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Liquidity of Short-term Assets Related to Debt Paying Ability: An Empirical Study on Pharmaceuticals Sector of Karachi Stock Exchange

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Abstract
The study is done to test the facts of statement "liquidity of short-term assets related to debt paying ability" with the help of econometric analysis. In this study the relationship between turnover ratios and liquidity ratios was studied with the help of regression and correlation. In this study the secondary data was collected from 5 self-selected pharmaceuticals companies from the year 2004 to 2014. Dependent variables of the study are net working capital, current ratio, acid test ratio, cash ratio and sales to working capital ratio and independent variables of the study are accounts receivable turnover, accounts receivable turnover in days, inventory turnover, inventory turnover in days and cash conversion cycle. The results studied that ART is positively related with NWC, CR and ATR but negatively related with STW. Moreover, it is studied that ARTD is positively related with CR and ATR, INVT and INVTD is positively related with CR and ATR but INVTD is negatively related with STW. There was no relationship studied between turnover ratios and cash ratio. The study concluded that by managing the turnovers efficiently an entity can easily manage its liquidity. Moreover, it can be concluded by this study that by maintaining the optimal level of liquidity and turnover ratios the short-term debt paying ability will also be improved.
Keywords: Liquidity Ratios, Turnover Ratios, Short-Term Debt Paying Ability, Log-Linear Model.

1. Introduction

The study is done to explain the concept of liquidity of short-term assets related to debt paying ability. The basic need of working capital management for an organization is to maintain the optimal level of liquidity and turnover ratios as well as managing the short-term financings. This paper will explain the concept of optimal level of liquidity and turnover ratios. It is already explained in previous researches that the holding of liquid assets cause profitability (Saleem & Rehman, 2011).

For this purpose the ordinary least square regression and Pearson's correlation is used. In this study the pharmaceutical companies listed on Karachi Stock Exchange were selected to test the hypotheses of the study. The data incorporated in this study was taken from 2004 to 2014 from annual reports. In this study the impact of turnover ratios was studied on liquidity ratios. If firms liquidity and turnover both are at optimal level so the firm's short-term debt paying ability would also be improved. The liquidity ratios include net working capital, current ratio, acid test ratio, cash ratio and sales to working capital ratio and turnover ratios includes debtors turnover, debtors turnover in days, inventory turnover, inventory turnover in days and cash conversion cycle.

According to the different finance literatures it was proved that there is relationship exists between liquidity and turnover ratios. Due to improvement in turnover the liquidity position will also be improved. The strong positive correlation between current ratio and accounts receivable turnover was studied and there were also strong positive correlation found between current ratio and inventory turnover and between current ratio and payable turnover (Agha, 2014).

1.1. Problem Statement and Research Questions

According to the past studies and financial literatures it was proved that there is a relationship exists between liquidity and turnover. This study is done to explain and test that concept. The following research questions were developed:

- Is there any relationship exists between liquidity and turnover ratios?
- Do turnover ratios have a significant impact on liquidity ratios?
- If liquidity and turnover ratios are at optimal level than does firm's short-term term debt ability would be improved?

1.2. Hypotheses of the Study

1.2.1. Tests for Significance of Net Working Capital

H_{A1}: Evidences found that accounts receivable turnover has significant impact on net working capital

H_{A2}: Evidences found that accounts receivable turnover in days has significant impact on net working capital

H_{A3}: Evidences found that inventory turnover has significant impact on net working capital
H_{A4}: Evidences found that inventory turnover in days has significant impact on net working capital
H_{A5}: Evidences found that cash conversion cycle has significant impact on net working capital

1.2.2. Tests for Significance of Current Ratio

H_{B1}: Evidences found that accounts receivable turnover has significant impact on current ratio
H_{B2}: Evidences found that accounts receivable turnover in days has significant impact on current ratio
H_{B3}: Evidences found that inventory turnover has significant impact on current ratio
H_{B4}: Evidences found that inventory turnover in days has significant impact on current ratio
H_{B5}: Evidences found that cash conversion cycle has significant impact on current ratio

1.2.3. Tests for Significance of Acid Test Ratio

H_{C1}: Evidences found that accounts receivable turnover has significant impact on acid test ratio
H_{C2}: Evidences found that accounts receivable turnover in days has significant impact on acid test ratio
H_{C3}: Evidences found that inventory turnover has significant impact on acid test ratio
H_{C4}: Evidences found that inventory turnover in days has significant impact on acid test ratio
H_{C5}: Evidences found that cash conversion cycle has significant impact on acid test ratio

