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Circulating Capital Management and Its Impact on Profitability: Evidence From Selected Food and Beverage Companies Listed in DSE

Md. Razu Ahmed (Corresponding author)

MBA (IBA), University of Rajshahi, Bangladesh

E-mail: razuahmedzubair@gmail.com

Md. Shajadul Islam

BBA, National University, Bangladesh

Md. Dipu Islam

BBA, National University, Bangladesh

Maruf Hossain

BBA, National University, Bangladesh

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Abstract

Circulating capital management and its impact on profitability seek an empirical relationship between circulating capital and profitability. The study is based on secondary data collected from the websites of food and beverage companies. Because of the availability of data, this study covers six food and beverage companies from 2016 to 2020. The circulating capital components are cash conversion cycle (CCC), inventory turnover (IT), accounts payable payment period (APPP), accounts receivable collection periods (ARCP), and profitability, which involves return on assets (ROA) and net profit margin (NPM). This study implicates descriptive statistics and inferential statistics, which have analyzed mean, standard deviation, correlation, and regression to summarize the inverse connection between CCC, IT, ARCP, APPP, and ROA. The study also summarizes the significant relationship between CCC,

ARCP, and NPM and the insignificant impact of IT and APPP on NPM. I have found both positive and negative connections between circulating capital components and profitability. So, CCC, IT, ARCP, and APPP should be well communicated with ROA and inventory turnover, and the accounts payable payment period should be optimal with NPM.

Keywords: Cash conversion cycle, Inventory turnover, Accounts payable payment period, Accounts receivable collection period, Profitability

1. Introduction

Two categories of capital are essential to the overall operations of an enterprise. The first constitutes long-term capital, while the second is circulating capital. Circulating capital is essential to the management of a company's regular operations because it contributes to the creation of current assets. In the concept of circulating capital management, there are two categories of circulating capital: excess circulating capital and net circulating capital. Circulating capital will be managed in a manner that ensures sufficient liquidity for daily business operations. Circulating capital is a requirement for internal control and a valid criterion for measuring the effectiveness of capital management. Circulating capital effectiveness is a crucial determinant of profitability and liquidity. Circulating capital is ubiquitous because it is required for all business categories. Therefore, circulating capital is the lifeblood of businesses. In this study, six food and beverage companies were chosen to illustrate the connection between circulating capital management and profitability.

The food and engineering industries have direct impact on Bangladesh's economy. In my experience, the food and beverage industry have a substantial seasonal profit, but the assumption of a goingconcern is that the business will continue indefinitely. For attaining seasonal substantial profit and average regular profit within a single year, businesses strive to manage circulating capital as efficiently and effectively as feasible.

2. Objectives of Research

2.1 Broad Objective

To appraise the empirical connection between circulating capital management and its impact on profitability of selected food and beverage companies listed in DSE, Bangladesh.

2.2 Specific Objectives

- To reckon the connection between CCC and profitability (NPM and ROA).
- To evaluate the connection between IT and profitability (NPM and ROA).
- To forecast the real impact of ARCP and APPP on Profitability (NPM and ROA).

3. Literature Review

Managing circulating capital involves making decisions regarding the investment of available funds, maintaining a specific level of inventory, and managing A/R and A/P (Van Horne, 1995).Circulating capital requirements are described by Arif et al. (2016) as inventories, receivables, cash, accounts payables, and NOC. The primary components of circulating

