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INTRODUCTION

REVIEW OF LITERATURE

NEED/IMPORTANCE OF THE STUDY

STATEMENT OF THE PROBLEM

OBJECTIVES

HYPOTHESES

RESEARCH METHODOLOGY

RESULTS & DISCUSSION

FINDINGS

RECOMMENDATIONS/SUGGESTIONS

CONCLUSIONS

SCOPE FOR FURTHER RESEARCH

ACKNOWLEDGMENTS

REFERENCES

APPENDIX/ANNEXURE

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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
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FINANCIAL STUCTURE OF MANUFACTURING CORPORATIONS AND THE DEMAND FOR WORKING CAPITAL: SOME EMPIRICAL FINDINGS

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ABSTRACT

The aim of the study is that to determine empirically whether transactions working capital balances including cash and inventories vary proportionately or less than proportionately to changes in the volume of sales. The study also describes the effect of capital costs on working capital holdings of the selected companies of Indian automobile industry. Further, Partial Adjustment Model used in the study explains the speed with which the actual level of working capital is adjusted to the desired level. The results of the study showed that Indian automobile industry and its three sectors desires to hold working capital balances depend not only on sales but on holding costs also. Further, the adjustment speed of actual to desired balances has been observed as highest for cash followed by net working capital, gross working capital, inventory and receivables in the Indian automobile industry.

KEYWORDS

Indian Automobile Industry, Demand for Working Capital, Partial Adjustment Model, Receivables, Inventory and Cash Management.

INTRODUCTION

Fixed capital and working capital are the dominant contributors to the total capital of a developing country. Fixed capital investments generate production capacity whereas working capital makes the utilisation of that capacity possible. Especially in small firms, working capital management may be the factor that decides success or failure; in larger firms, efficient working capital management can significantly affect the firms' risk, return and share price. A firm can exist and survive without fixed capital, but cannot survive without working capital. Management of working capital has acquired a great significance and sound position for the twin objects of profitability and liquidity. In a period of rising capital costs and scarce funds, the working capital is one of the most important areas requiring management review. It consumes a great deal of time to increase profitability as well as to maintain proper liquidity at minimum risk. Viewed in this perspective, the study devoted to working capital management may be very rewarding one.

REVIEW OF LITERATURE

Interest in the study of the demand for working by Indian Automobile Industry has been stimulated by the empirical works on the demand for cash and inventories. A review of the empirical works on the demand for cash showed that the Post – Keynesian revival of interest in the demand function for cash has followed two distinct paths. **Frazer, Nadiri and Coates** observed economics of scale thereby supporting **Baumol and Tobin,** while **Meltzer, Whalen, De Allessi and Vogel and Maddala** observed diseconomies of scale thereby supporting **Friedman** as far as the transactions demand for cash is concerned. Similarly, there are no unanimous findings as regards the effect of capital costs on the demand for cash. Among others, **Selden De Allessi, Nadiri and Coates** showed the statistically significant effect of capital costs on the demand for cash.

Like studies on the demand for cash the earlier studies on the demand for inventories also did not present unanimous findings. **Albert et al, Liu Kuznets, Lieberman**, **Irvine and Akhtar** observed significant effects of capital costs on the demand for inventories, while **Terleckyj, Robinson, McGouldrick, Lovell, Joyee, Burrows and Maccini and Rossana** did not observe the same. Similarly, some reported economies of scale with respect to holding inventories, while others did not report the same. Controversy also exists with respect to coefficients of adjustment. Among others, **Lovell and Grossman** noticed the slow speed of adjustment between actual inventories and target inventories, while **Goodwin, Burrows, and Maccini and Rossana** did not find the same.

