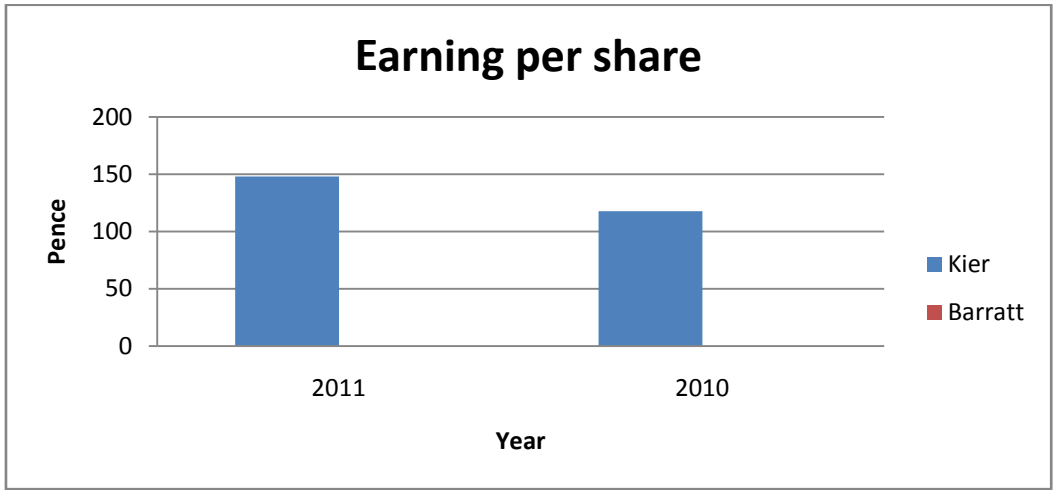
iii. *Earning per share (EPS)*

EPS is the relationship of the profit after tax attributable to each share in issue. It is how much of the after tax earnings shareholders will obtain for each share they hold in the company. EPS is calculated as follow:

$$\text{EPS} = \frac{\text{Earnings available to ordinary shareholders}}{\text{Number of ordinary shares in issue}}$$

Earning per share

	2011	2010
Kier	148.4	117.7
Barratt	0.00	0.00



The EPS for the Kier plc has increased by 26% in the past two years due to increasing profit after tax by 53%. The company is in a good profitable position. Nonetheless the number of ordinary share increased sharply from 38m to 42m in 2011.

iv. *Price earnings ratio (PE)*

PE ratio is a useful indicator of what premium or discount investors are prepared to pay or receive for the investment. PE ratio calculated as follow:

$$\text{Price earnings ratio} = \frac{\text{Market value per share}}{\text{Earnings per share}}$$

Price earnings ratio

	2011	2010
Kier	9.16	5.40
Barratt	0.00	0.00

The PE for Kier has increased by 70% in 2011 due to a sharp increase in the market price in the past two years. However PE is not relevant for Barratt because they did not pay a dividend in 2011 and 2010. Atrill and MacLaney (2008) said the greater PE, the more confidence in the future earnings and it is gives more certainty to investors.

g) Two extra Ratios

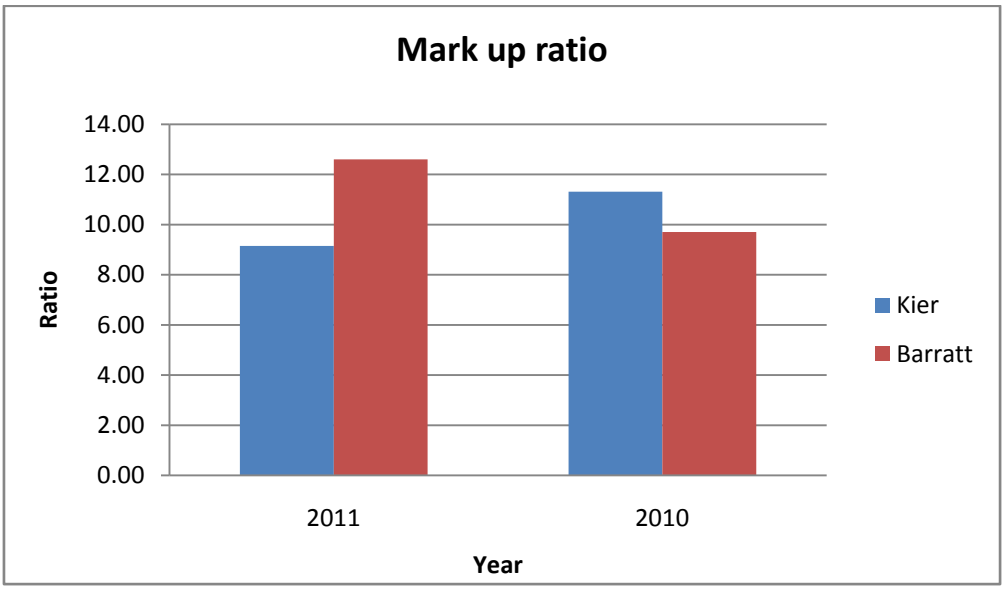
1. Mark up ratio (MUR)

The aim of using MUP is to explore the price to marginal cost. It indicates how much the price of a product is above the cost of producing and distributing it. It can also be used as a measure of market power across firms, industries, or economies. It is calculated as follow:

$$\text{MUR} = \frac{\text{Gross Profit}}{\text{Cost of sales}} \times 100$$

Mark up ratio

	2011	2010
Kier	9.15	11.32
Barratt	12.60	9.70



The above figure representing MUP for Kier plc has fallen in 2011 by 23% due to a decrease in gross profits by 15% in 2011 and the cost of sales increased by 5% in the same period. This is not a good indicator for Kier as it shows that extra sales have been cancelled by increased cost of sales; the finance directors must investigate the reasons and factors for the increased cost of sales. However the competitor company Barratt managed to increase MUR in 2011 by 23% due to a reduction in cost of sales by 3% in 2011. This is important for every business to meet targets and not over spend. The higher MUR the better profitability for the business.

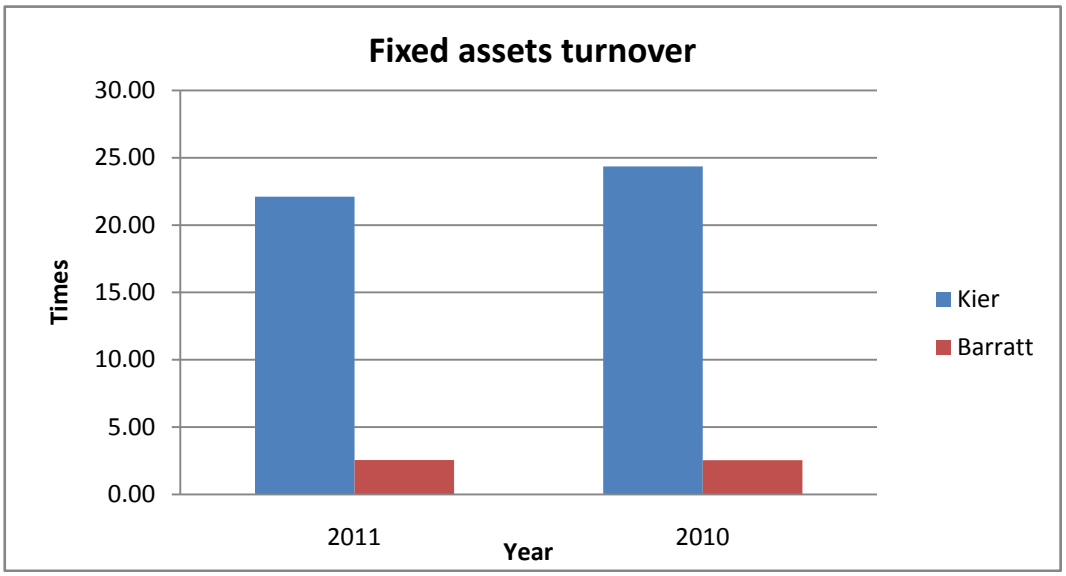
2. Fixed assets turnover

The purpose of this ratio is to evaluate how Kier plc used their fixed assets to generate the revenue (please see appendix 17). It is calculated as follows:

$$\text{Fixed assets turnover} = \frac{\text{Turnover}}{\text{Fixed assets at net book value}}$$

Fixed assets turnover

	2011	2010
Kier	22.11	24.36
Barratt	2.55	2.55



The above ratio shows Kier plc's declined in 2011 by 10%, despite turnover increasing by 3% in 2011; but the fixed assets increased by 12% in same period. According to above explanation Kier may over invest, however Kier is in the construction industry and they require high quality machines and they also need plants for future development. Fixed assets vary greatly among companies. Nevertheless fixed assets turnover for Barratt has changed because turnover has not increased in 2011 and they don't invest in fixed assets.

III. Benchmarking

a) What are the purposes of Benchmarking?

Bendell et al. (1998) said the purpose of benchmarking is to evaluate a current position of the organisations. It permits evaluation against another industry in the same sector. Benchmarking allows companies to recognising strengths and weaknesses and learns how to get better. Benchmarking is a way of finding and adopting best practices. Benchmarking may be practiced through number of different applications (please see appendix 18).

Bramham (1997) said it's important to set out clear objectives of the exercise such as investigating, analysing, planning and action; it is significant to ensure there are resources available to support your decisions. There is no point in collecting data and information if you do not have support or resources to make use of them. As with all perfect performances, it is better to begin with an identified problem area that is able to be defined or an activity where improvement will provide maximum benefit. You may not be able to see the need for improvement by looking internally. Look for opportunities in the widest context, e.g. what are your customers expecting now, what are your competitors achieving?

b) Benchmarking for Kier Group plc

Kier group plc comprises four divisions: Construction, Services, Property and Homes. 67% of the group's revenue was dominated by the construction division in 2011 according to annual report account 2011. This task will focus at benchmarking for the Construction division and how to measure four main activities; financial, market share, internal business perspective and innovation and enterprise and how often to appraise it.

Activities	Key Performance Indicator (KPI)
Financial	Balance sheet, Income statements, Liquidity Debt/coverage, Profitability, Asset-management and investor ratios
Market share	Revenue level and Dividend
Internal business perspective	Current ratio, Cash flow, liquidity and stock days
Innovation and enterprise	New product, Production times, Speed of response to customer complaints

i. *Financial*

The financial performance measures and benchmarks for construction division are to examinee their production competitiveness every six months. It examines if the division spends above group average for rent and utilities. How does the cost of materials compare within the group? Are employee salaries and benefits competitive with the rest of the group? Decision-making involves using financial information and analysis to manage a business effectively. These techniques allow operators to:

- set appropriate prices for products and services;
- improve profitability by accelerating the cash conversion cycle;
- establish an effective credit policy;
- maintain an appropriate inventory;
- assess the financial viability of capital investments such as new projects, expansions and renovations; and
- identify appropriate sources of financing.

In addition, financial ratios are helpful when reviewing divisions for effectiveness. Ratios should be tracked regularly to determine where fluctuations occur and what drives these differences.

ii. *Improve market share.*

The improvement of market share is based on the increase level of revenue and net profits; and every six months the division manager can measure market share through financial ratios such as profitability ratios. Kier plc can achieve better results than their competitors by changing the price or offer special incentives for buyers. Alternatively, Kier can find new methods to distribute products so people can buy it in more places. Finally, Kier can advertise and promote new products. Using these techniques in any combination may improve market share.

Increased market share is not always the best solution for businesses. It might not be profitable if it is associated with expensive advertising or a big price decrease. A company may not be able to meet the

demand of an increased market share without huge investments in new equipment and employees. In some cases it can be to a company's advantage to decrease market share, if the lower costs of lower market share can improve profitability. Managing market share, therefore, is a very important aspect of managing a business.

iii. *Internal business perspective*

This activity is based on good management skills such as reducing cost of sales and controlling the cash a company has on hand. The internal measure shows how long the company can maintain operations without additional revenue or financing (please see appendix 6). This perspective refers to internal business processes. This activity could be exercised through liquidity ratios every six months. Harris et al. (2006). Said this perspective allows the managers to know how well their business is running, and whether its products and services conform to customer requirements (the mission). These metrics have to be carefully designed by those who know these processes most intimately; with their unique missions this is not something that can be developed by outside consultants.

iv. *Innovation and enterprise*

Innovation and enterprise is pushing Kier's construction division to grow sharply especially from 2004 when they entered into partnerships with the local government and city councils. It is important for Kier to have the latest technology to deliver outstanding and complex projects. Since the current financial crisis and housing market bubble the competition among construction industries has become very difficult. Besides the fallen housing market, Kier needs to focus on their construction division with the latest technology and it needs to measure how it is going to improve revenue and long term profits.

The business structure is mainly local - to a very fragmented sustainable construction market. Many technical solutions are already available, but demand is highly fragmented. 40% of demand for Kier's construction work comes from the public sector. The introduction of machinery could improve Kier's construction division revenue further and speed up the delivery time for projects.

IV. Conclusion

The conclusion of this report for Kier group plc is that the share price, revenue and dividend per share increased in the past two years resulting in increasing revenue from the construction division. Kier increased profit in the last two years and increased a dividend which is a good indication for growth in market share. However the credit crunch, current financial crisis and falling house prices have affected both the property division and have hit their competitor company Barratt plc very hard. Revenue has not increased in last two years plus stock turnover increased sharply. The future of the market share for Barratt is uncertain, as they have not paid dividends in the last two years due to making a loss and it's possible that they are facing more losses in the future.

However Barratt Developments can't survive according to the Z analysis results from appendix 11, but Kier Group is in a better financial position, because Kier has specialised in building and civil engineering, support services, public and private house building property developments and the private finance initiative. The recent eurozone crisis and credit squeeze has further affected customer attitude and pressure on lending institutions has led to a tightening of lending criteria and mortgage availability, said Mark Clare, Barratt's chief executive. It is not yet clear how quickly the market will recover but Barratt has to assume that there will be downward pressure on volumes and price inflation in the short-term according to (BBC 2007).

Kier Group predicted a boom in construction in the next few years as the big builders form stronger relationships with local council's contractors ahead of the 2012 Olympics. John Dodd, chief executive said "he was comfortable with the prospects for the housing division and optimistic about winning a series of council maintenance contracts in the second half of the year."

V. Acknowledgement

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Appendices

1. Financial statement Analysis

Elliott and Elliott (2006) describe ratio analysis as the relationship between different items in the financial statements such as (Income Statements, Statement of Financial position and Cash flow statements). They also added that the expertise lies in knowing which ratios provide useful information. According to Melville (1999) ratio analysis on a single set of accounts is usually a pointless exercise. He further stated that most ratios mean very little in absolute terms and only become meaningful when used as a basis for comparison. There are two methods that for comparison.

a) Comparing one year with another for the same company. By doing so, any trends might be extrapolated into the future and used for making economic forecasts.
b) The second method is comparing one business with another. Melville stressed that the two companies or businesses must be in the same sector or industry (which I will apply for this report) for the comparison to be valid. And this is also supported by Elliott and Elliott (2006) where they use the term ''Compare like with like.''

2. Operating profit margin (OPM)

This is the most suitable calculation of operational presentation. This ratio compares one output of the company such as operation profit with another output such as cost of sales; sometimes actual sales increase but at the same time cost of sales increase, so in this situation the operating profit is actually not increasing because increasing cost of sales cover the proportion of increase in operating profit.

Benedict and Elliott (2011) suggested when the OPM increased compare it to previous financial year and this is usually achieved in identical circumstances, such as good management and economy e.g. maximise sales and minimums costing.

From the finance directors point of view they may think they are doing well, but from the shareholders point of view Kier are actually not operating very well compared to Barratt plc because their OP has increased sharply by almost 42% and its pushed OPM to rise by 41%. Nevertheless we have to be cautious they may have different targets such as increasing revenue by providing long term credit and it may causes liquidity problems in long term.

3. Asset turnover

When assets turnover increase then it is good for investors because when equity increases then the share price increases as well and the value of the company also increases. This is good for the long-term period and it is secure of liquidity problems. It also indicates pricing strategy: companies with low profit margins tend to have high asset turnover, while those with high profit margins have low asset turnover. Atrill (2009) explained asset turnover in different ways he said the higher ratios indicate that assets are being used more proactively to generate higher revenue and the financial manger should take careful consideration by using assets to generate higher profits. E.g. if you purchase a new machine and the machine actually creates more than expected (overtrading) this is good in the short term but if you are expecting to use the machine for long periods then it's not a very beneficial decision because when the machine get old it's impossible to use it as a new machine so the age of the assets should be taken to consideration.

4. Gross profit margin (GPM)

The gross profit tells an investor the percentage of revenue / sales left after subtracting the cost of goods sold. Melville (1999) further stated that the comparison between two companies in the same sector is very important as it might shed some light on the pricing policies adopted by each of the companies concerned. This is a clear indication of both companies' ability to use investments to generate earnings.

There are many factors can have an effect on increasing cost of sales e.g. currency deflation, economic down turn or unexpected costs which are not under control and for sure they have an impact on the GPM. Nevertheless the competitor company's GPM has increased by 22% in 2011, which sounds good but in reality it's not good because their revenue only increased by 0.001% and at the same time Barratt plc managed to reduce cost of sales by 3% in 2011. Usually when revenue increases then cost of sales increase too, but if we looking at Barratt the opposite happened.

5. Return on equity

ROE shows the profit attributable to the amount invested by the owners of the business and it measures a firm's efficiency at generating profits from every pound of net assets, and shows how well a company uses investment pound to generate earnings growth.

6. Liquidity Ratios

Wild et al (2007) said the significance of liquidity makes company percussions about failure to meet their requirement in short-term. Liquidity raises issues of a high level degree of risk. Occasionally companies offer discounts as a means of raising cash and the best way to prevent a shortage of cash they need to be careful that trade payables and receivables balance and that they have enough cash for any emergency matters. More extreme liquidity problems can lead to company to instability, bankruptcy or sale of assets at lower prices. Also liquidity can lead to a delay of products from suppliers and hence a loss of reputation amongst customers and suppliers.

7. Stock days

This ratio shows how well inventory is managed by calculating the number of times that a business turnover (or sell) inventory during an accounting period. Atrill and McLaney (2008) state that inventories are very much important for some types of businesses such as manufactures and inventories could account for a significant amount of the total assets held.

For the amount of inventories to carried, the business must consider demand for the inventories and supply shortage. But the main factors for the increasing stock turnover period for Kier are purely based on the current economic and financial crisis because Kier a construction and property provider and the downturn of property market had a direct impact.

Overall Kier plc is much better compared to Barratt because 66% of the revenue is coming from construction contracts. Barratt plc are struggling with the amount of stock they hold and 95% of their stocks are property and the revenue only increased by 0.001% in 2011; again the housing market and uncertainty among first time buyers are the main causes for increasing stock days.

8. Settlement period for trade receivable

A low figure represents greater efficiency but the higher the period to collecting receivables then this will result in an increased risk. The risk of trade receivables is actually much higher than the profit, for example you are selling your products on promises, what happens if promises are not delivered? Then there are other costs involved such as administration and agency costs which may damage relations with customers. The settlement period for the trade receivable ratio analyse how long credit customers take to pay the amounts that they owe to the business.

9. Settlement period for trade payable

The terms and options should be considering by the finance manger. It's not necessary to pay back your credit before the expiry date but it must be in correlation between your receivables and payables to ensure the business is collecting trade receivables before paying suppliers. In addition the finance manger should not use the saving account to pay creditors unless it is urgent.