capital are inventory, cash, receivables, marketable securities, current trade creditors, current provisions, and short-term borrowings (Noyem, 2017).The IT, ARCP, APPP, and CCC are indicators of the effectiveness of a company's circulating capital management (Brigham &Gapenski, 2013-14). The two primary objectives of circulating capital management are increasing a company's returns and ensuring there is sufficient liquidity to meet short-term obligations as they become due. Profitability is tied to the maximization of shareholder value, and investments in liquid assets are made only if a satisfactory return is realized. Despite the fact that a corporation needs liquidity to operate, it may choose to take on more capital than is required for operational or transactional purposes, i.e., for safety or speculation. With a view toward profitability and liquidity, circulating capital has strengthened its position and gained significant value in recent years (Raheman et al.,2010).In addition to increasing liquidity, having more circulating capital will impact profitability. While a decrease in circulating capital would diminish liquidity, it would also affect the company's day-to-day operations (Ranjith, 2008). A company's increased liquidity improves its ability to satisfy short-term obligations, but at the expense of profitability. In contrast, having less liquidity may increase profitability, but at the expense of a larger risk of being unable to pay short-term obligations (Anand& Gupta, 2001). Increasing circulating capital investment may result in the potential cost of cash tied up in inventory, accounts receivable, and enhanced inventory storage and issuance costs, which may reduce the firm's profitability (Deloof, 2003). From 1992 to 1996, it was an evaluation of a sample of significant Belgian enterprises. By decreasing the number of days that accounts receivable is past due and reducing inventory, Belgian businesses can increase their profitability. Less profitable businesses delay paying their expenditures for extended periods of time, as analyzed by Deloof (2003). Research on Pakistan's textile industry, return on assets, average day in receivable, and average days payable were found to have significant and negative relationships, whereas the average age of inventory and return on assets had significant and positive relationships. In addition, a substantial correlation was discovered between return on asset and cash conversion cycle, suggesting that the textile industry would benefit more from extending the cash conversion cycle (Ali, 2011).53 Bangladeshi manufacturing firms were estimated by Thakur (2017), listed on the DSE in order to provide empirical evidence of the link between circulating capital management and profitability, he discovered that the correlation between AR and return on assets is substantially negative, the duration of inventory conversion and return on assets have a significant negative correlation, the connection between return on asset and account payable term is negligible, and the link between the cash conversion cycle and return on assets is significantly inverse. Selected 15 Bangladeshi petroleum and power companies listed on the Dhaka Stock Exchange, Amin & Islam (2014) found that NPM and TI have a major positive liaison with ROA, and that Cash to C.L and APPP have a significant influence on NPM and found an incompatibility between the D/E ratio and the NPM.

4. Development of the Hypotheses

H_1: No connection exists between CCC and profitability (ROA).

H_2: No connection exists between CCC and profitability (NPM).

H_3: No connection exists between ARCP and profitability (ROA).

H_4: No connection exists between ARCP and profitability (NPM).

H_5: No connection exists between APPP and profitability (ROA).

H_6: No connection exists between APPP and profitability (NPM).

H_7: No connection exists between IT and profitability (ROA).

H_8: No connection exists between IT and profitability (NPM).

5. Methodology of the Research

5.1 Data Collection, Sample Size, and Statistical Tools

It is an empirical research which can show the significant or insignificant connection between circulating capital components and profitability. I have taken 6 Food & Beverage companies listed in DSE out of 10 because of availability of financial data from websites and DSE library as secondary sources and have considered 30 observations of financial data of particular food and beverage companies from year 2016 to 2020. I have used data analysis tools: Stata MP 13 & E Views for descriptive and inferential statistics. I have analyzed mean, minimum and maximum value, standard deviation for descriptive analysis by using stata MP 13 and also have analyzed Pearson correlation with Stata MP 13 and run Hausman test regressions by using E Views.

Conceptual Framework of the Research

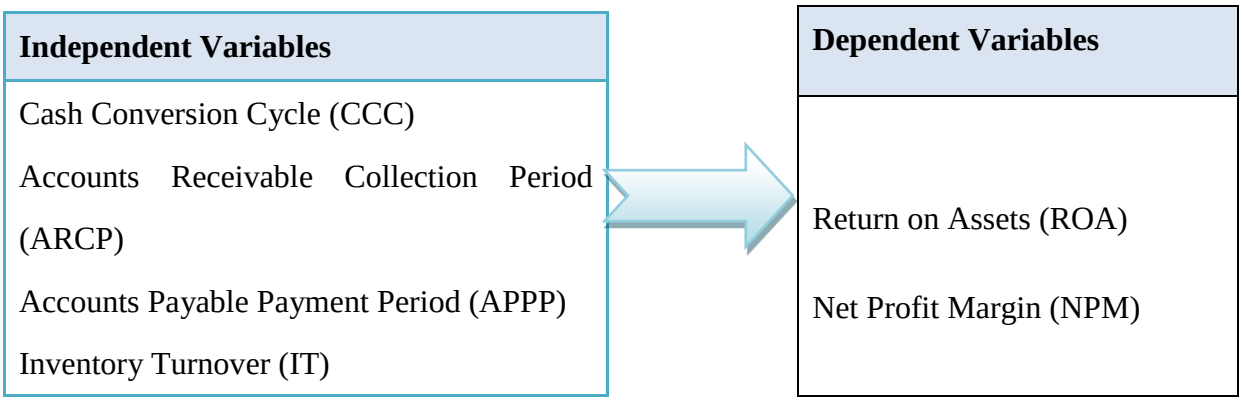

Figure 1. Conceptual Framework

Mathematical Model of the Research

To study the circulating capital management and profitability relationship, following model is

