



Factors that influence the working capital requirement of the pharmaceutical companies in India- A case study

Dr. Amalesh Patra

Associate Professor, Department of Commerce, Calcutta Girls' College, Kolkata, West Bengal, India

Abstract

The purpose of the study is to identify the Factors that influence the Net Working Capital requirement of the company under the pharmaceutical sectors listed on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) of India. The study followed static Pannal data analysis using fifteen years from 2010 to 2024 data from eight top pharmaceutical companies listed on Stock Exchange in India. To fulfill the objective of the study Net Working Capital (NWC) is considered as dependent variable Debt-Equity (DE), Inventory Turnover Ratio (ITR), Return on Asset (ROA) and Quick Ratio (QR) considered independent variables, and Price to Book Value (PB) considered as control variable. The study employees Pearsons Correlation test, Hadri LM Test, Kao and Pedroni test, Hausman test, Breusch-Pagan/Cook-Weisberg test and for the final result employee Fixed Effect model with the help of Statistical tool Stata-17.00. The result depicts that Debt- Equity (DE), Return on Assets (ROA) and Quick Ratio (QR) are the factors that have a significant impact on the Net Working Capital (NWC) requirement of the pharmaceutical companies listed in India.

The empirical result also suggested that Return on Assets (ROA) and Quick Ratio (QR) have a positive influence but Debt-Equity (DE) has a negative influence on the Net Working Capital (NWC) requirement of the pharmaceutical companies in India.

Keywords: Net Working Capital (NWC), Quick Ratio (QR), Inventory Turnover Ratio (ITR), Debt-equity (DE), Price to Book Value ratio (PB), Return on Assets ratio (ROA)

Introduction

Background

Short term financial decisions are the important tactical part of the management to conduct productivity, smoothly and efficiently of a businesses and enterprises. Working capital management as a function has gained importance due to its close association with the operations management of a firm as well as its ability to create shareholder wealth due to its twin aspects of profitability and liquidity (Kantawala & Shroff, 2012) ^[1]. Working capital management being a major revenue-generating activity which is important for maintaining a healthy and wealthy business (Goyal, 2018b ^[7]; Bhalla, 1997) ^[2]. Working Capital Management is critical for the long-term survival of the business and helps in maintaining sufficient liquidity to pay off current obligations as and when due (Panda, 2012) ^[14].

In this regard, the Indian Pharmaceutical Industry plays an important role in the global healthcare and pharmaceutical market. The production and supply of generic drugs are the key components of the Indian Pharmaceutical Industry. It is not only meeting the domestic demand for drugs and pharmaceuticals but also supplying countries across the globe. Over the last few years, the Indian Pharmaceutical industry has seen a huge expansion and is expected to grow about 13% of the size of the global pharma and healthcare market. During the financial year 2024, the Indian Pharmaceutical sector exported a huge number of drugs, and pharmaceuticals recorded a strong growth of 9.7% on the year-over-year basis. In the Financial Year 2023, the Indian hospital market was valued at US\$ 98.98 billion, and it has also been projected to grow by 8% CAGR and reach US\$ 193.59 billion by the Financial Year 2032 ^[3].

The research is based on purely secondary data followed static Pannal data analysis using fifteen years from 2010 to 2024 data from the eight top pharmaceutical companies listed on Stock Exchange in India. To fulfill the objective of the study Net Working Capital requirement (NWC) is considered as dependent variable, Debt-Equity (DE), Inventory Turnover Ratio (ITR), Return on Asset (ROA) and Quick Ratio (QR) considered as independent variables, and Price to Book Value (PB) considered as control variable. The result of this study will provide knowledge to the existing body by identifying key factors of working capital requirement of the company under the pharmaceutical sector listed in India.