10. Cash flow ratio

Operational cash flows represent all money brought into the business through producing and selling various goods or services. If the ratio is greater than 14% the companies is doing well, however any companies with less than 5% ratio indicate shortage of cash. Mills and Yamamura (2011) said when it comes to liquidity analysis; cash flow information is more reliable than balance sheet or income statement information. Balance sheet data are static measuring a single point in time while the income statement contains many random noncash allocations e.g. pension contributions and depreciation and paying off. In contrast, the cash flow statement records the changes in the other statements and nets out the bookkeeping artifice, focusing on what shareholders really care about: cash available for operations and investments.

The cash flows derived from the operations of a company after subtracting working capital, investment, and taxes and represent the funds available for distribution to the capital contributors i.e. shareholders and debt providers.

11. Z-score analysis

The Z-Score is a measure of a company's health and utilizes several key ratios for its formulation. The two best known Z-scores are Altman's.

Altman's Z-score

Developed in the 1960's this model uses financial ratios to predict bankruptcy.
The formula is:

$$Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$$

Where:
X1 = Working Capital / Total Assets
X2 = Retained Earnings / Total Assets
X3 = Profit before interest and Tax / Total Assets
X4 = Market Value of Equity / Total Liabilities
X5 = Sales / Total assets

A score above 2.7 indicates the company should be able to continue trading, at least in short to medium term; however a score below 1.8 indicates potentially serious problems.

Altman's Z-score for Kier Group Plc:

$$Z = 1.2(149.9/1144.7) + 1.4(120.7/1144.7) + 3.3(73/1144.7) + 0.6(47.3/980.5) + 1.0(2123/1144.7) = 2.4$$

The company indicated a positive result and should be able to continue trading based on the financial figure in the annual report ended 30/06/2011 and they can avoid bankruptcy.

Altman's Z-score for Barratt Developments Plc:

$$Z = 1.2(2393/4775.3) + 1.4(1542.6/4775.3) + 3.3(127.3/4775.3) + 0.6(303.1/1845.2) + 1.0(2035.4/4775.3) = 1.7$$

The company is considered 'unsafe' based on the financial figures in the annual report ended 30/06/2011 and they may go to bankruptcy unless the housing market recovers soon.

12. Financial gearing ratios

Financial gearing happens when a business is financed by borrowing to operate. For example Manchester United Football Club has been bought by borrowing rather than by owners such as Liverpool Football Club. When a business has high levels of borrowing then they have to pay interest, and this has a direct impact on the income statement. Therefore a higher level of gearing causes shareholders and investors to hesitate investing in the company.

13. Interest cover ratio

If the level of operating profits can't cover interest payable then the firms in serious financial difficulties and there is risk to the shareholder that the lender may take action against the firm to recover the interest by taking some assets instead of the interest.

14. Loan and borrowing

When a company has a large amount of loans, they are in a risky position, because they have to pay interest, and if they are not able pay the interest then it will be a problem.

The loan and borrowing for Kier Plc has not changed in the past two years. Profit for the year increased from 40m to 62m in 2011 but they did not pay back the loan this is due to some strategic issues such as low interest rates or increase in the dividend payment which they did it in 2011. There are strong suggestions the company is not paying back the loan and borrowings because they may have borrowed on a fixed rate as the finance cost has not changed from 2010 to 2011.

The comparative company Barratt Developments Company has borrowing huge amounts of money, because they bought rival builder Wilson Bowden for £2.2bn in 2006, before the credit crunch precipitated a fall in house prices. By end of June 2011 Barratt reduced the loans and borrowing from 918m to 405m, also they reduced level the of finance cost from 249m to 156m. For sure in 2012 the company will reduce the finance cost further and it can bring confidence to the business and it will improve share price.

The firm's shares have fallen alarmingly and some City insiders believe the company will have to go cap-in-hand to the City and raise money via a rights issue. (Guardian, 2008). Barratt forecasts increasing house sales during the coming years, by cutting the cost of houses, and making a better offer for first time buyers, but this is not guaranteed as the current housing market is uncertain.

15. Investment ratio

It is important to pay suppliers on time before the expiry date and to ensure there is no damage to the relationship with suppliers and the reputation of the business. Also the delay in paying creditors may result in a loss of creditor discounts by not paying on time. Settlement period for the trade payable ratio estimate by how long it takes to pay those who supplied goods and services on credit.

Note that when we refer to the share price, we are talking about the Market value and not the Nominal value as indicated by the par value. For this reason, it is difficult to perform these ratios on unlisted companies as the market price for their shares is not freely available. One would first have to value the shares of the business before calculating the ratios. Market value ratios are strong indicators of what investors think of the firm's past performance and future prospects.

16. Movement in share price

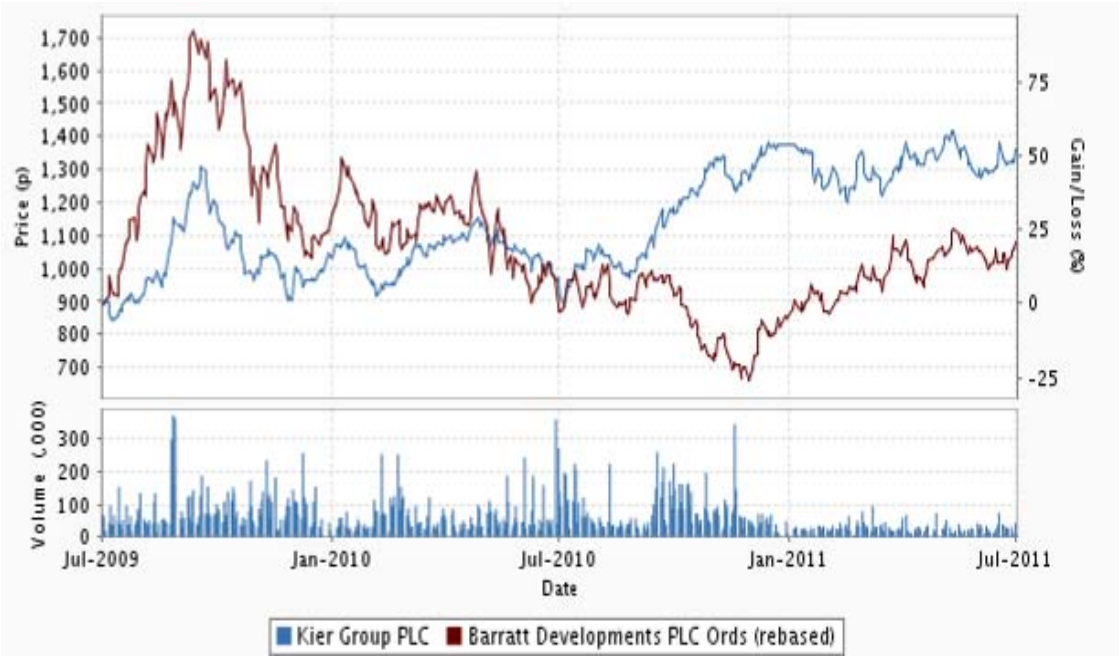
The share price for Kier Plc in the past two years has increased sharply, and shareholders invested in the company because of higher returned dividends and increase in the value of shares. When the companies

are in a good profit position, then share price might go up, because it's attractive for buyers. The share price for Kier group plc increased from 9680p in 30 June 2010 to 1360p in 30 June 2011.

However the share price for the comparative company Barratt Development Plc has decreased extraordinarily from 9500p in 30 June 2010 to 1140p in 30 June 2011, because of the company's net loss after tax for 2011 of 13m and in 2010 of 118m. If property markets recover then the share price will go up very quickly so there is a very strong correlation between the housing market and Barratt.

The share prices are determined by supply and demand, which in turn is determined by a whole range of factors. Many of these relate to the performance of the company, for example if a company undertakes an attractive investment, investors will be keen to buy shares, demand will exceed supply, and the share price will tend to increase.

Alternatively, if the sales and profits of a company decline, investors will be unenthusiastic about the company, and they will tend to sell their shares. Supply will exceed demand and the share price will tend to fall. However it's important to understand that investors buy and sell the shares for reasons that have nothing to do with the performance of the company. (Arnold, 2003)



Sources: Hemscott

The above figures show how the current financial crisis has had an effect on the company's share prices, the share prices for Barratt was 1700p in August 2009 and the share price decreased to 3500p in January 2011. This completed the blow for shareholders because the shares are hugely declining. However the shares for the main company Kier Plc have not been affected as much as Barratt due to having won many contracts from the 2012 Olympic Games and continuing to operate overseas.

Barratt Developments has seen its share price fall to around the 475p mark from a year-high of nearly 1,300p and has warned the market that it has suffered a 14% fall in private house sales this autumn. Kingfisher is one of a number of shares that usually perform badly when the US economy slows downs, according to quantitative analysts at JP Morgan. The analysts said other shares likely to suffer in the future included Barratt Developments. (the business, 2007).

The company can keep stockholders happy by returning a dividend, fundamentally when the companies make a profit they can pay a dividend to a shareholder, but when the company doesn't have a profit, then they can but they have to use other paid resources. Nonetheless Kier Plc also increased the dividend in the past two years, the dividend has increased from 58p in 2010 to 64p in 2011 and these kinds of returns are impressive to the shareholder. This makes them have the confidence to buy more shares in the company because the shareholder thinks about the increasing value of the shares and hence an increase in the return of the dividend as well.

Nonetheless Barratt Developments has not paid a dividend in the past two years because of making a loss in both years. This will have created uncertainty among the shareholder to buying more shares in the company, because the shareholders and new investors will think it is not worth it to invest in the business.

However the erouzone crisis will have an effect on both companies until it ends (guardian, 2008).

Once more British people can't afford to buy property, because lack of "Confidence is a very important factor in the housing market and much of this confidence is determined by expectations of the future path of house prices, said Earley, Nationwide's chief economist" (ft, 2008). However, economists expect consumer spending to slow during 2008-2011 in response to tighter credit conditions, rising food and energy bills and greater economic uncertainty.

17. Fixed assets turnover

Melville (1999) said fixed assets turnover indicates how well your business is using its fixed assets to generate sales. Generally speaking, the higher the ratio, the better because a high ratio indicates your business has less money tied up in fixed assets for each pound of sales revenue. A decaling ratio may indicate that you've over-invested in plant, equipment.

18. Trade analysis

The purpose of trade analysis is to evaluate an entity's profit and loss accounts and balance sheets for a specified period, requiring one period's results to be given a base of 100 and the other period results for each line in the accounts to be then converted into factors that relate to that base period of 100 Melville (1999).

Kier Group Plc	2010	Index	2011	Index	2 years +/-
Revenue (£m)	2056	100	2123	103.26	3.26
Cost of Sales (£m)	1847	100	1945	105.31	5.31
Gross Profit (£m)	209	100	178	85.17	-14.83
Operating Profit (£m)	58.7	100	73	124.36	24.36
Finance cost	4.1	100	4.2	102.44	2.44
Profit before tax (£m)	57.7	100	72.5	125.65	25.65
Profit after tax (£m)	40.5	100	62.3	153.83	53.83
Non-current assets (£m)	175.7	100	185.6	105.63	5.63
Fixed assets (£m)	84.4	100	96	113.74	13.74
Current assets (£m)	942.4	100	959.1	101.77	1.77
Inventories (£m)	406.8	100	430.9	105.92	5.92
Trade receivable (£m)	330.1	100	329.9	99.94	-0.06
Cash in hands (£m)	205.5	100	195.1	94.94	-5.06
Current liabilities (£m)	818	100	809.2	98.92	-1.08
Trade payable (£m)	811.5	100	799.2	98.48	-1.52
long-term borrowings (£m)	30.3	100	30.3	100.00	0.00
Non-current liabilities (£m)	195.9	100	171.3	87.44	-12.56
Equity (£m)	104.2	100	164.2	157.58	57.58
Capital expenditure (£m)	11.6	100	45.8	394.83	294.83
ROCE (%)	19.56	100	21.76	111.24	11.24
OPM (%)	2.86	100	3.44	120.44	20.44
GPM (%)	10.17	100	8.38	82.48	-17.52
Assets Turnover (%)	6.85	100	6.33	92.36	-7.64
ROE (%)	38.87	100	37.94	97.62	-2.38
Current Ratio (times)	1.15	100	1.19	103.29	3.29
Acid Test Ratio (times)	0.65	100	0.65	99.69	-0.31
Inventory Turnover (times)	4.54	100	4.51	99.42	-0.58
Inventory days	80	100	81	101.25	1.25
Trade receivable period (days)	59	100	57	96.61	-3.39
Trade payable period (days)	160	100	150	93.75	-6.25

Cash flow maturing (%)	711	100	1518	213.50	113.50
Free cash flow (times)	10	100	1	10.00	-90.00
Cash exhaustion ratio (days)	92	100	88	95.65	-4.35
Interest cover ratio (times)	14	100	17	121.43	21.43
Gearing ratio (%)	65	100	51	78.46	-21.54
Dividend yield (%)	5.99	100	4.71	78.63	-21.37
Dividend cover ratio (times)	1.99	100	2.82	141.71	41.71
EPS (pence)	179	100	148.4	82.91	-17.09
PE/ratio (times)	5.4	100	9.16	169.63	69.63
Mark up ratio	11.32	100	9.15	80.88	-19.12
Fixed assets turnover	24.36	100	22.11	90.78	-9.22

It can be seen that the revenue has increased by 3.26% over the past two year period and net profit for the year increased by 35% in 2011. It is also useful to look at contributing factors such as sales marketing expenses and cost of sales. Also it is interesting to note the dividend per share has increased in the past two years by 10%, which is more attractive for shareholders and is a contributing factor towards the increasing profits. Finally you can see in the analysis that Kier is in a more profitable position invest and hence more suited to attract investors to investing in the company.

19. Limitations of research

This report was produced by numerical analysis of figures presented in the company reports for the last 2 years. Therefore it must be noted that some figures may have been presented in a manner that looks favorably on performance or contains some bias.

It also must be noted that there was a change in Accounting Standards during the period that this report looks at. From 2005 all European Union companies must prepare their consolidated reports using IFRS (International Financial Reporting Standards). Prior to this, both Kier and Barratt prepared their reports using UK GAAP (General Accepted Accounting Principle). This has meant that there has been a change in the construction of some figures.

Therefore, wherever possible, the 2 year summary of the Annual Reports 2010 and 2011 has been used as it presents the data in both IFRS and UK GAAP formats, although some figures do vary when looking at individual reports for data which is not included in the 2 year summary.

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Index Approach of Corporate Governance

By Teber Zitouni

Carthage University, Tunisia

Abstract- This paper has an empirical aim. It consists in assessing, in original way, the corporate governance practices of a sample of 205 US firms based on an index over the period 2007-2012. It is a score calculated using the non-parametric method of the efficiency frontier which reflects, for each firm, the distance separating the firm from the border representing "best practices" in corporate governance. Thus, we build a corporate governance index where governance mechanisms constitute inputs and governance standards from the codes of good practices constitute the outputs.

The results analysis reveals that the firms of the sample are, on average, relatively well-governed with some sectoral disparities.

Keywords: corporate governance, index approach, data envelopment analysis, codes of good practices, efficiency frontier.

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The results analysis reveals that the firms of the sample are, on average, relatively well- governed with some sectoral disparities.

Furthermore, the average monthly return of "good corporate governance portfolio" which is composed of all firms whose quality of governance is the best, is higher than the average monthly return of "weak corporate governance portfolio" with firms whose corporate governance is considered poor.

Keywords: corporate governance, index approach, data envelopment analysis, codes of good practices, efficiency frontier.

I. Introduction

For some years, we have been witnessing the emergence of index approaches to evaluating corporate governance practices. The proposed indexes are usually based on corporate governance codes through which scores are attributed according to predefined coding systems.

The majority of these empirical studies testing the link between governance and corporate performance focus on one axis or a few specific mechanisms of corporate governance.

However, focusing on a specific mechanism may result in biased studies given that the governance mechanisms are various and interrelated.

Also, most studies assumed that different mechanisms contribute in the same way in improving the corporate governance quality. But assuming that corporate governance is a linear function of the selected mechanisms or that they are even-weighed can skew the quality of the corporate governance index.

Therefore, this article aims to humbly contribute to address these shortcomings, thus, by exploiting, in an original manner, the advantages of the method of data envelopment analysis. This article presents in its first section an overview of the different corporate governance codes from which governance standards are derived. The construction of the corporate governance index is the subject of the second section. The results are presented and analyzed in the third section.

II. Corporate Governance Codes

Since the last decade of the 20th century we have been witnessing the emergence of new standards, principles and recommendations that increasingly regulate the practices in corporate governance.

Since the publication of Cadbury's Report in1992 in Great Britain, thinking on corporate governance is enriched by the regular publication of a number of codes of "good behavior". To date, there are more than 400 worldwide. Thus, these codes of corporate governance are developing standards that guide the functioning of boards of directors and their special committees and ensure the respect of the rights of investors and the clarity and the sincerity of useful information for all the stakeholders.

In France, the traditional corporate governance model is focused on the manager who has absolute power; hence, the disciplinary impact of market mechanisms remains limited (Charreaux, 1996). Thus, different working committees made recommendations for French companies wishing to strengthen their good governance practices. To this end, they issued many reports namely Viénot I and Viénot II reports, the Bouton report and The Corporate Governance Principles for listed companies, ...

The report Viénot I (named after the President of the Committee, Marc Viénot, at that time CEO of Société Générale) is at the origin of a deep awareness for the importance of corporate governance principles in France. It is largely inspired by the Cadbury Report, of which it takes many recommendations.

The Viénot II report published in July 1999, makes a total of 35 recommendations, and brings a new and deeper reflection on the dual functions of Chairman and CEO, the executive compensation and shareholder rights to accees to information.

The report Button (named after the President of the committee, Daniel Bouton, who succeeded to Marc Viénotas CEO of Société Générale). It was published in September 2002, in the specific context of the financial scandals of the Internet bubble which ruined many small shareholders. The report focuses on corporate governance practices in the composition of the board and the independence of auditors and the accounting practices within the company. In September 2002, the corporate governance principles resulting from the consolidation of the joint reports of AFEP and MEDEF have been published.

Author: Carthage University, FSEG Nabeul, Tunisia.
e-mail: zteber@yahoo.fr

It highlights the "competence" as an essential quality of the director; it is even more essential than the concept of independence. Since then, the recommend-dations have been successively supplemented and updated in October 2008 with recommendations on the compensation of executive directors of listed companies and in April 2010, on the presence of women in the boards of directors.

More recently, in June 2013, the code of the AFEP and MEDEF was revised after consultation with public authorities, organizations representing individual and institutional shareholders.

As far as the German system of governance s concerned, it is largely based on internal monitoring mechanisms (Emmons and Schmid, 1998). The disciplinary power of the financial markets is particularly restricted, as opposed to the Anglo-American system characterized by more liquid markets and more active institutional shareholders (Elmeskov, 1995; Hanke and Walters, 1994). The internal monitoring of German companies is essentially characterized by the power of banks and the formal separation between management and surveillance bodies. In June 2000, the "German Corporate Governance Code" was published ; it was revised successively in 2002, 2003, 2005, 2006, 2007, 2008, 2009, 2010 and 2012, 2013, 2014 and finally in May 2015.

