Working Capital Approaches and Firm's Returns in Pakistan

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Abstract

This study investigates the relationship between the aggressive/conservative working capital policies for seventeen industrial groups of public limited companies listed at Karachi Stock Exchange for a period of 1998-2003. The ordinary least square regression model has been used to investigate into the relationship of working capital approaches and the returns of firms. The study found significant differences among their working capital investment and financing policies across different industries. Moreover, these significant differences are remarkably stable over the period of six years. The aggressive investment working capital policies are accompanied by aggressive working capital financing policies. Finally, we found a negative relationship between the profitability measures of firms and degree of aggressiveness of working capital investment and financing policies. The study would contribute a better understanding of working capital management policies in an emerging market like Pakistan.

 Key words: Working capital, Aggressive working capital policy, Aggressive financing policy.

1. Introduction

The corporate finance literature has traditionally focused on the study of long-term financial decisions. Researchers have particularly examined investments, capital structure, dividends or company valuation decisions, among other topics. However, short-term assets and liabilities are important components of total assets and needs to be carefully analyzed. Management of these short-term assets and liabilities warrants a careful investigation since the working capital management plays an important role for the firm's profitability and risk as well as its value (Smith, 1980). Firms try to keep an optimal level of working capital that maximizes their value (Howorth and Westhead 2003, Deloof 2003).

A firm may adopt an aggressive working capital management policy with a low level of current assets as percentage of total assets. Moreover, an aggressive working capital management policy may be used for the financing decisions of the firm with high level of current liabilities as percentage of total liabilities. Excessive levels of current assets may have a negative effect on the firm's profitability whereas a low level of current assets may lead to lower level of liquidity and stockouts resulting in difficulties in maintaining smooth operations (Van Horne and Wachowicz 2004).

Working capital management is very important for the success of a business. The optimal level of working capital is determined to a large extent by the methods adopted for the management of current assets and liabilities. It requires continuous management to maintain proper level in various components of working capital i.e. cash receivables, inventory and payables etc. In general, current assets represent important component of total assets of a firm. A firm may be able to reduce the investment in fixed assets by renting or leasing plant and machinery, whereas, the same policy cannot be followed for the components of working capital. The high level of current assets may reduce the risk of liquidity associated with the opportunity cost of funds that may have been invested in long-term assets. The above discussion highlights the significance of working capital management in a business. The impact of working capital policies is highly important, however, no empirical research has been carried out to examine the impact of working capital policies on profitability and risk of firm in Pakistan. This study will contribute to better understand these policies and their impact especially in the emerging markets like Pakistan. The present study investigates the relationship of the aggressive and conservative working capital investment and financing polices. Following are the main objectives of the present study:

- To investigate whether there is a significant difference among the working capital practices of the firms across different industries.

- To analyze whether these aggressive or conservative working capital policies relatively stable over the longer period of time.

- To validate the relationship of aggressive and conservative working capital policies among firms and see whether an aggressive policy accompanied by aggressive financing policy.

- To examine the impact of aggressive and conservative working capital policies on the profitability of the company.

2. Literature Review & Hypothesis Development

Many researchers have studied financial ratios as a part of working capital management; however, very few of them have discussed the working capital policies in specific. Some earlier work by Gupta (1969) and Gupta and Huefner (1972) examined the differences in financial ratio averages between industries. The conclusion of both studies was that differences do exist in mean profitability, activity, leverage and liquidity ratios amongst industry groups. Johnson (1970) extended this work by finding cross-sectional stability of ratio groupings for both retailers and primary manufacturers. Pinches et al. (1973) used factor analysis to develop seven classifications of ratios, and found that the classifications were stable over the 1951-1969 time periods.

Chu et al. (1991) analyzed the hospital sectors to observe the differences of financial ratios groups between hospital sectors and industrial firms sectors. Their study concluded that financial ratios groups were significantly different from those of industrial firms' ratios as well these ratios were relatively stable over the five years period of time. Sathyamoorthi (2002) focused on good corporate governance and in turn effective management of business assets. He observed that more emphasizes is given to investment in fixed assets both in management area and research. However, effective management working capital has been receiving little attention and yielding more significant results. He analyzed selected Co-operatives in Botswana for a period of 1993-1997 and concluded that an aggressive approach has been followed by these firms during all the four years of study.