STATEMENT OF THE PROBLEM

It has therefore become difficult to support one view or another in the context of Indian Automobile Industry. However, investigation in this study is not limited to the study of the demand for cash and inventories only. It has been extended to test whether models similar to those explaining the demand for cash and inventories also explain the demand for receivables, and gross and net working capital. The purpose of this study is that to determine empirically whether transactions working capital balances including cash and inventories vary proportionately or less than in proportion to changes in the volume of sales. It also describes the effect of capital costs on working capital holdings of the enterprises. Further, the study also takes in to account a Partial Adjustment Model of working capital behavior. The partial adjustment or flexible accelerator models that explain the speed with which the actual level of working capital balance is adjusted to the desired level.

METHODOLOGY

ECONOMETRIC MODEL

In this study, econometric models are used to describe the demand for working capital and its various components by Indian automobile companies. The decisions about the aggregate amount of working capital and its various components to be held may be regard as subject to wealth constraint and opportunity cost of working capital. As a first approximation to the theory, the functions may be written as

$y_1 = f(s, i)$ ---------- (i)
$y_2 = f(s, i)$ ---------- (ii)
$y_3 = f(s, i)$ ---------- (iii)
$y_4 = f(s, i)$ ---------- (iv)
$y_5 = f(s, i)$ ---------- (v)

Where

y_1 = Real Cash
y_2 = Real Inventories
y_3 = Real Receivables
y_4 = Real Gross working capital
y_5 = Real Net working capital
S = Real Sales in terms of $S_t - 1$
C = Opportunity cost of working capital measured by short – term interest rates of Indian commercial banks.
In an empirical investigation, it take the form.

$$Y^* = KS^{b_1} i^{b_{21}} e^u \text{.....(vi)}$$

where u is assumed to be independently and normally distributed. Taking the natural logarithm

$$\text{Ln } Y^* = K + b_1 \text{Ln } S + b_2 \text{Ln } i_2 + u \text{ ....(vii)}$$

Where b_1 and b_2 are elasticity's of y^* with respect to the explanatory variables of the model. The above models assume reasonable a priori hypothesis of

$\partial y / \partial s > 0$ and $> \partial y / \partial i_2 < 0$

PARTIAL – ADJUSTMENT MODEL

In estimating the above equations, the study also takes in to account a partial adjustment or flexible accelerator model of working capital behaviour. This model hypothesizes that each enterprise has a desired target level of working capital and that of each enterprise, finding its actual working capital not equal to its optimum, attempts only a partial adjustment towards the optimum level within any one period. The models indicate the speed with which firms adjust their actual working capital balances to the desired working capital balances.

The simplest assumption to make about the adjustment process on working capital balances is that

$$\frac{\bar{y}_t}{\bar{y}_{t-1}} = \left(\frac{y^*_t}{y_{t-1}} \right)^{\varphi} e^{ut} \text{.....(viii)}$$

Where ϕ - rate of adjustment or adjustment coefficient

$0 < \phi < 1$

Substituting expression (viii) for desired level of working capital balances into equation (vii) gives

$$\frac{\bar{y}_t}{\bar{y}_{t-1}} = \left(\frac{KS_t^{b_1} i_2^{b_2}}{\bar{y}_{t-1}} \right)^{\varphi} e^u \text{.....(ix)}$$

Taking logs of this equation gives

$$\text{Ln} \bar{y}_t - \text{Ln} \bar{y}_{t-1} = \varphi \text{Ln} b_0 + \varphi b_1 \text{Ln } S_t + \varphi b_2 \text{Ln } i_2 - \varphi \text{Ln } y_{t-1} + U_t \text{.....(x)}$$

(or)

$$\text{Ln} \bar{y}_t = C_0 + C_1 \text{Ln } S_t - C_2 \text{Ln } i_2 + (1-\varphi) \text{Ln } \bar{y}_{t-1} + U_t \text{.....(X)}$$

where C_1 and C_2 are the short – term elasticity's of working capital or its components with respect to sales and their opportunity cost, respectively. The long run elasticity's with respect to sales and cost are b_1 and b_2

Since $C_1 = \varphi b_1$ and $C_2 = \varphi b_2$

$b_1 = \frac{C_1}{\varphi}$ and $b_2 = \frac{C_2}{\varphi}$

ϕ - the rate of adjustment coefficient

The long – run elasticity's of cash with respect to sales and the opportunity cost of cash should be approximately equal to 0.5 and – 0.5, respectively if the Baumol model is correct.

