CHAPTER 5

DETERMINANTS OF COST OF EQUITY

This chapter presents the panel regression estimations for ascertaining the determinants of cost of equity for firms listed in the Malaysian stock market. The analyses cover the full sample, as well as on sectoral basis. The cost of equity used in this chapter is based on the SMSTD approach where in the previous chapter SMSTD is found to have relatively better explanatory power than other alternative cost of equity measures in explaining the actual stock returns.

As a start, the properties of the list of explanatory variables are examined. This is done in great details in Section 5.1 to Section 5.4, where the descriptive statistics on the explanatory variables are discussed, the correlation structure is analysed to check for any problem of multicolinearity, the scatter plots of the explanatory variable against the cost of equity are used to explore relationships; and finally, four unit root tests are carried out to ensure all the panel series have stationary property to avoid the problem of spurious regression.

The panel regression estimations of the determinant models are reported in Section 5.5 and Section 5.6. Three different settings from static panel models, that is, pooled, fixed-effect and random-effect models and two dynamic panel models, that is, difference-GMM and system-GMM are estimated. The panel regressions are repeated for the full sample and sub-sector panel series to check for robustness of relationship in order to draw conclusions on the determinants cost of equity for Malaysian firms. We summarise the results in Section 5.7.

5.1 Descriptive Statistics

Table 5.1 reports the summary of descriptive statistics for the pooled series for all the firms from the full sample (comprising of 354 firms) as well as by sector. The average cost of equity for the full sample is 24.03 percent with average standard deviation of 11.46 percent. Three sectors, namely, Construction, Industrial Products, and Properties have higher average cost of equity than the full sample. These sectors also have larger standard deviation, except for the Properties sector which has a slightly lower average standard deviation of 11.40 percent. The Plantation sector and Consumer Products sector have the two lowest costs of equity with an average value of 20.32 percent and 21.36 percent, respectively. Therefore, the Construction, Industrial Products, and Properties are sectors with higher risk among all sectors while the Plantation and Consumer Products are the less risky sectors.

CR, DE and TAT are ratios that measure the risk factor of a firm. Majority of the firms in the sectors have an average CR of 2.0 to 2.75 times. It means that for every RM1 of current liabilities, a firm holds at least RM2 of current assets. This is an indication of the firms' ability to satisfy claims from short-term creditors wholly with current assets. Interestingly, the Plantation sector has a much higher CR of 5.51 compared to other sectors, probably because the sector uses less debt as indicated by its average DE of 26 percent. For the full sample, DE is around 0.63, showing that Malaysian firms generally use a larger portion of debt in relative to their equity financing. Ameer (2007) found the average debt-to-equity ratio to be around 0.75, which suggests that firms in the Southeast Asian countries tend to have higher debt level in their capital structure. The effectiveness of firms in using their total assets in generating sales as measured by TAT for the full sample is 0.73 times.[11] This indicates that RM1 worth of asset is needed to

[11] The average TAT or total asset turnover ratio in Ameer's (2007) study is 0.82 times.

generate every 73 cents of sales. The finding seems to support the WTO's concerns over the inefficient allocation of capital in Malaysia in their trade policy review for 1997 and 2001.

EPS is the ratio used in this study to measure profitability or the return factor of a firm. This ratio represents the Malaysian ringgit earned on each common stock. For the full sample, the average EPS is about RM0.14. It means investors or common stockholders are earning 14 cents for every common stock that they hold. Two sectors that provide higher earnings for their investors are the Consumer Products and Plantation. Their average EPS are RM0.22 and RM0.21, respectively. The reason could be that the returns on these two sectors are less sensitive to the slow economic growth experienced by Malaysia in the early 2000s. It is not difficult to see why. Firms in the Consumer Products sector manufacture products such as liquor, cigarettes, textile and food which are meant for consumer use and therefore their revenues are more likely to remain stable during different phases of the economy cycle.

MB is categorized under the market ratios in the five basic categories of financial ratios. It measures both the risk and return factor of a firm. Malaysian firms have a tendency to trade at prices above its book value as indicated by the average MB ratio of RM1.45 for the full sample. It means that investors are willing to pay RM1.45 for each RM1.00 of book value of the firm's stock. Consistent with the findings for Plantation where the sector shows lower risk and higher return, investors are willing to pay RM1.33 for each RM1.00 of book value of the stocks. Nevertheless, the Technology sector which has been shown to have a lower DE, higher EPS and higher TAT than the full-sample average, has a MB ratio of 0.89. On the other hand, the Construction sector has a MB ratio of 1.54 even though it has a higher DE, lower EPS and a lower TAT than the full-sample average. It seems that MB does not reflect well on what is suggested by the accounting ratios for some sectors.

The range of the other two variables, SIZE and SL, is not large among the sectors. For the full sample, SIZE has an average of 5.09 while the range across sectors is within 4.60-6.03. Firms under the Construction, Consumer Products, Plantation, Technology, and Trading/Services sectors are generally larger in terms of market capitalization than the other sectors. The average for SL is 9.90. The Construction sector has stocks that are most liquid, with an average SL of 10.5. The SL figures for Plantation (10.12), Properties (10.33), Technology (10.36) and Trading/Services (10.45) are not much lesser than the Construction sector either. Even though the other two sectors, Consumer Products and Industrial Products, have a lower SL of 9.35 and 9.49, respectively, their figures are quite close to the full sample average. Basically, the sectors do not differ much in terms of their stock liquidity.