Filbeck and Krueger (2005) highlighted the importance of efficient working capital management by analyzing the working capital management policies of 32 non-financial industries in USA. According to their findings significant differences exist between industries in working capital practices across time. Moreover, these working capital practices, themselves, change significantly within industries across time. Similar studies are conducted by Gombola and Ketz (1983), Soenen (1993), Maxwell et al. (1998), Long et al (2001).

In a regional study, Pandey and Parera (1997), provided an empirical evidence of working capital management policies and practices of the private sector manufacturing companies in Sri Lanka. The information and data for the study were gathered through questionnaires and interviews with chief financial officers of a sample of manufacturing companies listed on the Colombo Stock Exchange. They found that most companies in Sri Lanka have informal working capital policy and company size has an influence on the overall working capital policy (formal or informal) and approach (conservative, moderate or aggressive). Moreover, company profitability has an influence on the methods of working capital planning and control.

However, Weinraub and Visscher (1998) have discussed the issue of aggressive and conservative working capital management policies by using quarterly data for a period of 1984 to 1993. Their study looked at ten diverse industry groups to examine the relative relationship between their aggressive/conservative working capital policies. The authors have concluded that the industries had distinctive and significantly different working capital management policies. Moreover, the relative nature of the working capital management policies exhibited remarkable stability over the ten-year study period. The study also showed a high and significant negative correlation between industry asset and liability policies and found that when relatively aggressive working capital asset policies are followed they are balanced by relatively conservative working capital financial policies.

In literature, there is a long debate on the risk/return tradeoff between the different working capital policies (Pinches 1991, Brigham and Gapenski 2004, Moyer et. al. 2005, Gitman 2005). More aggressive working capital policies are associated with higher return and higher risk while conservative working capital policies are concerned with the lower risk and return (Carpenter and Johnson 1983, Gardner et al. 1986, Weinraub and Visscher 1998). Working capital management is important because of its effects on the firm's profitability and risk, and consequently its value

(Smith, 1980). Greater the investment in current assets, the lower the risk, but also the lower the profitability obtained. Shin and Soenen (1998) analyze the relation between the working capital and profitability for a sample of firms listed on the US stock exchange during the period 1974-1994. Their results show that reducing the level of current assets to a reasonable extent increases firms' profitability.

More recently, Deloof (2003) analyzes a sample of large Belgian firms during the period 1992-1996. His results confirmed that Belgian firms can improve their profitability by reducing the number of days accounts receivable are outstanding and reducing inventories. Teruel and Solano (2005) suggested that managers can create value by reducing their firm's number of days accounts receivable and inventories. Similarly, shortening the cash conversion cycle also improves the firm's profitability.

Rehman (2006) investigated the impact of working capital management on the profitability of 94 Pakistani firms listed at Islamabad Stock Exchange (ISE) for a period of 1999-2004. He studied the impact of the different variables of working capital management including Average Collection Period, Inventory Turnover in Days, Average Payment Period and Cash Conversion Cycle on the Net Operating Profitability of firms. He concluded that there is a strong negative relationship between above working capital ratios and profitability of firms. Furthermore, managers can create a positive value for the shareholders by reducing the cash conversion cycle up to an optimal level. Similar studies on working capital and profitability includes Soenen (1993), Smith and Begemann (1997), and Ghosh & Maji (2003). In the light of the above discussion, the present study expects a positive relationship between the degree of aggressiveness and the profitability of the firms. The main hypothesis to be tested in this study are as follows:

> H_1 = *There are differences among the working capital investment policies of firms across different industries*
>
> H_2 = *The working capital policies are relatively stable over the period of time*
>
> H_3 = *An aggressive investment working capital policy is accompanied by a aggressive financing policy*
>
> H_4 = *An aggressive working capital policy is directly related to firms' profitability*

3. Variables and Methodology

Aggressive Investment Policy (AIP) results in minimal level of investment in current assets versus fixed assets. In contrast, a conservative investment policy places a greater proportion of capital in liquid assets with the opportunity cost of lesser profitability. In order to measure the degree of aggressiveness, following ratio will be used:

$$AIP = \frac{\text{Total Current Assets (TCA)}}{\text{Total Assets (TA)}}$$

Where a lower ratio means a relatively aggressive policy.

aggressive Financing Policy (AFP) utilizes higher levels of current liabilities and less long-term debt. In contrast, a conservative financing policy uses more long-term debt and capital. The degree of aggressiveness of a financing policy adopted by a firm will be measured by:

$$AFP = \frac{\text{Total Current Liabilities (TCL)}}{\text{Total Assets (TA)}}$$

Where higher ratio means relatively aggressive policy.