$$Y = \beta_0+\beta_1 X_1 +\beta_2 X_2 +\beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Model A:

$Y\ (ROA) = \beta_0+\beta_1\ (CCC) +\beta_2\ (ARCP) +\beta_3\ (APPP) + \beta_4\ (IT) + \varepsilon.$

Model B:

$Y\ (NPM) = \beta_0+\beta_1\ (CCC) +\beta_2\ (ARCP) +\beta_3\ (APPP) + \beta_4\ (IT) + \varepsilon.$

From this econometric equation, Y is a dependent variable and CCC, ARCP, APPP, and IT are independent variables. β_0 is an intercept point. β_1, β_2, β_3, and β_4 are the coefficients of independent variables. Last of all, ε indicates residual variables.

6. Analysis and Interpretation of the Research

6.1 Descriptive Statistics

Table 1. Descriptive Statistics

Variable|	Obs	Mean	Std. Dev.	Min	Max
----------+					
CCC |	30	210.88	198.5091	5.6	713.1
ARCP |	30	109.28	146.3762	4.6	514.1
APPP |	30	23.49333	14.73675	.4	52.6
IT |	30	4.267	2.801289	1.07	11.37
ROA |	30	3.148667	9.097814	-18.57	21.25
NPM |	30	6.947	10.57114	-11.87	30.1

Source: Stata 13 MP

CCC has a mean of 210.88 and Standard deviation is 198.5091 with minimum value of 5.6 and maximum value of 713.1. The ARCP mean is 109.28 and S.D of 146.3762. Minimum value of ARCP is 4.6 and Maximum value is 514.1. Mean value of APPP is 23.49333 and SD is 14.73675; the APPP indicates min. value is 0.4 and max value is 52.6. Mean IT is 4.267 and a standard deviation of 2.80 which have min. value (1.07) and max value (11.37). ROA has a mean value (3.14) and has S.D value (9.097814). ROA has minimum value (-18.57) and maximum value is 21.25. NPM has a mean value of 6.95 and S.D of 10.57. Minimum value of NPM is -11.87 and maximum value is 30.1.

6.2 Inferential Statistics

Pearson Correlation matrix

Table 2. Correlation Matrix

	CCC	ARCP	APPP	IT	ROA	NPM
CCC	1.0000					
ARCP	0.9550	1.0000				
APPP	0.2770	0.4244	1.0000			
IT	-0.7112	-0.5289	0.1289	1.0000		
ROA	-0.0174	-0.0004	-0.2734	0.2428	1.0000	
NPM	0.5409	0.6364	0.1542	-0.1249	0.6688	1.0000

Source: Stata 13 MP

The diagonal values (top-left to bottom-right) are all 1.0000 because they indicate the correlation between a variable and itself (which is always perfect). Pearson correlation matrix illustrates the correlation between two variables. The correlation between CCC and ARCP is .9550, indicating highly correlated. IT and ROA have a -0.2734 negative correlation.

6.3 Regression Analysis: For Model A

Table 3. Hausman Test: ROA

Test Summary		**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random		5.913691	4	0.2057
Cross-section random effects test comparisons:				
Variable	**Fixed**	**Random**	**Var(Diff.)**	**Prob.**
CCC	-.009542	-.007752	.000005	.4165
IT	1.055801	1.069018	.064314	.9584
APPP	-.046325	-.063143	.000312	.3413