Literature Review

Valipour *et al.* (2012) ^[17], intended to highlight the impact of company characteristics on working capital management. Sample of 83 listed large cap company in Teheran had been taken for the period of 10 years from 2001 to 2010 in this study. The study based on a correlation approach and multiple regression analysis employed to test the hypothesis. To fulfill the objective of the study Cash Conversion Cycle (CCC) is considered as dependent variable, OCF; Size; Sales growth; Current Ratio and Quick Ratio considered as independent variables. The study concluded that Profitability, OCF, and sale growth are the determinants have a significant and negative influence on working capital requirement. But Leverage has a significant and positive influence on WCR.

Abadi and Abadi (2013) ^[1], studied on the determinants of working capital requirement in Palestinian industrial

corporations. The result of the study revealed that firm size and leverage were negatively significant on working capital requirements but the cash conversion cycle and operating cash flows and profitability were positively significant on working capital requirements; they also found that economic variables such as interest rate and GDP growth rate were not significantly related to working capital requirements.

Salawu, R. O., & Alao, J. A. (2014) ^[16], had studied on the Determinants of working capital management: Case of manufacturing firms in Nigeria. The study used secondary data on financial variables such as sales, purchases, inventory, creditors, debtors and total assets were extracted from the Annual Reports of these non-financial quoted companies between the periods 2000-2009. The results depicted that the sales growth, size of the firm, gross domestic product, leverage were the factors have a significant impact on the working capital management. The proportion of fixed assets to total assets and the net trading cycle were not significant.

Zariyawatt *et al.* (2016), had studied on the working capital management determinants of small and large firms in Malaysia. Employed Random Effect model to fulfil the objective of the study. They found that leverage, performance, capital expenditure and operating cash flow were the firm-level variables affecting on the working capital management. the cash conversion cycle, along with economic conditions. The study also suggested that the working capital management decisions in small firms were quite different from that in large firms.

Cuong and Nhung (2017) ^[5], had studied on the determinants of working capital requirement: Evidence from non-financial firms listed on the Vietnam exchange. They found that size and asset tangibility had a significant negative impact on working capital ratio, while profitability had a significant positive impact on working capital ratio for listed non-financial firms.

Dash (2020) ^[6] studied to examine the determinants of working capital for sugar manufacturing companies under large cap categories in India. The sample included 15 listed sugar manufacturing companies for the period 2008–18. The study employed fixed-effects panel regression models, with size, leverage, asset tangibility, growth rate of sales and profitability as the independent variables, and the current ratio, inventory cycle, receivables cycle, payables cycle, cash conversion cycle, total assets turnover ratio, fixed assets turnover ratio, inventory turnover ratio, as the dependent variables. The results of the study depicted that size and leverage have a significant positive effects and asset-tangibility has a significant negative effect on working capital management of the listed Sugar companies in India.

Research gap

A few studies have been done on the factors that influence the working capital requirement of the pharmaceutical companies listed in India. Yet, there is no indisputable explanation of the factors that influence the Net Working Capital requirement of the company under the pharmaceutical sectors listed in India.

1. This study seeks to fill an existing gap in the literature of the firms listed on NSE and BSE in India.

2. The study provides new empirical evidence employing different statistical tools for analysis the data as a methodological contribution and includes new variables.
3. Finally, the present study brings significant insights and empirical evidence on the factors that influence the working capital requirement of companies in pharmaceutical sectors in India, which are directly or indirectly beneficial for both internal and external stakeholders.

Objective

The objective of the study is to-

1. Identify the factors that influence the working capital requirement of the companies in pharmaceutical sector listed in India and,
2. Examine the significant influence of the factors of the working capital requirement of the companies in pharmaceutical sector listed in India.

Significance of the study

This study emphasizes the comprehensive analysis of short-term financial decisions of the management to conduct productivity, smoothly and efficiently of businesses and enterprises. In a result, it creates shareholders' wealth due to its twin aspects of profitability and liquidity. The insights of this research are crucial for the stakeholders of this sector like Investors, creditors, policymakers, etc.

Methodology

Data collection and Study design

The objective of the study is to identify the factors that influence the Net Working Capital requirement of the company under the pharmaceutical sector listed in India.

