

WORKING CAPITAL TRENDS IN SELECTED PETROLEUM REFINING COMPANIES IN INDIA

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ABSTRACT

Astute management of working capital determines, to a very large extent, the overall success or failure of operations of a company. A study of the working capital is of major importance to internal and external analysts because of its close relationship to current day to day operations of a business. The inadequacy, or mismanagement, of working capital is one of the leading causes of the failures of the companies of the country. A working capital trend analysis indicates the changes which have taken place from time to time in the individual components of the working capital, like current assets and current liabilities, on the basis of any normal base year. The study has been conducted with the prime objective of analysing and interpreting the liquidity position of the selected petroleum refining companies in India. This analysis will provide a base of judging whether the practice and the prevailing policy of the management with regards to the working capital is appropriate or not or whether an important change is required to be made in managing the working capital funds. For this purpose, three leading companies have been selected. The study is based on the annual reports, accounts and other publications of the selected petroleum refining companies in India. The study period is nine years, from 2009-10 to 2017-18.

Keywords: *Trend Analysis, Working Capital, Chi- Square Test, Critical Value, Computed Value.*

Introduction

Meaning and Importance of Trend Analysis

A business involves an intricate and dynamic process. Therefore, an analysis is necessary for determining the direction of change and the trends of a business. In order to determine the possible direction and change, the past data are studied to determine the trend. An analysis of the trend helps in understanding the anticipated future tendency of the business. Trend analysis entails an in-depth study of the financial statements of a business for a number of years. This analytical technique indicates the direction - upward or downward - and involves computation of the percentage relationship that each item of statement bears to the same item in the base year, which may be the earliest year, involved in the comparison or the latest year or any intervening year. Trend percentages are related to the base year and emphasize the changes in the financial operating data occurring from year to year and conducts a horizontal study of the data available. Trend analysis is a dynamic technique depicting the changes over a period of state years. "It is with the help of the trend analysis that a financial analyst is able to judge the present position of a company and the direction in which it is going or is likely to go."

Methods of Expressing Trend

There are mainly two methods of expressing trends: Trend Ratio and Graphs and Diagrams.

Trend Ratio

According to John N. Myer, "The ratio of the magnitudes of a financial statement item in a series of statements to its magnitude in one of the statements selected as the base may be called ratios because they reveal the trend of the item with the passage of time."² Trend ratio forms the application of

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the analysis of financial statement of a device that has been used by statisticians. In fact, trend ratio is the index number of the variations of different factors of a business. Trend ratio is computed by assigning the number 100 to items of the base year. The percentage of each item of the successive year is calculated in relation to the base year. It may be noted that a normal year should be selected as the base year. Trend ratio is generally not computed for all the items in the statement, as the fundamental objective is to make a comparison between items having some logical relationship with one another. It must be noted that, although trend ratio shows the increase or decrease in an item, as well as the degree of change, it is valuable only to the extent to which it provides clues to favourable or unfavourable tendencies and point to the way for further analysis.

Limitations of Trend Ratio Analysis

There are various limitations of this technique. Some of these given below:

- If the year selected as the base year is not a normal year, then the trend calculated on that base will be a misleading one.
- Trend analysis fails to analyze the important events of the base year.

Graphs and Diagrams

Graphs and diagrams are used by business enterprises to show the tendency of significant business events. It is important, convenient, appealing and easily understood method of depicting the trend of business events. Graphs and diagrams are nothing but geometric figures like points, line bars, squares, rectangles, circles, cubes, pictures, maps, charts, etc. They represent business events in a more attractive, fascinating and impressive fashion than a bare set of numerical data. They are more appealing to the eye and leave a longer lasting impression on the mind, as compared to the dry and uninteresting statistical data. Even a layman, who has no statistical background, can understand graphic and diagrammatic presentation easily.

Working Capital Trend

A working capital trend analysis indicates the changes which have taken place from time to time in the individual components of the working capital, like current assets and current liabilities, on the basis of any normal base year. In financial analysis, the direction of change over a period of time is of crucial importance. Working capital is one of the important areas of financial management. It is, therefore, very essential for an analyst to study the trends and direction of working capital. Generally, there are two concepts of working capital: (a) Gross working capital, and (b) Net working capital. The net concept of working capital (excess of current assets over current liabilities) has been used in the present study. Further, a study should also be carried out of the trends of the components of the working capital movements to provide a deep and broad-based understanding while examining the working capital management of an industry. This analysis will provide a base for judging whether the practice and the prevailing policy of the management with regard to the working capital is appropriate or not or whether an important change is required to be made in managing the working capital funds. Moreover, any one trend by itself is not sufficient and, therefore, a comparison with related trends should also be made by an analyst. To illustrate, an upward trend in working capital, coupled with a downward trend in sales, would usually reflect an unfavorable situation. An upward trend in current assets, viz. inventories, accounts receivables, cash and bank balances and other current assets, will be viewed favorably. Such conclusions throw light on one aspect and should be reconciled with other aspects.

In the present era of science, logic and technology, any finding or conclusion cannot be called valid or accurate until it is proved objectively. Generally, we start with an assumption or a hypothesis and use research data to prove or disprove it. Every statistical hypothesis is put to test with appropriate statistical criterion. A research study may not be treated as complete and meaningful unless such statistical tests are carried out. In this study, null and alternative hypotheses (H_0 and H_1) are given below:

H_0 : There is no significance difference between actual and trend/estimated values.

H_1 : There is a significant difference between actual and trend/ estimated values. The testing of the hypothesis has also been performed in order to conclude whether or not the differences are insignificant (small) and they have arisen due to sample fluctuations only in the situations H_0 is rejected. For this purpose, a five-percent level of significance has been used. The degrees of freedom have been taken to be eight (formula being $N-1$), as there are nine years covered in this study.