In June 2002, the "Swiss Code of Good Practice" was published and it addressed public companies. It intends to establish a charter of conduct and make recommendations particularly for institutional investors and financial intermediaries. This code was revised in December 2008 and most recently in September 2014.

Canada is inspired by American capitalism marked by the power of the financial market. However, the institutional ownership is less than in the United States.

In December 1994, the Toronto Stock Exchange, following worries about the quality of corporate governance which are listed there, issued "guidelines for better corporate governance in Canada". It mainly emphasized the role of directors. Then, in December 2003, a "Guide to good disclosure: Corporate Governance" was published in 2006 and most recently revised in 2013.

In the US, the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (BRC, 1999) and the National Association of Corporate Directors Blue Ribbon Commission on Audit Committees (NACD, 2000) published reports with several recommendations to improve the quality of audit committees. The Securities and Exchange Commission SEC has published new rules for listed companies in particular regarding the communication on the composition and activity of audit committees (SEC 1999). Adopted on 23 January 2002 by the Federal Congress of the American Sarbanes, Oxley Act is a decisive step in the American regulations on corporate governance.

Indeed, after the highly publicized accounting fraud scandals, the US government was forced to strengthen national legislation in terms of corporate governance. Within this trend, the SOX (Sarbanes-Oxley Act) was submitted to congress. In 2002, the New York Stock Exchange (NYSE) issued a second report which requires that companies listed on the NYSE have boards of directors with a majority of independent members. In addition, the audit, nomination and compensation committees must be composed exclusively of independent. It should be added that the manager must certify each year that they are neither aware nor informed of violations of standards set by the New York Stock Exchange. This report was revised in September 2010.

More recently, The Business Roundtable (BRT) which is an association of Chief Executive Officers (CEO) has revised its code of corporate governance principles in March 2012. This association has long time fought for best practices in corporate governance. Recent reports have addressed the corporate governance principles (May 2002, November 2005 and April 2010), executive compensation (November 2003 and January 2007), the nomination process (April 2004) and the guidelines of communication between shareholder-manager (May 2005).

Morover, the « Organisation for Economic Cooperation and Development » (OECD) issued "corporate governance principles" in 1999 and 2004. Both reports addressed the rights of shareholders, the structure and responsibilities of the board of directors, internal and external audit, benefits of managers and stakeholder relations.

However, it is worth recalling that the culture, attitudes and economic history are country-specific; hence, corporate governance problems are treated differently. As a result, the rules on corporate governance were developed differently in different countries. But with the globalization of economic relations and more specifically with the globalization of financial markets, we are witnessing more and more convergence phenomenon for corporate governance practices. Thus, proximity to the corporate governance principles adopted by the various systems is highlighted by numerous studies and supporters of the convergence theory of corporate governance modes multiply the examples.

Definitely, "it does seem to be convergence around certain key principles usually based on the principles of corporate governance of the “Organisation for Economic Cooperation and Development (OECD)" such as transparency, accountability, monitoring and fairness (Mallin, 2004).

III. Index Approach of Corporate Governance Practices

a) Literature review

Below is a summary of some empirical works that built a corporate governance index for firms operating in various countries and test its impact on performance.

Authors or Agency	Year	Sample	Variables
Gompers, Ishii and Metrick	2001	1500 U.S firms	24 provisions against takeovers
Campos and al.	2002	188 firms listed on six emerging markets	transparency, ownership structure, the board of directors and shareholder rights
Black, Jang and Kim	2002	526 Korean firms	the rights of shareholders, the board of directors, independent directors, the audit quality, publications and ownership structure
Standard & Poor's	2002	859 firms from 27 different countries	the concentration of the ownership structure, the nature of relations between the various stakeholders, transparency and communication and the board of Directors
Alves and Mendes	2002	Portuguese firms	the voting rights and fairness to shareholders.
Institutional Shareholder Services (ISS)	2003	3000 American firms of the Russell Index	the board of directors, ownership structure, executive compensation, meetings of independent directors and director training
Durnev and Kim	2003	859 large firms from 27 countries	disclosure and governance practices and features of the legal environment.
Drobetz, Schillhofer and Zimmermann	2004	German firms	30 mechanisms linked to commitment to corporate governance, respect for shareholder rights, transparency, role of the board of directors and control.
Doidge and al.	2004	firms operating in 40 countries	the concentration of the ownership structure, transparency, discipline, and the Board of Directors and its characteristics.
Durnev and Kim	2005	859 firms operating in 27 countries	ownership structure, disclosure practices and transparency rankings
Mintz	2005	Firms operating in 23 countries	financial transparency, share-holder rights, ownership structure, the board of directors and internal control

Khiari, Karaa and Omri	2007	320 US firms	inside control, managerial discretion, ownership concentration, dominance of the board by the CEO and manager entrenchment
Credit Lyonnais Securities Asia (CLSA)	2008	495 firms operating in 25 emerging markets	transparency, discipline officers, responsibility of the audit committee, compo-sition and functioning of the board of directors.
Varshney, Kaul and Vasal	2012	Indian firms	internal and external mechanisms of corporate governance

Although the above studies consider a set of corporate governance practices when constructing the index, however the majority of empirical studies focus on one axis of corporate governance. Also, most studies assumed that all mechanisms contribute in the same way in improving the corporate governance quality.

That is why, a new approach based on efficiency frontiers was recently used to assess the quality of corporate governance.

The efficiency frontiers can be approached either by parametric methods such as "Stochastic Frontier Analysis" (SFA), or by the non-parametric methods such as "data envelopment analysis" (DEA). Few empirical studies have evaluated the quality of the corporate governance system of the countries using the efficiency frontier. Thus, the method of "data envelopment analysis" (DEA) was adopted especially by Wen and al. (2002) in China, Drake and Simper (2003) in the United Kingdom, Lehman and al. (2004) in Germany, Khanchel (2004) in the United States, Zheka (2005) and Zelenyuk and Zheka (2006) for Ukraine, Nanka-Bruce (2006) in Spain, Destefanis and Sena (2007) in Italy. Khiari Karaa and Omri (2007) used the method of stochastic frontier (SFA) in the United States. However, these studies do have some conceptual limitations. For example, Drake and Simper (2003) and Lehman et al. (2004) have only integrated the ownership structure as a corporate governance mechanism. Concerning outputs, studies have unanimously opted for measures of performance especially apprehended by Tobin's Q, the return on equity, investment in intangible assets and growth of the firm, this is the example of Lehman and al. (2004), Khanchel (2004), Louizi (2007) and Destefanis and Sena (2007).

The score calculated does not reflect an intrinsic efficiency of corporate governance but rather a measure of optimization of the governing mechanism for a better corporate performance.

Therefore, this article aims to humbly contribute to address these shortcomings. Thus, by exploiting, in an original manner, the advantages of the method of data envelopment analysis, we build a corporate governance index where governance mechanisms constitute inputs and governance standards from the codes of good practices constitute the outputs. This way of building corporate governance score is consistent with the foundations of agency theory since firms use various mechanisms either of monitoring (board of directors) or incentive (pay, ownership structure) to produce more transparency, accountability, and credibility.

b) Sample

The sample consists of 205 US firms listed on the NYSE. This type of firms has usually significant agency problems, due to the dispersion of capital and the separation between share ownership and decision making.

This period stretches over 5 years, from July 2007 to June 2012.

Data on the ownership structure and corporate governance mechanisms are retrieved from reporting agents available thanks to Edgarscan services and the database “Value Line Investment”. Stock market data are from the site www.yahoofinances.com.

c) Methodology

i. *Presentation of the method*

The basic rationale of 'Data Envelopment Analysis' method is to determine a production possibility frontier which links the given inputs to the "best practices" for outputs.

This technique can take into consideration endogenous or exogenous relations between different mechanisms and corporate governance standards. In addition, it has the ability to simultaneously integrate multiple inputs and multiple outputs without explicitly specifying a priori functional form.

Also, it determines a "good practice" frontier, a kind of 'benchmarking' of firms whose combination of governance mechanisms abide by the best corporate governance standards. Not only does this technique determine the sources but also it decides on the level of inefficiency relative to each input (governance mechanism) and / or to each output (governance standard). Units which are operating efficiently have a score equal to 1 while the less efficient have scores lower than 1. Finally, this technique has the ability to

objectively weigh inputs or outputs to build the efficient frontier. This reduces the bias of subjectivity and avoids equal weighting mechanisms.

However, one limitation of the method is the need for a fairly large number of observations so as to generate stable frontiers[1]. Furthermore, variables related to corporate governance have been defined and operationalized in the light of the literature review and codes of good practice, such as corporate governance principles of the OECD (2004).

We adopt the following linear program:

$$\begin{aligned} &\text{Min}_{\theta,\lambda,\,OS,\,IS}\ \theta - (M1'OS + K1'IS),\\ &sc \quad -y_j + Y\lambda - OS = 0,\\ &\theta x_i - X\lambda - IS = 0,\\ &\lambda, OS, IS \geq 0,\\ &N1'\lambda = 1 \end{aligned}$$

where xi is the $i^{ème}$ input, y^j is the $j^{ème}$ output,
λ is a (N $\times$ 1) constants vector,
OS is a (N $\times$ 1) variables vector related to of deviations outputs,
IS is a (K$\times$1) variables vector related to of deviations inputs,
M1 and K1 are respectively (M$\times$1) and (K$\times$1) unit vectors [2].
The additional constraint ($N1'\lambda = 1$) allow to compare firms operating on a similar scale.

ii. *The inputs*

As afore mentioned, we believe that firms are implementing corporate governance mechanisms in order to better manage the interests of shareholders and more generally all stakeholders and to show their good faith and their know-how in the use of resources which have been entrusted to them. The mechanisms and the measures chosen are summarized in the following table:

Table 1 : The input variables

Mechanisms	Variables	Measures adopted
Ownership structure	Ownership of the majority shareholders	Number of majority shareholders holding at least 5% of capital.
		The cumulative percentage of capital held by the majority shareholders.
	Institutional ownership	The cumulative percentage of capital held by institutional investors.
	Managerial ownership	The percentage of capital held by the managers.
Structure of the board of directors	Size	Total number of members of the Board of Directors
	Activity	Total number of meetings per year of the Board per year.
	Independance	The percentage of directors who are not current employees of the firm, or retired, or having links of kinship with the CEO.
	CEO duality	A dummy variable that takes the value 1 if the CEO is a member of the board and 0 otherwise.
Structure of the Audit Committee	Independance	The percentage of independent members of the Audit Committee.
	Activity	Total number of meetings per year of the Audit Committee.
	Expertise of the auditors	A dummy variable that takes the value 1 if there are auditors with finance and accounting skills, and 0 otherwise.
Structure of the nomination committee	Existence of the Nomination Committee	A dummy variable that takes the value 1 if there is a Nomination Committee and 0 otherwise.
	CEO is a member of the Nomination Committee	A dummy variable that takes the value 1 if the CEO is a member of the Nomination Committee and 0 otherwise.

[1] We hope to exceed this limit with a sample of 205 firms.

[2] The value of θ obtained will be the (proportional) reduction applied to all inputs of the firm evaluated to achieve efficiency.

Structure of the Compensation Committee	Existence of the Compensation Committee	A dummy variable that takes the value 1 if there is a compensation committee and 0 otherwise.
	CEO is a member of the Compensation Committee	A dummy variable that takes the value 1 if the CEO is a member of the Compensation Committee and 0 otherwise.
Structure of the Execution Committee	Existence of the Execution Committee	A dummy variable that takes the value 1 if there is an Executive Committee and 0 otherwise.
Structure of the Governance Committee	Existence of the Governance Committee	A dummy variable that takes the value 1 if there is a Governance Committee and 0 otherwise.
Incentive and Compensation Plan	Existence of an Incentive Plan	A dummy variable that takes the value 1 if there is an incentive plan, and 0 otherwise.
	Compensation of the CEO	The total remuneration of the CEO divided by total assets.
	Compensation of the CEO in the form of stock option	The percentage of the remuneration of the CEO in the form of stock option divided by total compensation.
Financial Policy	Distribution of dividends	Dividend paid per share per year.
	Indebtedness	Long-term debt divided by total assets.

iii. *The outputs*

Firms which use governance mechanisms to generate information,… This should signal the good faith, transparency, relevance of the strategic choices, etc. We believe that the principles and governance standards issued in various codes summarize this type of information sought by all stakeholders. To construct the corporate governance index, we used the outputs inspired by the "Corporate Governance Principles of the OECD (2004)". Thus, corporate governance standards call for the timely dissemination of information on all significant events occurring between the publications of periodic reports. They are also favorable to the simultaneous dissemination of this information to all types of shareholders so that they receive fair treatment. Furthermore, and as regards managerial accountability, Williamson (1994) states: « I am not saying that everyone is continually opportunistic, but individuals are sometimes opportunistic and that loyalty differences are rarely visible ex ante ".

Managerial opportunism can be approximated by the free cash flow (Charreaux, 1997). To summarize, we hold the following outputs:

Table 2 : The output variables

Standards	Variables	Measures adopted
Transparency and dissemination of information	Financial transparency	Timeliness Score (from the Value Line Investment database)
	Dissemination of information	
Managerial accountability	Limiting managerial opportunism	Free cash flow (from the Value Line Investment database) divided by total assets

IV. Results Analysis

Table 3 summarizes the sectorial composition of the 205 firm of the sample for the period between July 2007 and June 2012.

Table 3 : Sectoral Composition

Sector	Number of firms	Percentage
Basics Materials	20	10,39
Consumer Products	30	15,34
Health care	21	9,41
Industrial Goods	67	34,16
Retail	15	6,44
Services	11	5,44
Technologies	22	9,90
Transport	10	4,95
Utilities	9	3,96
Total	205	100,00

Table 4 summarizes the corporate governance indices calculated with the method of data envelopment analysis for the period from July 2007 to June 2012.

Table 4 : Corporate Governance Indices

Years	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012
Min	0.429	0.379	0.389	0.256	0.231
Max	1	1	1	1	1
Mean	0.869	0.875	0.811	0.829	0.793
Standard deviation	0.172	0.174	0.207	0.210	0.232

From Table 4, we note that firms in our sample are, on average, relatively well governed with an average score close to 80%. This corroborates that US companies adopt governance standards, voluntarily or forced by law and regulations. However, one point deserves special attention; a continuous increase in the standard deviation of the corporate governance index during 2007-2012. This should intrigue us because, since the enactment of the Sarbanes Oxley Act in 2002, firms should increasingly align their practices with new standards and their corporate governance index should then converge. A plausible explanation could be advanced: The data envelopment analysis method can establish efficiency scores relating to the remaining sample and every inefficient firm deviates from the efficiency frontier constituted solely by efficient firms. That is why, with the harmonization of rules of good corporate governance, any deviation from the efficiency frontier is heavily sanctioned and visibly seen through the corporate governance index.

Moreover, since the financial crisis (subprime) of 2007/2008, the stock exchanges and regulators have continued to revise their recommendations. Therefore, any firm which does not abide by new standards (especially those who remain optional) is severely punished by the data envelopment analysis method which proposes a new «benchmark».

Furthermore, table 5 summarizes the descriptive statistics of the corporate governance index by sector. Some sectoral disparities can be noted: firms of the transport and health sectors are, on average, those which respect the corporate governance recommendations, while those in the technology and utilities sector tend to fail to abide by the standards. This finding corroborates that emitted by Drobetz, Schulhofer and Zimmermann (2003) for the German market.

Table 5 : Average corporate governance index by sector

Secteur	Nombre d'entreprises	$\overline{CGI}$	MIN	MAX
Basics Materials	20	0,8339	0,6141	1
Consumer Products	30	0,8147	0,5321	1
Health care	21	0,8918	0,4980	1
Industrial Goods	67	0,8343	0,5184	1
Retail	15	0,8027	0,4988	1
Services	11	0,8654	0,6544	1
Technologies	22	0,7781	0,5540	0,9992
Transport	10	0,9368	0,6236	1
Utilities	9	0,8001	0,5061	1

Furthermore, on the basis of the efficiency scores found, we classify the firms in a descending order. That is to say from the most efficient firms in terms of governance to the least efficient firms. We divided them into three groups:

- the first group corresponds to the three first deciles (30% of the sample)
- the second group corresponds to the median four deciles (40% of the sample)
- the third group includes the last three deciles (30% of the sample).

We construct the following two extreme portfolios: the first portfolio consists of firms of the first group, those of good corporate governance while the second portfolio consists of the last group firms those of weak corporate governance.

Table 6 : Average return of the two extreme portfolios

	Good corporate governance portfolio	Weak corporate governance Portfolio	Difference
Mean	0. 017286	0. 013831	0. 003455*
Standard deviation	0. 049785	0. 044520	_

** significant at the 10% threshold.*

Table 6 shows the difference between the average yield of the two extreme portfolios. The results show that the good corporate governance portfolio has an average monthly return of 0.3455% higher than the weak corporate governance portfolio, namely 4.15% per year. This difference is significant at the 10% threshold.

V. Conclusion

In this article, we tried to exploit, in an original way, the advantages of the technique of the data envelopment analysis to build a corporate governance index. To the best of our knowledge, there is no empirical study that measured the efficiency of the corporate governance system by using the governance mechanisms as inputs and governance standards from the codes of good practice as outputs.

The 20 variable inputs characterizing the corporate governance mechanisms of the sample of 205 US firms are grouped around 4 themes: the ownership structure, the Board of Directors and its committees, compensation and incentive Plan and financial policy. As for outputs variables, we selected 2 which represent the following principles or corporate governance standards: financial transparency and dissemination of information and managerial accountability.

The results analysis reveals that the firms of the sample are, on average, relatively well- governed with an average score above 80% over the period 2007-2012. This confirms the fact that US firms adopt corporate governance standards, by their own free will or forced by the regulations. Furthermore, the descriptive statistics of the corporate governance index reveal some sectoral disparities.

Furthermore, the average monthly return of "good corporate governance portfolio" which is composed of all firms whose quality of governance is the best, is higher than the average monthly return of "weak corporate governance portfolio" with firms whose corporate governance is considered poor. This average return difference between the two extreme portfolios is statistically significant at the 10% threshold.

This makes us wonder whether there is really a relationship between the stock return and the corporate governance quality. The investigation on this issue can be the subject of future work.

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Measuring Efficiency of Select Large Cap and Small Cap Open Ended Equity Schemes

By Adavelli Sagar Reddy, Dr. Y Rama Krishna & Dr. Sindhu

RK Business School, India

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Keywords: mutual funds, DEA, sharpe index, comparative fund performance, risk adjusted portfolio performance, portfolio funds performance.

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I. Introduction

Investment in mutual fund is considered as safe bet and yields high returns due to professional management and large Asset Under Management (AUM). AUM is a monetary term indicates the market value of all the funds being managed by a fund house on behalf of its clients and investors. The percentage of scheme type aggregate AUM of various mutual fund categories at the end of the study period has been category wise mentioned in Table-1. With their phenomenal investments the fund houses can leverage on low expense ratio, transaction cost, advertisement etc. on the other hand the funds with large amount of AUM may suffer from investing in substandard or low yield investments. Historical research reveals that fund performance is minimal. When risk adjustment is considered, the performance is dismal. In this context researchers assessed the performance of open ended equity growth schemes in India. Samples of 17 schemes with eight years of data were sourced. The data were analyzed using Sharpe risk adjusted measure; Analysis of variance to find the difference in funds managed by different fund houses, compared performance between small cap and large cap funds and finally measured the relative efficiency using DEA.