SAMPLE DESIGN

Keeping in view the scope of the study, it is decided to include all the companies under automobile industry working before or from the year 1996-97 to 2008-09. There are 26 companies operating in the Indian automobile industry. But, owing to several constraints such as non-availability of financial statements or non-working of a company in a particular year etc., it is compelled to restrict the number of sample companies to 20. The companies under automobile industry are classified into three sectors namely; Commercial vehicles, Passenger Cars and Multiutility vehicles and Two and Three wheelers. For the purpose of the study all the three sectors have been selected. It accounts for 73.23 per cent of the total companies available in the Indian automobile industry. The selected 20 companies include 5 under commercial vehicles, 6 under Passenger cars and Multiutility vehicles and 9 under two and three wheeler sectors. It is inferred that sample company represents 98.74 percentage of market share in commercial vehicles, 89.76 percentage of market share in Passenger Cars and Multiutility vehicles and 99.81 percentage of market share in two and three wheelers. Thus, the findings based on the occurrence of such representative sample may be presumed to be true representative of automobile industry in the country.

DATA

The study is mainly based on secondary data. The major source of data analysed and interpreted in this study related to all those companies selected is collected from "PROWESS" database, which is the most reliable on the empowered corporate database of Centre for Monitoring Indian Economy (CMIE). Besides prowess database, relevant secondary data have also been collected from BSE Stock Exchange Official Directory, CIME Publications, Annual Survey of Industry, Business newspapers, Reports on Currency and Finance, Libraries of various Research Institutions, through Internet etc.

RESULTS AND DISCUSSION

SCALE AND CAPITAL COST EFFECTS ON DEMAND FUNCTIONS OF WORKING CAPITAL

The pooled regression results of the model showing the scale and capital cost effects on demand functions of working capital and its components of Indian Automobile Industry and its three sectors are presented in Table – to Table -. The overall results presented in the table are encouraging. The signs of the entire co-efficient are as expected and the goodness of fit of the model is also satisfactory.

AUTOMOBILE INDUSTRY

It is evident from the Table 1 that the co-efficient of sales are highly significant and indicated that higher sales increases working capital and its components. The sales elasticity varies from 0.34 for cash to 0.91 for gross working capital. Thus, the sales elasticity is smallest for cash, followed by net working capital, receivables, inventory and gross working capital. This elasticity's are consistently less than unity in all cases, suggesting economies of scale. This finding seems to support the theoretical propositions of Baumol, Tobin, Frazer, Nadiri and Coates and contradict the propositions of Friedman, Meltzer, Whalen, De Allessi and Vogel and Maddala, as far as the demand for cash by the Indian Automobile Industry is concerned. Similarly, the results, seem to support the findings of Akhtar and Irvine, among others, and contradict unitary or more than unitary sales elasticity noticed in some of the equations of Liberman showing the demand for inventories is concerned.

Table 1 also showed that fluctuations in cash and inventory levels depend in a statistically significant manner on fluctuations in their financial carrying costs. This finding is consistent with the results of Seldom, De Allessi, Nadiri, and Coates and contradicts Friedman's so far as the effect of capital costs on cash holding is concerned. Similarly, the finding supports the conclusion of Albert et al., Liu, Kuznets, Lieberman, Irvine and Akhtar and contradicts the results of Terlekyj, Robinson, Lovell, Jon Joyce and Maccini and Rossana as far as the effect of interest cost on inventory demand is concerned.