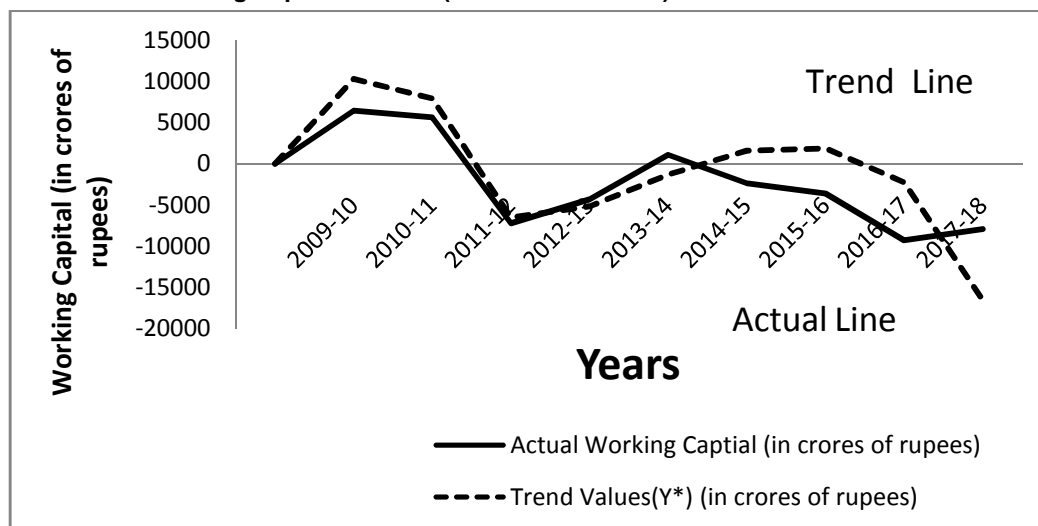
Working Capital Trend: BPCL**Table 1: Working Capital Trend of BPCL**

Years	Actual Working Capital (in Crores of Rupees)	Indices (2009-10=100)	Trend Values(Y*) (in Crores of Rupees)
2009-10	6,452.78	100	3,815.16
2010-11	5,647.51	87.52	2,263.39
2011-12	-7,222.22	-111.92	711.62
2012-13	-4,303.59	-66.69	-840.15
2013-14	1,070.56	16.59	-2,391.92
2014-15	-2,352.04	-36.45	3,943.69
2015-16	-3,622.99	-56.15	5,495.46
2016-17	-9,286.67	-143.92	7,047.23
2017-18	-7,910.63	-122.59	-8,598.99

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	7,4000.80	H_0 is Rejected

Note: $Y^* = -2,391.92 + -1551.77 X$ (Origin of X = 2009-10, X in units of years and Y in crores of rupees).

Linear Trend of Working Capital of BPCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of BPCL from 2009-10 to 2017-18.

In Table 1 the working capital indices of BPCL show a fluctuating trend throughout the period under study. In 2010-11 the index of the working capital decreased to 87.52 in 2010-11 and -111.92 in 2011-12 as compared to 2009-10, the base year. However the indices significantly rose again to -66.69 in 2012-13 and to 16.59 in 2013-14. The indices again continued their decline to -36.45 in 2014-15, to -56.15 in 2015-16 and to -143.92 in 2016-17. The index once again rose to -122.59 in 2017-18. The reason for the fluctuation in the working capital appears to be the increase in the current liabilities.

Table 1 shows the least square trend value of the working capital of BPCL. The yearly increase in working capital comes to Rs. -1551.77 crore. The trend values differed materially from the actual working capital throughout all the years except 2017-18. The difference in this year was not very significant. The differences were positive in 2009-10, 2010-11, 2013-14, 2017-18 and were negative in rest of the years covered under the study. The positive differences due to increase in the working capital.

Chi-square test has been applied to test the significance of the difference between the actual values and trend values of working capital of BPCL. It can be observed that the critical value of Chi-square at five-percent level of significance is 15.51, while the calculated value of Chi-square is 74,000.80. As the calculated value is Chi-square is more than the critical value, it shows that the differences between the actual values and the trend values of working capital were significant.

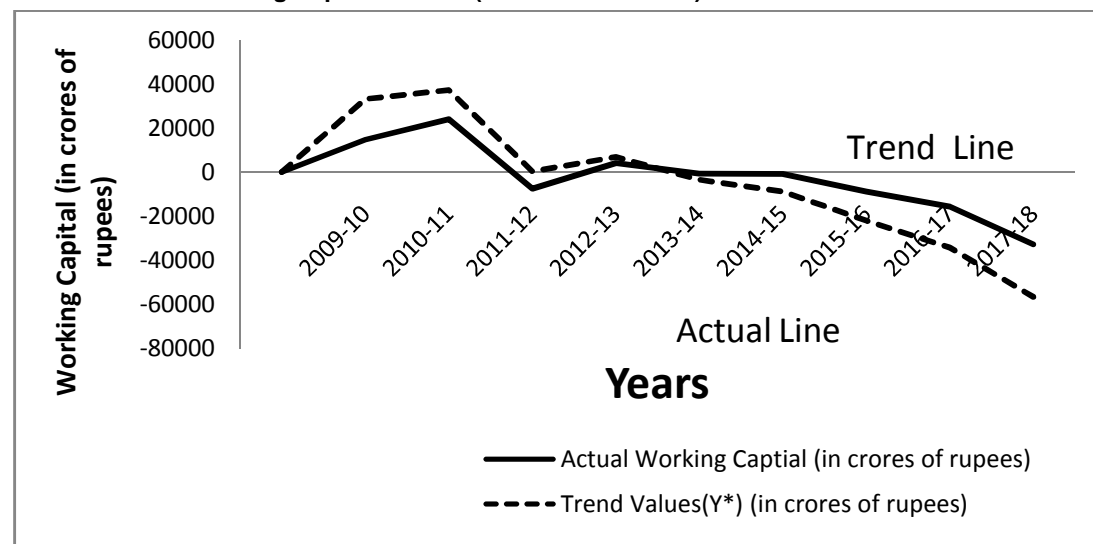
Working Capital Trend: IOCL**Table 2: Working Capital Trend of IOCL**