Table 5.1: Descriptive Statistics for the Pooled Series for Full Sample and by Sector

Statistics	COE (%)	CR	DE	EPS (RM)	TAT	MB (RM)	SIZE	SL
Full Sample								
Mean	24.0324	2.6872	0.6292	0.1382	0.7363	1.4563	5.0946	9.9064
Std. Dev.	11.4690	3.4106	1.0442	0.2419	0.5099	0.9586	1.5589	1.8701
No. of Observations	2832	2832	2832	2832	2832	2832	2832	2832
Construction								
Mean	25.4076	2.0417	0.7911	0.1079	0.5623	1.5438	5.1757	10.5007
Std. Dev.	11.7963	2.8183	0.9429	0.1547	0.3026	1.0931	1.4827	1.9307
No. of Observations	224	224	224	224	224	224	224	224
Consumer Products								
Mean	21.3666	2.4922	0.4771	0.2209	1.0062	1.3176	5.1902	9.3573
Std. Dev.	10.3043	2.4071	0.5453	0.3932	0.4513	0.7885	1.6129	1.5079
No. of Observations	432	432	432	432	432	432	432	432
Industrial Products								
Mean	25.2794	2.7467	0.6362	0.1074	0.7743	1.4868	4.6041	9.4922
Std. Dev.	12.0837	3.2022	1.1039	0.1851	0.4913	0.8330	1.2880	1.7095
No. of Observations	1032	1032	1032	1032	1032	1032	1032	1032
Plantation								
Mean	20.3226	5.5115	0.2605	0.2167	0.3906	1.3362	6.0308	10.1262
Std. Dev.	10.1679	7.2979	0.3658	0.2734	0.3523	1.1081	1.5787	1.7962
No. of Observations	168	168	168	168	168	168	168	168

Table 5.1, continued.

	COE (%)	CR	DE	EPS (RM)	TAT	MB	SIZE	SL
Properties								
Mean	26.6963	3.2144	0.6087	0.0675	0.3671	2.1386	4.9056	10.3373
Std. Dev.	11.4000	4.4788	0.8980	0.1058	0.3417	1.2947	1.0199	1.7892
No. of Observations	264	264	264	264	264	264	264	264
Technology								
Mean	23.9319	1.9540	0.4283	0.1694	0.8862	0.8972	5.2463	10.3679
Std. Dev.	9.6666	1.0537	0.4410	0.2652	0.3959	0.4990	1.2004	1.6233
No. of Observations	96	96	96	96	96	96	96	96
Trading/Services								
Mean	23.1986	2.0772	0.8059	0.1469	0.7757	1.2980	5.6217	10.4528
Std. Dev.	11.0439	1.8066	1.3904	0.2196	0.5895	0.9018	1.8685	2.1330
No. of Observations	616	616	616	616	616	616	616	616

Notes: This table provides the descriptive statistics of cost of equity (COE) measured by SMSTD (semi-deviation) and explanatory variables: CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume. % means the explanatory variable is measured in percentage and RM stands for Ringgit Malaysia.

5.2 Correlation of the Pooled Series for Full Sample and Across Sectors

This section examines the strength of the linear relationship between all the determinant variables to check for potential occurrence of multicollinearity. The correlations of all the variables which include COE (cost of equity) for the full sample is tabulated in Table 5.2, while the correlations for all the variables for the seven sectors are tabulated in Table 5.3 to Table 5.9. Overall, the variables do not display extremely strong correlation, that is, all the pair-wise correlation coefficients are less than 0.7 in magnitude. The absolute value of 0.7 is the standard threshold proposed in many textbooks in statistics to imply strong correlation (weak correlation will be below 0.3). Since none of the pairs of proposed determinant variables has a correlation coefficient above 0.7 in magnitude, all the variables are retained in the panel regression estimations for all the sectors.

A vast majority of the absolute correlation coefficients between the determinant variables tabulated in Table 5.2 to Table 5.9 are actually below 0.5, which is the threshold value used by Omran and Pointon (2004) to avoid multicollinearity problem in their study on the determinants for cost of equity in Egypt. In fact, around one third of the cases of the pairwise correlations are below 0.1 in absolute value. The highest incidence being the Industrial Products sector in Table 5.5, with 13 cases of 28 with absolute correlations below 0.1.

Table 5.2: Correlation of the Pooled Series for Full Sample

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.1299	1.0000						
DE	0.1667	-0.2449	1.0000					
EPS	-0.2138	0.0325	-0.0600	1.0000				
TAT	-0.1537	-0.1427	0.0112	0.2317	1.0000			
MB	0.2470	-0.0632	-0.0420	-0.2450	-0.2309	1.0000		
SIZE	-0.4176	0.0323	-0.1018	0.4964	0.0003	-0.3710	1.0000	
SL	-0.0118	-0.0840	0.0230	0.0889	-0.1622	-0.1445	0.5284	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm’s outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Table 5.3: Correlation of the Pooled Series for Construction Sector

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.0489	1.0000						
DE	0.0663	-0.1785	1.0000					
EPS	-0.1051	0.0096	0.0359	1.0000				
TAT	-0.0222	-0.1448	-0.3052	-0.0536	1.0000			
MB	0.1382	0.1004	-0.0720	-0.1298	-0.1901	1.0000		
SIZE	-0.3513	0.0283	0.1322	0.4104	-0.2612	-0.4615	1.0000	
SL	-0.1271	-0.0590	0.1635	0.1949	-0.1663	-0.3644	0.6967	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Table 5.4: Correlation of the Pooled Series for Consumer Products Sector

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.2199	1.0000						
DE	0.1825	-0.4462	1.0000					
EPS	-0.3050	0.0154	0.0629	1.0000				
TAT	-0.2883	-0.0987	-0.1069	0.4120	1.0000			
MB	0.3191	-0.1063	-0.0352	-0.4035	-0.4298	1.0000		
SIZE	-0.5196	0.1018	-0.0935	0.6609	0.3683	-0.4694	1.0000	
SL	-0.0640	-0.2014	0.1358	0.1918	0.0704	-0.1992	0.4592	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Table 5.5: Correlation of the Pooled Series for Industrial Products Sector