The estimated elasticity's of the target levels of working capital and its components with respect to capital costs measure indicate that the target level of cash is much more sensitive to capital cost fluctuations as compared to the target level of inventory, receivables and gross and net working capital. Among, these, the target level of gross working capital is least sensitive to fluctuations in capital costs. It all be seen from the interest rate elasticity of 0.78 for cash, 0.30 for net working capital, 0.29 for inventory, 0.17 for receivables and 0.04 for gross working capital.

Holding the sales constant, Table 1 indicates that a one percentage point increase interest rate leads on an average to about 0.78 per cent decline in the cash balances. Similarly, this kind of decline is noticed to be about 0.29 per cent for inventory, 0.17 per cent for receivables, 0.04 per cent for gross working capital and 0.30 per cent for net working capital balances when there is a one percentage point increase in interest rate. In the same way, holding the interest rate constant, a one percentage point increase in sales leads on an average to about 0.34 per cent increase in cash balances. This kind of increase is noticed to be about 0.70 per cent for inventory, 0.65 per cent for receivables, 0.91 per cent for gross working capital and 0.64 per cent for net working capital. The increase in target cash, receivables, inventories and gross and net working capital as a whole due to the increase in the capital cost may mean higher production and higher employment.

The estimated regression results of Partial Adjustment Model of Indian Automobile Industry are presented in Table 2. The regression results indicated that co-efficient of y_{t-1} are significant in all the cases. The coefficient of the lagged dependent variable has been observed to be 0.27 for cash, 0.46 for inventory, 0.51 for receivables, 0.34 for gross working capital and 0.28 for net working capital. Since the coefficient of lag $L_n y_t$ is equal to 1 minus the adjustment coefficients $(1-\phi)$, the adjustment coefficient is equal to 0.73 for cash, 0.54 for inventory, 0.49 for receivables, 0.66 for gross working capital and 0.72 for net working capital. It seems that 73 per cent of the adjustment of actual to desired real cash balances is completed within one year. Similarly, the adjustment speed of actual to desired balances is 54 per cent for inventory, 49 per cent for receivables, 66 per cent for gross working capital and 72 per cent for net working capital. The speed of adjustment is however highest for cash followed by net working capital, gross working capital, Inventory and receivables.

In the partial adjustment models, the estimated coefficients of the independent variables are equal to the elasticity's of these variables times the adjustment coefficient. These long-run elasticizes are 0.49 for sales and 0.81 for short-term interest rates with respect to cash; 0.63 and 0.80 with respect to inventory; 1.24 and 0.22 with respect to receivables; 0.88 and 0.13 with respect to gross working capital; and 0.32 and 0.51 with respect to net working capital.

COMMERCIAL VEHICLES SECTOR

The estimated demand function of commercial vehicles sector of Indian Automobile Industry are presented in Table 3. The table indicates that higher the sales increases working capital and its components. The sales elasticity's are consistently less than unity in all cases, suggesting economies of scale. This finding seems to support the theoretical propositions of Baumol, Tobin, Frazer, Nadiri and Coates and contradict the propositions of Friedman, Meltzer, Whalen, De Allessi and Vogel and Maddala, as far as the demand for cash by the commercial vehicles sector of Indian Automobile Industry is concerned. The results also support the findings of Akhtar and Irvine and contradict unitary or more than unitary sales elasticity noticed in the some of the equations of Liberman showing the demand for inventories is concerned.

The table also revealed that fluctuations in cash and inventory levels depend in a statistically significant manner on fluctuations in their financial carrying cost supporting the findings of Selden, De Allessi, Nadiri and Coates and contradicts Friedman's result. Similarly, the finding supports the conclusion of Albert et al., Liu, Kuznets, Liberman, Irvine and Akhtar as far as the effect of interest cost on inventory demand is concerned. The estimated elasticity's of the target levels of working capital and its components with respect to capital costs measure indicated that the target level of cash (0.98) is much more sensitive to capital cost fluctuations, followed by Receivables (0.88), Net working capital (0.86), Gross working capital (0.48) and Inventory (0.30). The increase in target cash, inventories, receivables, gross working capital and net working capital as a whole due to the increase in the capital cost may mean higher production and higher employment.