Years	Actual Working Capital (in Crores of Rupees)	Indices (2009-10=100)	Trend Values(Y*) (in Crores of Rupees)
2009-10	14,637.07	100	18,462.96
2010-11	24,007.78	164.02	13,185.53
2011-12	-7,596.59	-51.90	7,908.09
2012-13	4,164.90	28.45	2,630.66
2013-14	-742.47	-5.07	-2,646.77
2014-15	-870.33	-5.95	-7,924.20
2015-16	-8,853.91	-60.52	-13,201.64
2016-17	-15,735.08	-107.50	-18,479.07
2017-18	-32,827.31	-224.28	-23,756.50

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	28,020.06	H_0 is Rejected

Note: $Y^* = -2,646.77 + -5,277.43 X$ (Origin of X = 2009-10, X in units of years and Y in crores of rupees).

Linear Trend of Working Capital of IOCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of IOCL from 2009-10 to 2017-18.

Table 2 shows that the working capital of IOCL registered a decreasing trend throughout the period under review, except in 2010-11 and 2012-13. The working capital index rose significantly to 164.02 in 2010-11 from the base year 2009-10. However the index fell to -51.90 in 2011-12. It again increased to 28.45 in 2012-13. Thereafter, the indices decreased for the next five years to -5.07 in 2013-14, -5.95 in 2014-15, -60.52 in 2015-16, -107.50 in 2016-17 and -224.28 in 2017-18, the highest during the study period. The reason for the decrease in the working capital indices appears to be the decrease in the working capital during the years under study.

Table 2 shows the linear least square trend values of working capital of IOCL. The yearly increase in the working capital comes to Rs. -5277.43 crore. The trend values of the working capital differ materially and significantly from the actual values of working capital during the period under study. The deviations were negative and significant in 2009-10, 2011-12 and 2017-18, while deviations were positive in the rest of the years. The reason for the fluctuation in the working capital of IOCL appears to be increase in current liabilities.

Chi-square test has been applied to test the significance of the difference between the actual values and trend values of the working capital of IOCL. It can be observed that the critical value of Chi-square at a five-percent level of significance is 15.51, while the calculated value of Chi-square is 28,020.06. As the calculated value of Chi-square is more than the critical value, it shows that the differences between the actual values and the trend values of working capital were significant.

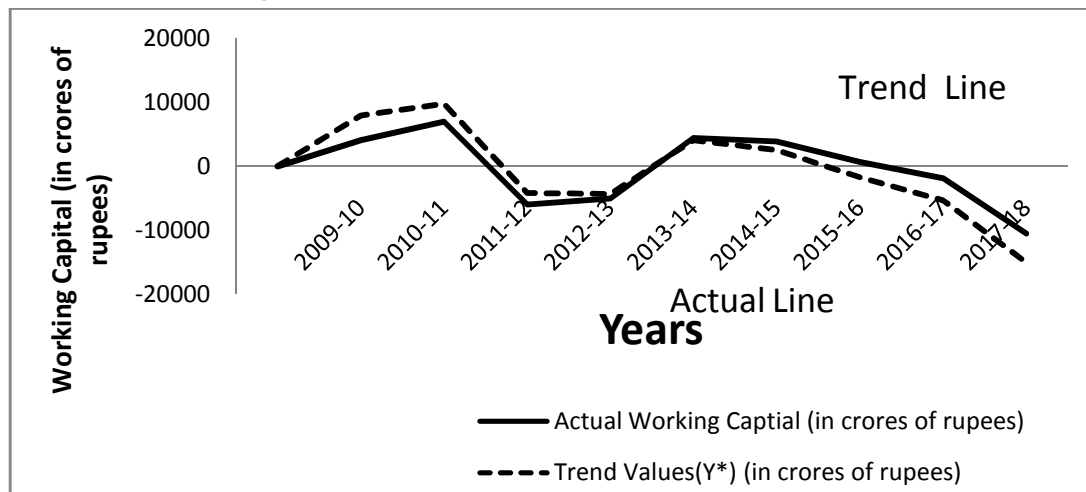
Working Capital Trend: HPCL**Table 3: Working Capital Trend of HPCL**

Years	Actual Working Capital (in crores of rupees)	Indices (2009-10=100)	Trend Values(Y*) (in crores of rupees)
2009-10	4,086.83	100	3,817.66
2010-11	6,984.37	170.90	2,774.04
2011-12	-5,940.62	-145.36	1,730.42
2012-13	-5,032.01	-123.13	686.80
2013-14	4,429.52	108.39	-356.82
2014-15	3,904.18	95.53	-1,400.44
2015-16	699.69	17.12	-2,444.06
2016-17	-1,839.69	-45.01	-3,487.68
2017-18	-10,503.60	-257.01	-4,531.30

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	-8,956.32	H_0 is Accepted

Note: $Y^* = -356.82 + -1,043.62 X$ (Origin of X = 2009-10, X in units of years and Y in crores of rupees).

Linear Trend of Working Capital of HPCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of HPCL from 2009-10 to 2017-18.