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.1081	1.0000						
DE	0.1175	-0.2744	1.0000					
EPS	-0.1751	0.0036	-0.0874	1.0000				
TAT	-0.0809	-0.1215	0.0574	0.2644	1.0000			
MB	0.3048	-0.1298	-0.0683	-0.2159	-0.1074	1.0000		
SIZE	-0.4379	0.0436	-0.1278	0.4634	0.0703	-0.3718	1.0000	
SL	-0.0658	0.0015	-0.0704	0.1043	-0.0296	-0.0386	0.4383	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm’s outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Table 5.6: Correlation of the Pooled Series for Plantation Sector

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.1800	1.0000						
DE	0.1121	-0.4156	1.0000					
EPS	-0.0890	0.1209	-0.1011	1.0000				
TAT	0.0476	-0.3187	0.3380	0.0085	1.0000			
MB	-0.0702	-0.1390	0.0368	-0.1823	-0.2760	1.0000		
SIZE	-0.3796	-0.1005	0.0796	0.5212	0.1872	-0.2298	1.0000	
SL	0.2025	-0.3043	0.2532	0.0614	0.3131	-0.3060	0.4515	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Table 5.7: Correlation of the Pooled Series for Properties Sector

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.1923	1.0000						
DE	0.3181	-0.2445	1.0000					
EPS	-0.2245	-0.0083	-0.1638	1.0000				
TAT	-0.1666	0.0505	-0.1496	0.3043	1.0000			
MB	0.1894	-0.1020	-0.0831	-0.1161	-0.2590	1.0000		
SIZE	-0.3328	0.1060	-0.2806	0.3012	-0.0656	-0.2994	1.0000	
SL	0.1744	-0.0607	0.2364	-0.0931	-0.1854	-0.1426	0.3668	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Table 5.8: Correlation of the Pooled Series for Technology Sector

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.0889	1.0000						
DE	0.2120	-0.4508	1.0000					
EPS	-0.1155	-0.0098	-0.1308	1.0000				
TAT	-0.1202	-0.0435	-0.1435	0.0357	1.0000			
MB	0.3164	0.2608	0.1189	-0.2202	-0.0468	1.0000		
SIZE	-0.3129	-0.2273	-0.0139	0.4553	-0.2553	-0.6572	1.0000	
SL	0.3515	-0.4026	0.4238	-0.1177	-0.1960	-0.1545	0.3019	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Table 5.9: Correlation of the Pooled Series for Trading/Services Sector

	COE	CR	DE	EPS	TAT	MB	SIZE	SL
COE	1.0000							
CR	-0.1217	1.0000						
DE	0.2178	-0.2633	1.0000					
EPS	-0.2094	0.0412	-0.0712	1.0000				
TAT	-0.2214	-0.1187	0.0430	0.1154	1.0000			
MB	0.2276	-0.0176	-0.0267	-0.2316	-0.1696	1.0000		
SIZE	-0.3888	0.0185	-0.1361	0.4635	-0.1510	-0.3797	1.0000	
SL	-0.0332	-0.0592	-0.0528	0.1166	-0.3419	-0.1938	0.6523	1.0000

Notes: COE is cost of equity; CR is current assets divided by current liabilities; DE is total debt divided by common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.

Generally, from the analysis on the full sample as well as majority of the sectors, all the determinant variables have negative correlation with COE, except for DE and MB. Most of the time, the results for the sectors are quite consistent with those of the full sample and the correlations between the variables and COE have the expected sign as laid out in Chapter 3, Section 3.3, except for EPS. As mentioned in Section 3.3, DE, EPS and MB are expected to have a positive relationship with COE, while its relationship with TAT, SIZE and SL is expected to be negative, and could be either way with CR. The correlation of COE with CR, TAT and SL in all cases (except for Technology in the case of SL) are below -0.3, indicating they are negative but weakly correlated. The correlation of COE with DE is also below 0.3 in all cases, except for the Properties sector where the correlation is slightly over 0.3. The correlation between MB and COE is also less than 0.3 with the exception of Consumer Products (0.3191), Industrial Products (0.3048) and Technology (0.3164). SIZE may be considered as moderately correlated with COE as indicated in the results for the full sample (-0.4176), and the Consumer Products (-0.5196) and Industrial Products (-0.4379) sectors.

5.3 Scatter Plots for Cost of Equity and Determinants

This section assesses the relationships between the determinant variables and cost of equity by plotting the scatter diagrams. This scatter diagram analysis is conducted for the full sample, as well as for the seven sectors to provide a graphical representation of the possible relationship between the variables.

For the full sample in Figure 5.1, all the plots show a negative trend line, except for DE and MB. The scatter plot for SL seems to suggest that there is no relationship with COE. A careful examination on the density of the shape of the plotted points shows that most explanatory variables do not exhibit a clear linear relationship with COE, except for

SIZE. The scatter plot strongly suggests that firm size is negatively associated with cost of equity. A clearer picture can be obtained by using the scatter plots for the individual sectors.