II. Review of Literature

Since last five decades, the capital market investments in India have been growing continuously on long term basis except in occurrence of crisis or economic slowdown. The mutual funds industry in India is expected to grow 18.6 percent by 2018 (Capoor, 2015). Investments in mutual funds have also increased with increase in investments in stock markets. Lai and Lau (2010) argue that mutual fund performances yield superior returns with relatively lower systematic risks using risk-adjusted performance models. Lipton and Kish (2010) found that funds reported higher returns when those were adjusted separately using information ratio for systematic risk and individual risk. Shawky and Tian (2011) examined that equity mutual funds play some role liquidity of fund holding and shown that mutual fund managers earns additionally return of 1.5% annually as return by rendering liquidity services. Horng (2011) suggests that the mutual funds can generate huge returns and minimize risk by considering transaction fee. Gottesman and Morey (2012) analyzed performance of domestic equity funds using the ratings of Morningstar's corporate culture over a period of five years from 2005 to 2010. To measure fund performance they used Sharpe ratio and regression method. Results show insignificant evidence that corporate culture predicts outperformance. Investors of mutual funds perceive that funds with good corporate culture may not prey to scandal as other funds; this assumption may lead to significant performance of funds. The better corporate cultures have lower expense and turnover ratios are also a reason of better performance.

Oleksandra and Oldrich (2015) evaluated performance of increased investment in emerging regions like BRIC, CEE, Sea, and MENA. They evaluated both active and non-active mutual funds from 27 countries during 2000 to 2015 using Sharpe, Treynor, Jenson models, Fama-French three factor, and Carhart four factor models. The results reveal that mutual funds were underperformed during recession time and recovered little during economic growth.

Vassilios et.al (2015) conducted a study on performance of mutual funds on the basis of gender and style diversity. To understand the effect on fund performance they examined 358 diversified European

Author α: Associate Professor, RK Business School Hyderabad, India. e-mail: sagar@rkbusinessschool.com
Author σ: Professor, RK Business School Hyderabad, India.
Author ρ: Associate Professor, School of Management Studies Jawaharlal Nehru technological University Hyderabad, India.

equity funds, and performance was evaluated against market indices. Fama-French (1996) three factor model and Treynor and Mazuy (1996) timing approach were used to test the growth timing skills of fund managers. To deal with the bias from heterogeneity in fund returns they took quintile regression approach. They found no significant difference in performance among male and female fund managers.

Laes & Silva (2014) analyzed the performance of equity funds in Brazil for a period during 2002 to 2012. They used Carhart's four factor model to assess the performance of the funds. Bootstrap procedures and simulation analysis were conducted to identify whether the skill of fund managers influencing the performance or luck. The results of the study say that returns from investment are mostly depending on luck of the fund managers than their skill. They finally expose that the funds with smaller NAVs was underperformed and funds with higher NAVs performed better. The negative unconditional risk-adjusted performance of properly managed funds performs better even in bad conditions than in good conditions of the economy.

The performance persistence using various models like Sharpe ratio, Treynor's measure and Jenson's alpha etc. of any mutual fund in most economies does not give any future guaranteed outperformance or otherwise. The persistence of individual fund performance can be well equipped using the cross-section bootstrap methodology to distinguish skill and luck. The results of many studies reveal that the there is no great extent role of skill of managers when it outperformed, but the performance is attributed to good luck (Cuthbertson et.al.).

Vincent Glode (2011) analyzed 3,147 USA equity mutual funds during 1980 to 2005 and find that the funds with poor performance were charging high fees and generating counter cyclical returns. Eling and Faust (2010) conducted a study on hedge funds and other mutual funds in emerging markets for different sub-periods from 1996 to 2008. Their results designate that majority of the mutual funds were underperformed with traditional benchmarks. Whereas some hedge funds produce momentous positive alpha and hedge funds are more dynamic in transforming the asset allocation.

Basso and Funari (2001) used DEA model to evaluate the performance of mutual funds. The model allows determining the relative efficiency of the funds considered as DMUs. They have collected data of weekly logarithmic returns of 47 Italian mutual funds for a period of 30 months for the research. As the DEA model needs at least one input variable and one output variable, they considered Portfolio Standard Deviation, Subscription and Redemption costs as inputs and Portfolio return as output. The results of their study reveal that the performance of mutual funds are better explained using the DEA by simulating input-oriented, output oriented models and Constant Returns to Scale (CRS), Variable Returns to Scale (VRS), Increasing Returns to Scale (IRS), and Decreasing Returns to Scale (DRS). The results of their study suggest that the DEA methodology is useful in complement the traditional performance indexes in measuring the mutual funds performance.

Data Envelopment Analysis (DEA) is a data analysis tool mostly used in Operational Research area. The DEA has become accepted model in assessing performance in various cases. As a first step in entering the DEA modeling researcher must identify Decision Making Units (DMUs). Portfolio management and its assessment is a key area of financial research. Jensen's alpha and Sharpe index are the two accepted indices in the performance evaluation of mutual funds. But these indices will not provide the efficiency level of the portfolios considered. The problem of efficiency persistence can be defeated easily using the model in operations research is DEA (Choi et.al., 1997).

III. Methodology

a) Objective of the Study

Existing literature discussed above provides mixed results. Few of the researchers (Lai and Lau, Horng, and Shawky and Tian) found mutual funds outperform market, and few others argue that, mutual funds underperform (Eling and Faust, Vincent Glode). Furthermore, performance of mutual funds depends on various factors like fund size, portfolio, expense ratio, managers skills, market conditions etc. In addition to these factors timing and persistence is a major topic for research. If a fund outperforms market, then that performance should continue irrespective of macro economic conditions. Another point to be noted is performance persistence of fund manager, if the fund is performing better under the aegis of a particular fund manager, then that performance should stand for longer time frame.

The present study aims to evaluate performance of open ended equity growth schemes in India. Researchers set the following objectives to conduct this research

1. To evaluate mutual fund scheme performance after adjusted to risk
2. To find out whether there is any difference among performance of fund schemes
3. Is the performance of small cap schemes and large cap schemes are same
4. To measure the relative efficiency of fund schemes using Data Envelopment model.

b) Hypotheses

H1: As different mutual fund schemes are managed by different fund managers, scheme performance differs from each other.

H2: There will be significant difference in the performance of small cap and large cap schemes

c) Data

As on December 31, 2015 there are 43 mutual funds operating in India (Source: Securities and Exchange Board of India - SEBI). The total schemes were grouped into three categories namely Open ended, Close ended, and Interval funds. As on December 31, 2015 there are 31,409 mutual fund schemes exist in India, of which 22,002 are in the category of close end funds, 9,334 are in the category of open ended funds, and 73 schemes exist in the category of interval funds (Source: Association of Mutual Funds in India - AMFI).

Of the 9,334 open ended schemes, 2,161 are open ended equity growth schemes. The present study period was between 2005 and 2014, so the researchers set 2005 as cutoff year and shortlisted 260 open ended equity growth schemes that were launched in the year 2005.

Even though the schemes were launched in the year 2005, there was a time lag between issue date and trading date. For the year 2006 the data was insufficient and irregular. So, researchers considered data from January 1, 2007 to December 31, 2014. Of the 260 schemes many schemes were withdrawn from trading or merged with other schemes, and in few instances, the fund houses were merged with other funds. Considering all these factors, the final sample turned into 17 schemes with complete data for a period of eight years.

The daily Net Asset Value (NAVs) of 17 sample schemes was sourced from AMFI India. For the purpose of comparison schemes were grouped into large cap and small cap based on the average Assets Under Management (AUM). Schemes with AUM above or equal to INR 1,000 crore are categorized as large cap and schemes with AUM below INR 1,000 crore are categorized as small cap schemes.

d) Data Analysis Tools

For the purpose of present study daily NAVs of 17 open ended equity growth schemes were collected during 2007 to 2014. Initially, daily NAVs of the entire sample Scheme were plotted on scatter plots to identify outliers or extreme values. There were no outliers in the data and when a trend line was fitted on scatter plot, data points were cluttered on to the trend line. The data was found linear.

Next, as the data span for eight years researchers opted log normal returns instead of daily continuous compounding returns. The log normal returns smooth the data and make it more linear. After that, researchers computed descriptive statistics to check the normality of the data. Normality test is important, because hypothesis testing tools researchers applied assumes that the data is normally distributed. Skewness and Kurtosis are used to check normality of distributed time series data.

Researchers calculated monthly average return and unsystematic risk of the schemes on daily lognormal returns to understand risk and reward relationship among schemes and in different years of study under consideration.

Thereafter, monthly returns and unsystematic risk was used to calculate the annualized return (continuous compounding return) and yearly compounding individual risk which explain the risk and return relationship among the schemes every year. The performance of mutual fund schemes were evaluated on the basis of risk-adjusted performance measure of Sharpe index after reporting individual risk i.e. Standard deviation.

Hypothesis testing has done to test if there is any significance difference among schemes on the basis of monthly average returns of individual schemes during the period of eight years. To test the hypothesis researchers run year wise Analysis of Variance (ANOVA) on monthly returns of all individual schemes.

The schemes considered for this study were categorized into large cap and small cap equity funds. To test the difference among two categories independent sample t-test was performed, this test considers unequal variances among variables. For this test all the sample schemes in each category treated group as whole during the years of study.

Efficiency of all schemes in each group has measured on a scale using the Scale efficiency measurement tool of Data Envelopment Analysis (DEA), an operations research tool which can be applied in assessing mutual fund performance efficiency. The scale measurement results will be explained in terms of percentage efficient to the most efficient scheme.

IV. Results & Discussion

a) Descriptives

In previous section researchers discussed on selection of funds and statistical tests conducted to analyze the performance of mutual fund schemes. In continuation to that, to test the stationary of the data considered, descriptive statistics were run on daily log normal returns for eight continuous years from 2007. The Skewness results that the data is normally distributed (Skewness is near to '0') among all years and also for all schemes.

b) Risk-adjusted Performance

i. *Annualized Return*

From the daily lognormal returns of 17 schemes, monthly average return has been calculated for the purpose of testing hypothesis. The monthly compounding returns have been used to calculate annualized return every year for eight full years from the year 2007 to 2014. From the Table-3 it is evident that the

schemes reported significant positive annualized returns in years 2007, 2009, 2012, and 2014. ICICI Prudential Blended Plan (ICICI Blended) reported significant consistent positive returns during all years for the period of study considered. All the schemes except ICICI Blended were reported negative continuous compounding returns in the years 2008 and 2011 due to pessimistic market conditions during these years.

ii. *Annualized Standard Deviation*

The volatility of the schemes considered can be seen from the Table-4. The annualized Standard deviation represents the volatility of the schemes in all the years considered. The Schemes were more volatile during negative return period and less in the favorable return period compared to high volatile period. The schemes with positive returns are less volatile in the years 2007, 2012, and 2014. It is further identified that the Standard deviation of all schemes in the year 2008 were more compared to the previous year i.e. 2007 and the year 2008 was more volatile than all other years. The very recent year to the study period i.e. 2014 ended positively reporting positive returns and less volatile compared to all other previous years.

All the schemes experienced fat volatility in the year 2008 and the near volatility continued to the subsequent year. The higher volatility severely impacted returns in years where the schemes reported negative returns. The relation between risk and reward explanation has here been done independently. These results might not yield appropriate discussion in assessing the performance of funds during the years of study. The suitable measure can be a risk-adjusted performance of mutual funds is Sharpe index.

iii. *The Sharpe Ratio*

The annualized return on Net Asset Value of mutual funds provides information on returns without considering the risk parameter. Sharpe ratio is one of the risk-adjusted performance indexes of other measures. The Sharpe ratio is calculated using the expected return on portfolio, risk free rate of return, and Standard deviation. The same tool applied on the schemes for the study under consideration. Table- 5 shows the results of the Sharpe ratio after adjusting for risk for individual years from 2007 to 2014 for all the schemes of the sample. The higher the ratio the better performance will be considered by using Sharpe ratio.

The results of the Sharpe ratio reveal that the favorable returns mutual fund schemes after adjusting risk for the years 2007, 2009, 2012, and 2014, with highest return of 2.81 by Birla Sunlife India Gennext Fund (BIRLA Gennext), 3.07 by ICICI Prudential Blended Plan A (ICICI Blended), 2.46 by Principal Large Cap Fund (SP), 4.81 by ICICI Blended, and 6.21 by ICICI Blended respectively. All the schemes reported negative results in the years 2008 and 2011 except the scheme ICICI Blended. Researchers can observe the clear difference from the Table-1 and Table-3 are the annualized returns in the year 2010 were significant positive returns, but Sharpe ratio showing the negative performance as the risk was more in that year. The performance of mutual funds was not positive due to fluctuations in the fund movements as market influences these funds.

c) *Testing Hypothesis*

Performance persistence of mutual funds has been tested with differences between the sample. For this, researchers used monthly average return of all the schemes for the eight years from 2007 to 2014 were considered. Researchers tested hypothesis by stating the null hypothesis that there is no significance difference between the individual schemes taken into consideration. The hypothesis test has been conducted using one-way Analysis of Variance (one-way ANOVA) using Microsoft Excel. The results of the ANOVA can be figured from Table-6, which reveal that the degree of freedom (df) between the sample (t) is 16 (t-1=17-1) and the df within sample is 187. The relationship of F value and F critical value give justification to the hypothesis. From the table-5 it is observed that the F-value is less than F-critical value in all years from 2007 to 2014, hence the null hypothesis cannot be rejected. As per the test results of the ANOVA there is no significance difference between the samples used for the evaluation of performance of mutual funds.

d) *Comparative Analysis (t-test)*

The interim objective of the study was to perform comparative evaluation of large cap and small cap open ended equity schemes. To achieve the objective researchers categorized the 17 schemes into large cap equity and small cap equity funds on the basis of Average Assets under Management (AAUM) sourced from the factsheets of respective fund houses as on 31/12/2014. The comparative analysis of the performance efficiency has been done after testing the significance difference i.e. variability among two categories using the t-test statistic.

The t-test results presented in Table-7 presents the values of hypothesized Mean difference of the categories. The one tail p-value of the t-test result is more than alpha i.e. 0.05, the null hypothesis says that there is no significance difference among the categories is accepted. Further study on comparative performance efficiency model applied, as the results of the independent sample t-test is accepting the null hypotheses.

e) *Data Envelopment Analysis*

The results of relative efficiency of large cap equity funds category provided in table - 8, which explains the most efficient scheme to other efficient and inefficient funds. The scheme with 1 (100%) is to be considered as most efficient among the other schemes.

The scheme UTI Opportunities Fund-Growth Option (UTI Opportunity) and SBI Magnum Multiplier Fund (ICICI Infra) were most efficient schemes for the year 2007 and efficiency of other schemes in the year can be seen from table 7. UTI Equity was continued with more efficiency in three consecutive years from 2008 to 2010. In the subsequent years other schemes were efficient i.e. UTI Opportunity in 2011, Franklin Small in years 2012 and 2014, and SBI Multiplier in 2013.

The efficiency scores of small cap equity schemes were shown in table - 9, which provide the scores of ten small cap schemes from the year 2007 to 2014. It is observed that ICICI Blended was the only scheme with the highest efficiency score (1) in all the years except in 2013, ICICI Exports occupied maximum efficiency score during 2013. Interestingly, the schemes reported maximum efficiency score in all the years from the same mutual fund. All small cap schemes compared to large cap schemes were treated as inefficient schemes. The overall efficiency of both large cap and small cap equity funds were also tested by aggregating the eight years annualized return of individual schemes. The efficiency scores of both large cap and small cap equity funds were finally evaluated as inefficient.

V. Conclusion

One of the objectives of the study is to analyze performance of mutual fund schemes after adjusting for risk. The results of the study reveal that for four years all the funds reported positive risk adjusted returns and for remaining four years negative returns. The years when positive returns reported during those years the stock market in general reported positive returns. The years when schemes reported negative returns, the market was also moved downside performance.

Another objective is to test whether there is any difference in returns among schemes or they similar. When researchers tested to find out the difference among returns of funds using analysis of variance, researchers failed to reject the null hypothesis, which mean all the funds moved in tandem. This result implies that, fund managers did not exhibit any extraordinary skill to outperform the market. However to some extent during the time of bull market they chose right portfolio and reported similar results as of markets.

The study hypothesize that there will be a significant difference in the performance of small cap and large cap schemes. The hypothesis testing results of present study did not find any difference in the performance of small cap and large cap schemes. The study failed to reject null hypothesis.

Finally, the relative efficiency of schemes considered was measured using the DEA model. The DEA results were also mixed. The performances of Schemes are not persistent. In large cap category UTI Fund Schemes were more efficient than other schemes in the category. Whereas, ICICI Blended was most efficient scheme than other schemes in the small cap category. Researchers conclude that when market conditions are positive and Bull Run is there similar to stock markets, mutual funds also yield same returns.

VI. Practical Implications

Researchers suggest that investors with quite good amount of money to invest are advised to invest in equity stocks directly instead of opting for mutual funds. By this they can save expense ratio, portfolio management fee, high transaction cost, spread in bid-ask price. However, small investors can opt for mutual funds, because the fund houses offer professional services.