Table 3 shows that working capital of HPCL registered a fluctuating trend throughout the period under study from 2009-10 to 2017-18. The working capital index rose sharply to 170.90 in 2010-11 from the base year 2009-10. However the indices fell to -145.36 in 2011-12 and -123.13 in 2012-13. The index again increased significantly to 108.39 in 2013-14. The indices again continued to decline to 95.53 in 2014-15, 17.12 in 2015-16 and -45.01 in 2016-17. The working capital index fell sharply to -257.01 in 2017-18, the highest during the study period. The reason for the fluctuation appears to be that "The current liabilities of the company increased to Rs. 42,700.36 crore in 2011-12 and to Rs. 47,377.35 crore in 2017-18 from Rs. 19,606.60 crore in 2010-11 and Rs. 34,755.50 crore in 2016-17."³

Table 3 shows the linear least square trend value of the working capital of HPCL. The yearly increase in working capital comes to Rs. -1043.62 crore. The trend values of the working capital differed and were positive throughout the period under study except in 2011-12, 2012-13 and 2017-18. During 2011-12, 2012-13 and 2017-18 the working capital of the company decreased significantly as apparently the current liabilities of the company increased. Chi-square test has been applied to test the significance of the differences between the actual values and trend values of working capital of HPCL. It can be observed that the Table value of Chi-square at a five-percent level of significance is 15.51, while the calculated value of Chi-square is -8,956.32. As the calculated value of Chi-square is less than the Table value, it shows that the difference between the actual values and the trend values of the working capital were not significant.

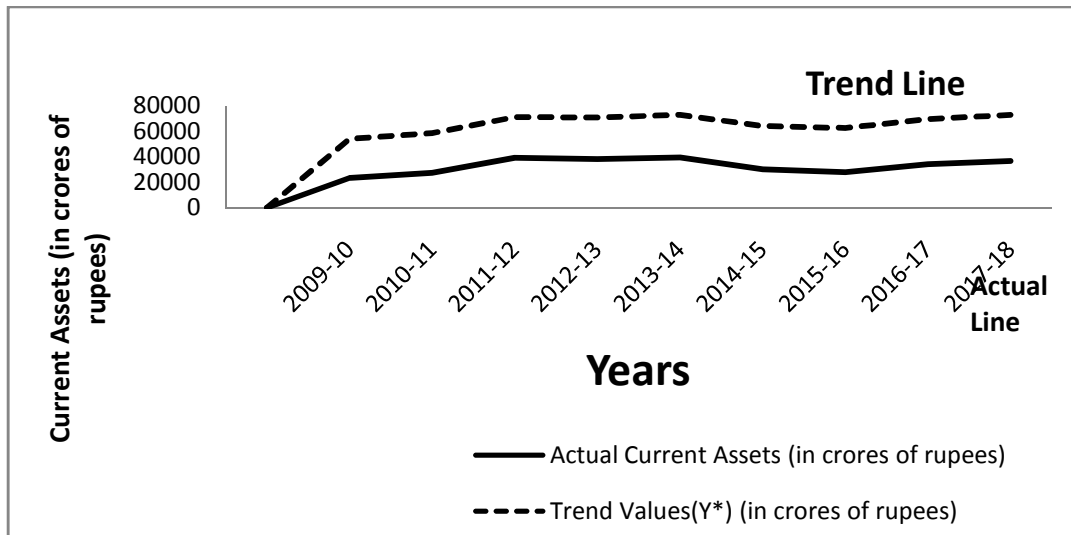
Current Assets Trend: BPCL**Table 4: Current Assets Trend of BPCL**

Years	Actual Current Assets (in crores of rupees)	Indices (2009-10=100)	Trend Values(Y*) (in crores of rupees)
2009-10	23,583.93	100	30,310.61
2010-11	27,605.83	117.05	31,015.67
2011-12	39,445.33	167.26	31,720.72
2012-13	38,389.81	162.78	32,425.77
2013-14	39,651.90	168.13	33,130.83
2014-15	30,285.46	128.42	33,835.88
2015-16	28,075.57	119.05	34,540.93
2016-17	34,258.12	145.26	35,245.98
2017-18	36,881.48	156.38	35,951.04

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	7,763.78	H_0 is Rejected

Note: $Y^* = 33,130.83 + 705.05 X$ (Origin of X = 2009-10, X in units of years and Y in crores of rupees).

Liner Trend of Current Assets of BPCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of BPCL from 2009-10 to 2017-18.

Table 4 shows the current assets of BPCL showed a fluctuating trend throughout the period under study from 2009-10 to 2017-18. The indices of current assets increased to 117.05 in 2010-11 and to 167.26 in 2011-12 as compared to base year 2009-10. It decreased to 162.78 in 2012-13, highest during the period of the study. The index again increased to 168.13 in 2013-14. However the indices declined to 128.42 in 2014-15 and 119.05 in 2015-16. The indices rose again to 145.26 in 2016-17 and to 156.38 in 2017-18. The increase in the current assets index in 2017-18 was apparently due to a significant increase in trade receivables.

Table 4 shows the linear least square trend value of current assets of BPCL. The yearly increase in current assets comes to Rs. 705.05 crore. The trend values of current assets varied significantly from the actual values of current assets in first seven years from 2009-10 to 2015-16, while, They were not vary significantly in the remaining years. However the deviations were negative in 2009-10, 2010-11, 2014-15, 2015-16 and 2016-17. Apparently, the positive deviation was high in rest years, due to more investment in current assets especially in trade receivables.

Chi-square test has been applied to test the significance of the differences between the actual values and trend values of current assets of BPCL. In BPCL the difference between the actual and trend value of current assets at a five-percent level of significance are significant because the computed value of Chi-square exceeds the Table value of Chi-square. The computed value of Chi-square comes to 7,763.78. While the Table value of Chi-square is only 15.51.