The scatter plots for each of the sectors are given in Figure 5.2 to Figure 5.8. In general, similar patterns are observed, where they all show a negative trend line, except for DE and MB. Surprisingly, in the case of SL, where the scatter plot for the full sample seems to suggest no relationship with COE, a negative trend line is observed for SL of three sectors. They are Construction, Consumer Products and Industrial Products. On the other hand, another three sectors, namely, Plantation, Property and Technology, show a positive trend line for SL. Not only that, a positive trend line is found for the Plantation sector for TAT. Consistent with the full sample analysis, SIZE is the only variable showing a negative linear relationship with COE for all sectors, although it is less clear for the Plantation sector and Technology sector. This could be due to the smaller number of firms available for analysis for these two sectors (21 firms for the Plantation sector and 12 firms for the Technology sector) when compared to the other sectors.

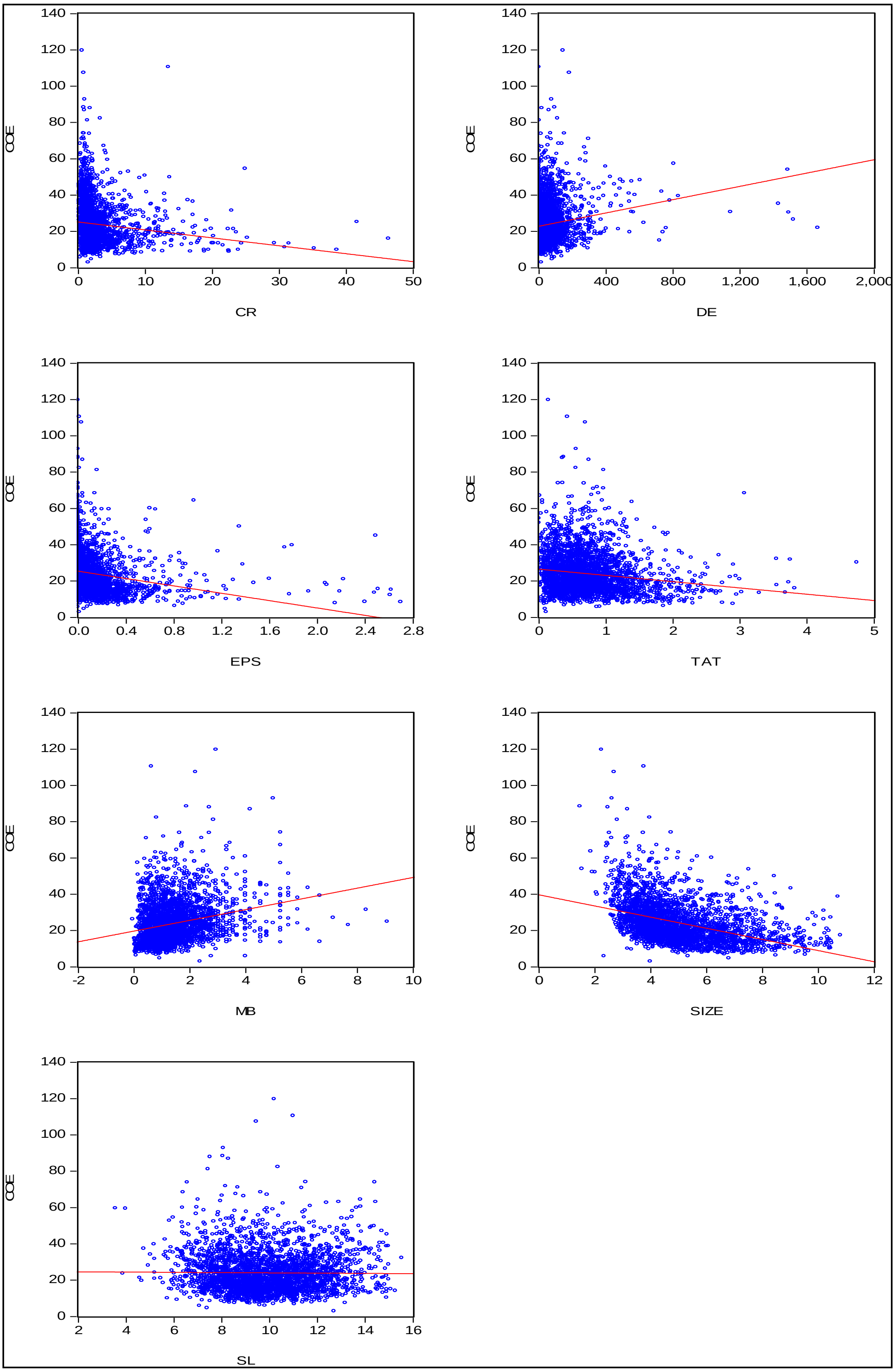

Figure 5.1 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Full Sample

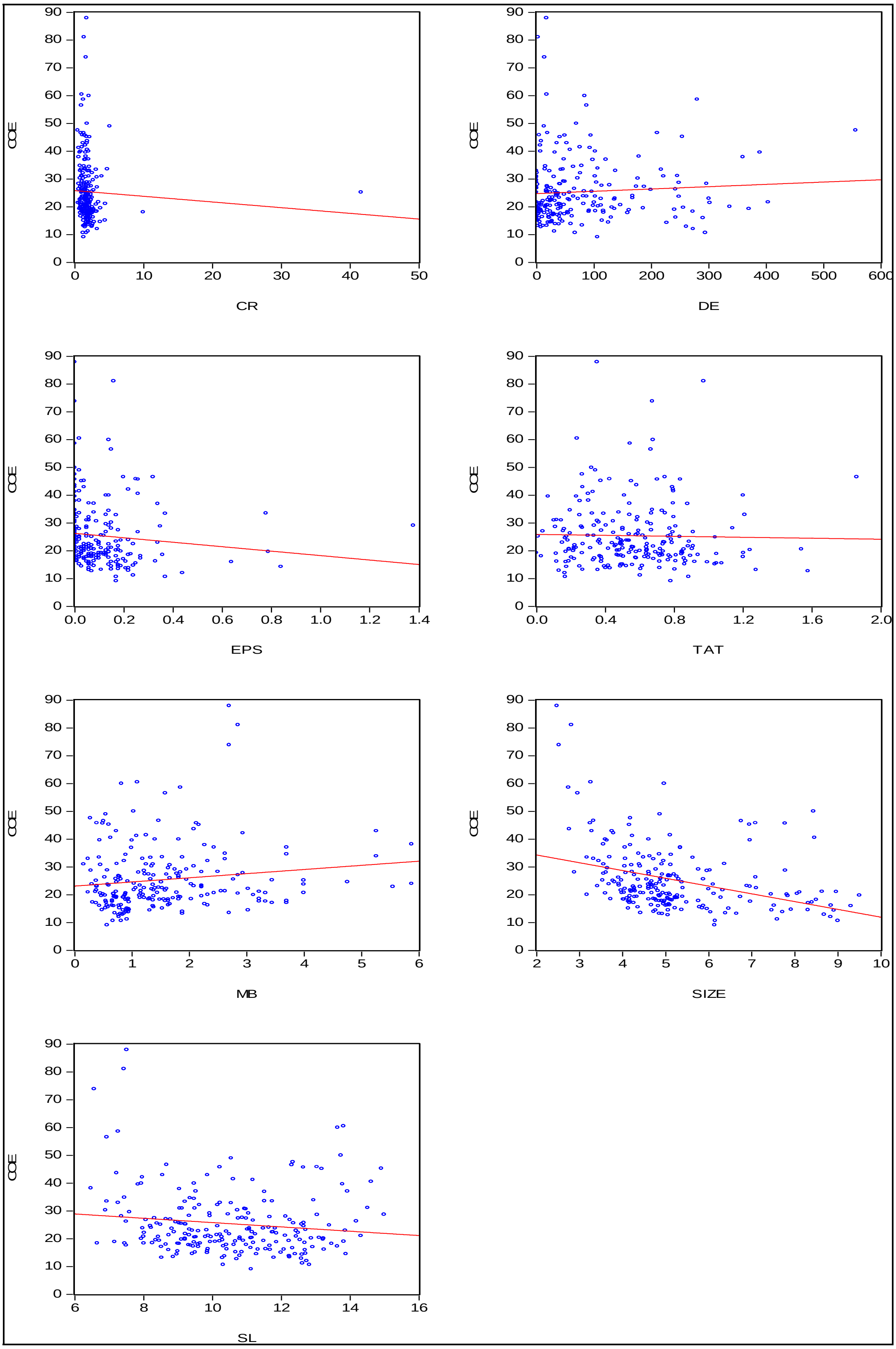

Figure 5.2 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Construction Sector