The pooled estimates of the partial adjustment models of commercial vehicles sector of Indian Automobile Industry are presented in Table 4. The regression results indicated that coefficients of $S_{t-1}, i \; and \; y_{t-1}$ are significant in all cases. It is evident from the table that the adjustment coefficient is equal to 0.76 for cash, 0.85 for inventories, 0.60 for receivables, 0.71 for gross working capital and 0.79 for net working capital. In other words, the speed of adjustment implied by these values is much higher. It seems that 76 per cent of the adjustment of actual to desired real cash balances is completed within one year. Similarly, the adjustment speed of actual to desired balance is 85 per cent for inventories, 60 per cent for receivables, 71 per cent for gross working capital and 79 per cent for net working capital. These results supports the high speed of adjustment observed by Coates and Nadiri in the case of cash and by Goodwin, Burrows, Maccini and Rossana and Irvine in the case of inventories.

In the partial adjustment models, the estimated coefficients of the independent variables are equal to the elasticity's of these variables times the adjustment co-efficient. The long-run elasticity's are 0.20 for sales and 1.07 for short-run interest rates with respect to cash; 0.93 for sales and 0.32 for short-term interest rates with respect to inventories; 0.43 for sales and 1.10 for short-term interest rates with respect to receivables; 0.82 for sales and 0.46 for short-term interest rates with respect to gross working capital; and 0.90 for sales and 1.22 for short-term interest rates with respect to net working capital.

PASSENGER CARS AND MULTIUTILITY VEHICLES SECTOR

It is evident from the Table 5 that the coefficients of sales are highly significant in the case of passenger cars and multiutility vehicles sector of Indian Automobile Industry and indicate that higher sales increase working capital and its component. The sales elasticity is smallest for networking capital (0.43) followed by inventory and receivables (0.53), gross working capital (0.94) and net working capital (0.97). These elasticity's are consistently less than unity in all cases supports the theoretical propositions of Baumol, Tobin, Frazer, Nadiri and Coates and contradict the propositions of Friedman, Meltzer, Whalen, De Allessi and Vogel and Maddala, as far as the demand for cash is concerned. Similarly, the results support the findings of Akhtar and Irvine and contradict unitary or more than unitary sales elasticity noticed in some of the equations of Lieberman as far as the demand for inventories is concerned.

The results also show that fluctuations in cash and inventory levels depend in a statistically significant manner on fluctuations in their financial carrying costs. This finding is consistent with the results of Selden, De Allessi, Nadiri and Coates and contradicts Friedman's so far as the effect of capital costs on cash holding is concerned. The findings supports the conclusion of Albert et al., Liu, Kuznets, Lieberman, Irvine and Akhtar and contradicts the results of Robinson, Lovell, and Maccini and Rossana as far as the effect of interest cost on inventory demand is concerned. The effect of capital costs can be observed for investment in receivables, gross working capital and net working capital. The sign of interest rate co-efficient is not only negative but also statistically significant in all these cases except net working capital.

The regression results of Partial Adjustment Model are presented in Table 6 . It is from the table that the coefficient of the lagged dependent variable has been observed to be 0.25 for cash, 0.65 for inventories, 0.37 for receivables, 0.64 for gross working capital and 0.42 for net working capital. The adjustment co-efficient $(1-\phi)$ is equal to 0.75 for cash, 0.35 for inventory, 0.63 for receivables, 0.36 for gross working capital and 0.58 for net working capital. The speed of adjustment is however highest for cash followed by receivables, net working capital, gross working capital and inventory. These results support the high speed of adjustment observed by Coates and Nadiri in case of cash and contradict by Goodwin, Maccini and Rossana and Irvine in the case of inventories. The long-run elasticity's are 1.32 for sales and 0.53 for short-term interest rates with respect to cash; 2.06 and 1.37 with respects to inventories; 0.62 and 0.51 with respect to receivables; 2.56 and 0.50 with respect to gross working capital; and 0.69 and 0.26 with respect to net working capital.