The impact of working capital policies on the profitability has been analyzed through frequently used profitability measures i.e. Return on Assets (ROA) and Return on Equity (ROE) by running cross-sectional regressions. The performance variables ROA and ROE as well as the TCA/TA and TCL/TA have been averaged for the period of six years i.e. 1998-2003. The regression models to be estimated are:

$$ROA_i = \alpha + \beta_1 (TCA/TA_i) + \beta_2 (TCL/TA_i) + \varepsilon \ \ldots\ldots\ldots\ (i)$$

$$ROE_i = \alpha + \beta_1 (TCA/TA_i) + \beta_2 (TCL/TA_i) + \varepsilon \ \ldots\ldots\ldots\ (ii)$$

Where:

ROA $_i$	=	*Average Return on Assets of Firm i for the period of 1998-2003*
ROE $_i$	=	*Average Return on Equity of Firm i for the period of 1998-2003*
TCA/TA $_i$	=	*Average Total Current Assets to Total Assets Ratio of Firm <u>i</u> for the period of 1998-2003*
TCL/TA $_i$	=	*Average Total Current Liabilities to Total Assets Ratio of Firm <u>i</u> for the period of 1998-2003*
α	=	*intercept*
$\sum$	=	*error term of the model*

4. Sample & Data

The study analyzed the working capital management practices and impact on profitability of Pakistani Firms for a period of 1998 to 2003. The total population of the study is the all non-financial firms listed in Karachi Stock Exchange. At the first stage, 438 non-financial firms were selected whose financial data was available for the study period i.e. 1998-2003. Furthermore, firms with negative equity and negative profitability for study period were removed from the sample. This left with the final population of 263 non-financial firms from 17 various industrial sectors. This whole population has been taken to census for analysis. The annual data for the financial statements of firms obtained from the companies' annual reports and publications of State Bank of Pakistan.

5. Statistical Analysis

Table 1 presents the descriptive analysis of 263 public limited firms of KSE from 1998 to 2003. The TCA/TA ratio and TCL/TA ratios are averaged for each firm for all six years and then industry mean has been calculated out of these firm means. The standard deviation is the variation of these ratios for each year and an average value has been calculated for each industry by the same method.

The number of companies varies from 4 to 47 firms in each industry. The mean values of TCA/TA ranges from 0.443 to 0.661 except cement and Leather & Tanneries sector on extreme values of 0.316 and 0.85 respectively. The variation in the TCA/TA is less than 0.1 for all the industrial sectors with the exception of 0.132 of Transportation and Communication Sector. The TCL/CA, on average, is near about 0.50 except the Cables & Electrical Sector and Leather & Tanneries. However, the variation in financing policies is relatively higher as compared to investment policies with almost half of the industries having standard deviation near 0.1.

TABLE 1: Industry Means and Standard Deviations for Current Assets / Total Assets and Current Liabilities / Total Assets

Industry	No. of Companies	TCA / TA		TCL / TA	
		Mean	SD	Mean	SD
Auto & Allied	18	0.661	0.061	0.498	0.073
Cables and Electrical	5	0.778	0.048	0.590	0.067
Cement	14	0.316	0.058	0.347	0.100
Chemical & Pharma.	23	0.668	0.051	0.412	0.060
Engineering	9	0.562	0.055	0.454	0.088
Food & Allied Industries	16	0.637	0.050	0.491	0.079
Fuel & Energy	20	0.533	0.059	0.412	0.065
Glass and Ceramics	6	0.443	0.056	0.366	0.064
Jute	4	0.563	0.047	0.436	0.090
Leather & Tanneries	4	0.850	0.027	0.662	0.068
Paper & Boards	11	0.556	0.071	0.407	0.073
Sugar & Allied Industries	23	0.461	0.083	0.434	0.100
Synthetic & Rayon	19	0.517	0.058	0.375	0.102
Textile Composite	29	0.517	0.058	0.375	0.102
Textile Spinning	47	0.521	0.074	0.489	0.086
Textile Weaving	9	0.489	0.074	0.503	0.056
Transportation & Comm.	6	0.490	0.132	0.444	0.115