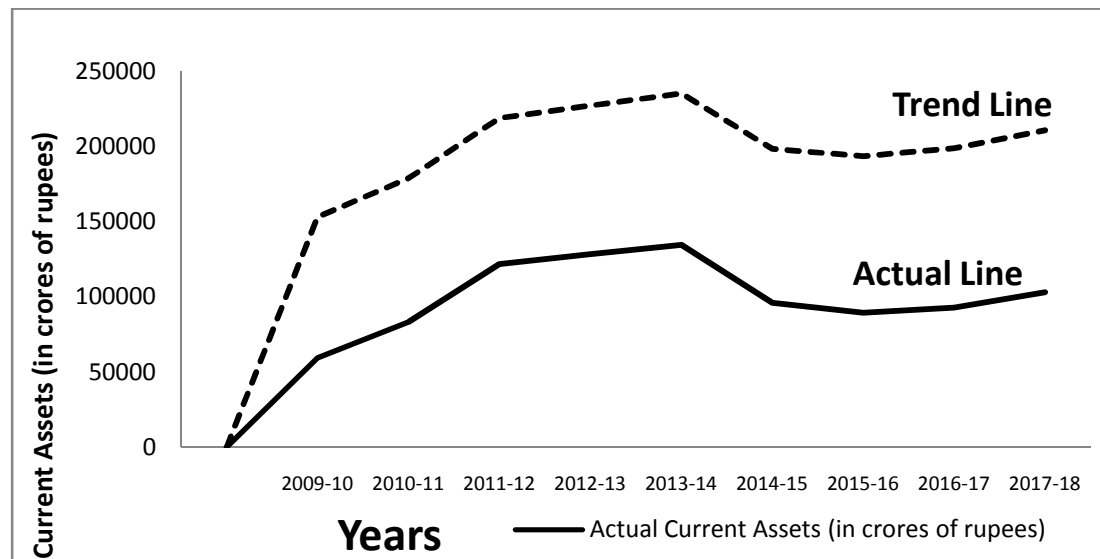
Current Assets of IOCL:**Table 5: Current Assets Trend of IOCL**

Years	Actual Current Assets (in crores of rupees)	Indices (2009-10=100)	Trend Values(Y*) (in crores of rupees)
2009-10	59,388.80	100	93,874.56
2010-11	83,321.18	140.29	95,640.27
2011-12	1,21,726.83	204.97	97,405.98
2012-13	1,28,298.57	216.03	99,171.69
2013-14	1,34,577.77	226.60	1,00,937.40
2014-15	95,931.02	161.53	1,02,703.11
2015-16	89,349.74	150.45	1,04,468.81
2016-17	92,787.70	156.24	1,06,234.52
2017-18	1,03,054.97	173.53	1,08,000.23

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	44,657.41	H_0 is Rejected

Note: $Y^* = 1,00,937.40 + 1,765.71 X$ (Origin of X = 2009-10, X in units of years and Y in crores of rupees).

Linear Trend of Current Assets of IOCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of IOCL from 2009-10 to 2017-18.

Table 5 shows the current assets of IOCL had an increasing trend during the period of the study except in 2014-15 and 2015-16. The indices of current assets continuously increased from 2010-11 to 2013-14 and were 140.29, 204.97, 216.03 and 226.60 respectively. However as compared to 2013-14, the indices declined to 161.53 in 2014-15 and 150.45 in 2015-16. Thereafter, indices in last two years increased to 156.24 in 2016-17 and 173.53 in 2017-18. It appears that "In 2017-18 the index of current assets increased because of increase in inventories of IOCL."⁴

Table 5 shows the linear least square trend value of the current assets of IOCL from 2009-10 to 2017-18. The yearly increase in current assets comes to Rs. 1,765.71 crore. The trend values of current assets deviated significantly from the actual values of current assets. The deviations in 2011-12, 2012-13 and 2013-14 were both positive and significant, apparently, a jump in negative due to low investment in current assets in 2009-10, 2010-11, 2014-15, 2015-16, 2016-17 and 2017-18.

Chi-square test has been applied to test the significance of the differences between the actual values and trend values of Chi-square at five-percent level of significance is 15.51 while the calculated value of Chi-square is 44,657.41. As the calculated value of Chi-square is more than the Table value. It shows that the difference between the actual values and the trend values were significant.

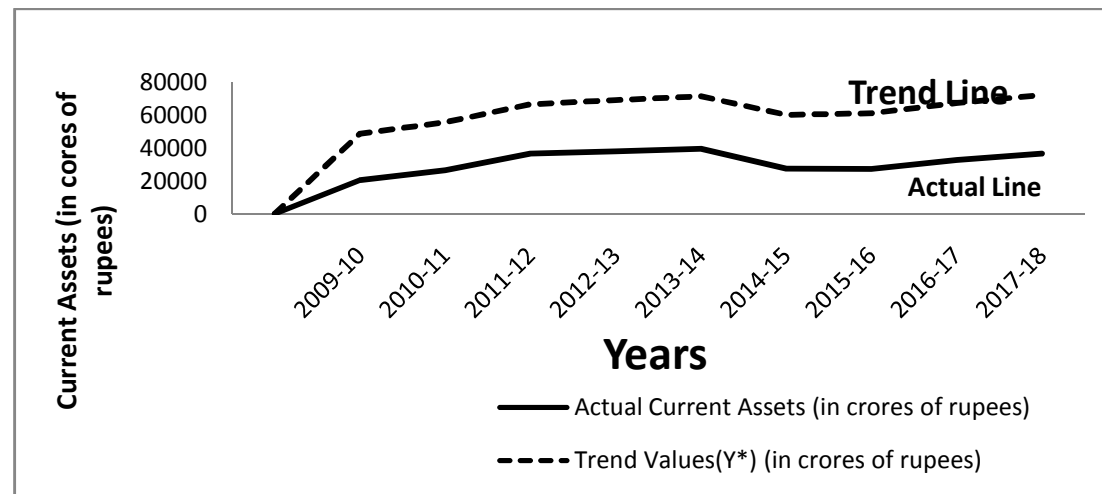
Current Assets Trend of HPCL:**Table 6: Current Assets Trend of HPCL**