1.2.4. Tests for Significance of Cash Ratio

H_{D1}: Evidences found that accounts receivable turnover has significant impact on cash ratio
H_{D2}: Evidences found that accounts receivable turnover in days has significant impact on cash ratio
H_{D3}: Evidences found that inventory turnover has significant impact on cash ratio
H_{D4}: Evidences found that inventory turnover in days has significant impact on cash ratio
H_{D5}: Evidences found that cash conversion cycle has significant impact on cash ratio

1.2.5. Tests for Significance of Sales to Working Capital Ratio

H_{E1}: Evidences found that accounts receivable turnover has significant impact on sales to working capital
H_{E2}: Evidences found that accounts receivable turnover in days has significant impact on sales to working capital
H_{E3}: Evidences found that inventory turnover has significant impact on sales to working capital
H_{E4}: Evidences found that inventory turnover in days has significant impact on sales to working capital
H_{E5}: Evidences found that cash conversion cycle has significant impact on sales to working capital

1.3. Objective and Justifications of the Study

This study is done to explain the relationship between liquidity and turnover ratios. With the help of this study the finance professionals and practitioner can analyze the liquidity and turnover position of pharmaceutical companies in Pakistan and their short-term debt paying ability. This study is also a contribution of knowledge in the field of corporate finance which would give new ideas to researchers and scholars.

2. Literature Review

The study is done to explain the classical theory 'liquidity of short term assets related to debt paying ability'. This concept is common in financial management and analysis of financial statements. According to Hossan & Habib (2010), Liquidity ratios explain the relationship between current assets and current liabilities and turnover ratios explain how efficiently company use and control its assets and generate turnover by sales. It is also common in financial literatures that the liquidity would impact on profitability. The significant impact of cash ratio on ROA was studied and there was also significant impact of current ratio, acid test ratio and cash ratio studied on ROI but there was no impact found on ROE. It was concluded that the holding of liquid assets cause profitability (Saleem & Rehman, 2011).

The results of different studies explain the relationship between liquidity and turnover ratios. The study done by Raheman & Nasr (2007), in which their main objective was to explain the relationship between working capital management and profitability, for this purpose secondary data of 94 listed firms on KSE was collected for the period of six years from 1999 to 2004 and correlation matrix of the study explained that the current ratio was positively related with accounts receivable turnover, inventory turnover in days and cash conversion cycle and negatively related with accounts payable turnover at level of significance 0.01. It means that there is significant

relationship exist between liquidity and turnover ratios. Moreover, the study explained the significant positive relationship of current ratio with accounts receivable turnover and insignificant relationships with accounts payable turnover, inventory turnover in days and cash conversion cycle (Nzioki et al, 2013). In another study with the help of correlation analysis author studied strong positive correlation between current ratio and accounts receivable turnover which was 0.85. There were also strong positive correlation found between current ratio and inventory turnover which was 0.84 and between current ratio and payable turnover which was 0.56. So it was studied that by improving turnovers liquidity can be improved (Agha, 2014).

A research done in India by Kaur & Silky (2013), on all Indian cement companies and analysis explained that the inventory turnover was insignificantly related to current ratio, liquid ratio and cash ratio according to the evidences. There was also a relationship studied between turnover ratios by Gill, Biger & Mathur (2010), that accounts receivable turnover in days has a positive correlation with inventory turnover in days and cash conversion cycle at level of significance 0.01. Inventory turnover has a positive correlation with cash conversion cycle at level of significance 0.01. Moreover, Positive correlation between accounts receivable turnover, accounts payable turnover and inventory turnover was studied. There was also positive correlation found between cash conversion cycle, accounts receivable turnover and inventory turnover but negative correlation studied between cash conversion cycle and accounts payable turnover (Manzoor, 2013). Finally in the past studies it was concluded that the short-term debt financing become common in financial crises because in financial crises businesses generally sell out their fixed assets (Fosberg, 2013). So it is important for any entity to manage its short-term liquidity because it is directly related to short-term debt paying position of an entity.