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Data Sources:
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Tables

Table-1 : Category Wise Aggregate AUM As On December 31, 2014 (% of Scheme total)

Types of Schemes / Investor Type	Corporates	Banks/FIs	FIIs	High Networth Individuals*	Retail
Liquid/Money Market	83.27	5.33	0.58	9.73	1.08
Gilt	59.92	1.12	0.6	33.72	4.64
Debt Oriented	57.59	1.41	1.27	32.91	6.83
Equity Oriented	12.02	0.37	1.56	29.32	56.74
Balanced	16.11	1.17	0.17	40.32	42.23
Gold ETF	48.82	0.06	0.04	15.92	35.17
ETFs(other than Gold)	21.07	34.16	20.87	13.63	10.27
Fund of Funds investing Overseas	18.84	0	0	56.39	24.77

*Source: Association of Mutual Funds in India. *Individuals investing ₹ 5 lakh and above.*

Table-2 : Descriptive Statistics of 17 Schemes

Scheme Code	Kurtosis	Skewness
Birla Gennext	3.683	-0.608
Birla Top100	3.518	-0.393
Franklin Flexicap	3.815	-0.347
Franklin Small	4.638	-0.755
HDFC	3.560	-0.426
HSBC	2.633	-0.704
ICICI Blended	7.332	0.816
ICICI Exports	4.095	-0.496
ICICI Infra	4.707	-0.268
Kotak	4.204	-0.506
Principal	6.051	-0.525
SBI Contra	4.995	-0.503

SBI Multicap	3.899	-0.432
SBI Multiplier	3.454	-0.441
Sundaram	4.305	-0.657
UTI Equity	3.832	-0.473
UTI Opportunity	3.946	-0.314

Source: Researchers' own contribution

Table-3 : Annualized Return of 17 Schemes for Eight Years (%)

Scheme Code	2007	2008	2009	2010	2011	2012	2013	2014
Birla Gennext	**53.64**	-61.33	**39.49**	17.04	-18.13	**38.90**	-2.63	**41.67**
Birla Top100	**43.73**	-61.42	**43.30**	8.42	-26.25	**34.07**	4.83	**41.54**
Franklin Flexicap	**46.98**	-61.68	**49.85**	9.95	-27.76	**28.01**	1.48	**44.21**
Franklin Small	**51.49**	-92.93	**59.54**	7.80	-33.78	**40.64**	5.57	**63.88**
HDFC	**46.38**	-70.09	**54.48**	14.91	-26.96	**19.94**	-6.31	**43.37**
HSBC	**53.02**	-103.33	**55.96**	-0.38	-64.30	**40.29**	-8.55	**60.93**
ICICI Blended	**7.69**	9.50	**4.10**	6.47	7.78	**9.77**	9.29	**8.76**
ICICI Exports	**53.65**	-93.35	**43.99**	10.06	-28.79	**31.07**	35.76	**42.95**
ICICI Infra	**73.69**	-64.94	**43.45**	4.27	-39.38	**27.33**	-10.02	**46.50**
Kotak	**45.94**	-67.27	**48.78**	6.68	-28.08	**28.99**	4.04	**36.17**
Principal	**57.12**	-76.04	**62.34**	12.61	-31.82	**32.17**	-1.52	**38.43**
SBI Contra	**56.67**	-70.22	**49.24**	-5.45	-37.84	**31.76**	-6.45	**40.40**
SBI Multicap	**42.61**	-78.12	**44.52**	-3.01	-40.56	**36.07**	-0.62	**46.63**
SBI Multiplier	**57.34**	-75.12	**48.44**	2.35	-34.87	**31.27**	4.82	**41.28**
Sundaram	**63.79**	-80.55	**64.93**	-3.46	-44.38	**36.99**	-13.01	**74.32**
UTI equity	**47.70**	-55.63	**50.83**	11.92	-23.26	**31.53**	4.03	**41.77**
UTI Opportunity	**65.14**	-58.15	**53.67**	10.54	-15.47	**24.87**	1.01	**37.00**

Source: Researchers' own contribution

Table-4 : Annualized Standard Deviation of 17 Schemes for Eight Years (%)

Scheme Code	2007	2008	2009	2010	2011	2012	2013	2014
Birla Gennext	17.29	35.15	19.33	15.04	21.32	13.38	18.18	12.18
Birla Top100	19.57	35.78	21.51	13.81	18.74	17.67	15.21	16.03
Franklin Flexicap	20.04	40.12	24.45	15.46	20.03	17.39	15.72	14.46
Franklin Small	22.04	45.46	30.91	16.61	19.03	15.53	18.08	15.48
HDFC	20.69	46.91	27.60	13.52	17.30	17.22	19.88	20.69
HSBC	21.39	47.27	25.56	21.97	31.67	25.16	26.91	16.13
ICICI Blended	1.23	1.47	1.18	1.14	0.89	0.99	0.56	0.61
ICICI Exports	19.94	44.98	27.59	15.52	21.02	19.65	11.46	15.54
ICICI Infra	26.50	49.15	21.43	14.67	19.14	21.44	20.32	29.37
Kotak	18.69	40.39	21.26	13.98	19.14	17.85	10.41	12.28
Principal	23.06	47.50	23.27	13.87	17.84	16.78	14.23	15.00
SBI Contra	21.54	42.69	24.53	15.91	20.28	15.79	14.82	12.90
SBI Multicap	23.50	39.61	22.83	14.90	21.86	17.03	15.26	12.99
SBI Multiplier	20.81	40.83	21.51	13.41	19.66	15.42	15.08	12.30
Sundaram	26.48	50.80	31.87	18.18	22.08	18.82	21.68	26.59

UTI Equity	21.59	35.82	19.77	14.00	17.93	15.78	14.27	13.68
UTI Opportunity	24.30	32.73	22.41	14.60	15.47	15.43	14.27	13.54

Source: Researchers' own contribution

Table-5 : Sharpe Ratio as a measure of risk-adjusted Performance (%)

Scheme code	2007	2008	2009	2010	2011	2012	2013	2014
Birla Gennext	2.81	-1.89	1.78	0.80	-1.08	2.53	-0.42	3.01
Birla Top100	1.98	-1.86	1.78	0.25	-1.67	1.64	-0.01	2.28
Franklin Flexicap	2.09	-1.66	1.83	0.32	-1.64	1.32	-0.22	2.71
Franklin Small	2.11	-2.15	1.76	0.17	-2.04	2.29	0.03	3.80
HDFC	2.00	-1.60	1.79	0.73	-1.85	0.87	-0.57	1.85
HSBC	2.24	-2.29	1.99	-0.24	-2.19	1.40	-0.50	3.47
ICICI Blended	2.19	3.07	-0.76	1.29	3.12	4.81	7.65	6.21
ICICI Exports	2.44	-2.19	1.41	0.33	-1.61	1.33	2.68	2.44
ICICI Infra	2.59	-1.42	1.79	-0.05	-2.32	1.04	-0.74	1.41
Kotak	2.19	-1.79	2.06	0.12	-1.73	1.34	-0.09	2.54
Principal	2.26	-1.71	2.46	0.55	-2.06	1.62	-0.46	2.23
SBI Contra	2.40	-1.76	1.80	-0.66	-2.11	1.69	-0.77	2.75
SBI Multicap	1.60	-2.10	1.73	-0.54	-2.08	1.83	-0.37	3.20
SBI Multiplier	2.52	-1.96	2.02	-0.20	-2.03	1.70	-0.01	2.95
Sundaram	2.22	-1.68	1.88	-0.47	-2.24	1.70	-0.83	2.61
UTI Equity	1.98	-1.69	2.32	0.49	-1.58	1.68	-0.07	2.69
UTI Opportunity	2.47	-1.93	2.17	0.38	-1.32	1.29	-0.28	2.36

Source: Researchers' own contribution

Table-6 : Analysis of Variance of Schemes

		df between-16		df within-187	
aYear	MS Between	MS Within	F-value	P-value	F critical
2007	0.0016	0.0037	0.43	0.97	1.70
2008	0.0048	0.0142	0.34	0.99	1.70
2009	0.0015	0.0047	0.32	0.99	1.70
2010	0.0004	0.0019	0.19	1.00	1.70
2011	0.0018	0.0033	0.56	0.91	1.70
2012	0.0005	0.0025	0.20	1.00	1.70
2013	0.0010	0.0023	0.43	0.97	1.70
2014	0.0016	0.0022	0.70	0.79	1.70

Source: Researchers' own contribution

Table-7 : t-Test -Two-Sample Assuming Unequal Variances		
	Small Cap	*Large Cap*
Mean	9.75	11.34
Variance	1793.91	1762.96
Observations	80.00	56.00
Hypothesized Mean Difference	0.00	
df	119.00	
t Stat	-0.22	
P(T<=t) one-tail	0.41	
t Critical one-tail	1.66	
P(T<=t) two-tail	0.83	
t Critical two-tail	1.98	

Source: Researchers' own contribution

Table-8 : Efficiency of Large Cap Funds (%)								
Scheme	2007	2008	2009	2010	2011	2012	2013	2014
UTI Opportunity	1.00	0.96	0.93	0.92	1.00	0.62	0.77	0.73
UTI Equity	0.85	1.00	1.00	1.00	0.67	0.78	0.98	0.82
Franklin Flexi cap	0.84	0.86	0.98	0.89	0.49	0.69	0.80	0.84
SBI Contra	0.98	0.62	0.97	0.00	0.06	0.79	0.25	0.80
ICICI Infra	1.00	0.77	0.85	0.57	0.00	0.68	0.00	0.86
Franklin Small	0.91	0.00	0.75	0.77	0.23	1.00	0.94	1.00
SBI Multiplier	0.99	0.49	0.95	0.46	0.19	0.77	1.00	0.81

Source: Researchers' own contribution

Table-9 : Efficiency of Small Cap Funds (%)								
Scheme	2007	2008	2009	2010	2011	2012	2013	2014
Birla Top100	0.51	0.37	0.78	0.77	0.53	0.30	0.66	0.28
ICICI Blended	1.00	1.00	1.00	1.00	1.00	1.00	0.82	1.00
Sundaram	0.39	0.20	0.59	0.00	0.28	0.30	0.00	0.19
ICICI Exports	0.50	0.09	0.78	0.67	0.49	0.31	1.00	0.28
SBI Multicap	0.51	0.22	0.78	0.05	0.33	0.30	0.46	0.27
HDFC	0.50	0.29	0.77	0.54	0.52	0.38	0.25	0.28
Principal	0.45	0.24	0.77	0.59	0.45	0.31	0.42	0.28
HSBC	0.50	0.00	0.77	0.31	0.00	0.16	0.17	0.26
Birla Gennext	0.50	0.37	0.78	0.51	0.64	0.29	0.38	0.28
Kotak	0.50	0.32	0.77	0.96	0.50	0.32	0.63	0.29

Source: Researchers' own contribution

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An Empirical Analysis of Financial Performance of Conventional Banking Sector in Islamic Republic of Pakistan

By Shaheera Noman, Syeda Shabih Fatima & Rachel Shahlal

Quaid-e-Azam University, Pakistan

Abstract- This study is focused on investigating the collision of leverage and liquidity on banks' profitability of the conventional banking sector of Pakistan. The major indicators of the financial performance of corporate entities are liquidity, leverage and profitability. Two independent variables i.e. leverage and liquidity were taken into consideration to find out the impact on dependent variable, i.e. bank's profitability. The sample chosen for this certain study is the three famous Pakistani conventional banks. The 10 years data was collected from the "Annual Reports and Accounts" of the 3 banks, i.e. Faysal Bank, Alfalah and MCB. Regression, correlation and t-statistics are used for the examination of hypothesis. The research results states that liquidity is insignificantly positively related with profitability and leverage is significantly negatively correlated with profitability. Focusing on liquidity and profitability will help banks to enhance their growth.

Keywords: liquidity, bank's profits, ratios, profitability, leverage.

GJMBR - C Classification : JEL Code : G24, F65

Strictly as per the compliance and regulations of:

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Shaheera Noman [α], Syeda Shabih Fatima [σ] & Rachel Shahlal [ρ]

Abstract- This study is focused on investigating the collision of leverage and liquidity on banks' profitability of the conventional banking sector of Pakistan. The major indicators of the financial performance of corporate entities are liquidity, leverage and profitability. Two independent variables i.e. leverage and liquidity were taken into consideration to find out the impact on dependent variable, i.e. bank's profitability. The sample chosen for this certain study is the three famous Pakistani conventional banks. The 10 years data was collected from the "Annual Reports and Accounts" of the 3 banks, i.e. Faysal Bank, Alfalah and MCB. Regression, correlation and t-statistics are used for the examination of hypothesis. The research results states that liquidity is insignificantly positively related with profitability and leverage is significantly negatively correlated with profitability. Focusing on liquidity and profitability will help banks to enhance their growth. As higher leverage results in low profitability so banks should control their leverage level effectively.

Keywords: liquidity, bank's profits, ratios, profitability, leverage.

I. Introduction

Financial statement analysis significantly affects the business decision making. In the modern era of globalization and competitive work environment, if business wants to be successful then it is essential to be aware of the financial performance of the business. Ratio analysis is one of the relevant exercise that will give the idea about the secured future of the business. According to third edition of Oxford University ratio analysis or financial statement analysis is directly proportional to assess the business performance in financial terms (Nwakanma, 2008). Business strength and weaknesses are best identified with the help of deep analysis of financial statements (Babatunde, 2002). This paper explore the impact of liquidity and leverage on the profitability of the conventional banks of Pakistan.

Liquidity and leverage are the two basic measures that in glance gives the idea of banks financial performance, position and the adequacy of their resources. According to Ibenta, the firm's ability to meet its short-term maturing obligations is known as liquidity. Thus financial health is best described by the measurement of profitability, liquidity and leverage relationship(Ibenta, 2005).Today this is a need of every business to keep the bird eye view on each and every minute factor in order to remain stable and successful in the market. Banking sector plays a critical role in the development and growth of economy. In the context of Pakistan, banking sector is one of the biggest employer so it seems to be very important to study its financial structure in detail. No comprehensive study has been carried out for the measurement of the efficiency of conventional banks in Pakistan.

From the last decade, banking system in Pakistan has developed a lot. Muslim commercial Bank, faysal bank and alfalah bank has been taken as the sample for this study. MCB and Faysal bank are the leading banks in Pakistan. Whereas the bank Alfalah is the most significant bank in terms of growth. Faysal bank has more than 270 branches in 80 cities and its footprints are spreading day by day. It has assets of more than PKR 350 Billion. Bank Alfalah is the sixth largest bank in Pakistan having more than 500 branches in more than 170 cities in Pakistan. MCB is the most leading bank in Pakistan having the network of 1200 branches.

This paper will help banks to forestall the future financial quagmire and take the proactive actions in order to maintain the continuous development and growth. Being a biggest employer of the country, it is the responsibility of this sector to remain its business solvent and profitable and this paper will definitely help and open the doors of improvement, this paper depicts the past performance of the banks and also give viable and practical implications for the future growth and development. Due to economic instability it is very essential for the banks to have the idea about the optimal utilization of resources. So the financial ratios allows us for the temporal and cross sectional comparison. Thus, this study aims at determining the impact of leverage and liquidity on profitability and will suggest how to continue or improve the financial structure of the banking sector.

This paper comprises of four sections. First section consists of literature review, second describes the methodology while the third and fourth comprises of data analysis and conclusion respectively.

Author α: Quaid-e-Azam University, Pakistan.
e-mail: shaheeranoman4@gmail.com

II. Literature Review

Eljelly says that to reduce the business risk and unrequired investment in assets, an organization should be able to calculate and forecast its working capital. Moreover author says it is also important to meet short term business commitments (Eljelly, 2004).

According to International Accounting Standards (IFRS, 2006), liquidity is available cash to meet near future activities after deducting the financial obligation for that specific period (Reham, 2011). Liquidity risk indicates the situation of the organization where it will not be able to make any payment to its creditors. This is as the result of change in the proportion of long term credit and short term credit plus non-correlation with the structure of liability of that organization (Stoica, 2000). Different researchers of many universities say the liquidity required rate of each organization or business depends upon its financial position (D.Manzler, 2004). To find out the liquidity position of the business, special importance is held by the way which any organization is divided which are its assets and liabilities (D.Manzler, liquidity risk and the closed-end fund discount, 2004). Liquidity risk for any business is considered to be one the biggest risk, but it is matter of extreme liquidity, "security cushion" or the specialty of mobilizing capital at a "normal" cost (DEDU, 2009).

According to Morris and Shin “realizable cash on the balance sheet to short term liabilities”. In this definition a term “realizable cash” is used this term mean short term asset and also other assets to which haircut has been applied (Morris, 2010). George H.Pink, G. Mark Holmes explained that ratio analysis helps to know the financial position of the company. (George H.Pink, 2005). Liquidity of the company is calculated by dividing its short term assets to its short term liabilities. Liquidity of the company shows the amount available to the business to invest in the business and also for the expenses of the company. It also show the amount available to meet long term and short term liabilities (Ross, 1977). A firm which own some extra amount of short term assets can increase the chance of internal funding which will further result in relationship between leverage and liquidity (S.Myers, 1977) (Bhunia, 2012) (Qureshi, 2012). A reasonable liquidity position has an impact on the financial position of the business (Zhao Bei, 2012) Many studies have proven a statistical relationship between leverage and liquidity (Harris, 1991) (Al-Najjar, 2011) (Al-Najjar B. T., 2008) (Eriotis N, 2007) (Rajan, 1995) (Sheikh NA, 2011) (Titman, 1988) (Qureshi1, 2012).

According to Archer and D’ Ambrosio "The more the amount of fixed costs to total costs the more the operating leverage of the firm”. (ARCHER, 1972) Schultz and Schultz said that, "as a fixed expense is compared with an amount which is a function of a fluctuating base (sales), profit-and-loss results will not accept an in proportion relationship to that base. These results in fact will be subject enlargement, the degree of which depends on the relative size of fixed costs vis-a-vis the potential range of sales volume. This is commonly known as operating leverage." (Schultz, 1972).

Weston and Brigham explained to the business world that if the total fixed cost of the business will increase than the variable cost will be decreased which will also change the percentage of the profit of the firm, it can be increased and decreased (Brigham, 1969). Luoma and Spiller explain the financial leverage in the term of accounting. Financial leverage where increase the business’s risk at the same time also increase the profit of shareholders (Luoma, 2002). The financial leverage which a firm employed may earn more on fixed cost than short term cost (Pandey, 2007). No noticeable relationship is found between cost of capital and financial leverage (Bhayani J Sanjay, 2009). A firms can use economic tools (borrowed funds) to finance a particular business project or to invest in company’s assets. (Awan, Feb. 2014)

The total return on company’s total assets is considered to the profit the company. According to pecking-order theory the companies who are earning high profit will reduce the external funding, this will show the creditors that they have low rate to being bad debts. (Titman S. &., 1988) (Rajan R. &., 1995)(Wald, 1999) (Chen, 2003) (Supanvanij, 2006) (Kim, 2008)(Akhtar, 2009) (Liaqat Ali, 2011) (Sheikh NA, Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan, 2011). The firms which are earning high profit can issue loan at small rate of interest as the creditors have trust on them and they can even more profit with small capital as compare to firms which are earning small profit. (Titman S. &., The Determinants of Capital Structure Choice, (1988)); (Mazur, (2007)) (Rajan R. & ., What Do We Know about Capital Structure? Some Evidence from International Data, 1995), (Abor, 2005). Furthermore profitable companies does not provide complete information to its creditors or to whom they will pay the interest and investors (Myers, 1984); (Ali, 2011); (Qureshi1, (2012)). Yes there is a relationship between leverage and profitability (John, 1985); (Ali., 2011); (Tong, 2005)(Al-Najjar B. T., The relationship between capital structure and ownership structure: new evidence from Jordanian panel data, 2008); (Mazur, 2007).

Profit and liquidity are really important components of any business. This is not possible for any firm to survive without liquidity. A business who is not earning profit but reaching its breakeven point can survive in the market for years but a business who is not maintaining its liquidity position will not survive for even short period of time. So even by observing the

management of the liquidity a firm's future performance can be judged. (Bardia, 2004).

There is positive relationship between financial leverage and the profitability of any business. But there is no study held, on the relationship between cost of capital and financial leverage (Bhayani, 2006).

III. Methodology

a) Research design

i. *Purpose of study*

The purpose of this study is the hypothesis testing and prediction of the relationships of two independent variables (liquidity and leverage) on a dependent variable (profitability).

ii. *Type of investigation*

It is a correlational study finding out the answer of whether the variables are related or not.

iii. *Extent of researcher interference*

This involves minimal interference of the researcher as there is no manipulation in the research.

iv. *Study setting*

The study setting is non-contrived and natural as it is done on a secondary data takes form the bank's financial statements.

v. *Unit of analysis*

Organizations are taken as the unit of analysis in this research to find out the relationship of leverage and liquidity on profitability.

vi. *Time horizon*

This is a cross-sectional study in which only one time data is taken. There is no manipulation to find out the before and after results as it is done in a natural environment.

vii. *Sampling technique*

This research is done on the public limited conventional banks as their availability of financial reports is easy through their websites. For sampling techniques, convenient sampling has been adopted for the collection of data. One bank MCB (one of the pioneer bank in Pakistan formed in 1947) privatized in 1993 and two other private banks: Bank Alfalah incorporated in 1992 and Fysal Bank incorporated in 1994 was selected for the study.

Sample size: 10 year data of Faysal Bank, MCB and Alfalah Bank of Pakistan.