TWO AND THREE WHEELER SECTOR

Table 7 showed the results of estimated demand functions of two and three wheeler sector of Indian Automobile Industry. It is evident from the table that higher the sales increases working capital and its component and sales elasticity's are consistently less than unity in all cases, suggesting economies of scale. This

result supports the findings of Baumol, Tobin, Frazer, Nadiri and Coates and contradict the propositions of Friedman, Meltzer, Whalen, De Allessi and Vogel and Maddala, as far as the demand for cash is concerned. The results also showed that short-term interest rate elasticity's are less than unity in all cases, supporting the findings of Akhtar and Irvine and contradict the findings of Lieberman showing the demand for inventory is concerned.

Further, the estimated elasticity's of the target levels of working capital and its components with respects to capital costs measures indicated that target level of cash (0.67) is more sensitive to capital cost fluctuations, followed by net working capital (0.56), gross working capital (0.36), inventory (0.13) and receivables (0.03). The pooled estimates of the partial adjustment models of two and three wheeler sector of Indian automobile industry presented in Table 8. It is evident from the table that the speed of adjustment of actual to desired real cash balances is 79 per cent completed within one year. Similarly, the adjustment speed of actual to desired balance is 88 per cent for inventories, 86 per cent for receivables, 82 per cent for gross working capital and 74 per cent for net working capital. These results supports the high speed of adjustment observed by Coates and Nadiri in the case of cash and by Goodwin, Burrows, Maccini and Rossana and Irvine in the case of inventories. The long-run elasticity's are given by $b_1 = c_1/\phi$ and $b_2 = c_2/\phi$. These elasticity's are 1.25 for sales and 0.67 for short-term interest rates with respect to cash; 0.49 and 0.09 for inventories; 0.67 and 0.06 for receivables; 0.77 and 0.38 for gross working capital; and 1.34 and 1.09 for net working capital.

CONCLUSION

The pooled regression results of this analysis contradict unitary or more than unitary sales elasticity hypothesis of Friedman, Meltzer, Whalen, De Allessi and Vogel and Maddala with respect to demand for cash by all the three sectors and the whole Indian automobile industry. The presence of economies of scale in cash holdings is consistent with the conclusion of Baumol, Tobin, Frazer, Nadiri and Coates. The demand for inventory equations showed economies of scale in inventory thereby supporting the findings of Akhtar and Irvine and contradicts the findings of Lieberman. The presence of economies of scale has also been observed for receivables, gross working capital and net working capital. The regression results also show that the levels of working capital and its components of Indian automobile industry and its three sector desires to hold depend not only on sales but on holding costs also. The capital cost coefficients are all statistically significant with the theoretically correct signs. This finding is consistent with the findings of Selden, De Allessi, Nadiri, and Coates and contradicts Friedman's so far the effect of capital costs on cash holdings is concerned. Further, the results supports the conclusion of Albert et al., Liu, Kuznets, Lieberman, Irvine and Akhtar and contradicts the results of Robinson, Lovell and Maccini and Rossana as far as the effect of capital cost on inventory demand is concerned. Besides, the effect of capital costs has also been observed in the case of receivables, and gross and net working capital. The adjustment speed of actual to desired balances has been observed as highest for cash followed by networking capital, gross working capital, inventory and receivables in the Indian Automobile Industry during the study period.