3. Research Methodology

The study uses the deductive approach in which the hypotheses were tested for slope-coefficients of multiple regression models. In this study used the log-linear model to analyze the data with help of E-Views. The study used secondary data of five pharmaceutical companies listed on Karachi Stock Exchange. The data was collected for 11 years from 2004 to 2014 and five models were regressed.

3.1. Research Design

The study is explanatory in nature and study tested predetermined hypotheses. Type of investigation is causal with minimum interference by researcher. The study settings were non-contrived and unit of analysis was organizations. Type of data used in study was panel and secondary in nature.

3.2. Theoretical Framework and Regression Model

Theoretical framework for this study is as follows:

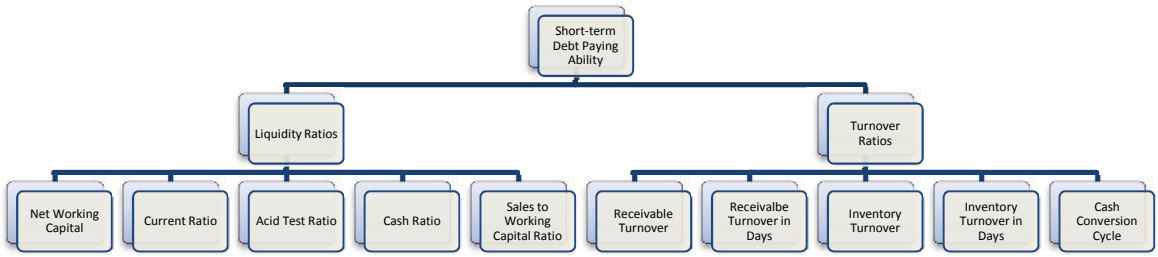

Table 1

Dependent Variables		*Independent Variables*	
	Symbols		***Symbols***
Net Working Capital	**NWC**	Accounts Receivable Turnover	**ART**
Current Ratio	**CR**	Accounts Receivable Turnover in Days	**ARTD**
Acid Test Ratio	**ATR**	Inventory Turnover	**INVT**
Cash Ratio	**CSHR**	Inventory Turnover in Days	**INVTD**
Sales to Working Capital Ratio	**STW**	Cash Conversion Cycle	**CCC**

Regression models for the study:

In this study the log-linear models were used for regression analysis, these models are as under:

1. $\text{Log NWC}_{i,t} = \boldsymbol{\alpha}_1 + \boldsymbol{\alpha}_2\text{ART}_{i,t} + \boldsymbol{\alpha}_3\text{ARTD}_{i,t} + \boldsymbol{\alpha}_4\text{INVT}_{i,t} + \boldsymbol{\alpha}_5\text{INVTD}_{i,t} + \boldsymbol{\alpha}_6\text{CCC}_{i,t} + \mu_{i,t}$
2. $\text{Log CR}_{i,t} = \boldsymbol{\beta}_1 + \boldsymbol{\beta}_2\text{ART}_{i,t} + \boldsymbol{\beta}_3\text{ARTD}_{i,t} + \boldsymbol{\beta}_4\text{INVT}_{i,t} + \boldsymbol{\beta}_5\text{INVTD}_{i,t} + \boldsymbol{\beta}_6\text{CCC}_{i,t} + \mu_{i,t}$
3. $\text{Log ATR}_{i,t} = \boldsymbol{\gamma}_1 + \boldsymbol{\gamma}_2\text{ART}_{i,t} + \boldsymbol{\gamma}_3\text{ARTD}_{i,t} + \boldsymbol{\gamma}_4\text{INVT}_{i,t} + \boldsymbol{\gamma}_5\text{INVTD}_{i,t} + \boldsymbol{\gamma}_6\text{CCC}_{i,t} + \mu_{i,t}$
4. $\text{Log CSHR}_{i,t} = \boldsymbol{\lambda}_1 + \boldsymbol{\lambda}_2\text{ART}_{i,t} + \boldsymbol{\lambda}_3\text{ARTD}_{i,t} + \boldsymbol{\lambda}_4\text{INVT}_{i,t} + \boldsymbol{\lambda}_5\text{INVTD}_{i,t} + \boldsymbol{\lambda}_6\text{CCC}_{i,t} + \mu_{i,t}$
5. $\text{Log STW}_{i,t} = \delta_1 + \delta_2\text{ART}_{i,t} + \delta_3\text{ARTD}_{i,t} + \delta_4\text{INVT}_{i,t} + \delta_5\text{INVTD}_{i,t} + \delta_6\text{CCC}_{i,t} + \mu_{i,t}$

3.3. Study Procedure and Plan of Analysis

The study is done to explain the relationship between liquidity and turnover ratios and test the significance of impact of turnover on liquidity. For this purpose self-selected sample of five companies is used. Study used data based on ratios were collected from annual reports if available and unavailable ratios were computed with the help of relevant formulas. For analyzing the data MS-Excel 2010 and E-Views 7 were used and with help of E-Views 7 the models were regressed.