ARCP	.01572	.015806	.00005	.9903
Cross-section random effects test equation:				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	.026159	4.618781	.005664	.9955
CCC	-0.009542	.018108	-0.526929	.604
IT	1.055801	.685754	1.539621	.1393
APPP	-0.046325	.070979	-0.652658	.5214
ARCP	.01572	.025593	.614232	.546
Effects Specification				
Cross-section fixed (dummy variables)				
R-square	.938603	Mean dependent var		3.14867
Adjusted R-square	.910975	S.D. dependent var		9.09781
S.E. of regression	2.714521	Akaike info criterion		5.09631
Sum squared resid.	147.3725	Schwarz criterion		5.56338
Log likelihood	-66.44465	H-Q criterion		5.24573
F-statistic	33.97232	D-W stat		2.22688
Prob (F-statistic)	0			

Source: E Views

This is our regression model to justify the hypotheses for panel data. Hausman Test, here, judges both fixed or random effects and which is superior to other. If I choose Random Effect, it is better to select null hypotheses and vice- versa.

Cross-section random effects and fixed effects did not vary statistically (chi-squared statistic = 5.913691, degrees of freedom = 4, p-value = 0.2057).

ROA is the dependent variable, and CCC, IT, APPP, and ARCP are independent variables. The table shows independent variable coefficients, standard errors, t-statistics, and probabilities. The model has strong explanatory power (R-squared = 0.938603). CCC, IT, ARCP, APPP have no connection with ROA at 5% level of significance.

6.4 Regression Analysis: For Model B

Table 4. Hausman Test: NPM

Test Summary		**Chi-Sq. Statistic**	**Chi-Sq. d.f.**	**Prob.**
Cross-section random		10.224231	4	.0368
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
CCC	-.110616	-.099324	.000046	.0963
IT	-.312347	-.431709	.419189	.8537
APPP	-.104485	-.139386	.002517	.4866
ARCP	.17025	.168262	.000336	.9137
Cross-section random effects test equation:				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	15.45637	7.052603	2.191583	.0404
CCC	-.110616	.02765	-4.000597	.0007
IT	-.312347	1.047106	-0.298295	.7686
APPP	-.104485	.108381	-0.964048	.3465
ARCP	.17025	.039079	4.356555	.0003
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	.893972	Mean dependent var		6.947
Adjusted R-squared	.84626	S.D. dependent var		10.5711
S.E. of regression	4.144912	Akaike info criterion		5.94284
Sum squared resid	343.6059	Schwarz criterion		6.40991
Log likelihood	-79.14263	H-Q criter.		6.09226
F-statistic	18.73669	D-W stat		2.91106
Prob(F-statistic)	0			

Source: E Views

R squared value of 89% specifies that independent variables explain clearly about dependent variable (NPM), so the model is good enough fit. The D-W test 2.91 indicates no auto

correlation in the residuals. In this regression model, I have also chosen random effect for result and for maintaining consistency. Cross-section random effects and fixed effects did not vary statistically (chi-squared statistic = 10.22, degrees of freedom = 4, p-value = .0268).

NPM has no connection with IT and APPP but has a connection with CCC and ARCP at.05 level of significance.

7. Discussion

In my research with panel data, I have evaluated 30 observations in Hausman Test from the regression model, found no connection between CCC and ROA; ARCP and ROA; APPP and ROA; IT and ROA which indicate my research is congruent with Thakur, (2017) and also same as the investigation (Raheman & Nasr, 2007; Huynh Phuong & Su., 2010; Quayyum, 2011; Bari, 2012). I have established a connection exists between CCC and NPM that was happened same as Nijam (2016) and also have got a connection between ARCP and NPM (Amin & Islam, 2014).

After getting the results from the regression model, I have analyzed my research results are in the same track of other researchers but some has contrary to my research results. So, both cases my happen in case of company's business nature, size, growth, choices of capital, and operational practice. In my observation, mostly has negative connection between circulating capital and profitability because I have used random effect test in comparison with fixed effect test from Hausman Test but two tests are viable. Various business concerns have a certain circulating capital choice but it is not said surely that they have an effective circulating capital management which is a positive indicator of profitability. Due to semi strong form of efficiency of capital market, my data had a constraint and for that reason I collected six organization's financial data (2016-2020) for my analysis purpose and cannot mention updated and big financial data. Many researches regarding circulating capital were done by various researchers and they covered food industries, cement industries, chemical industries, fertilizer industries, pharmaceuticals industry, etc. but I have covered food and beverage industries that can add a new literature in the future research and different analysis and findings. Circulating capital management is not an easy task to communicate with profitability. However, effective circulating capital management must be well balanced with profitability measures but always difficult.