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TABLES

TABLE 1: ESTIMATING DEMAND FOR WORKING CAPITAL – INDIAN AUTOMOBILE INDUSTRY

($LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n i$)

Dependent Variables	Regression Co-efficient		R^2	Adj R^2	F Value	DW
	S_{t-1}	i				
Cash	0.34 (6.75) *	-0.78 (2.03)***	0.92	0.90	54.17	1.94
Inventory	0.70 (5.85) *	-0.29 (4.25)*	0.81	0.78	21.71	1.52
Receivables	0.65 (8.86) *	-0.17 (5.23)*	0.92	0.90	54.05	1.48
Gross Working Capital	0.91 (7.42)*	-0.04 (3.17)*	0.90	0.88	43.44	1.86
Net Working Capital	0.64 (2.85)**	-0.30 (4.45)*	0.82	0.79	20.16	1.63

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.

Source: Computed

TABLE 2: PARTIAL ADJUSTMENT MODEL – INDIAN AUTOMOBILE INDUSTRY

($LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n i + (1 - \phi) L_n Y_{t-1} + u$)

Dependent Variables	Regression Co-efficient			R^2	Adj R^2	F Value	DW
	S_{t-1}	i	Y_{t-1}				
Cash	0.36 (4.77)*	-0.59 (3.16)*	0.27 (6.81)*	0.94	0.92	44.89	1.52
Inventory	0.34 (2.89)**	-0.43 (3.61)*	0.46 (4.86)*	0.82	0.76	13.60	1.96
Receivables	0.61 (4.46)*	-0.11 (2.80)**	0.51 (6.04)*	0.91	0.88	30.82	1.64
Gross Working Capital	0.58 (3.82)*	-0.09 (4.16)*	0.34 (3.86)*	0.90	0.87	27.50	1.89
Net Working Capital	0.23 (2.84)*	-0.37 (4.07)*	0.28 (4.26)*	0.81	0.79	12.96	1.19

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.

Source: Computed

TABLE 3: ESTIMATING DEMAND FOR WORKING CAPITAL – COMMERCIAL VEHICLES SECTOR

($LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n i$)

Dependent Variables	Regression Co-efficient		R^2	Adj R^2	F Value	DW
	S_{t-1}	i				
Cash	0.18 (4.87) *	-0.98 (2.80)**	0.86	0.84	31.78	1.40
Inventory	0.76 (16.96) *	-0.30 (3.20)*	0.97	0.96	166.61	1.28
Receivables	0.44 (4.93) *	-0.88 (4.70)*	0.75	0.70	15.19	1.37
Gross Working Capital	0.71 (10.66)*	-0.48 (3.42)*	0.92	0.91	60.12	1.31
Net Working Capital	0.65 (5.74)*	-0.86 (6.23)*	0.94	0.93	75.67	1.58

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.

Source: Computed

TABLE 4: PARTIAL ADJUSTMENT MODEL – COMMERCIAL VEHICLES SECTOR

($LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n i + (1 - \phi) L_n Y_{t-1} + u$)

Dependent Variables	Regression Co-efficient			R^2	Adj R^2	F Value	DW
	S_{t-1}	i	Y_{t-1}				
Cash	0.15 (3.87)*	-0.81 (4.71)*	0.24 (3.19)*	0.87	0.84	26.92	1.48
Inventory	0.79 (4.90)*	-0.27 (3.39)*	0.15 (4.59)*	0.97	0.96	90.80	1.31
Receivables	0.26 (3.90)*	-0.66 (2.84)**	0.40 (3.12)*	0.77	0.73	17.66	1.71
Gross Working Capital	0.58 (3.75)*	-0.33 (3.12)*	0.29 (4.30)*	0.92	0.89	33.22	1.42
Net Working Capital	0.71 (3.64)*	-0.96 (4.15)*	0.21 (2.86)**	0.96	0.95	70.98	1.33

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.