Difference in the relative degree of aggressive/conservative investment policies across industries has been testes through one-way ANOVA and results are presented in Table 2. The resulting value of F-test is 5.11 which is

significant at 1% level indicate that there is significant difference exists between the industry practices relating to aggressive/conservative investment policies. To further examine the strength of results of ANOVA, a post hoc Least Significant Difference (LSD) test has also been applied to compare the industry mean values of TCA/TA on a paired sample basis. Among 136 pairs, 65 are statistically significant at different levels of significance [Table 2]. It is apparent from both ANOVA and LSD test that significant differences exist among various industrial groups regarding investment working capital management policies.

ANOVA and Test of Least Significant Difference (LSD) have also been applied to TCL/TA ratio to examine the differences in financing policies among industries over the study period. The results are presented in Table 3. The F-statistics is 2.151 significant at 1% level, which clearly indicates the existence of statistically significant differences among industries regarding working capital financing policies. Table 3 also shows 41 pairs of industries that are significant at different level of significant. It is clear now that significant industry differences do exist in the relative degree of both aggressive/conservative working capital investment and financing policies. However, both the ANOVA and Test of Least Significance Difference (LSD) show these differences are generally broader and more significant when examining working capital investment policies. In the light of results presented in Table 2 and 3, we can accept our first two hypotheses (H_{11} and H_{12}) which state the significant differences among the working capital management practices across different industries.

Once the significance differences for working capital investment and financing policies are explored across industries, next to examine was the relative stability of these differences over the study period. For this purpose, a mean industry value for TCA/TA has been calculated for each industry for each year and ranked from the highest to lowest ratio. Then the base year (1998) rankings were sequentially compared to the TCA/TA rankings of each succeeding year. The industries were also ranked for each year on the basis Total Current Liabilities / Total Assets and their rankings were also compared with the base year of 1998. The rank order correlation coefficients and their respective Z-values are presented in Table 4. It is evident from the results that each industry maintained its relative degree of aggressiveness for both working capital investment (TCA/TA) and financing (TCL/TA) policies over time. There is strong correlation between the base year rankings and succeeding year rankings for both the policies. Furthermore, these correlation values are statistically significant at 1% level. It means that working capital investment and financing policies sustained over the period of study. So we can accept our third hypotheses H_{13} that working capital policies are relatively stable over time.

Moreover, the relationship between the working capital investment and financing policies is also examined in this study. The objective was to determine how an aggressive investment policy corresponds to aggressive financing policy. To validate this relationship, a year-by-year analysis has been conducted. Industries were ranked from low to high TCA/TA ratios for the first year, an ascending order of degree of aggressiveness for working capital investment policy and from high to low TCL/TA ratios corresponding to an ascending order of aggressiveness of working capital financing polices. Rank order correlation has performed on these policies for first year and all succeeding years subsequently. The results are presented in Table 5.

TABLE 2

Results of ANOVA (F-test) and Test of Least Significance Differences (LSD) for Total Current Assets / Total Assets (TCA / TA)