8. Findings and Recommendations

1. **H_1:** No connection exists between CCC and profitability (ROA); 0.60>.05 = accepted.
2. **H_2:** No connection exists between CCC and profitability (NPM); 0.0007<.05 = rejected.
3. **H_3:** No connection exists between ARCP and profitability (ROA); 0.55>.05 = accepted.
4. **H_4:** No connection exists between ARCP and profitability (NPM); 0.0003<.05= rejected.
5. **H_5:** No connection exists between APPP and profitability (ROA); 0.52 > .05 = accepted.
6. **H_6:** No connection exists between APPP and profitability (NPM); 0.347>.05 = accepted.

7. **H_7:** No connection exists between IT and profitability (ROA); 0.14 >.05 = accepted.

8. **H_8:** No connection exists between IT and Profitability (NPM); 0.77 > 0.05 = accepted.

From hypotheses accept-reject criterion, the summary is:

- A connection exists between CCC and NPM.
- A connection exists between ARCP and NPM.
- ROA has an insignificant connection among CCC, ARCP, APPP, IT.
- NPM has an insignificant relationship between APPP and IT.

Based on findings and results, some recommendations should put into effect and also conductive to users of my research about food and beverage industries of Bangladesh:

- Cash is the life blood of regular operations of business and it should be proper balanced with profitability and cash conversion cycle should be limited within one year.
- Inventory turnover should be optimal with industry structure that can ensure substantial profit.
- Receivables collection period of food and beverage industry should be balanced between profitability and liquidity.
- Accounts payable payment period, IT, ARCP and CCC should generate optimal ROA.
- Inventory turnover and accounts payable payment period should be balanced and should generate acceptable NPM.
- Food and beverage industries should generate cash from receivables within estimated time and terminate payables within promised period and also should target ROA and NPM at an acceptable range.
- Circulating capital should be well managed to earn both NPM and ROA.

9. Conclusion

Food and Beverage industries are very much popular in Bangladesh. It is a profitable sector in Bangladesh. Previously established companies have a good market in both mega city and countries, for that reason, some companies earn huge profit and earn goodwill with adequate circulating capital practice. Newly established food and beverage companies have no good financial back up because previously established companies have numerous subsidiaries of other sector and when newly founded companies have no established wide distribution channel in mega city and countries, it faces circulating capital shortage, it injects more receivables with lower collections of cash and after a certain time, operation of business could be set up within countries that ensure bad circulating capital management with lower amount of profit. Food and Beverage companies have both good times and bad times that can have seasonal substantial profit or regular lower profit margin but profitability depends upon good circulating capital management which can give optimal flow of fund and further use to

circulate of cash to make happy various parties involved in daily operation of businesses. My findings, on the whole, provide clear insights about circulating capital and its impact on profitability that have a room for development with more empirical evidences. Food and beverage industries should be cautious about circulating capital management policy that associates many economic variables of relationship. At last, optimal and effective circulating capital management is not easy to estimate for a company.

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Appendix

Company	Year	CCC	ARCP	APPP	IT	ROA	NPM
ACI Foods LTD	2016	30.7	26.7	52.6	6.46	-18.57	-11.87
ACI Foods LTD	2017	59	31.6	17.6	8.12	-6.35	-3.31
ACI Foods LTD	2018	78.8	45	24.7	6.23	-13.38	-7.67
ACI Foods LTD	2019	62.1	44.8	40.6	7.02	-14.43	-7.77
ACI Foods LTD	2020	30.7	26.7	52.6	6.46	-4.47	-2.07
PRAN AMCL	2016	136.9	17.6	0.5	3.05	3.63	2.53
PRAN AMCL	2017	125.4	19.8	0.4	3.44	3.76	2.31