4. Results and Findings

4.1. Analysis for Net Working Capital Model

With help of E-Views the correlation matrix was run and results are as under:

Table 2

	NWC	ART	ARTD	INVT	INVTD	CCC
NWC	1.000000					
ART	0.367564	1.000000				
ARTD	-0.177091	-0.664429	1.000000			
INVT	0.373082	0.226187	-0.198240	1.000000		
INVTD	-0.431349	-0.287340	0.243057	-0.925164	1.000000	
CCC	-0.415449	-0.451335	0.400853	-0.777340	0.876124	1.000000

Table 2 shows the results of correlation between net working capital and turnover ratios. There was positive correlation found between net working capital, accounts receivable turnover and inventory turnover. Also the negative correlation studied between net working capital, accounts receivable turnover in days, inventory turnover in days and cash conversion cycle. There is also a problem of multicolinearity exists between accounts receivable turnover and accounts receivable turnover in days. Also the strong multicolinearity exists between inventory turnover and inventory turnover in days and cash conversion cycle is also related with other turnover ratios. But this type of multicolinearity cannot be removed and has no meaning as a problem because all turnover ratios have relationship with each other. The regressed model for net working capital is as under:

$$\text{Log } NWC_{i,t} = 16.14 + 0.79\ ART_{i,t} - 0.009\ ARTD_{i,t} - 0.25\ INVT_{i,t} - 0.02\ INVTD_{i,t} + 0.004\ CCC_{i,t} + \mu_{i,t}$$

t-Statistic	4.096	-0.597	-0.534	-1.351	0.417
p-value	0.0002	0.5529	0.5954	0.1839	0.6783
F-Statistic	5.176	***p-value (F-Statistic)***		0.000	
R-Square	0.34	***Adjusted R-Square***		0.28	

The detailed results of above model are given in Table 7 which is attached in appendix. Above log-linear model is statistically significant and explains the impact of turnover ratios on net working capital. The accounts receivable turnover has positive strongly significant impact on net working capital but accounts receivable turnover in days, inventory turnover, inventory turnover in days and cash conversion cycle were not significantly related to net working capital. So the evidences studied that the H_{A1} cannot be rejected and H_{A2}, H_{A3}, H_{A4} and H_{A5} cannot be accepted.

4.2. Analysis for Current Ratio Model

Table 3

	CR	ART	ARTD	INVT	INVTD	CCC
CR	1.000000					
ART	0.159687	1.000000				
ARTD	0.114372	-0.664429	1.000000			
INVT	-0.039139	0.226187	-0.198240	1.000000		
INVTD	0.146373	-0.287340	0.243057	-0.925164	1.000000	
CCC	0.082858	-0.451335	0.400853	-0.777340	0.876124	1.000000

According to the table 3 there is weak correlation exist between dependent variable current ratio and independent variables accounts receivable turnover, accounts receivable turnover in days, inventory turnover in days and cash conversion cycle but negative correlation studied between current ratio and inventory turnover.

$$\text{Log } CR_{i,t} = -2.13 + 0.005\ ART_{i,t} + 0.015\ ARTD_{i,t} + 0.41\ INVT_{i,t} + 0.01\ INVTD_{i,t} - 0.003\ CCC_{i,t} + \mu_{i,t}$$

t-Statistic	2.526	2.339	2.663	2.839	-0.993
p-value	0.0148	0.0235	0.0105	0.0066	0.3254
F-Statistic	3.238	***p-value (F-Statistic)***		0.013	
R-Square	0.25	***Adjusted R-Square***		0.17	

Above result explain that the model is significant for further interpretations. The detailed results are given in table 8 in appendix section. In this model accounts receivable turnover, accounts receivable turnover in days, inventory turnover and inventory turnover in days have significant positive impact on current ratio. But there was insignificant impact of cash conversion cycle studied in this regression analysis. So according to the results there were no evidences found to reject H_{B1}, H_{B2}, H_{B3} and H_{B4} and no evidences found to accept H_{B5}.