1. The research is based on purely secondary data from the top 8 pharmaceutical companies listed on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) of India over 15 years period of time from 2010 to 2024.
2. To fulfill the objective of the study Net Working Capital requirement (NWC) is considered as dependent variable, Debt-Equity (DE), Inventory Turnover Ratio (ITR), Return on Asset (ROA) and Quick Ratio (QR) considered as an independent variables, and Price to Book Value (PB) considered as control variable.
3. The study is based on purely Secondary data collected from the Annual Reports of the companies and the data sources: www.moneycontrol.com
4. The nature of the study is Static Panel Data analysis.
5. The data analysis through STATA 17.00.

Sample

- a. Firm must belong only to the Pharmaceutical Companies.
- b. The data for the companies must be available from 2010 to 2024.
- c. Companies must be in large cap categories. Market cap more than Rs. 10,000 crore.

Steps for the Analysis

Diagnostic test

1. For testing the Collinearity -: Pearsons’ Correlation
2. For the stationary test: Hadri LM test
3. For cointegration test: Kao and Pedroni test.
4. To Examine the Heteroskedasticity- Bruesch-Pagan/Cook-Weisberg test.

Model Selection-To select the appropriate model: the Hausman test.

Regression Analysis - Fixed Effect Model

Hypothesis

H0:H0.....H0n. The null hypothesis assumed that the factors do not influence the Net Working Capital requirement of the companies under the pharmaceutical sector listed in India.

H1: H1.....H1n. The alternative hypothesis assumed that

the factors influence the Net Working Capital requirement of the companies under the pharmaceutical sector listed in India.

Multiple Regression model

The multiple regression model used in this research can be written as:

$$NWC_{it} = \beta_0 + \beta_1 DE_{it} + \beta_2 ITR_{it} + \beta_3 ROA_{it} + \beta_4 QR_{it} + \beta_5 PB_{it} + \epsilon_i$$

Where, NWC= Net Working Capital Ratio of the firm i in period t

β_0 = Constant

DE=Debt-Equity Ratio

ITR=Inventory Turnover Ratio

ROA= Return on Assets

QR= Quick Ratio

PB=Price to Book Value Ratio

ϵ_i = Standard Error

The variables are summarized in the following table

Name of Variables	Definition	Hypothesis	Hypothesis Impact
Dependent Variable			
NWC= Working Capital Ratio	NWC=Current Assets-Current Liabilities/ Total Assets	Liquidity	-
Independent Variables			
DE=Debt-Equity Ratio	DE=Debt/ Equity	solvency	‘-’ Negative
ITR= Inventory Turnover Ratio	ITR=Cost of Goods Sold/Average Stock	Efficiency	‘+’ Positive
ROA= Return on Assets	ROA=Net profit/ Total Assets	Profitability	‘+’ Positive
QR=Quick Ratio	QR=Quick Assets/ Quick Liabilities	Liquidity	‘+’ Positive
Control Variable			
PB= Price to Book Value	PB= Current Market Value / Book value	Value of the firm	‘+’ Positive

Result and Discussion

Descriptive Statistics: Descriptive statistics that deals with the summarization and description of collected data. It simplifies and present data in a manner that is easy to understand often through visual or numerical methods.

Table 1: Summarization

Variable	Obs	Mean	Std. dev.	Min	Max
NWC	120	24.37258	13.64608	-.32	57.27
DE	120	.3763333	.3601025	0	1.66
ITR	120	3.040542	1.933267	.185	7.64
ROA	120	9.629917	5.603083	-10.45	22.96
QR	120	1.612417	.9961354	.59	5.73
PB	120	4.381917	1.98047	.96	10.37

Sources: Author’s calculation through STATA-17.00

Discussion: The mean value of Net Working Capital (NWC) is 24.37 variable ranging from a maximum of 57.27 to a minimum of -0.32 and the standard deviation is 13.65 implying the NWC variation during the study period of 2010 to 2024.