Years	Actual Current Assets (in crores of rupees)	Indices (2009-10=100)	Trend Values(Y*) (in crores of rupees)
2009-10	20,641.94	100	28,222.31
2010-11	26,590.97	128.82	29,134.45
2011-12	36,759.74	178.08	30,046.59
2012-13	38,230.64	185.21	30,958.73
2013-14	39,736.78	192.51	31,870.87
2014-15	27,599.48	133.71	32,783.01
2015-16	27,488.73	133.17	33,695.15
2016-17	32,915.81	159.46	34,607.29
2017-18	36,873.71	178.64	35,519.43

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	9,504.53	H_0 is Rejected

Note: $Y^* = 31,870.90 + 912.14 X$ (Origin of X = 2009-10, X in units of years and Y in crores of rupees).

Linear Trend of Current Asset of HPCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of HPCL from 2009-10 to 2017-18.

Table 6 shows that the current assets of HPCL had an increasing trend throughout the period under review, except in 2014-15 and 2015-16. The current assets indices continuously increased from 2010-11 to 2013-14 and were 128.82, 178.08, 185.21 and 192.51 respectively. However as compared to 2013-14, the index decreased to 133.71 in 2014-15 and to 133.17 in 2015-16. The indices again increased to 159.46 in 2016-17 and 178.64 in 2017-18. Apparently, the increase in current assets was due to an increase in the level of inventories and loans of the company.

Table 6 shows the linear least square trend value of the current assets of HPCL. The yearly increase in current assets comes to Rs. 912.14 crore. The trend values of current assets differed materially from their actual value during the period of the study except in 2017-18. The deviations were positive in 2011-12, 2012-13, 2013-14 and 2017-18 and negative in the rest of the years. The increase in the current assets was due to an increase in the level of inventory and loans and advances. Apparently, the negative deviations were due to a significant decrease in the level of loans and advances. Therefore, it can be concluded that inventory and loans and advances played a crucial role in the fluctuation of the current assets, as compared to trend values.

Chi-square test has been applied to test the significance of the differences between the actual values and trend values of current assets of HPCL. It can be observed that the Table value of Chi-square at five-percent level of significance is 15.51, while the calculated value of Chi-square is 9,504.53. The calculated value of Chi-square is more than the Table value, it shows that the difference between the actual values and the trend values of current assets were significant.

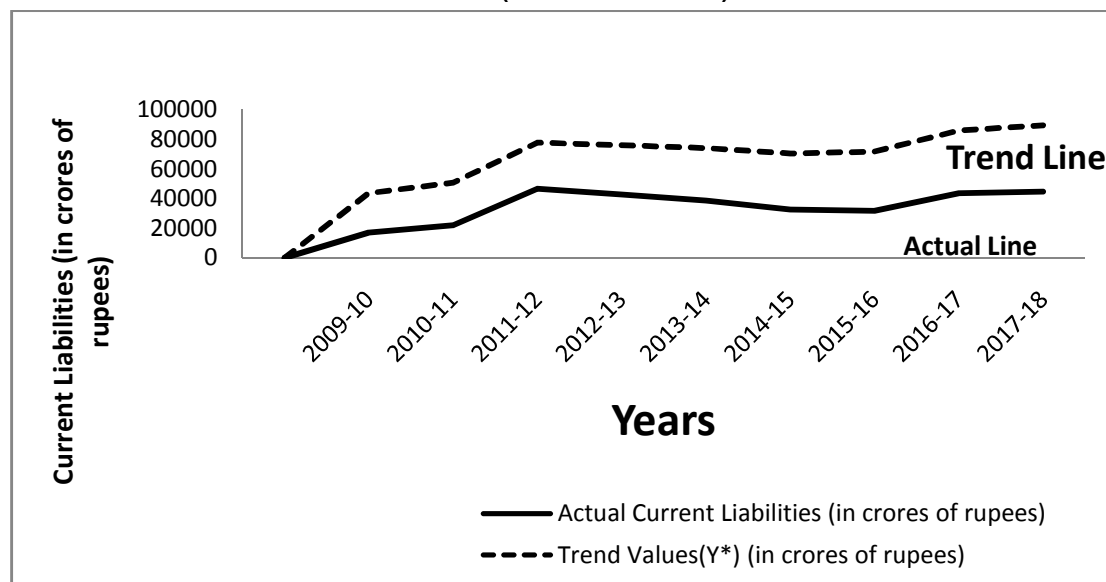
Current Liabilities Trend: BPCL**Table 7: Current Liabilities Trend of BPCL**

Years	Actual Current liabilities (in crores of rupees)	Indices (2009-10=100)	Trend Values(Y*) (in crores of rupees)
2009-10	17,131.15	100	26,495.46
2010-11	21,958.32	128.18	28,752.28
2011-12	46,667.55	272.42	31,009.10
2012-13	42,693.40	249.22	33,265.92
2013-14	38,581.34	225.21	35,522.75
2014-15	32,637.50	190.52	37,779.57
2015-16	31,698.56	185.03	40,036.39
2016-17	43,544.79	254.18	42,293.21
2017-18	44,792.11	261.47	44,550.04

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	18,231.64	H_0 is Rejected

Note: $Y^* = 35,522.75 + 2,256.82 X$ (Origin of $X = 2009-10$, X in units of years and Y in crores of rupees).