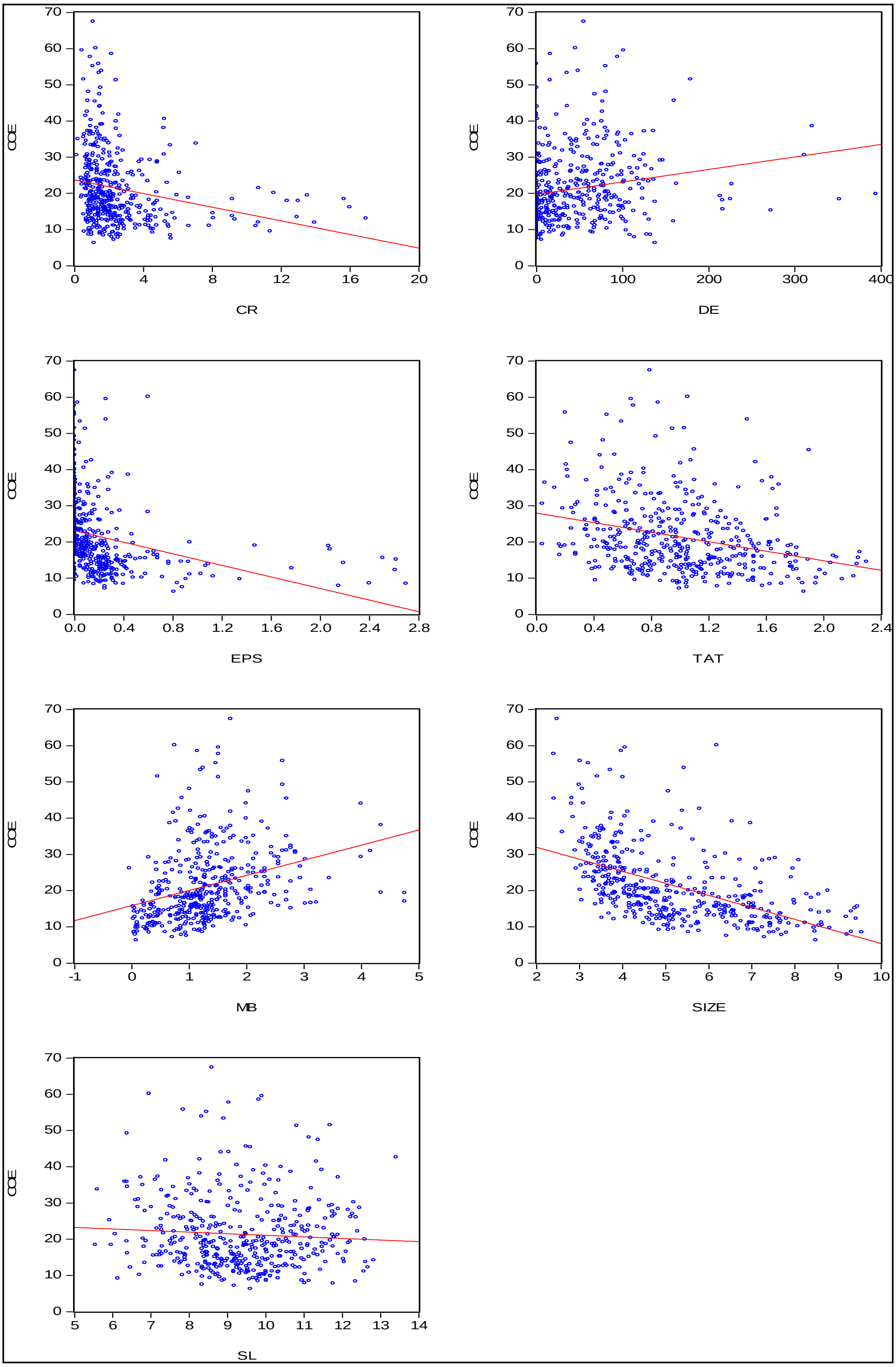

Figure 5.3 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Consumer Products Sector

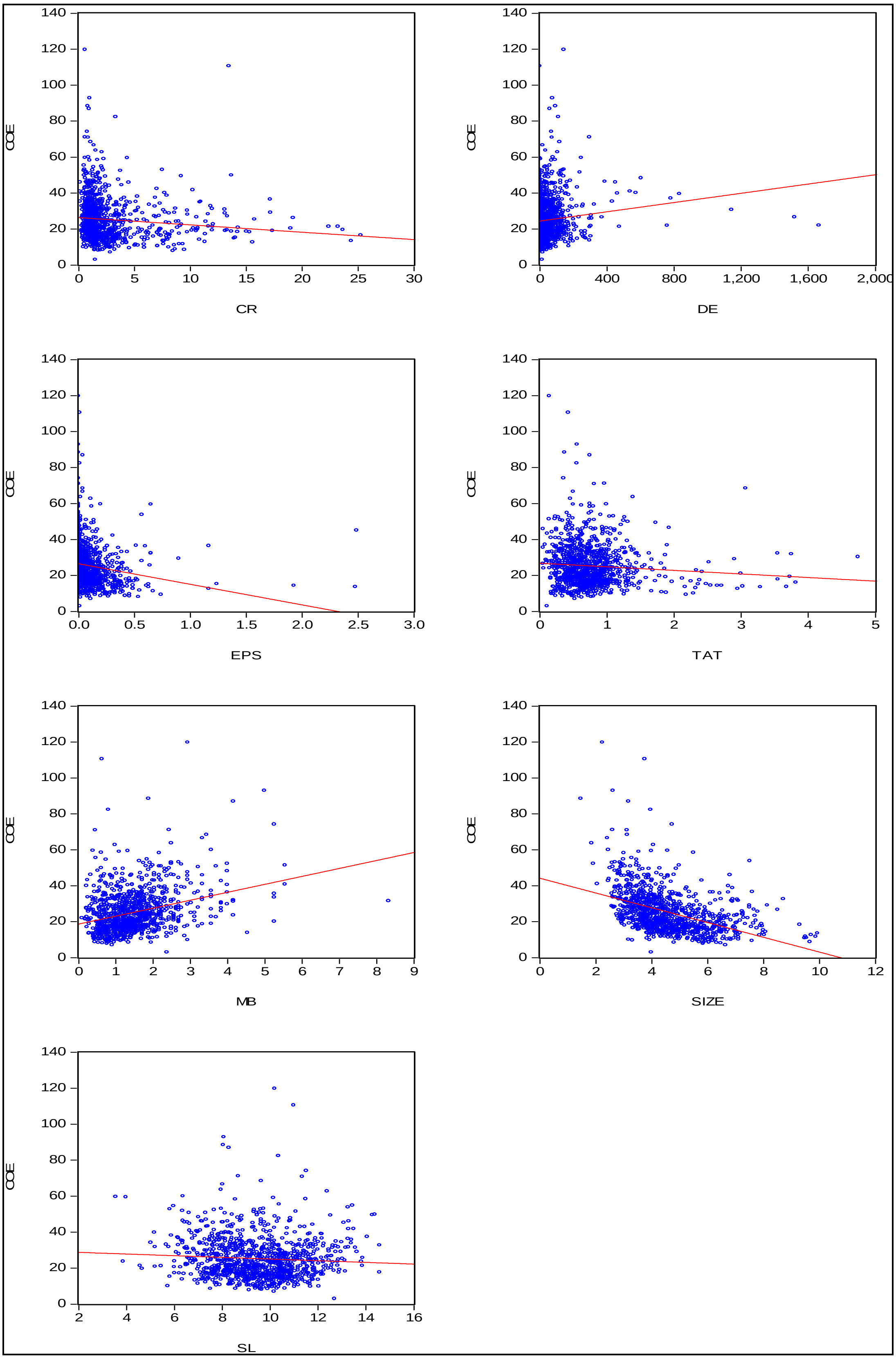

Figure 5.4 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Industrial Products Sector