Diagnostic Test

1. Multicollinearity test: Multicollinearity is the situation where a high correlation exists between exploratory

variables causing loss of precisions, which means the value of R-square will be high but the individual coefficients exist high standard errors and inference are not reliable (Brooks. C. 2014) [4] If an absolute correlation value exceeding 0.8 which indicates that there is a strong correlation exists and this circumstance does not desirable.

Table-2: Pearson’s’ Co-relation

```

. correlat NWC DE ITR ROA QR PB
(obs=120)
    
```

	NWC	DE	ITR	ROA	QR	PB
NWC	1.0000					
DE	-0.6083	1.0000				
ITR	-0.2169	0.2725	1.0000			
ROA	0.4840	-0.3765	0.0581	1.0000		
QR	0.8663	-0.5286	-0.1543	0.3773	1.0000	
PB	0.2727	-0.1042	0.1829	0.5248	0.2798	1.0000

Sources: Author’s calculation through STATA-17.00

Discussion: Table 2 shows that the correlation between the independent variables used in the model is less than 80%. The highest correlation coefficients exist between the DR and DE (52.86%), followed by PB and ROA variables (52.48%) during the study period of 2010 to 2024. We can conclude from the result table that there is no collinearity exists in the exploratory variables.

Stationary Test

Table 3: Hadri LM test – At level

```

H0: All panels are stationary           Number of panels = 8
Ha: Some panels contain unit roots     Number of periods = 15

Time trend:      Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust         sequentially
LR variance:     (not used)
    
```

Variables	Statistic(z)	P-value
NWC	6.7853	0.0000
DE	14.7857	0.0000
ITR	12.7701	0.0000
ROA	8.9791	0.0000
QR	13.2021	0.0000
PB	7.7378	0.0000

Sources: Author’s calculation through STATA-17.00

Discussion: The result of the Hadri LM test reveals that the P-value of all the variables is less than 0.05, at a 5% significant level. It indicates that the Null hypothesis is rejected. The result depicts that the series contains non-stationary at a level.

Table 4: Hadri LM test (First difference)

```

H0: All panels are stationary           Number of panels = 8
Ha: Some panels contain unit roots     Number of periods = 14

Time trend:      Not included           Asymptotics: T, N -> Infinity
Heteroskedasticity: Not robust         sequentially
LR variance:     (not used)
    
```

Variables	Statistic(z)	P-value
D.NWC	0.8284	0.2037
D.DE	-1.4374	0.9247
D.ITR	0.1893	0.4240
D.ROA	-0.8517	0.8028
D.QR	-1.1006	0.8645
D.PB	-1.1969	0.8843

Sources: Author’s calculation through STATA-17.00

Discussion: The result of the first difference shows that the P-value of all the variables is greater than 0.05 at a 5% significant level. It implies that the Null hypothesis is accepted. The result depicts that the series contains stationary at first difference.

Cointegration Test: The pre-condition of the co-integration test is that the model should be non-stationary at level but stationary at first difference. Since the conditions are fulfilled from the unit root test and it allows to run the Cointegration test.

Table 5: Kao and Pedroni test-

Kao test			Pedroni test		
. xtointtest kao NWC DE ITR ROA QR PB			. xtointtest pedroni NWC DE ITR ROA QR PB		
Kao test for cointegration			Pedroni test for cointegration		
H0: No cointegration			H0: No cointegration		
Ha: All panels are cointegrated			Ha: All panels are cointegrated		
Cointegrating vector: Same			Cointegrating vector: Panel specific		
Panel means: Included	Kernel: Bartlett	Number of panels = 8	Panel means: Included	Kernel: Bartlett	Number of panels = 8
Time trend: Not included	Lags: 1.50 (Newey-West)	Number of periods = 13	Time trend: Not included	Lags: 0.00 (Newey-West)	Number of periods = 14
AR parameter: Same	Augmented lags: 1		AR parameter: Panel specific	Augmented lags: 1	
	Statistic	p-value		Statistic	p-value
Modified Dickey-Fuller t	-0.8968	0.1849	Modified Phillips-Perron t	2.0742	0.0190
Dickey-Fuller t	-1.5666	0.0586	Phillips-Perron t	-8.0406	0.0000
Augmented Dickey-Fuller t	-1.1005	0.1356	Augmented Dickey-Fuller t	-5.6159	0.0000
Unadjusted modified Dickey-Fuller t	-2.4525	0.0071			
Unadjusted Dickey-Fuller t	-2.3678	0.0089			