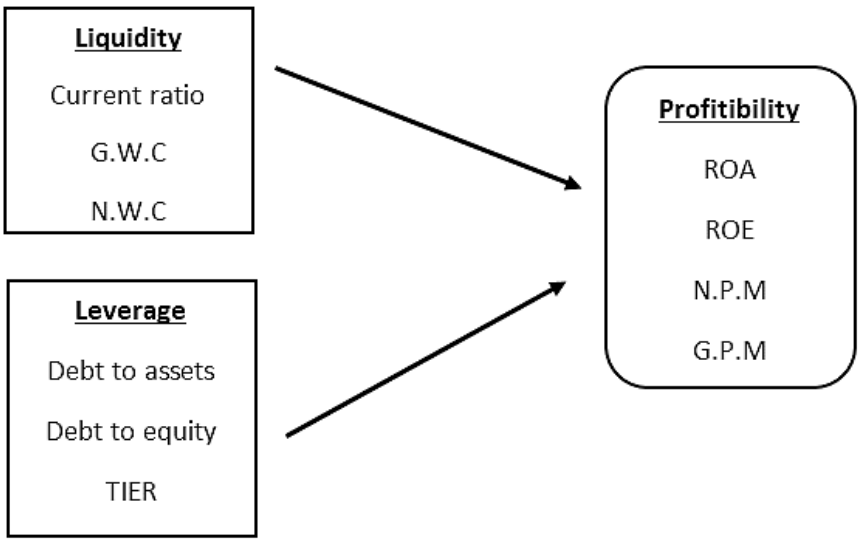


Figure 1 : Theoretical framework

b) Hypothesis

H0: Liquidity and leverage is not associated with the bank's profitability

i. H1: Liquidity is positively associated with the bank's profitability

H1a: Current ratio is positively associated with profitability

H1b: Gross working capital is positively associated with profitability

H1c: Net working capital is positively associated with profitability

ii. *H2:* Liquidity is negatively associated with the bank's profitability

H2a: Current ratio is negatively associated with profitability

H2b: Gross working capital is negatively associated with profitability

H2c: Net working capital is negatively associated with profitability

iii. *H3:* Leverage is positively associated with the bank's profitability

H3a: Debt to assets is positively associated with profitability

H3b: Debt to equity is positively associated with profitability

H3c: Times interest ratio is positively associated with profitability

iv. H4: Leverage is negatively associated with the bank's profitability

H4a: Debt to assets is negatively associated with profitability

H4b: Debt to equity is negatively associated with profitability

H4c: Times interest ratio is negatively associated with profitability

c) *Operational Definitions*

i. *Liquidity ratios*

Liquidity ratios of a company is used for measuring the ability to honor its (current and short term) obligations for a year. It measures the aptitude of a company to speedily convert current assets into cash. Liquidity is important factor to study because it is said that profitability and liquidity is achieved on the expense on each other.

ii. *Current ratio*

It shows the ability of company to pay its current liabilities from its current assets and is used for quick measurement of the liquidity of a company.

Formula: Current Assets ÷ Current liabilities

iii. *Gross working capital*

Gross working capital is the amount of total current assets of the company which is important to know by the analysts and the creditors which shows the amount the business will recover within one year.

Formula: Gross working capital = All current assets

iv. *Net working capital*

Net working capital is the figure used to calculate the short term liquidity position of a company. It is important to know for maintaining a balance between the current assets and current liabilities.

Formula: Net working capital = Current assets - Current liability

v. *Leverage ratios*

Leverage ratios tells about the capital structure specifically the liability portion of the company in a year and its effect on the income of that company. This over all depicts the company's flexibility in paying its due debts of the year which gives a major indication to the investors interested to invest in the company.

vi. *Debt to Assets*

This ratio gives an indication of the risk involved in increasing or decreasing its creditor's investment and the equity investment of the company. It tells the company's liabilities position and burden to meet its obligations.

Formula: Total liabilities ÷ Total assets

vii. *Debt to Equity*

This ratio is used in finding out the proportion of company's creditors in relation to the owners (common shareholders) of the company. It calculates how low is this ratio which would be preferable by the investors in the market. And how high the ratio is which can violate the incomes because of high interest expense on the liabilities.

Formula: Total liabilities ÷ Total common stock equity

viii. *Times Interest Earned Ratio (TIER)*

The ratio tells about the interest payment made by the company with its earnings before interest and taxes. It indicates that how many times the company can pay its finance cost with its one year EBIT.

ix. *Profitability*

The profitability ratios are used to measure the operating efficiency of a company and the rate of generation of profit by the company.

x. *Return on asset*

This is the major profitability ratio that shows the efficient use of assets by the organization.

Formula: ROA = (Net Income + Interest Expense) ÷ (Average Assets during the period) (OR) Net profit margin × total asset turnover

xi. *Return on equity*

This ratio of profitability is used to measure the productivity of equity and indicator of the ability to attract capital from the investors.

Formula: Net income ÷ shareholder's equity

xii. *Net profit margin*

Net profit margin is an important tool for measuring net income on each unit of sales which tells the company's performance of the year. On this figures he investors take decision to invest in that business or not.

Formula: Net profit ÷ total revenue

xiii. *Gross profit margin*

It is a tool to measure the manufacturing and distribution efficiency during the production process in a year. Higher percentage shows that the more company retains on each dollar of sales to service its other costs and obligations and it is better to control costs.

Formula: Gross profit ÷ Total sales

IV. Data Analysis

Table 1 : Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Liquidity	30	-3.06E8	1.94E8	-2.8245E6	1.41950E8
Leverage	30	7.88	38.31	16.7895	7.28953
Profitability	30	5.79	202.76	82.9525	52.40911
Valid N (list wise)	30				

Independent variables: Liquidity, Leverage
Dependent variable: Profitability

In the above table the descriptive statistics of the research variables are given. Liquidity is an independent variable and its minimum value is (3.06), its maximum value is 1.94, its mean is (2.8245) with a standard deviation of 1.42. Leverage is an independent variable and its minimum value is 7.88, maximum value is 38.3 and mean is 16.79 with a standard deviation of 7.28953. Profitability is the dependent variable and its minimum value is 5.79, maximum value is 202.76, mean is 82.95 and standard deviation is 52.41.

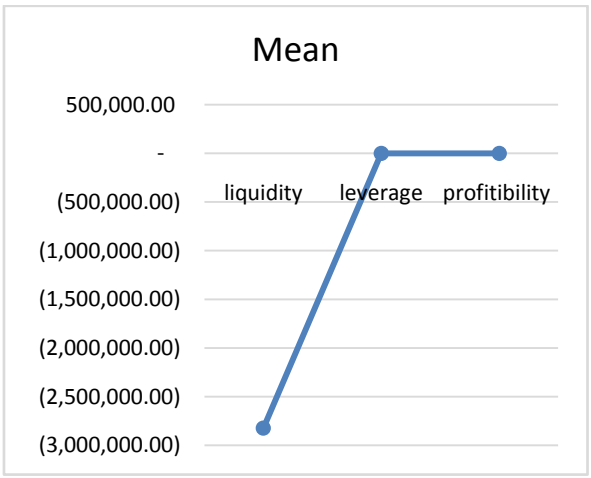


Figure 2 (a) : Mean of profitability, leverage and liquidity

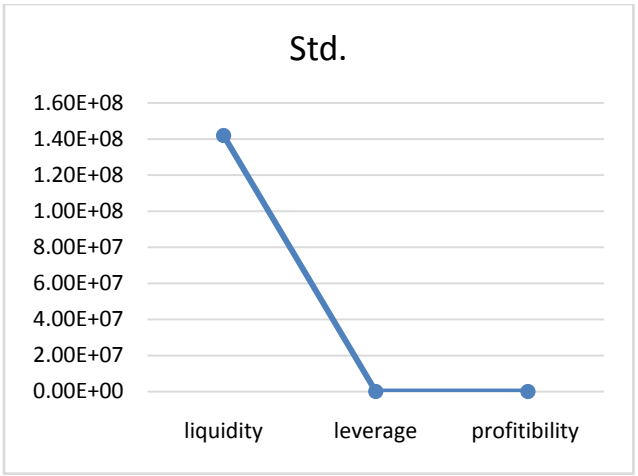
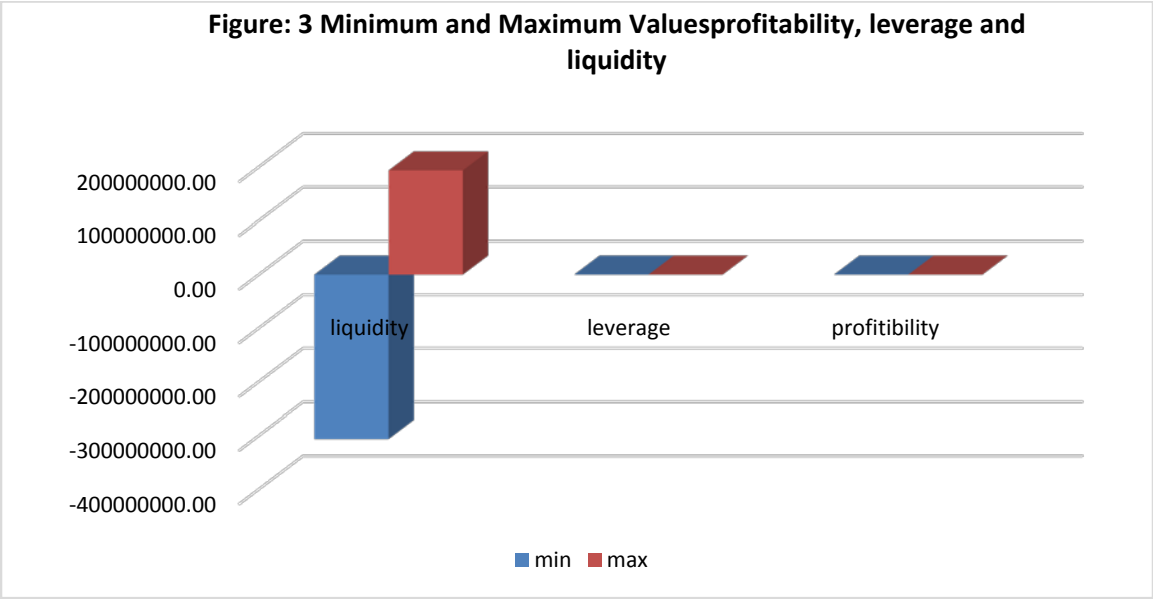


Figure 2 (b) : Standard Deviations of profitability, leverage and liquidity

The graphical representation of mean and standard deviation of all the observations of three variables under study are presented above. Liquidity is having the most extreme values as shown in the graphs.



In the above figure the minimum and maximum values in the observations of the variables recorded are shows which gives a pictorial view of ranges of the calculated values. The range of liquidity values is 200000000 to (300000000) having the highest range.

Table 2 : Correlation of variables

		Liquidity	Leverage	Profitability
Liquidity	Pearson Correlation	1	.262	.095
	Sig. (2-tailed)		.161	.616
	N	30	30	30
Leverage	Pearson Correlation	.262	1	-.611**
	Sig. (2-tailed)	.161		.000
	N	30	30	30
Profitability	Pearson Correlation	.095	-.611**	1
	Sig. (2-tailed)	.616	.000	
	N	30	30	30

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

In the above table correlation of the three variables under study are shown. Liquidity is an independent variable which is positively correlated 0.262 with leverage and insignificantly positively related 0.95 with profitability. Leverage is an independent variable which is positively related with liquidity and have significantly negative relation with profitability. Profitability which is the dependent variable is insignificantly positively related with liquidity and significantly negatively correlated with leverage.

Table 3 : Correlation of ratios

		CRatio	GWC	NWC	DtoA	DtoE	TIER	Profitability
CRatio	Pearson Correlation	1	-.060	.694**	-.049	-.178	.210	.469**
	Sig. (2-tailed)		.751	.000	.795	.347	.265	.009
	N	30	30	30	30	30	30	30
GWC	Pearson Correlation	-.060	1	.077	.087	.589**	.488**	-.465**
	Sig. (2-tailed)	.751		.684	.649	.001	.006	.010
	N	30	30	30	30	30	30	30
NWC	Pearson Correlation	.694**	.077	1	-.052	-.244	.290	.534**
	Sig. (2-tailed)	.000	.684		.786	.194	.120	.002
	N	30	30	30	30	30	30	30
DtoA	Pearson Correlation	-.049	.087	-.052	1	.420*	.242	-.347
	Sig. (2-tailed)	.795	.649	.786		.021	.198	.060
	N	30	30	30	30	30	30	30
DtoE	Pearson Correlation	-.178	.589**	-.244	.420*	1	.422*	-.665**
	Sig. (2-tailed)	.347	.001	.194	.021		.020	.000
	N	30	30	30	30	30	30	30
TIER	Pearson Correlation	.210	.488**	.290	.242	.422*	1	.010
	Sig. (2-tailed)	.265	.006	.120	.198	.020		.959
	N	30	30	30	30	30	30	30
Profitability	Pearson Correlation	.469**	-.465**	.534**	-.347	-.665**	.010	1
	Sig. (2-tailed)	.009	.010	.002	.060	.000	.959	
	N	30	30	30	30	30	30	30

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

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

In the above table current ratio is negatively related with gross working capital, significant positively related with net working capital, negatively related with debt to asset ratio, negatively related with debt to equity ratio, positively related with times interest ratio and significant positively related with profitability. Gross working capital is negatively related with current ratio, positively related with net working capital, positively related with debt to asset ratio, significant positively related with debt to equity ratio, significant positively related with times interest earned ratio and significant negatively related with profitability. Net working capital is significant positively related with current ratio, positively related with gross working capital, negatively related with debt to asset ratio, negatively related with debt to equity ratio, positively related with times interest ratio and significantly positively related with profitability. Debt to asset ratio is negatively related with current ratio, positively related with gross working capital, negatively related with net working capital, significant positively related with debt to equity ratio, positively related with times interest earned ratio and negatively related with profitability. Debt to equity is negatively related with current ratio, significant positively related with gross working capital, negatively related with net working capital, significant positively related with debt to asset ratio, significant positively related with times interest earned ratio and significant negatively related with profitability. Times interest earned ratio is positively related with current ratio, significant positively related with gross working capital, positively related with net working capital, positively related with debt to asset ratio, significant positively related with debt to equity ratio and positively related with profitability. Profitability which is the dependent variable is significantly positively related with current ratio, significant negatively related with gross working capital, significantly positively related with net working capital, negatively related with debt to asset ratio, significantly negatively related with debt to equity ratio and positively related with times interest ratio.

Table 4 : Regression Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	165.745	19.451		8.521	.000
	Liquidity	1.015E-7	.000	.275	1.848	.076
	Leverage	-4.914	1.069	-.684	-4.597	.000

a. Dependent Variable: Profitability

The above table shows than the constant term which is the intercept term is 165.745. This means that when the independent variables (liquidity and leverage) will be zero the value of independent variable (profitability) will be 165.745. The unstandardized coefficient of liquidity is very small which means that the effect of liquidity on profitability is very low and the unstandardized coefficient of leverage is negative with show that the leverage is effecting on the profitability is a negative manner. The standardized coefficients shows that the relatively highest influencing variable between the two independent variables is the leverage. That means if the bank wants to enhance its profitability it has to reduce its leverage.

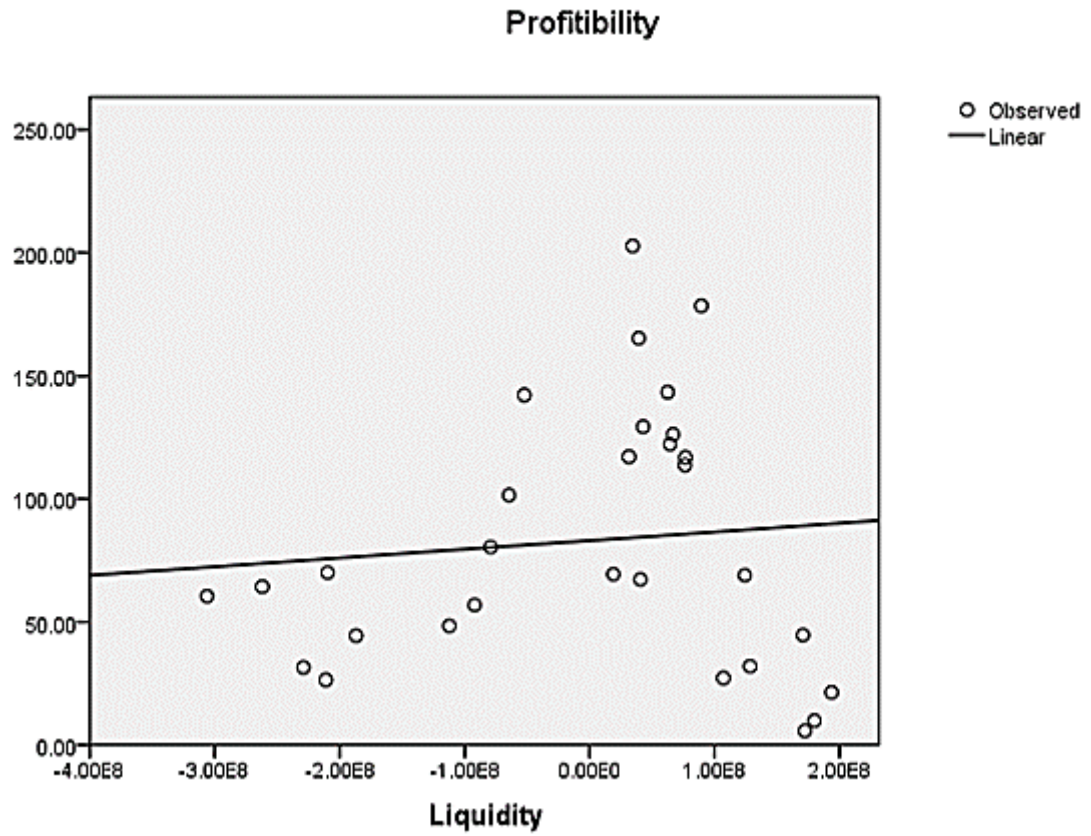


Figure 4 : Scattered diagram of profitability and liquidity

The above figure shows the regression line of profitability (dependent variable) with the independent variable (liquidity). It is having a positive and flat regression line that means profitability is slightly positively affected by liquidity.