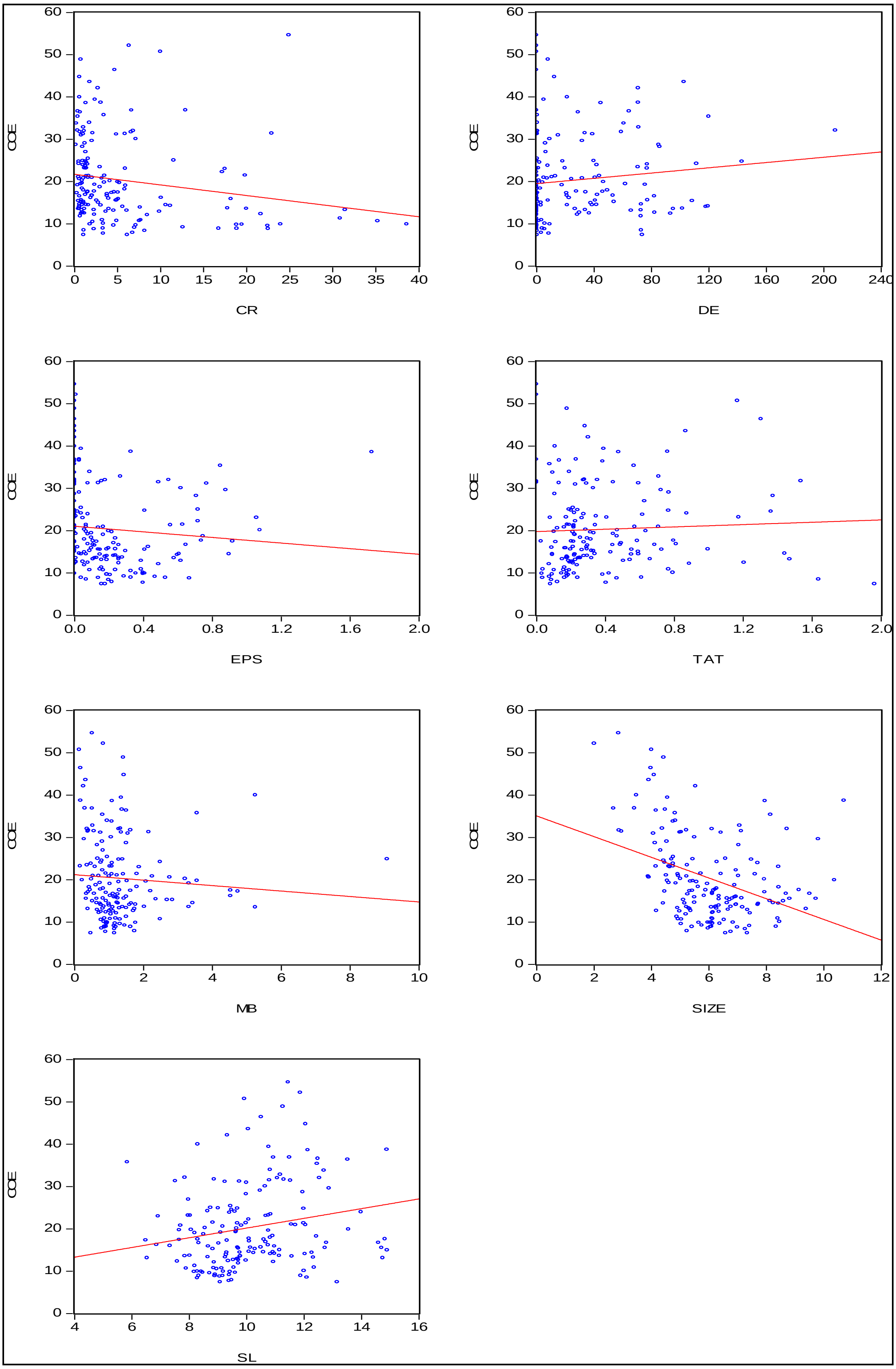

Figure 5.5 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Plantation Sector