Sources: Author’s calculation through STATA-17.00

Discussion: Result of Kao and Pedroni test in table -5. Shows that p- value of five statistical tests above are significant at 5% level out of eight Statistical tests, implies that Null hypothesis is rejected. The result suggests that there is a long run association among the variables.

Hausman test: To select the appropriate model for data analysis between Fixed Effect and Random Effect Model, the study applied Hausman test.

Table 7: Hausman test

```
. hausman fe re
```

	Coefficients		(b-B)	sqrt(diag(V_b-V_B))
	(b)	(B)	Difference	Std. err.
	fe	re		
DE	-7.594592	-6.931797	-.6627953	.9425881
ITR	.1641712	-.2425968	.406768	.2045999
ROA	.2868648	.3792209	-.0923561	.0516519
QR	7.965431	8.996304	-1.030873	.3949232
PB	.0215476	-.0296064	.051154	.0541606

b = Consistent under H0 and Ha; obtained from xtreg.
 B = Inconsistent under Ha, efficient under H0; obtained from xtreg.

Test of H0: Difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
 = 17.59
 Prob > chi2 = 0.0035

Sources: Authors’ computation through STATA-17.00

Discussion: Hausman test result table reveals that chi2 (5) =17.59 (Positive) and Prob> chi2=0.0035, i.e., < 0.05 at 5% significant level. It Indicates that Fixed Effect Model is applicable for the data analysis.

Heteroscedasticity test: The Breusch-Pagan/ Cook-Weisberg test has been run to examine the heteroscedastic problem in the data series.

Table 8: Breusch-pagan/ Cook-Weisberg test for heteroskedasticity

```
. estat hettest
```

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
 Assumption: Normal error terms
 Variable: Fitted values of NWC

H0: Constant variance

chi2(1) = 0.34
 Prob > chi2 = 0.5613

Sources: Author’s calculation Through STATA 17.00

Discussion: The result table above reveals that $\text{Chi}^2(1) = 0.34$ (positive) and $\text{Prob} > \text{chi}^2 = 0.5613$; > 0.05 . It suggests that there is no heteroscedastic problem in the data series.

Regression Analysis [Fixed Effect Model]

Fixed Effect Model is applied to identify the Factors that influence the Net Working Capital requirement of the company under the pharmaceutical sectors listed on the

National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) of India. To fulfill the objective of the study Net Working Capital (NWC) is considered as dependent variable Debt-Equity (DE), Inventory Turnover Ratio (ITR), Return on Asset (ROA) and Quick Ratio (QR) considered independent variables, and Price to Book Value (PB) considered as control variable.

Table 9: Regression analysis: -

. xtreg NWC DE ITR ROA QR PB, fe						
Fixed-effects (within) regression			Number of obs = 120			
Group variable: COMPANY			Number of groups = 8			
R-squared:			Obs per group:			
Within = 0.5378			min = 15			
Between = 0.9347			avg = 15.0			
Overall = 0.7929			max = 15			
corr(u_i, Xb) = 0.4957			F(5,107) = 24.90			
			Prob > F = 0.0000			
NWC	Coefficient	Std. err.	t	P> t	[95% conf. interval]	
DE	-7.594592	2.333042	-3.26	0.002	-12.21958	-2.969608
ITR	.1641712	.4104173	0.40	0.690	-.6494333	.9777757
ROA	.2868648	.1440683	1.99	0.049	.0012663	.5724633
QR	7.965431	.8495348	9.38	0.000	6.281327	9.649535
PB	.0215476	.3490691	0.06	0.951	-.6704412	.7135364
_cons	11.03101	2.285474	4.83	0.000	6.50033	15.5617
sigma_u	3.7677078					
sigma_e	5.6901732					
rho	.30479915 (fraction of variance due to u_i)					
F test that all u_i=0: F(7, 107) = 3.78			Prob > F = 0.0011			