F Statistics   = 5.11***

Industries	Auto	Cabl. & Elec.	Cement	Chem & Pharma.	Engin.	Food	Fuel & Energy	Glass & Cer.	Jute	Leather	Pap. & Brd.	Sugar	Syn. & Rayon	Tex. Comp.	Tex. Spinning	Tex. Weaving
Cabl. & Elec.	-0.117	--														
Cement	0.345***	0.463***	--													
Chem &	-0.007	0.110	-0.35***	--												
Engin.	0.099	0.216**	-0.25***	0.106	--											
Food	0.024	0.141	-0.32***	0.031	-0.075	--										
Fuel & Energy	0.128**	0.245***	-0.22***	0.135**	0.029	0.104*	--									
Glass & Cer.	0.218***	0.336***	-0.127	0.225***	0.119	0.195**	0.090	--								
Jute	0.097	0.215*	-0.248**	0.104	-0.001	0.074	-0.030	-0.121	--							
Leather	-0.189**	-0.072	-0.53***	-0.182*	-	-0.213**	-	-	-	--						
Pap. & Brd.	0.105	0.222**	-0.24***	0.111*	0.006	0.081	-0.023	-0.114	0.007	0.294***	--					
Sugar	0.199***	0.317***	-0.146**	0.206***	0.101	0.176***	0.072	-0.019	0.102	0.389***	0.095	--				
Syn. & Rayon	0.144**	0.262***	-0.20***	0.1507***	0.045	0.120**	0.016	-0.074	0.046	0.333***	0.039	-0.056	--			
Tex. Composite	0.132**	0.249***	-0.21***	0.139***	0.033	0.108**	0.004	-0.086	0.035	0.321***	0.028	-0.067	-0.012	--		
Tex. Spinning	0.141***	0.257***	-0.21***	0.147***	0.041	0.116**	0.012	-0.078	0.043	0.329***	0.035	-0.060	-0.004	0.008	--	
Tex. Weaving	0.172**	0.290***	-0.173**	0.179***	0.074	0.149**	0.045	-0.046	0.075	0.361***	0.068	-0.027	0.028	0.040	0.032	--
Trans.&Comm.	0.171**	0.288***	-0.175**	0.177**	0.072	0.147*	0.043	-0.048	0.073	0.359***	0.066	-0.029	0.027	0.038	0.030	-0.002

*** *Significant at 1 % level*

** *Significant at 5 % level*

Significant at 10 % level

TABLE 3

Results of ANOVA (F-test) and Test of Least Significance Differences (LSD) for Total Current Liabilities / Total Assets (TCL / TA)

F Statistics = 2.151***

Industries	Auto	Cabl. & Elec.	Cement	Chem & Pharma.	Engin.	Food	Fuel & Energy	Glass & Cer.	Jute	Leather	Pap. & Brd.	Sugar	Syn. & Rayon	Tex. Comp	Tex Spinning	Tex. Weaving
Cabl. & Elec.	-0.092	--														
Cement	0.151***	0.243***	--													
Chem & Pharma.	0.087*	0.179**	-0.064	--												
Engin.	0.044	0.136	-0.107	-0.043	--											
Food	0.007	0.099	-0.14***	-0.079	-0.037	--										
Fuel & Energy	0.086*	0.178**	-0.07***	-0.001	0.042	0.079	--									
Glass & Cer.	0.132*	0.225**	-0.019	0.046	0.088	0.125	0.046	--								
Jute	0.062	0.155	-0.089	-0.024	0.018	0.055	-0.024	-0.07	--							
Leather	-0.163*	-0.071	-0.315	-0.25***	-0.21**	-0.17*	-	-	-0.27*	--						
Pap. & Brd.	0.091	0.184**	-0.060	0.005	0.047	0.084	0.005	-0.04	0.029	0.255***	--					
Sugar	0.064	0.156**	-0.087	-0.023	0.020	0.057	-0.022	-0.07	0.002	0.228***	-	--				
Syn. & Rayon	0.124**	0.216***	-0.027	0.037	0.080	0.17**	0.038	-0.01	0.061	0.287***	0.032	0.059	--			
Tex. Composite	0.012	0.104	-0.14***	-0.08*	-0.032	0.005	-0.074	-0.12*	-	0.176**	-	-	-0.11**	--		
Tex. Spinning	0.010	0.102	-0.14***	-0.08**	-0.034	0.002	-0.076*	-0.12*	-	0.173**	-	-	-0.1***	-		
Tex. Weaving	-0.005	0.088	-0.156**	-0.091	-0.049	-0.01	-0.091	-0.14*	-	0.159*	-	-	-0.13**	-	-0.014	
Transp. & Comm.	0.055	0.147	-0.097	-0.032	0.010	0.047	-0.032	-0.08	0.008	0.218**	0.037	0.010	-0.069	0.042	0.045	0.059

*** Significant at 1 % level

** Significant at 5 % level

* Significant at 10 % level

TABLE 4 :Rank Order Correlations and Z values Between Base Year (1998) and Each Succeeding Year for

TCA/TA and TCL/TA

TCA / TA			TCL / TA	
Between Base Year and:				
Year	Correlation	Z Value	Correlation	Z Value
2	0.995	3.921***	0.992	3.872***
3	0.981	3.685***	0.940	2.958***
4	0.975	3.577***	0.970	3.479***
5	0.952	3.174***	0.957	3.263***
6	0.938	2.919***	0.925	2.693***

*** Significant at 1 % level

All the coefficients of rank order correlation are positive and statistically significant at 5% except year 1999, which is significant at 1% level of significance. The positive correlation between the investment and financing policies indicate the industries, which follow aggressive investment working capital policies, simultaneously follow aggressive working capital financing policies too. Therefore, we cannot reject our hypothesis, H_{14} that an aggressive investment policy is accompanied by an aggressive financing policy.