4.3. Analysis for Acid Test Ratio Model

Table 4

	ATR	ART	ARTD	INVT	INVTD	CCC
ATR	1.000000					
ART	0.281747	1.000000				
ARTD	0.097377	-0.664429	1.000000			
INVT	-0.012647	0.226187	-0.198240	1.000000		
INVTD	0.101209	-0.287340	0.243057	-0.925164	1.000000	
CCC	-0.047062	-0.451335	0.400853	-0.777340	0.876124	1.000000

There is positive relation studied between acid test ratio, accounts receivable turnover, accounts receivable turnover in days and inventory turnover in days but inventory turnover and cash conversion cycle are negatively related with acid test ratio.

$$\text{Log ATR}_{i,t} = -5.05 + 0.014\ \text{ART}_{i,t} + 0.04\ \text{ARTD}_{i,t} + 0.76\ \text{INVT}_{i,t} + 0.03\ \text{INVTD}_{i,t} - 0.015\ \text{CCC}_{i,t} + \mu_{i,t}$$

t-Statistic	3.791	3.656	2.559	3.538	-2.39
p-value	0.0004	0.0006	0.0136	0.0009	0.0207
F-Statistic	6.125	***p-value (F-Statistic)***		0.000	
R-Square	0.38	***Adjusted R-Square***		0.32	

For detailed results review the table 9 in appendix. Above regressed model explains the impact of explanatory variables on acid test ratio and the model is also highly significant. This model explained the significant positive impact of accounts receivable turnover, accounts receivable turnover in days, inventory turnover and inventory turnover in days on acid test ratio and negative significant impact of cash conversion cycle on acid test ratio was studied. There were no evidences found to reject H_{C1}, H_{C2}, H_{C3}, H_{C4} and H_{C5}.

4.4. Analysis for Cash Ratio Model

Table 5

	CSHR	ART	ARTD	INVT	INVTD	CCC
CSHR	1.000000					
ART	0.577525	1.000000				
ARTD	-0.205447	-0.664429	1.000000			
INVT	0.295925	0.226187	-0.198240	1.000000		
INVTD	-0.349276	-0.287340	0.243057	-0.925164	1.000000	
CCC	-0.435859	-0.451335	0.400853	-0.777340	0.876124	1.000000

Table 5 explains the Pearson's correlation. In above matrix positive moderate correlation studied between cash ratio, accounts receivable turnover and inventory turnover. The accounts receivable turnover in days, inventory turnover in days and cash conversion cycle are negatively related with cash ratio.

$$\text{Log CSHR}_{i,t} = -2.8 + 0.01\ \text{ART}_{i,t} + 0.025\ \text{ARTD}_{i,t} + 0.25\ \text{INVT}_{i,t} + 0.02\ \text{INVTD}_{i,t} - 0.022\ \text{CCC}_{i,t} + \mu_{i,t}$$

t-Statistic	1.872	1.119	0.453	0.918	-1.84
p-value	0.0671	0.2685	0.6524	0.3633	0.0718
F-Statistic	2.85	***p-value (F-Statistic)***		0.0245	
R-Square	0.22	***Adjusted R-Square***		0.15	

Detailed results are given in the table 10 in appendix. Above model explain the insignificant impact of turnover ratios on cash ratio. But there was no evidence studied in above analysis to accept H_{D1}, H_{D2}, H_{D3}, H_{D4} and H_{D5}. So the study concluded that the all variables of turnover ratios do not impact cash ratio.