Linear Trend of Current Liabilities of BPCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of BPCL from 2009-10 to 2017-18.

Table 7 shows that current liabilities of BPCL registered a fluctuating trend throughout the period under study. The indices of current assets increased to 128.18 in 2010-11 and to 272.42 in 2011-12 compared to 2009-10. However the indices continuously declined from 2012-13 to 2015-16 and were 249.22, 225.21, 190.52 and 185.03 respectively. Thereafter as compared to 2015-16, the indices again increased to 254.18 in 2016-17 and to 261.47 in 2017-18.

Table 7 shows the least square trend values of the current liabilities of BPCL. The yearly increase in current liabilities comes to Rs. 2256.82 crore. The trend values of current liabilities varied materially from actual values of current liabilities throughout the period under study except 2016-17 and 2017-18. The deviations were positive in 2011-12, 2012-13, 2013-14, 2016-17 and 2017-18, while they were negative in rest of years.

It can be observed that the difference between actual and trend values of current liabilities of BPCL were significant because the computed value of Chi-square 18,231.64 is more than the Table value 15.51 of Chi-square at a five-percent level of significance. Chi-square test has been applied to test the significance of the difference between the actual value and trend values of current liabilities of BPCL.

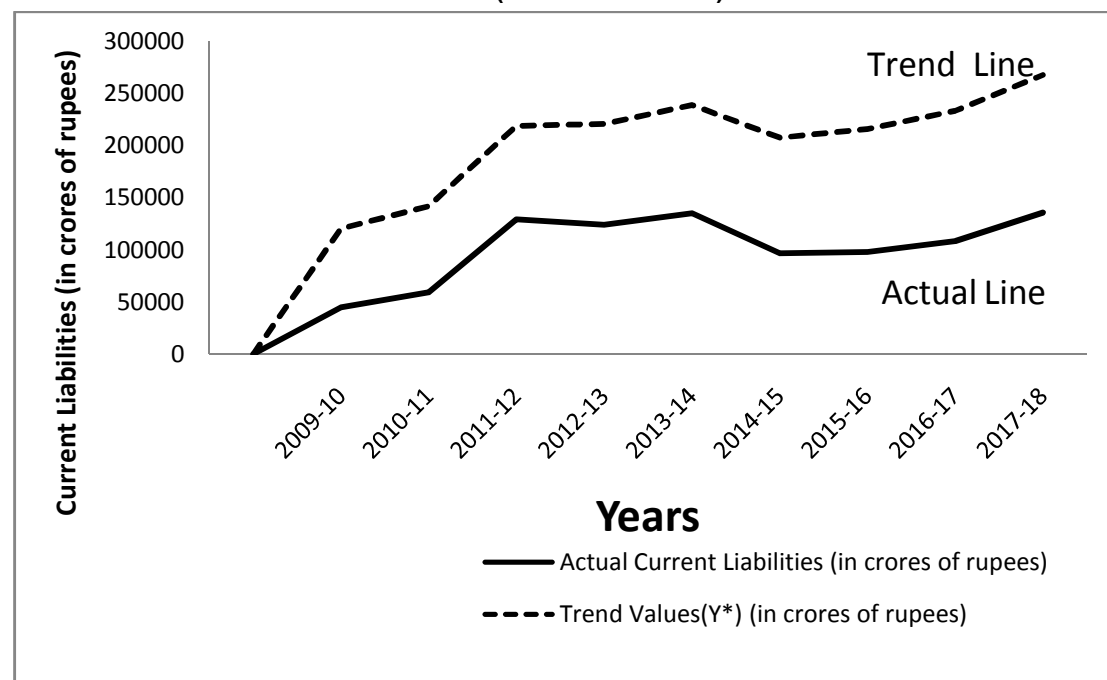
Current Liabilities Trend: IOCL**Table 8: Current Liabilities Trend of IOCL**

Years	Actual Current Liabilities (in crores of rupees)	Indices (2009-10=100)	Trend Values(Y*) (in Crores of Rupees)
2009-10	44,751.73	100	75,411.60
2010-11	59,313.40	132.54	82,454.75
2011-12	1,29,323.42	288.98	89,497.89
2012-13	1,24,133.64	277.38	96,541.03
2013-14	1,35,320.24	302.38	1,03,584.17
2014-15	96,801.35	216.31	1,10,627.31
2015-16	98,208.65	219.45	1,17,670.45
2016-17	1,08,522.78	242.50	1,24,713.59
2017-18	1,35,882.28	303.64	1,31,756.73

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	61,469.45	H_0 is Rejected

Note: $Y^* = 1,03,584.17 + 7043.14 X$ (Origin of $X = 2009-10$, X in units of years and Y in crores of rupees).

Linear Trend of Current Liabilities of IOCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of IOCL from 2009-10 to 2017-18.

Table 8 shows that the current liabilities of IOCL registered an increasing trend throughout the period under study except in 2012-13 and 2014-15. The indices of current liabilities rose to 132.54 in 2010-11 and to 288.98 in 2012-13. However the index dropped to 277.38 in 2012-13. It again increased to 302.39 in 2013-14. Thereafter the index decreased to 216.31 in 2014-15. However as compared to 2014-15 the indices rose from 2015-16 to 2017-18 and were 219.45, 242.50 and 303.64 respectively.

Table 8 shows the linear least square trend values of the current liabilities of IOCL. The yearly increase in current liabilities is Rs. 7,043.14 crore. The trend values of current liabilities differed materially. The deviations were positive in 2011-12, 2012-13, 2013-14 and 2017-18 and were negative in rest of the years.