Sources: Author's Calculation through STATA-17.00

Interpretation

The result table-9, depicts that the overall R² value is 79.29% and $\text{Prob} > \text{chi}^2 = 0.0000$ which is > 0.05 , significant at the 5% level, indicates that the model is fitted well.

- H01(DE):** The value of P is (0.002), < 0.01 at the 1% significant level implying that the null hypothesis (H01) is rejected. The result depicts that Debt-Equity (DE) has a significant and negative impact on the Net Working Capital requirement (NWC) of the companies in this study if the other things remain unchanged. The coefficient value of DE suggests that if the DE increased by 1 unit, the NWC decreased by 7.59%. The result is supported by the earlier studies of (Atseye *et al.*, 2015 ^[2]; Salawu & Alao, 2014) ^[16]. (Wasiuzzaman & Arumugam, 2013) ^[18].
- H02(ITR):** The value of P is (0.690), > 0.05 at the 5% significant level implying that the null hypothesis (H02) is accepted. It indicates that Inventory Turnover Ratio (ITR) has no significant impact on the Net Working Capital requirement (NWC) of the companies in this study if the other things remain unchanged.
- H03(ROA):** The value of P is (0.049), < 0.05 at the 5% significant level implying that the null hypothesis (H03) is rejected. It indicates that Return on Assets (ROA) has a significant and positive impact on the Net Working Capital requirement (NWC) of the companies in this study if the other things remain unchanged. The coefficient value of ROA suggests that if the ROA increased by 1 unit, the NCW increased by 0.29%. The result is consistent with the earlier study of Abbadi and Abbadi (2013) ^[1]; Mansoori and Muhammad (2012) ^[12]; Nazir and Afza (2009) ^[13].

- H04(QR):** The value of P is (0.000), < 0.01 at the 1% significant level implying that the null hypothesis (H04) is rejected. It indicates that Quick Ratio (QR) has a significant and positive impact on the Net Working Capital requirement (NWC) of the companies in this study if the other things remain unchanged. The coefficient value of QR suggests that if the QR increased by 1 unit, the NWC increased by 7.97%.
- H05(PB):** The value of P is (0.951), > 0.05 at the 5% significant level implying that the null hypothesis (H05) is accepted. It indicates that Price to Book Value (PB) has no significant impact on the Net Working Capital requirement (NWC) of the companies in this study if the other things remain unchanged.

Conclusion and Recommendation

Conclusion

The present study attempts to identify the factors that influence the profitability of pharmaceutical companies in India over 15 years from 2010 to 2024. From the regression analysis, it has been observed that the Debt-Equity (DE), Return on Assets (ROA) and Quick Ratio (QR) are the factors that influence the Net Working Capital (NWC) and no significant influence found of Inventory Turnover Ratio (ITR) and Price to Book value (PB) ratio on the Net Working Capital (NWC) requirement of the pharmaceutical companies listed in India.

The empirical result suggested that: -

- The Debt-Equity (DE) has a significant and negative impact on the Net Working Capital (NWC) requirement of the pharmaceutical companies in India. An organization with high debt ratio is cautious about the working capital.