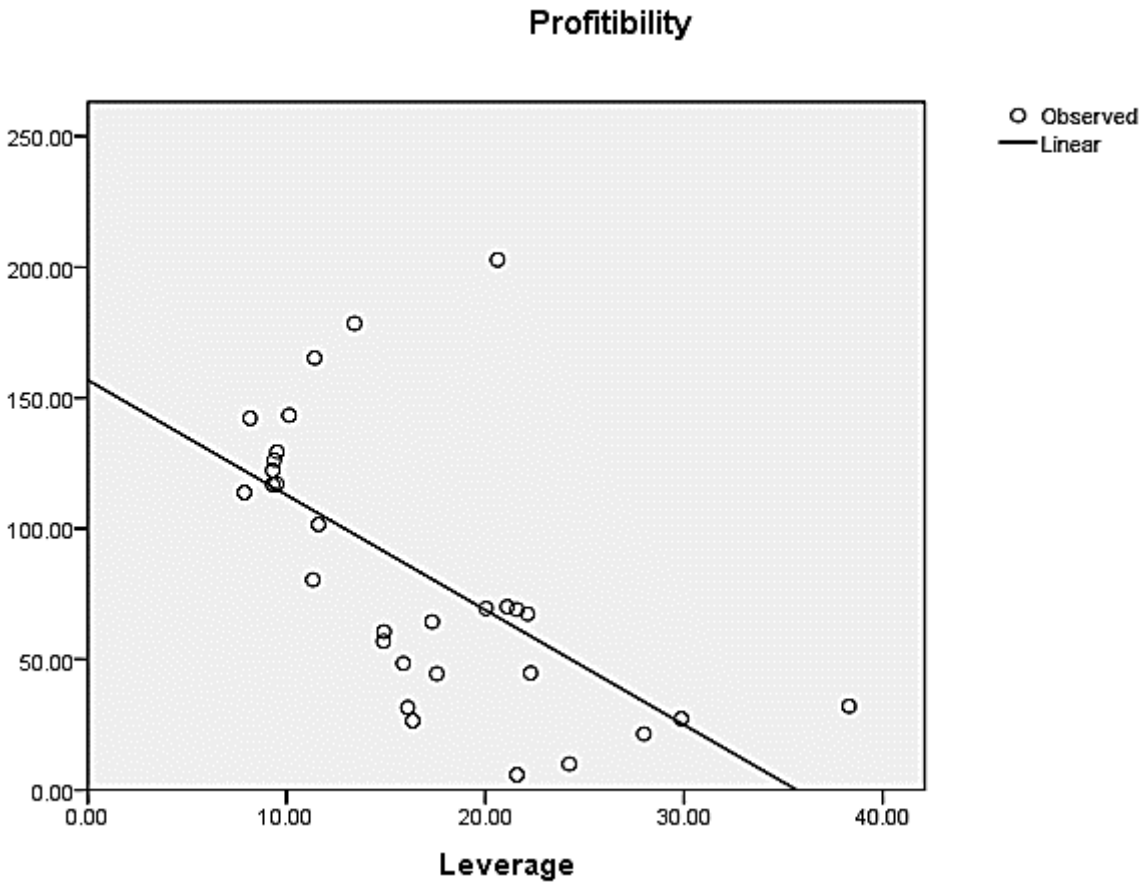


Figure 5 : Scattered diagram of profitability and leverage

The above figure shows the regression line of profitability (dependent variable) and leverage (independent variable). The line plotted is negatively sloped and it is steeper than the liquidity regression line. It means that the leverage is significantly affecting the dependent variable: profitability.

Table 5 : Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.666[a]	.444	.403	40.49658

a. Predictors: (Constant), Leverage, Liquidity

In the table given above, the correlation of liquidity and leverage with profitability is 66.60% and variance (R square) is 0.444 which indicates that the combined effect of liquidity and leverage on profitability is 44.4% whereas the exogenous variables impact on profitability 0.666 (1-0.444). Adjusted r- square is slightly lower than the R- square which shows that the result are more generalizable. Model summary shows that R, R-square and adjusted R- square are positively significant. The standard error of estimate is 40.496 which clearly indicates that observed values are distant from the regression line.

Table 6 : ANOVA[b] Test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35375.468	2	17687.734	10.785	.000[a]
	Residual	44279.271	27	1639.973		
	Total	79654.739	29			

a. Predictors: (Constant), Leverage, Liquidity
b. Dependent Variable: Profitability

In the above table, the first value of degree of freedom shows the number total independent variable which is 2. Second term 27 (N-K-1) is the total number of complete responses minus total number of independent variables minus 1. The F- value i.e. 10.785 is significant at 0.000 level.

V. Conclusion

In our study, we took a sample of 3 conventional banks of Pakistan: one is one of the pioneer banks of Pakistan (MCB) which was privatized in 1993, other two are the newly formed private banks. The study had the observations of the variables under study over the period of 2005-2014 which makes a total of 10 years. Thus we have collected longitudinal data for a continuous examination of the banks' liquidity, leverage and profitability. The analysis performed for the research was correlation and regression. The study *came* to a conclusion that liquidity is insignificantly positively related with profitability and leverage is significantly negatively related with profitability.

Current ratio is significantly positively related with profitability. Gross working capital is significantly negatively related with profitability. Net working capital is significantly positively related with profitability. Debt to asset ratio negatively related with profitability. Debt to equity is significant negatively related with profitability. Times interest earned ratio is positively related with profitability.

The results proves that our null hypothesis is rejected that the two independent variables are not related to profitability. H1 is accepted that of Liquidity is positively associated with the bank's profitability. In its further parts hypothesis H1a and H1c is accepted that is current ratio and net working capital is positively associated with profitability. H2 is rejected as no negative relation is found between liquidity and profitability but the gross working capital is found negatively associated with profitability.

H3 is rejected as there is no positive relation between leverage and profitability but the times interest ratio is found positively associated with profitability. H4 is accepted because of a negative relation. But times interest ratio is not negatively associated with profitability.

VI. Limitation and Future Directives

This study has set some preliminaries in exploring the relationships of liquidity, leverage and profitability on Pakistani conventional banks. But a further detailed evaluation could can be done. New research can be done on larger number of conventional banks. Secondly the study of the same variables and their relationships can be done on Islamic Banks of Pakistan.

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Fuzzy Linear Programming on Portfolio Optimization: Empirical Evidence from FTSE 100 Index

By Fatih Konak & Buğra Bağcı

Hitit University, Turkey

Abstract- Portfolio is a list of securities that the investor has. The main objective of portfolio management is to maximize return while minimizing unsystematic risk. Firstly, fundamental definitions are given about theory of fuzzy logic and fuzzy logic approach is stated in this study. In the model of fuzzy logic price/earnings ratio and accumulation/distribution index which are added by the model that Werner improved. Taking all into consideration a new model is developed at the last part of this research.

Keywords: *fuzzy linear programming, FTSE 100.*

GJMBR - C Classification : *JEL Code : G11, G12*

Fuzzy Linear Programming on Portfolio Optimization: Empirical Evidence from FTSE 100 Index

Fatih Konak [α] & Buğra Bağcı [σ]

Abstract- **Portfolio is a list of securities that the investor has. The main objective of portfolio management is to maximize return while minimizing unsystematic risk. Firstly, fundamental definitions are given about theory of fuzzy logic and fuzzy logic approach is stated in this study. In the model of fuzzy logic price/earnings ratio and accumulation/distribution index which are added by the model that Werner improved. Taking all into consideration a new model is developed at the last part of this research.**

Keywords: fuzzy linear programming, FTSE 100.

I. Introduction

Investors are aiming to increase and protect their income in various ways by taking into account every condition that they encounter. For this reason, one way of applying this is using their incomes in financial markets. However, financial markets are affected by financial and social events, this causes a vague structure. To decide under this uncertainty is one of the hardest challenges for the investors.

Besides, investor's knowledge and experience are very important during making the decision process. To use investors experience in the model will provide more realistic results. Fuzzy set theory is used to let experience and uncertain conditions as linear programming technique participate in the decision making process. The aim of this study is in this direction.

By adding fuzzy theory to the linear programming models fuzzy linear programming models are created. Fuzzy linear programming is recommended for solutions to the problems which have fuzzy parameters and can be modeled by using linear functions. It provides easier solutions to developed models and allows decision makers to express their demands in a flexible way.

In the first part of the study, decision under fuzzy environment technique is discussed. Membership functions are introduced and the structure of the purpose function is described. In the second part of the study, the model for choosing the portfolio using fuzzy linear programming method is discussed. In the third and last part, suitable portfolios are created according to investors behaviors from FTSE-100 shares.

Author α: Teaching Assistant (Phd) at Hitit University FEAS Department of Business Administration, Turkey. e-mail: fatihkonak@hitit.edu.tr
Author σ: Research Assistant at Hitit University FEAS Department of Business Administration, Turkey. e-mail: bugrabagci@hitit.edu.tr

II. Decision Making in the Fuzzy Environment

Mathematical formulation of fuzzy set theory was created for the first time in 1965 by Zadeh. Zadeh introduced a way where uncertain conditions can be modeled mathematically. (Mansur, 2002:1) Linear programming problems divided into three main components. Those components are decision variables, restricts and purpose function. In fuzzy linear programming, purpose function and purpose function coefficient are named as fuzzy target and represented by G. Fuzzy restricts are represented by C. For conclusion, decision for fuzzy target and fuzzy restricts is called fuzzy decision. Fuzzy decision is represented by D and μ D (x) is the membership function of the fuzzy decision. Functions related to fuzzy targets is represented by μG (x), functions related to fuzzy restricts is represented by μC (x).

Membership function related to targets is represented by μ G (x) $\in$ [0, 1] and valued from 0 to 1. If the membership function equals to 1 then target is fully achieved, if function equals to 0 target is not fully achieved. However, if membership function equals a value between 0 and 1 then target is partially achieved. Membership function related to restricts is represented as μC(x) $\in$ [0, 1] and valued from 0 to 1. When membership function is equal to 0 then related restrict is not fully relevant, when equals to 1 then related restrict is fully relevant. When between 0 to 1, related restrict is partially relevant. Fuzzy decision is described as fuzzy target and fuzzy restricts are provided together. This is described as,

$$D = G \cap C \qquad (1)$$

Using equality membership functions in (1)

$$\mu D(x) = \mu G(x) \wedge \mu C(x) = [\mu G(x), \mu C(x)] \qquad (2)$$

can be written (Terano et al, 1992). For more general description equalities in (1) ve (2) G1 , G2 ,..., Gn n number of fuzzy targets and C1 , C2 ,..., Cm m number of fuzzy restricts,

$$D=G1_{\cap}G2_{\cap}...{}_{\cap}Gn_{\cap}C1_{\cap}\,C2\,{}_{\cap}\,...\,{}_{\cap}\,Cm \qquad (3)$$

with membership functions (Bellman and Zadeh, 1970: 141-164).

$$\mu\, D(x) = \min\,[\mu G1(x)\,,\,\mu G2(x)\,,...,\,\mu Gn(x\,),\,\mu C1\,(x\,)\,,\,\mu\, C2(x\,)\,,...,\,\mu\, Cm\,(x\,)] \qquad (4)$$

In order to achieve optimum decision in the problem, the highest degree of the element in the fuzzy decision set should be determined. This is calculated as (Terano et al 1992).

$$\mu D(xM)=\max\mu D(x) \qquad (5)$$

The equality in (5) is known as max-min processor. Max-min processor is a reliable method to choose the best solution between the worst cases. Extendedly Max-min processor is written as,

$$\max\mu D(x)=\max(\min(\mu G(x),\mu C(x))) \qquad (6)$$

III. Fuzzy Linear Programming and Portfolio Analysis

Investors are aiming to increase and protect their income in various ways by taking into account every condition that they encounter. For this reason, one way of applying this is using their incomes in financial markets. However, financial markets are affected by financial and social events, this causes a vague structure. To decide under this uncertainty is one of the hardest challenges for the investors. Uncertainty in this environment brings lots of risk parameters for the investors. Investors are trying to reduce risk factors into minimum by using different instruments for their assets. By creating portfolio and managing it, risk is already reduced. Because, risk of the portfolio as a whole is smaller than risks that every share possesses individually. But, over diversification can be harmful while creating the portfolio. While doing over diversification, low-performance investment instruments are included in the portfolio. Also, it can be harder to provide information about investment tools when the number is increased. Generally, portfolio is a new entity, which has measurable qualities in relation with together to fulfill certain purposes (Ceylan and Korkmaz, 1998). Portfolio is a pool in where at least two instruments are in it in order to reduce risk and provide the highest income due to that risk (Ercan ve Ban, 2005).

Markowitz's modern portfolio approach put forward in 1952 by at least risk level needed to reach the targeted level of investor returns and begin to determine the structure of the model portfolio risk level (Ulucan, 2004). Although it is theoretically appropriate, Markowitz portfolio optimization model is not preferred in practice for especially large-scale portfolios. The most important reason behind the practical usefulness of the Markowitz model poses challenges emerging in the solution of quadratic programming problems with large-scale covariance matrix.

Sharpe (1967, 1971) developed alternative methods to Markowitz. Konno (1990) used linear programming in his study instead of quadratic programming approach. Konno and Yamazaki (1991) used absolute deviation risk function instead of Markowitz risk function. Simaan (1997) Compared average variance model between average absolute deviation models in his study. Speranza (1993) used semi absolute deviation portfolio model in his study to measure portfolio risk.

As a model portfolio of functional formulation requires the return of the shares that make up the portfolio and estimation of the distribution of the risk. Information on the selected shares during the time interval, the return and risk distribution of the portfolio is random therefore managers of the portfolios should have reviews regarding shares provides great importance.

These different interpretations by different portfolio managers can be caused from the same set of information. Having different interpretations of the portfolio by the managers will be transferred to the portfolio models created with use of fuzzy set theory.

Followed by the development of fuzzy decision theory by Bellman and Zadeh (1970:141-164) took the form of a tool that can be used for portfolio optimization fuzzy linear programming. Ramaswamy (1998) created portfolio selection model using fuzzy decision theory. We can encounter same studies in Östermark (1996: 243-254) and Leon and others (2002: 178-189) Östermark created dynamic portfolio management model in his study. Watada (2001: 141-162) also created portfolio selection model using the same theory. Tanaka and Guo (1999) used probability theory in order to study uncertainty. Lai and others (2002), Wang and Zhu (2002) used linear interval programming model to choose portfolio in their studies.

In this study, based on recommended model by Konno and Yamazaki (1991: 515-531) Fang and others (2005:879-893 will try to create optimum portfolio. This model is explained below.

Here, ρM0 (expected fuzzy income amount), is in the closed interval of τ, tolerance value known amount of expected [ρM0, ρM0+τ]. ρM0+τ, is determined by decision maker as an upper value of expected income.

$$minw(x) = \frac{\sum_{t=1}^{T} y_t}{T}$$

$$y_t + \sum_{j=1}^{n} a_{jt}\, x_j \geq 0\,, \quad t = 1,2,\dots,T$$

$$y_t - \sum_{j=1}^{n} a_{jt}\, x_j \geq 0\,, \quad t = 1,2,\dots,T$$

$$\sum_{j=1}^{n} r_j x_j \geq \rho M_0 + \tau$$

$$0 \leq x_j \leq 1\,,\quad j = 1,2,\dots,n$$

$$\sum_{j=1}^{n} x_j = 1$$

Here, ρM0 (expected fuzzy income amount), is in the closed interval of τ, tolerance value known amount of expected [ρM0, ρM0+τ]. ρM0+τ, is determined by decision maker as a upper value of expected income.

This model can be used to determine how much to invest in to different stocks by using α [0, 1] for different levels of expectation. Besides, decision makers at this level can determine target income and risk values at specified level.

However, the main purpose of this model is to achieve an optimum solution from a variety of combinations of return and risks are not fully adequate. Werners have suggested that the objective function due to blurred and fuzzy inequality constraints sources may also be fuzzy. As in Verdegay's approach, every fuzzy source tolerance is assumed to be known. In order to apply Werner's approach to the model is solved for ρM0 (α=0) and ρM0 τ (α=1) expected income and function values are found as Z0 and Z1 (minimized risk values). As the expected income value in the model is increased, the minimized risk value will also increase and therefore Z1>Z0. As the investors are sensitive to risk, when risk is increased, satisfaction will decrease. When the membership functions are introduced in the linear programming model, fuzzy target DP model becomes standard DP model below:

$$Maks.\alpha$$

$$\sum_{t=1}^{T} \frac{y_t}{T} + \alpha(Z^1 - Z^0) \leq Z^1$$

$$y_t + \sum_{j=1}^{n} a_{jt} x_j \geq 0\,,\quad t = 1,2,\dots,T$$

$$y_t - \sum_{j=1}^{n} a_{jt} x_j \geq 0\,,\quad t = 1,2,\dots,T$$

$$\sum_{j=1}^{n} r_j - \alpha\tau \geq \rho M_0$$

$$0 \leq x_j \leq 1\,,\quad j = 1,2,\dots,n$$

$$\sum_{j=1}^{n} x_j = M_0$$

IV. Application

In this part of the study, with the help of proposed model, creation of an optimal portfolio for FTSE 100 stocks included in the index will be calculated for portfolio risk and return of amounts obtained. After calculation of monthly income of stocks expected income is (The average rate of return on average equity, ρ) 0, 02 (% 2) and the maximum expected rate of return can be obtained from stock, the maximum of the average returns of stock (ρ max) is found as 0,055 (%5, 5). The tolerance of expected income tolerance (τ=ρ max-ρ) is 0,035 (%3, 5). By taking membership function as $M_0 = 1$, table is created as below.

$$\mu_K(x) = \begin{cases} 0 & , \quad \sum_{j=1}^{n} r_j x_j < \rho M_0 \\ \left[\sum_{j=1}^{n} r_j x_j - \rho M_0\right] / \tau, & \rho M_0 \leq \sum_{j=1}^{n} r_j x_j \leq \rho M_0 + \tau \\ 1 & , \quad \sum_{j=1}^{n} r_j x_j > \rho M_0 + \tau \end{cases}$$

$$\mu_K(x) = \begin{cases} 0 & , \quad \sum_{j=1}^{30} r_j x_j < 0{,}02 \\ \left[\sum_{j=1}^{30} r_j x_j - 0{,}02\right] / 0{,}035 & , \quad 0{,}02 \leq \sum_{j=1}^{30} r_j x_j \leq 0{,}055 \\ 1 & , \quad \sum_{j=1}^{30} r_j x_j > 0{,}055 \end{cases}$$

Here τ is the tolerance value of expected rate of return.

After that, parametric equation is solved accordingly for expected incomes ρM0 (α=0) and ρM0+τ (α=1), by doing this Z0 and Z1 (minimized risk values) target function values are found.

$$minw(x) = \frac{\sum_{t=1}^{T} y_t}{T}$$

$$y_t + \sum_{j=1}^{n} a_{jt} x_j \geq 0\,,\quad t = 1,2,\dots,T$$

$$y_t - \sum_{j=1}^{n} a_{jt} x_j \geq 0\,,\quad t = 1,2,\dots,T$$

$$\sum_{j=1}^{n} r_j x_j \geq \rho M_0 + \tau$$

$$0 \leq x_j \leq 1\,,\quad j = 1,2,\dots,n$$

$$\sum_{j=1}^{n} x_j = M_0$$

By solving with this model, Z0=0.0080 and Z1=0.0113 values are found.