The differences between the actual and trend values of current liabilities of IOCL were significant at a five-percent level of significance. The calculated value of Chi-square comes to 61,469.45 which exceed the Table value 15.51 of Chi-square. Chi-square test has been applied to test the significance of the differences between the actual values and trend values of current liabilities of IOCL.

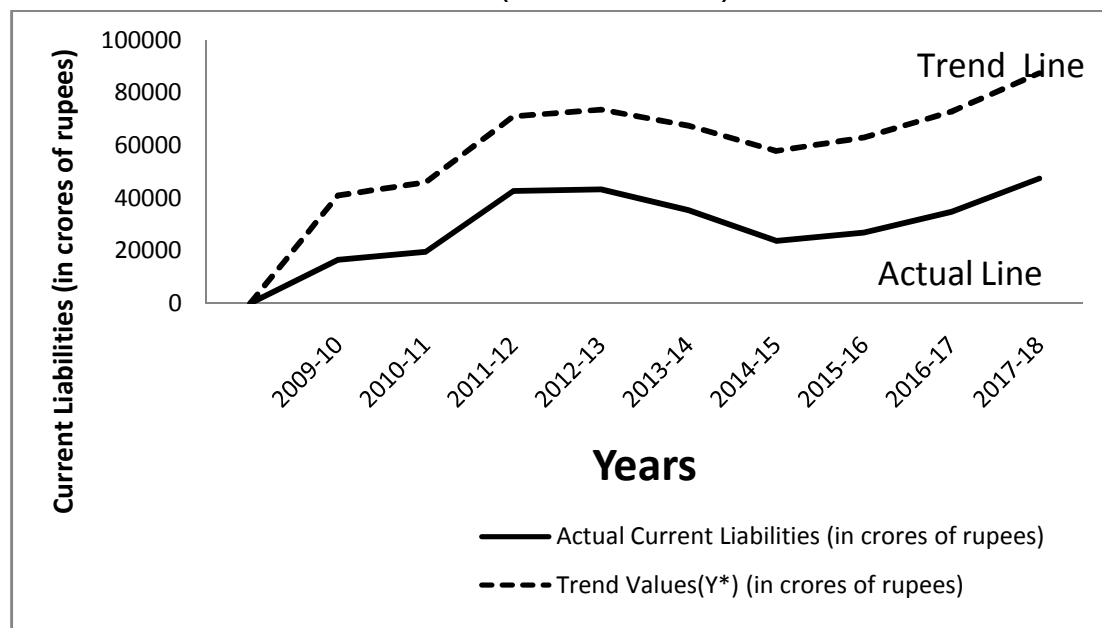
Current Liabilities Trend: HPCL**Table 9: Current Liabilities Trend of HPCL**

Years	Actual Current Liabilities (in crores of rupees)	Indices (2009-10=100)	Trend Values(Y*) (in crores of rupees)
2009-10	16,555.11	100	24,404.64
2010-11	19,606.60	118.43	26,360.40
2011-12	42,700.36	257.93	28,316.16
2012-13	43,262.65	261.33	30,271.92
2013-14	35,307.26	213.27	32,227.69
2014-15	23,695.30	143.13	34,183.45
2015-16	26,789.04	161.82	36,139.21
2016-17	34,755.50	209.92	38,094.97
2017-18	47,377.35	286.18	40,050.73

Result of Chi-square Test (χ^2)

Critical Value of χ^2	Computed Value of χ^2	Result
15.51	24,701.26	H_0 is Rejected

Note: $Y^* = 32,227.69 + 1,955.76 X$ (Origin of $X = 2009-10$, X in units of years and Y in crores of rupees).

Linear Trend of Current Liabilities of HPCL (2009-10 to 2017-18)

Source: Computed from Annual Reports and Accounts of HPCL from 2009-10 to 2017-18.

Table 9 shows the current liabilities of HPCL registered an increasing trend throughout the period under study except in 2013-14 and 2014-15. The indices of current liabilities continuously increased from 2010-11 to 2012-13 and were 118.43, 257.93 and 261.33 respectively as compared to base year. However the indices dropped to 213.27 in 2013-14 and to 143.13 in 2014-15. Thereafter the indices increased to 161.82 in 2015-16, to 209.92 in 2016-17 and to 286.18 in 2017-18. Table 9 shows the linear least square trend values of the current liabilities of HPCL. The yearly increase in current liabilities comes to Rs. 1,955.76 crore. The trend values of current liabilities differ materially and significant. The differences in 2011-12, 2012-13, 2013-14 and 2017-18 were positive and negative in the remaining years.

Chi-square test has been applied to test the significance of the difference between the actual values and trend values of current liabilities of HPCL. It can be seen that the difference between the actual and trend values of current liabilities of HPCL were significant at five-percent level of significance because the calculated value of Chi-square 24,701.26 is more than the Table value of Chi-square 15.51.

Summary

The indices of working capital of BPCL and HPCL marked a fluctuating trend during the period under review. IOCL marked a decreasing trend during the period of the study. There was a significant decrease in the working capital indices in 2017-18. The reason for the decrease in working capital was fall in current assets. The differences between calculated values and actual values of the working capital were significant. In HPCL, the calculated value of Chi-square is less than the critical value; it shows that the differences between the actual values and the trend values of working capital were not significant. Chi-square test has been applied to test the significance of the differences between the actual values and trend values at a five-percent level of significance.

The indices of current assets also moved upwards in all the three companies, but the trend declined in 2014-15 and 2015-16. The deviations between the actual and computed values of current assets were significant in BPCL, IOCL and HPCL. The indices of current liabilities had an increasing trend in both IOCL and HPCL and the index declined in 2014-15. The indices of BPCL had a fluctuating trend throughout the period of the study. The deviations between the actual and trend values of current liabilities were significant at a five-percent level of significance.

References

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