PRAN AMCL	2018	118.3	19.8	0.5	3.69	3.88	2.19
PRAN AMCL	2019	108	16.4	0.6	3.96	4.17	2.07
PRAN AMCL	2020	117.7	18	0.8	3.63	3.21	1.73
APEX Foods LTD	2016	164.6	22.7	13.4	2.35	-0.86	-0.65
APEX Foods LTD	2017	213.4	43.7	24.3	1.88	0.51	2.94
APEX Foods LTD	2018	203.9	41	24.7	1.95	0.55	0.54
APEX Foods LTD	2019	230.5	35.2	17.8	1.71	0.7	0.69
APEX Foods LTD	2020	169.8	25.8	19.8	2.23	0.63	0.49
FU-WANG Foods Ltd	2016	218.4	125.7	25.7	3.06	5.81	11.23
FU-WANG Foods Ltd	2017	330.7	192.3	30.7	2.16	3.91	10.53
FU-WANG Foods Ltd	2018	364.4	209.9	23.6	2.05	3.65	10.31
FU-WANG Foods Ltd	2019	274.8	158	12.9	2.82	4.73	9.97
FU-WANG Foods Ltd	2020	313.4	174	14.6	2.37	3.22	7.66
Golden Harvest	2016	307.1	223.9	38.8	2.99	4	18.31
Golden Harvest	2017	574.2	443.5	42.8	2.1	4.75	29.84
Golden Harvest	2018	674.4	514.1	35.2	1.87	5.37	30.1
Golden Harvest	2019	579.9	361.9	35.1	1.44	5.82	27.83
Golden Harvest	2020	713.1	413.7	38.6	1.07	0.15	0.9
Olympic Foods Ltd	2016	5.6	4.6	31.1	11.37	21.25	14.81
Olympic Foods Ltd	2017	13.6	5.4	27.5	10.23	18.02	14.55
Olympic Foods Ltd	2018	29.6	4.8	21.3	7.93	16.56	13.85
Olympic Foods Ltd	2019	37.5	5.2	18.6	7.17	17.08	13.63
Olympic Foods Ltd	2020	39.9	6.6	17.4	7.2	17.16	12.74

Correlated Random Effects - Hausman Test

Equation: Untitled

Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.9137	4	0.2057

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CCC	-0.0095	-0.0078	5E-06	0.4165
IT	1.0558	1.069	0.0643	0.9584
APPP	-0.0463	-0.0631	0.0003	0.3413
ARCP	0.0157	0.0158	5E-05	0.9903

Cross-section random effects test equation:

Dependent Variable: ROA

Method: Panel Least Squares

Date: 03/18/23 Time: 20:41

Sample: 2016 2020

Periods included: 5

Cross-sections included: 6

Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.0262	4.6188	0.0057	0.9955
CCC	-0.0095	0.0181	-0.5269	0.604
IT	1.0558	0.6858	1.5396	0.1393
APPP	-0.0463	0.071	-0.6527	0.5214
ARCP	0.0157	0.0256	0.6142	0.546

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.9386	Mean dependent var	3.1487
Adjusted R-squared	0.911	S.D. dependent var	9.0978
S.E. of regression	2.7145	Akaike info criterion	5.0963
Sum squared resid	147.37	Schwarz criterion	5.5634
Log likelihood	-66.445	Hannan-Quinn criter.	5.2457
F-statistic	33.972	Durbin-Watson stat	2.2269
Prob(F-statistic)	0		

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	10.224	4	0.0368

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CCC	-0.1106	-0.0993	5E-05	0.0963
IT	-0.3123	-0.4317	0.4192	0.8537
APPP	-0.1045	-0.1394	0.0025	0.4866
ARCP	0.1703	0.1683	0.0003	0.9137

Cross-section random effects test equation:
Dependent Variable: NPM
Method: Panel Least Squares
Date: 03/18/23 Time: 20:45
Sample: 2016 2020
Periods included: 5
Cross-sections included: 6
Total panel (balanced) observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	15.456	7.0526	2.1916	0.0404
CCC	-0.1106	0.0277	-4.0006	0.0007
IT	-0.3123	1.0471	-0.2983	0.7686
APPP	-0.1045	0.1084	-0.964	0.3465
ARCP	0.1703	0.0391	4.3566	0.0003

Effects Specification
Cross-section fixed (dummy variables)

R-squared	0.894	Mean dependent var	6.947
Adjusted R-squared	0.8463	S.D. dependent var	10.571
S.E. of regression	4.1449	Akaike info criterion	5.9428
Sum squared resid	343.61	Schwarz criterion	6.4099
Log likelihood	-79.143	Hannan-Quinn criter.	6.0923
F-statistic	18.737	Durbin-Watson stat	2.9111
Prob(F-statistic)	0		