4.5. Analysis for Sales to Working Capital Ratio Model

Table 6

	STWC	ART	ARTD	INVT	INVTD	CCC
STWC	1.000000					
ART	-0.138304	1.000000				
ARTD	0.039528	-0.664429	1.000000			
INVT	0.220597	0.226187	-0.198240	1.000000		
INVTD	-0.290266	-0.287340	0.243057	-0.925164	1.000000	
CCC	-0.099957	-0.451335	0.400853	-0.777340	0.876124	1.000000

In table 6, sales to working capital ratio is positively correlated with accounts receivable turnover in days and inventory turnover and negatively correlated with accounts receivable turnover, inventory turnover in days and cash conversion cycle.

$$\text{Log } STW_{i,t} = 4.29 - 0.003\ ART_{i,t} - 0.009\ ARTD_{i,t} - 0.26\ INVT_{i,t} - 0.02\ INVTD_{i,t} + 0.011\ CCC_{i,t} + \mu_{i,t}$$

t-Statistic	-1.263	-0.99	-1.134	-3.177	2.339
p-value	0.2125	0.3266	0.2623	0.0026	0.0234
F-Statistic	4.313	***p-value (F-Statistic)***		0.0024	
R-Square	0.31	***Adjusted R-Square***		0.23	

Above model explains the impact of turnover ratios on sales to working and study stated that the model is significant. The detailed results are given in tables 11 in appendix. According to the above results inventory turnover in days has negative impact on sales to working capital as well as cash conversion cycle has positive impact in this study. There was insignificant impact studied of accounts receivable turnover, accounts receivable turnover in days and inventory turnover on sales to working capital. According to studied evidences the study cannot reject H_{E4} and H_{E5} and study cannot accept H_{E1}, H_{E2} and H_{E3}.

5. Discussion and Conclusion

5.1. Discussion

After analyzing data with help of Pearson's correlation and ordinary least square regression it is studied that there is a significant relationship exist between turnover ratios and liquidity ratios in pharmaceuticals sector of Karachi Stock Exchange. In this study developed five log-linear models and tested the hypotheses for partial regression coefficients. With the help of analysis the relationship was studied between turnover ratios and liquidity ratios. Study found that the increase in accounts receivable turnover and inventory turnover will increase in net working capital but increase in accounts receivable turnover in days, inventory turnover in days and cash conversion cycle will decrease in net working capital. The positive impact of accounts receivable turnover was found on net working capital. The study also found that the increase in accounts receivable turnover, accounts turnover in days, inventory turnover and inventory turnover in days would increase the current ratio. Acid test ratio can be increased by increasing accounts receivable turnover, accounts receivable turnover in days, inventory turnover and inventory turnover in days but it can be decreased due to increase in cash conversion cycle. Cash ratio was not affected by turnover ratios because there was no significant relationship studied between cash ratio and turnover ratios. Finally the sales to working capital ratio may be affected by inventory turnover in days and cash conversion cycle. Increase in inventory turnover in days would increase the sales to working capital ratio but increase in cash conversion cycle would decrease sales to working capital ratio.

5.2. Conclusion

This study was done to explain the relationship between liquidity ratios and turnover ratios. The results revealed that there is a significant relationship found between liquidity and turnover ratios. It means that by improving the turnover companies can improve their liquidity. The study explained that by improving the accounts receivable turnover an entity can easily manage its net working capital. It can also be concluded by this study that an entity can improve its current ratio by improving accounts receivable turnover in time and in days and inventory turnover in time and in days but cash conversion cycle do not play any vital role in managing the current ratio in pharmaceuticals sector. Acid test ratio can be improved by improving turnover ratios except cash conversion cycle which studied negative impacts on acid test ratio. There was also studied that the turnover ratios may not such important in managing cash ratio but by improving inventory turnover in days and decreasing the cash conversion cycle an entity can efficiently manage its sales to working capital ratio. In this study it can be concluded that by improving the turnover ratios an entity can improve its liquidity as well as an entity can bring its liquidity on such optimal level which is described in different financial literatures by which entity can improve its short-term debt paying ability.

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Appendix

Table 7

Dependent Variable: LOG(NWC)
Method: Panel Least Squares
Date: 04/19/15 Time: 12:10
Sample: 2004 2014
Periods included: 11
Cross-sections included: 5
Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	16.13816	2.895125	5.574251	0.0000
ATR	0.790738	0.193064	4.095724	0.0002
ARTD	-0.009472	0.015853	-0.597484	0.5529
INVT	-0.255249	0.477531	-0.534518	0.5954
INVTD	-0.022215	0.016443	-1.351022	0.1829
CCC	0.004359	0.010445	0.417310	0.6783

R-squared	0.345620	Mean dependent var	13.86976
Adjusted R-squared	0.278846	S.D. dependent var	1.322214
S.E. of regression	1.122834	Akaike info criterion	3.172258
Sum squared resid	61.77707	Schwarz criterion	3.391240
Log likelihood	-81.23709	Hannan-Quinn criter.	3.256940
F-statistic	5.176005	Durbin-Watson stat	0.355474
Prob(F-statistic)	0.000685		