TABLE 5: Rank Correlation, Per Year, of AIP and AFP

Year	Correlation	Z Value
1998	0.626	2.555**
1999	0.605	2.919***
2000	0.630	2.477**
2001	0.656	2.024**
2002	0.632	2.447**
2003	0.635	2.388**

*** Significant at 1 % level   ** Significant at 5 % level

Finally, impact of aggressive/conservative working capital management policies on profitability of firms has been examined by running two linear regression models. The mean TCA/TA values of each firm for six years are regressed against mean values of Return on Assets (ROA) and Return on Equity (ROE). Table 6 represents the results of regression analysis. The t-statistics of both TCA/TA and TCL/TA are statistically significant at 1% level

for ROA. The positive coefficient of TCA/TA indicates a negative relationship between the degree of aggressiveness of investment policy and return on assets. As the TCA/TA increases, degree of aggressiveness decreases, and return on assets increases. Therefore, there is negative relationship between the relative degree of aggressiveness of working capital investment policies and return on assets. The negative value of □ coefficient for TCL/TA also points out the same negative relationship between the aggressiveness of working capital financing policy and return on assets. Higher the TCL/TA ratio, more aggressive the financing policy, that yields negative return on assets. Durbin-Watson correlation coefficient (1.775) indicates less autocorrelation between the independent variables.

The second regression model produced more or less same results for Return on Equity (ROE) and working capital variables. The relationship is same among the TCL/TA, TCL/TA and ROE as it is in the case of ROA as indicated by the β coefficients 0.115 and -0.153 of TCA/TA and TCL/TA respectively.

Table 6: Regression Analysis of TCA / TA and CL / TA on Return on Assets (ROA) and Return on Equity (ROE)

Variables	Return on Assets (ROA)			Return on Equity (ROE)		
	β Coefficients	t-Statistics	*p* Value	β Coefficients	t-Statistics	*p* Value
α		3.455***	0.0006		0.273	0.7851
TCA / TA	0.351	5.920***	0.0000	0.115	1.78*	0.0762
TCL / TA	-0.371	-6.249***	0.0000	-0.153	-2.376**	0.0181
D-Watson	1.775			1.988		

*** *Significant at 1 % level*   ** *Significant at 5 % level*   **Significant at 10 % level*

Theses results are contradictory with Carpenter and Johnson (1983), Gardner, Mills and Pope (1986), and Weinraub and Visscher (1998) and produced negative relationship between the aggressiveness of working capital policies and accounting measures of profitability. Although, results of both the regression are significant, however, regression (i) produced more broader and consistent results where F-value and □ coefficients are highly significant as compared to second regression model. Therefore, the profitability hypotheses i.e. H_{15} is rejected, which stated the direct relationship between the aggressive working capital policies and firm's profitability.

6. Conclusion

This study investigate the relative relationship between the aggressive/conservative working capital policies for seventeen industrial groups public limited companies listed at Karachi Stock Exchange for a period of 1998-2003. The study found significant differences among their working capital investment and financing policies across different industries. Moreover, these working capital policies are remarkably stable over the period of six years. The positive and significant correlation between the investment and financing policies for industries indicate that industries which pursue aggressive investment working capital policies also follow aggressive working capital financing policies. These results are contradicting with the findings of Weinraub and Visscher (1998) that showed a negative correlation between the asset management policies and financing policies.

Finally, the impact of aggressive/conservative working capital investment and financing policies has been examined through two ordinary least square (OLS) models. We found a negative relationship between the profitability measures of firms and degree of aggressiveness of working capital investment and financing policies. The firms yield negative returns if they follow an aggressive working capital policy. These results may further validated by examining the impact of aggressive working capital policies on market measures of profitability and growth of the firms. This phase is left for the future research.

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