After finding Z0 and Z1 values, target membership function, when α=0 is Z0 and when α= 1 Z1 values are used to determine target membership function like below.

$$\mu_z(x) = \begin{cases} 1, & Z < Z_0 \\ 1 - \dfrac{Z - Z_0}{Z_1 - Z_0}, & Z_0 \le Z \le Z_1 \\ 0, & Z > Z_1 \end{cases}$$

$$\mu_Z(x) = \begin{cases} 1, & Z < Z_0 \\ 1 - \dfrac{Z - 0.0080}{0.0033}, & 0.0080 \le Z \le 0.0113 \\ 0, & Z > 0.0113 \end{cases}$$

By putting membership functions into their places, fuzzy target and sourced DP model becomes standard DP model.

$$Max\ \alpha$$

$$\sum_{t=1}^{T} \frac{y_t}{T} + \alpha(Z_1 - Z_0) \le Z_1$$

$$y_t + \sum_{j=1}^{n} a_{jt} x_j \ge 0$$

$$y_t - \sum_{j=1}^{n} a_{jt} x_j \ge 0$$

$$\sum_{j=1}^{n} r_j x_j - \alpha\tau \ge \rho M_0$$

$$\sum_{j=1}^{n} x_j = M_0$$

$$0 \le x_j \le 1$$

$$\alpha \in [0,1]$$

$$j = 1,2,3,\dots,n \qquad t = 1,2,3,\dots,T$$

By solving this model, α=0.51 is found. Minimum risk ratio related to this α value is found using membership function as below:

$$\mu_z(x) = \alpha = 1 - \frac{z - 0.0080}{0.0033}$$

$$0.51 = 1 - \frac{z - 0.0080}{0.0033}$$

$$\frac{z - 0.0080}{0.0033} = 0.49$$

$$z - 0.0080 = 0.001617$$

$$z = 0.009617$$

With α=0.51 satisfaction level minimized risk ratio z is calculated as approximately % 9.6. In this satisfaction level expected rate of return is;

$$Expected\ Return = \rho M_0 + \alpha\tau$$

$$= 0.000325 + 0.51 * 0.00076$$

$$= 0.000325 + 0.0003876$$

$$= 0.0007126$$

With α=0.51 satisfaction level, with taking %9.6 as risk, expected rate of return is around %0.7. The table below shows that after solving the recommended model, stocks which should be present in the portfolio and the amount of stocks in the portfolio (%).

Table 1 : Weights of Shares in the Target Portfolio

x_j	Shares	Weight
x_1	ANGLO AMERICAN	0
x_2	BRITISH AMERICAN TOBACCO	0.6065
x_3	CARNIVAL	0
x_4	DIAGEO	0
x_5	EXPERIAN	0
x_6	FRESNILLO	0
x_7	GLAXOSMITHKLINE	0
x_8	HIKMA PHARMACEUTICALS	0.3935

x_9	HSBC HDG.	0
x_{10}	IMPERIAL TOBACCO GP.	0

In the portfolio created using the values, %60.65 of BRITISH AMERICAN TOBACCO stocks and %39.35 of HIKMA PHARMACEUTICALS stocks should be presented.

V. Conclusion

Behind the portfolio concept, idea of risk minimization lies. For this reason, in order to invest the assets into only one instrument, it is beneficial to invest a portfolio which consists of more than one instrument. This diversification should be done by comparing the stocks in the portfolio or in the sector they are in. By doing this, expected rate of return could be achieved easily. The study which Markowitz conducted in 1952 created new horizons for the investors. In the meantime, new assumptions and approaches are created after Markowitz's work. Linear programming model by Konno-Yamazaki, which is an approach to this model, was fuzzed by Werners and other researchers. In this study, Werner's model using fuzzy linear programming for portfolio optimization is taken as a basis.

This model is now examining the situation and the past performance of stocks in the sector, which is one of the main methods of analysis Price / Earnings ratio of technical analysis and collection - distribution index is created as a new model by adding constraints. By solving the proposed model by economic package program, portfolio is created. In this portfolio, there should be BRITISH AMERICAN TOBACCO stock by %60.65 and HIKMA PHARMACEUTICALS stocks by %39.35. This portfolio is expected to have a rate of return of % 0.7 with %9.6 risk.

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4. MANUSCRIPT'S CATEGORY

Based on potential and nature, the manuscript can be categorized under the following heads:

Original research paper: Such papers are reports of high-level significant original research work.

Review papers: These are concise, significant but helpful and decisive topics for young researchers.

Research articles: These are handled with small investigation and applications

Research letters: The letters are small and concise comments on previously published matters.

5.STRUCTURE AND FORMAT OF MANUSCRIPT

The recommended size of original research paper is less than seven thousand words, review papers fewer than seven thousands words also.Preparation of research paper or how to write research paper, are major hurdle, while writing manuscript. The research articles and research letters should be fewer than three thousand words, the structure original research paper; sometime review paper should be as follows:

Papers: These are reports of significant research (typically less than 7000 words equivalent, including tables, figures, references), and comprise:

(a)Title should be relevant and commensurate with the theme of the paper.

(b) A brief Summary, "Abstract" (less than 150 words) containing the major results and conclusions.

(c) Up to ten keywords, that precisely identifies the paper's subject, purpose, and focus.

(d) An Introduction, giving necessary background excluding subheadings; objectives must be clearly declared.

(e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition; sources of information must be given and numerical methods must be specified by reference, unless non-standard.

(f) Results should be presented concisely, by well-designed tables and/or figures; the same data may not be used in both; suitable statistical data should be given. All data must be obtained with attention to numerical detail in the planning stage. As reproduced design has been recognized to be important to experiments for a considerable time, the Editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned un-refereed;

(g) Discussion should cover the implications and consequences, not just recapitulating the results; conclusions should be summarizing.

(h) Brief Acknowledgements.

(i) References in the proper form.

Authors should very cautiously consider the preparation of papers to ensure that they communicate efficiently. Papers are much more likely to be accepted, if they are cautiously designed and laid out, contain few or no errors, are summarizing, and be conventional to the approach and instructions. They will in addition, be published with much less delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and to make suggestions to improve briefness.

It is vital, that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

Format

Language: The language of publication is UK English. Authors, for whom English is a second language, must have their manuscript efficiently edited by an English-speaking person before submission to make sure that, the English is of high excellence. It is preferable, that manuscripts should be professionally edited.

Standard Usage, Abbreviations, and Units: Spelling and hyphenation should be conventional to The Concise Oxford English Dictionary. Statistics and measurements should at all times be given in figures, e.g. 16 min, except for when the number begins a sentence. When the number does not refer to a unit of measurement it should be spelt in full unless, it is 160 or greater.

Abbreviations supposed to be used carefully. The abbreviated name or expression is supposed to be cited in full at first usage, followed by the conventional abbreviation in parentheses.

Metric SI units are supposed to generally be used excluding where they conflict with current practice or are confusing. For illustration, 1.4 l rather than 1.4 × 10-3 m3, or 4 mm somewhat than 4 × 10-3 m. Chemical formula and solutions must identify the form used, e.g. anhydrous or hydrated, and the concentration must be in clearly defined units. Common species names should be followed by underlines at the first mention. For following use the generic name should be constricted to a single letter, if it is clear.

Structure

All manuscripts submitted to Global Journals Inc. (US), ought to include:

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Abstract, used in Original Papers and Reviews:

Optimizing Abstract for Search Engines

Many researchers searching for information online will use search engines such as Google, Yahoo or similar. By optimizing your paper for search engines, you will amplify the chance of someone finding it. This in turn will make it more likely to be viewed and/or cited in a further work. Global Journals Inc. (US) have compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Key Words

A major linchpin in research work for the writing research paper is the keyword search, which one will employ to find both library and Internet resources.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy and planning a list of possible keywords and phrases to try.

Search engines for most searches, use Boolean searching, which is somewhat different from Internet searches. The Boolean search uses "operators," words (and, or, not, and near) that enable you to expand or narrow your affords. Tips for research paper while preparing research paper are very helpful guideline of research paper.

Choice of key words is first tool of tips to write research paper. Research paper writing is an art.A few tips for deciding as strategically as possible about keyword search:

- One should start brainstorming lists of possible keywords before even begin searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in research paper?" Then consider synonyms for the important words.
- It may take the discovery of only one relevant paper to let steer in the right keyword direction because in most databases, the keywords under which a research paper is abstracted are listed with the paper.
- One should avoid outdated words.

Keywords are the key that opens a door to research work sources. Keyword searching is an art in which researcher's skills are bound to improve with experience and time.

Numerical Methods: Numerical methods used should be clear and, where appropriate, supported by references.

Acknowledgements: Please make these as concise as possible.

References

References follow the Harvard scheme of referencing. References in the text should cite the authors' names followed by the time of their publication, unless there are three or more authors when simply the first author's name is quoted followed by et al. unpublished work has to only be cited where necessary, and only in the text. Copies of references in press in other journals have to be supplied with submitted typescripts. It is necessary that all citations and references be carefully checked before submission, as mistakes or omissions will cause delays.

References to information on the World Wide Web can be given, but only if the information is available without charge to readers on an official site. Wikipedia and Similar websites are not allowed where anyone can change the information. Authors will be asked to make available electronic copies of the cited information for inclusion on the Global Journals Inc. (US) homepage at the judgment of the Editorial Board.

The Editorial Board and Global Journals Inc. (US) recommend that, citation of online-published papers and other material should be done via a DOI (digital object identifier). If an author cites anything, which does not have a DOI, they run the risk of the cited material not being noticeable.

The Editorial Board and Global Journals Inc. (US) recommend the use of a tool such as Reference Manager for reference management and formatting.

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Tables: Tables should be few in number, cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g. Table 4, a self-explanatory caption and be on a separate sheet. Vertical lines should not be used.

Figures: Figures are supposed to be submitted as separate files. Always take in a citation in the text for each figure using Arabic numbers, e.g. Fig. 4. Artwork must be submitted online in electronic form by e-mailing them.

Preparation of Electronic Figures for Publication

Even though low quality images are sufficient for review purposes, print publication requires high quality images to prevent the final product being blurred or fuzzy. Submit (or e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Do not use pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings) in relation to the imitation size. Please give the data for figures in black and white or submit a Color Work Agreement Form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

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Upon approval of a paper for publication, the manuscript will be forwarded to the dean, who is responsible for the publication of the Global Journals Inc. (US).

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TECHNIQUES FOR WRITING A GOOD QUALITY RESEARCH PAPER:

1. Choosing the topic: In most cases, the topic is searched by the interest of author but it can be also suggested by the guides. You can have several topics and then you can judge that in which topic or subject you are finding yourself most comfortable. This can be done by asking several questions to yourself, like Will I be able to carry our search in this area? Will I find all necessary recourses to accomplish the search? Will I be able to find all information in this field area? If the answer of these types of questions will be "Yes" then you can choose that topic. In most of the cases, you may have to conduct the surveys and have to visit several places because this field is related to Computer Science and Information Technology. Also, you may have to do a lot of work to find all rise and falls regarding the various data of that subject. Sometimes, detailed information plays a vital role, instead of short information.

2. Evaluators are human: First thing to remember that evaluators are also human being. They are not only meant for rejecting a paper. They are here to evaluate your paper. So, present your Best.

3. Think Like Evaluators: If you are in a confusion or getting demotivated that your paper will be accepted by evaluators or not, then think and try to evaluate your paper like an Evaluator. Try to understand that what an evaluator wants in your research paper and automatically you will have your answer.

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7. Use right software: Always use good quality software packages. If you are not capable to judge good software then you can lose quality of your paper unknowingly. There are various software programs available to help you, which you can get through Internet.

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10. Bookmarks are useful: When you read any book or magazine, you generally use bookmarks, right! It is a good habit, which helps to not to lose your continuity. You should always use bookmarks while searching on Internet also, which will make your search easier.

11. Revise what you wrote: When you write anything, always read it, summarize it and then finalize it.

12. Make all efforts: Make all efforts to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in introduction, that what is the need of a particular research paper. Polish your work by good skill of writing and always give an evaluator, what he wants.

13. Have backups: When you are going to do any important thing like making research paper, you should always have backup copies of it either in your computer or in paper. This will help you to not to lose any of your important.

14. Produce good diagrams of your own: Always try to include good charts or diagrams in your paper to improve quality. Using several and unnecessary diagrams will degrade the quality of your paper by creating "hotchpotch." So always, try to make and include those diagrams, which are made by your own to improve readability and understandability of your paper.

15. Use of direct quotes: When you do research relevant to literature, history or current affairs then use of quotes become essential but if study is relevant to science then use of quotes is not preferable.

16. Use proper verb tense: Use proper verb tenses in your paper. Use past tense, to present those events that happened. Use present tense to indicate events that are going on. Use future tense to indicate future happening events. Use of improper and wrong tenses will confuse the evaluator. Avoid the sentences that are incomplete.

17. Never use online paper: If you are getting any paper on Internet, then never use it as your research paper because it might be possible that evaluator has already seen it or maybe it is outdated version.

18. Pick a good study spot: To do your research studies always try to pick a spot, which is quiet. Every spot is not for studies. Spot that suits you choose it and proceed further.

19. Know what you know: Always try to know, what you know by making objectives. Else, you will be confused and cannot achieve your target.

20. Use good quality grammar: Always use a good quality grammar and use words that will throw positive impact on evaluator. Use of good quality grammar does not mean to use tough words, that for each word the evaluator has to go through dictionary. Do not start sentence with a conjunction. Do not fragment sentences. Eliminate one-word sentences. Ignore passive voice. Do not ever use a big word when a diminutive one would suffice. Verbs have to be in agreement with their subjects. Prepositions are not expressions to finish sentences with. It is incorrect to ever divide an infinitive. Avoid clichés like the disease. Also, always shun irritating alliteration. Use language that is simple and straight forward. put together a neat summary.

21. Arrangement of information: Each section of the main body should start with an opening sentence and there should be a changeover at the end of the section. Give only valid and powerful arguments to your topic. You may also maintain your arguments with records.

22. Never start in last minute: Always start at right time and give enough time to research work. Leaving everything to the last minute will degrade your paper and spoil your work.

23. Multitasking in research is not good: Doing several things at the same time proves bad habit in case of research activity. Research is an area, where everything has a particular time slot. Divide your research work in parts and do particular part in particular time slot.

24. Never copy others' work: Never copy others' work and give it your name because if evaluator has seen it anywhere you will be in trouble.

25. Take proper rest and food: No matter how many hours you spend for your research activity, if you are not taking care of your health then all your efforts will be in vain. For a quality research, study is must, and this can be done by taking proper rest and food.

26. Go for seminars: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

27. Refresh your mind after intervals: Try to give rest to your mind by listening to soft music or by sleeping in intervals. This will also improve your memory.

28. Make colleagues: Always try to make colleagues. No matter how sharper or intelligent you are, if you make colleagues you can have several ideas, which will be helpful for your research.

29. Think technically: Always think technically. If anything happens, then search its reasons, its benefits, and demerits.

30. Think and then print: When you will go to print your paper, notice that tables are not be split, headings are not detached from their descriptions, and page sequence is maintained.

31. Adding unnecessary information: Do not add unnecessary information, like, I have used MS Excel to draw graph. Do not add irrelevant and inappropriate material. These all will create superfluous. Foreign terminology and phrases are not apropos. One should NEVER take a broad view. Analogy in script is like feathers on a snake. Not at all use a large word when a very small one would be sufficient. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Amplification is a billion times of inferior quality than sarcasm.

32. Never oversimplify everything: To add material in your research paper, never go for oversimplification. This will definitely irritate the evaluator. Be more or less specific. Also too, by no means, ever use rhythmic redundancies. Contractions aren't essential and shouldn't be there used. Comparisons are as terrible as clichés. Give up ampersands and abbreviations, and so on. Remove commas, that are, not necessary. Parenthetical words however should be together with this in commas. Understatement is all the time the complete best way to put onward earth-shaking thoughts. Give a detailed literary review.

33. Report concluded results: Use concluded results. From raw data, filter the results and then conclude your studies based on measurements and observations taken. Significant figures and appropriate number of decimal places should be used. Parenthetical remarks are prohibitive. Proofread carefully at final stage. In the end give outline to your arguments. Spot out perspectives of further study of this subject. Justify your conclusion by at the bottom of them with sufficient justifications and examples.

34. After conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print to the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects in your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form, which is presented in the guidelines using the template.
- Please note the criterion for grading the final paper by peer-reviewers.

Final Points:

A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

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Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

· Adhere to recommended page limits

Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

In every sections of your document

· Use standard writing style including articles ("a", "the," etc.)

· Keep on paying attention on the research topic of the paper

· Use paragraphs to split each significant point (excluding for the abstract)

· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

· Shun familiar wording, don't address the reviewer directly, and don't use slang, slang language, or superlatives

· Shun use of extra pictures - include only those figures essential to presenting results

Title Page:

Choose a revealing title. It should be short. It should not have non-standard acronyms or abbreviations. It should not exceed two printed lines. It should include the name(s) and address (es) of all authors.

Abstract:

The summary should be two hundred words or less. It should briefly and clearly explain the key findings reported in the manuscript--must have precise statistics. It should not have abnormal acronyms or abbreviations. It should be logical in itself. Shun citing references at this point.

An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Yet, use comprehensive sentences and do not let go readability for briefness. You can maintain it succinct by phrasing sentences so that they provide more than lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study, with the subsequent elements in any summary. Try to maintain the initial two items to no more than one ruling each.

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- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
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- A conceptual should situate on its own, and not submit to any other part of the paper such as a form or table
- Center on shortening results - bound background information to a verdict or two, if completely necessary
- What you account in an conceptual must be regular with what you reported in the manuscript
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The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

- Explain the value (significance) of the study
- Shield the model - why did you employ this particular system or method? What is its compensation? You strength remark on its appropriateness from a abstract point of vision as well as point out sensible reasons for using it.
- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

- Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done.
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- Shape the theory/purpose specifically - do not take a broad view.
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This part is supposed to be the easiest to carve if you have good skills. A sound written Procedures segment allows a capable scientist to replacement your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt for the least amount of information that would permit another capable scientist to spare your outcome but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section. When a technique is used that has been well described in another object, mention the specific item describing a way but draw the basic principle while stating the situation. The purpose is to text all particular resources and broad procedures, so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step by step report of the whole thing you did, nor is a methods section a set of orders.

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- Explain materials individually only if the study is so complex that it saves liberty this way.
- Embrace particular materials, and any tools or provisions that are not frequently found in laboratories.
- Do not take in frequently found.
- If use of a definite type of tools.
- Materials may be reported in a part section or else they may be recognized along with your measures.

Methods:

- Report the method (not particulars of each process that engaged the same methodology)
- Describe the method entirely
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures
- Simplify - details how procedures were completed not how they were exclusively performed on a particular day.
- If well known procedures were used, account the procedure by name, possibly with reference, and that's all.

Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
- Use standard style in this and in every other part of the paper - avoid familiar lists, and use full sentences.

What to keep away from

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings - save it for the argument.
- Leave out information that is immaterial to a third party.

Results:

The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.

Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
- In manuscript, explain each of your consequences, point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

What to stay away from

- Do not discuss or infer your outcome, report surroundings information, or try to explain anything.
- Not at all, take in raw data or intermediate calculations in a research manuscript.
- Do not present the similar data more than once.
- Manuscript should complement any figures or tables, not duplicate the identical information.
- Never confuse figures with tables - there is a difference.

Approach

- As forever, use past tense when you submit to your results, and put the whole thing in a reasonable order.
- Put figures and tables, appropriately numbered, in order at the end of the report
- If you desire, you may place your figures and tables properly within the text of your results part.

Figures and tables

- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
- Despite of position, each figure must be numbered one after the other and complete with subtitle
- In spite of position, each table must be titled, numbered one after the other and complete with heading
- All figure and table must be adequately complete that it could situate on its own, divide from text

Discussion:

The Discussion is expected the trickiest segment to write and describe. A lot of papers submitted for journal are discarded based on problems with the Discussion. There is no head of state for how long a argument should be. Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implication of the study. The purpose here is to offer an understanding of your results and hold up for all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of result should be visibly described. Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved with prospect, and let it drop at that.

- Make a decision if each premise is supported, discarded, or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
- Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work
- You may propose future guidelines, such as how the experiment might be personalized to accomplish a new idea.
- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
- One research will not counter an overall question, so maintain the large picture in mind, where do you go next? The best studies unlock new avenues of study. What questions remain?
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Approach:

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References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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