Source: Computed

TABLE 5: ESTIMATING DEMAND FOR WORKING CAPITAL – PASSENGER CARS AND MULTIUTILITY VEHICLES SECTOR

$(LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n\, i)$

Dependent Variables	Regression Co-efficient		R^2	Adj R^2	F Value	DW
	S_{t-1}	*i*				
Cash	0.97 (2.84)**	-0.42 (3.67)*	0.84	0.77	19.06	1.98
Inventory	0.53 (4.03)*	-0.23 (2.95)**	0.87	0.83	10.22	1.74
Receivables	0.53 (5.39)*	-0.09 (2.47)***	0.81	0.77	21.60	1.19
Gross Working Capital	0.94 (11.45)*	-0.27 (3.73)*	0.95	0.94	90.39	2.01
Net Working Capital	0.43 (3.14)*	-0.23 (1.32)	0.75	0.69	9.12	1.83

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.

Source: Computed

TABLE 6: PARTIAL ADJUSTMENT MODEL – PASSENGER CARS AND MULTIUTILITY VEHICLES SECTOR

$(LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n\, i + (1 - \phi) L_n\, Y_{t-1} + u)$

Dependent Variables	Regression Co-efficient			R^2	Adj R^2	F Value	DW
	S_{t-1}	*i*	Y_{t-1}				
Cash	0.99 (3.29)*	-0.40 (4.28)*	0.25 (3.14)*	0.78	0.74	15.62	2.05
Inventory	0.72 (3.72)*	-0.48 (4.71)*	0.65 (3.61)*	0.86	0.81	18.29	1.85
Receivables	0.39 (4.06)*	-0.32 (2.90)**	0.37 (2.80)**	0.86	0.81	18.37	1.79
Gross Working Capital	0.92 (3.14)*	-0.18 (4.30)*	0.64 (2.86)**	0.94	0.92	49.88	1.98
Net Working Capital	0.40 (3.10)*	-0.15 (4.26)*	0.42 (2.87)**	0.72	0.71	9.32	1.86

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.
Source: Computed

TABLE 7: ESTIMATING DEMAND FOR WORKING CAPITAL – TWO AND THREE WHEELERS SECTOR

$(LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n\, i)$

Dependent Variables	Regression Co-efficient		R^2	Adj R^2	F Value	DW
	S_{t-1}	*i*				
Cash	0.92 (7.87)*	-0.61 (2.11)***	0.90	0.88	46.44	1.45
Inventory	0.47 (5.74)*	-0.13 (3.65)*	0.90	0.88	43.50	1.97
Receivables	0.47 (7.28)*	-0.03 (2.18)***	0.93	0.91	61.60	1.62
Gross Working Capital	0.72 (8.82)*	-0.36 (1.79)***	0.93	0.91	64.31	1.43
Net Working Capital	0.98 (2.33)**	-0.56 (3.34)*	0.96	0.93	68.50	1.69

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.

Source: Computed

TABLE 8: PARTIAL ADJUSTMENT MODEL – TWO AND THREE WHEELERS SECTOR

$(LnY^* = \beta_0 + \beta_1 L_n S_{t-1} + \beta_2 L_n\, i + (1 - \phi) L_n\, Y_{t-1} + u)$

Dependent Variables	Regression Co-efficient			R^2	Adj R^2	F Value	DW
	S_{t-1}	*i*	Y_{t-1}				
Cash	0.99 (5.07)*	-0.53 (2.78)***	0.21 (2.93)**	0.93	0.90	37.29	1.86
Inventory	0.43 (4.78)*	-0.08 (3.42)*	0.12 (2.14)***	0.90	0.86	25.54	1.93
Receivables	0.58 (4.45)*	-0.05 (2.46)**	0.14 (3.77)*	0.93	0.91	40.32	1.89
Gross Working Capital	0.63 (3.31)*	-0.31 (4.22)*	0.18 (2.88)**	0.95	0.93	51.61	1.63
Net Working Capital	0.99 (3.68)*	-0.81 (2.59)**	0.26 (3.77)*	0.98	0.95	55.16	2.02

*- Significant at 0.01 level; ** - Significant at 0.05 level
*** - Significant at 0.10 level; DW - Durban-Watson Statistics;
Figures in Parenthesis denotes 't' value.

Source: Computed

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