Table 8
Dependent Variable: LOG(CR)
Method: Panel Least Squares
Date: 04/19/15 Time: 12:24
Sample: 2004 2014
Periods included: 11
Cross-sections included: 5
Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.131528	0.960250	-2.219763	0.0311
ART	0.004864	0.001926	2.525744	0.0148
ARTD	0.014610	0.006246	2.339086	0.0235
INVT	0.406509	0.152657	2.662885	0.0105
INVTD	0.014118	0.004973	2.838847	0.0066
CCC	-0.003279	0.003301	-0.993345	0.3254

R-squared	0.248357	Mean dependent var	1.016728
Adjusted R-squared	0.171659	S.D. dependent var	0.411575
S.E. of regression	0.374587	Akaike info criterion	0.976685
Sum squared resid	6.875465	Schwarz criterion	1.195667
Log likelihood	-20.85884	Hannan-Quinn criter.	1.061367
F-statistic	3.238113	Durbin-Watson stat	1.153512
Prob(F-statistic)	0.013246		

Table 9
Dependent Variable: LOG(ATR)
Method: Panel Least Squares
Date: 04/19/15 Time: 12:36
Sample: 2004 2014
Periods included: 11
Cross-sections included: 5
Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.523328	1.504719	-3.006095	0.0042
ART	0.008049	0.003018	2.667141	0.0103
ARTD	0.031306	0.009788	3.198511	0.0024
INVT	0.574831	0.239215	2.402990	0.0201
INVTD	0.024911	0.007793	3.196489	0.0024
CCC	-0.010991	0.005173	-2.124703	0.0387

R-squared	0.297799	Mean dependent var	0.128608
Adjusted R-squared	0.226146	S.D. dependent var	0.667259
S.E. of regression	0.586981	Akaike info criterion	1.875020
Sum squared resid	16.88278	Schwarz criterion	2.094001
Log likelihood	-45.56304	Hannan-Quinn criter.	1.959702
F-statistic	4.156126	Durbin-Watson stat	1.042469
Prob(F-statistic)	0.003165		

Table 10
Dependent Variable: LOG(CSHR)
Method: Panel Least Squares
Date: 04/19/15 Time: 12:43
Sample: 2004 2014
Periods included: 11
Cross-sections included: 5
Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.813143	3.478375	-0.808752	0.4226
ART	0.013062	0.006976	1.872291	0.0671
ARTD	0.025322	0.022626	1.119182	0.2685
INVT	0.250594	0.552980	0.453171	0.6524
INVTD	0.016531	0.018015	0.917616	0.3633
CCC	-0.022008	0.011958	-1.840394	0.0718

R-squared	0.225344	Mean dependent var	-1.255516
Adjusted R-squared	0.146298	S.D. dependent var	1.468560
S.E. of regression	1.356891	Akaike info criterion	3.550938
Sum squared resid	90.21648	Schwarz criterion	3.769920
Log likelihood	-91.65079	Hannan-Quinn criter.	3.635620
F-statistic	2.850779	Durbin-Watson stat	0.752274
Prob(F-statistic)	0.024511		

Table 11
Dependent Variable: LOG(STWC)
Method: Panel Least Squares
Date: 04/19/15 Time: 12:51
Sample: 2004 2014
Periods included: 11
Cross-sections included: 5
Total panel (balanced) observations: 55

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.296802	1.434803	2.994699	0.0043
ART	-0.003635	0.002878	-1.263277	0.2125
ARTD	-0.009247	0.009333	-0.990811	0.3266
INVT	-0.258680	0.228100	-1.134063	0.2623
INVTD	-0.023612	0.007431	-3.177459	0.0026
CCC	0.011538	0.004933	2.339159	0.0234

R-squared	0.305641	Mean dependent var	1.326571
Adjusted R-squared	0.234788	S.D. dependent var	0.639838
S.E. of regression	0.559707	Akaike info criterion	1.779862
Sum squared resid	15.35031	Schwarz criterion	1.998843
Log likelihood	-42.94619	Hannan-Quinn criter.	1.864544
F-statistic	4.313743	Durbin-Watson stat	0.401223
Prob(F-statistic)	0.002487		

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