2. Return on Assets (ROA) has a significant and positive impact on the Net Working Capital requirement (NWC) of the pharmaceutical companies in India. A major revenue-can be generated by utilizing the working capital efficiently.
3. Quick Ratio (QR) has a significant and positive impact on the Net Working Capital requirement (NWC) of the pharmaceutical companies in India. Enough liquidity ensures to pay short-term liabilities of the companies, resulting positive impact on Net Working Capital (NCW) requirement.
4. Finally, the Net Working Capital (NWC)= $11.031-7.595(DE)+0.287(ROA)+7.965(QR) + \epsilon$

Recommendation

The main implication of this study is that it sheds more light on the key determinants of working capital management in the Indian economy. The work is thus very useful to both academic and policymakers in general, and the managers can use the significant factors to enhance the Profitability to set appropriate financial policies for the company.

Limitation: i) A generalization of the results is limited because of the small sample size.
ii) The secondary data have been taken from the Journals, Trade Magazines, and the Internet which may vary with the actual position of the company.

Scope of further study: In this study, the independent variables explain 79% of the dependent variable (NWC) but 21% remain unexplained. Thus, there is a scope for further study in this area as there are several internal and external factors not considered in this study.

References

1. Abbadi SM, Abbadi RT. The determinants of working capital requirement in Palestinian industrial corporations. *International Journal of Economics and Finance*,2013;5(1):67-75.
2. Atseye FA, Ugwu JI, Takon SM. Determinants of working capital management. *International Journal of Economics, Commerce and Management*,2015;3(2):1–11.
3. Bhalla VK. *Modern working capital management*. New Delhi: Anmol Publications Pvt Ltd, 1997.
4. Brooks C. *Introductory Econometrics for Finance*. 3rd Edition, Cambridge University Press, Cambridge, 2014.
5. Cuon NT, Nhung NTH. Determinants of working capital requirement: Evidence from non-financial firms listed on the Vietnam exchange. *Journal of Insurance and Financial Management*,2017;3(1):19-29.
6. Dash. Determinants of Working Capital in the Indian Sugar Industry, *Journal of Commerce & Accounting Research*,2020;9(2):41-49.
7. Goyal SS. Working capital policy of Indian service industry. *Pacific Business Review International*,2018b;10(8):104-118.
8. Hadri K. Testing for Stationarity in Heterogeneous Panel Data. *The Econometrics Journal*,2000;3:148-161.
9. Hausman JA. Specification Tests in Econometrics. *Econometrical, Journal of the Econometric Society*,1978;46:1251-1271.
10. Indian Pharmaceuticals Industry Analysis Presentation | IBEF
11. Kantawala AS, Shroff SJ. A study on working capital management of Indian hotel industry. *Management Trends*,2012;9(1):69-74.
12. Mansoori E, Muhammad DDJ. Determinants of working capital management: Case of Singapore firms. *Research Journal of Finance and Accounting*,2012;3(11):15-2
13. Nazir MS, Afza T. Working capital requirements and the determining factors in Pakistan. *IUP Journal of Applied Finance*,2009;15(4):28-38.
14. Panda A. The status of working capital and its relationship with sales: An empirical investigation of Andhra Pradesh Paper Mills Ltd (India). *International Journal of Commerce and Management*,2012;22(1):36-52.
15. Pedroni P. Critical Values for Cointegration Tests in Heterogeneous Panels with Multiple Regressors. *Oxford Bulletin of Economics and Statistics*,1999;61:653-670.
16. Salawu RO, Alao JA. Determinants of working capital management: Case of Nigerian manufacturing firms. *Journal of Economics and Sustainable Development*,2014;5(14):49-56.
17. Valipour H, Moradi J, Farsi FD. The impact of company characteristics on working capital management. *Journal of Applied Finance and Banking*,2012;2(1):105-25.
18. Wasiuzzaman S, Arumugam VC. Determinants of working capital investment: A study of Malaysian public listed firms. *Australasian Accounting, Business and Finance Journal*,2013;7(2):63–83.
19. Zariyawati MA, Annuar MN, Pui-San N. Working capital management determinants of small and large firms in Malaysia. *International Journal of Economics and Management*,2016;10(2):365-377.