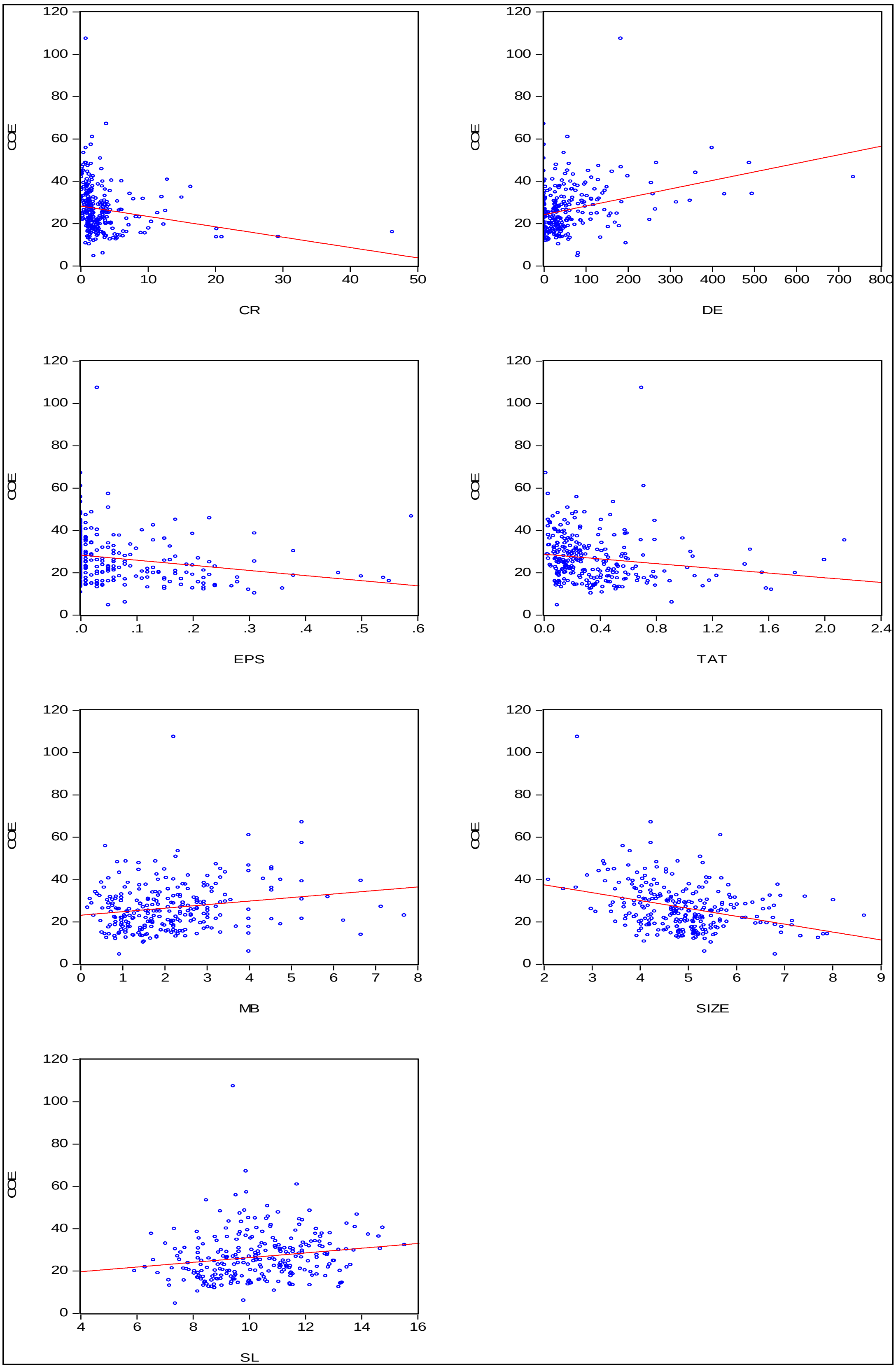

Figure 5.6 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Properties Sector

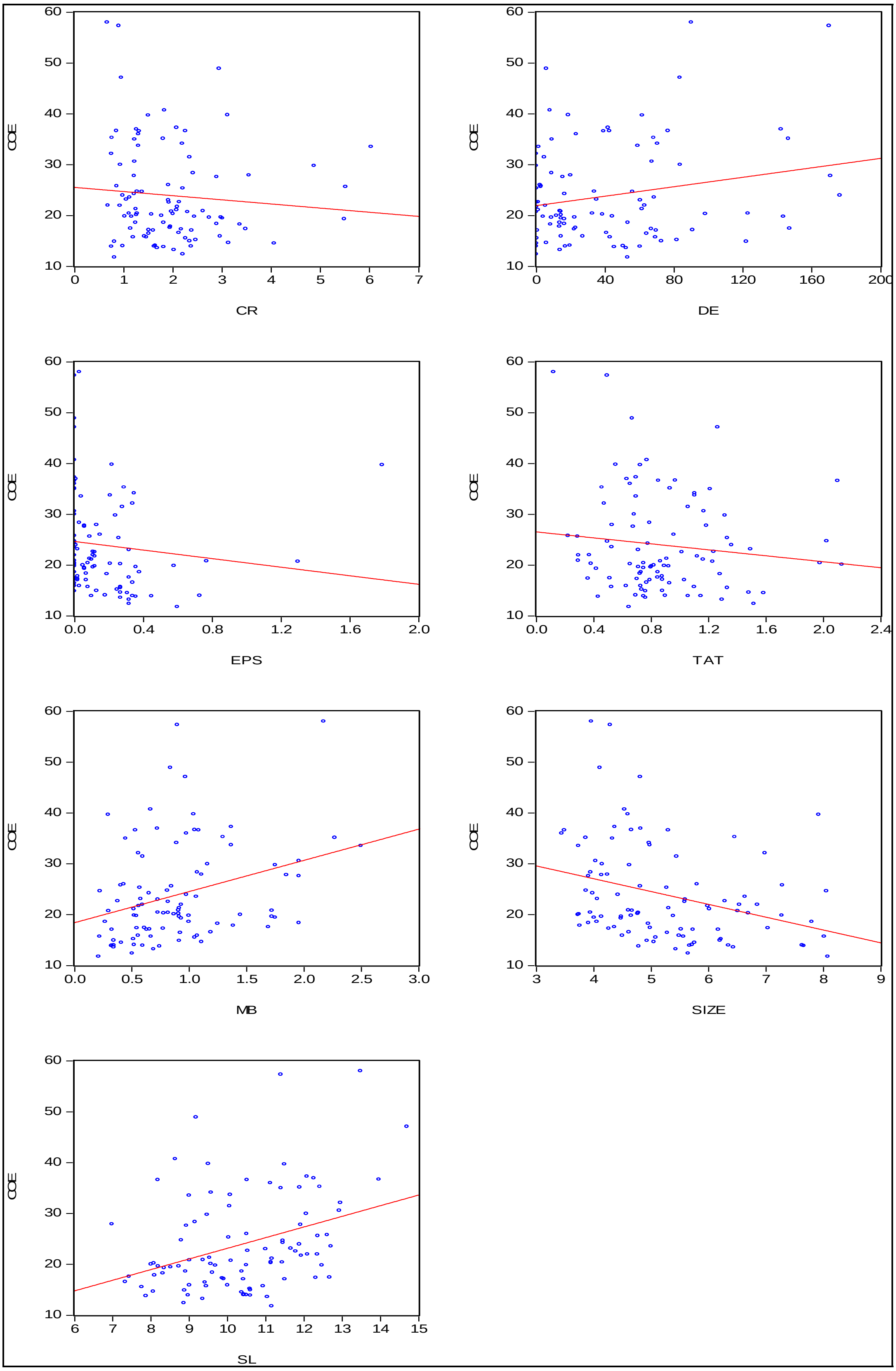

Figure 5.7 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Technology Sector

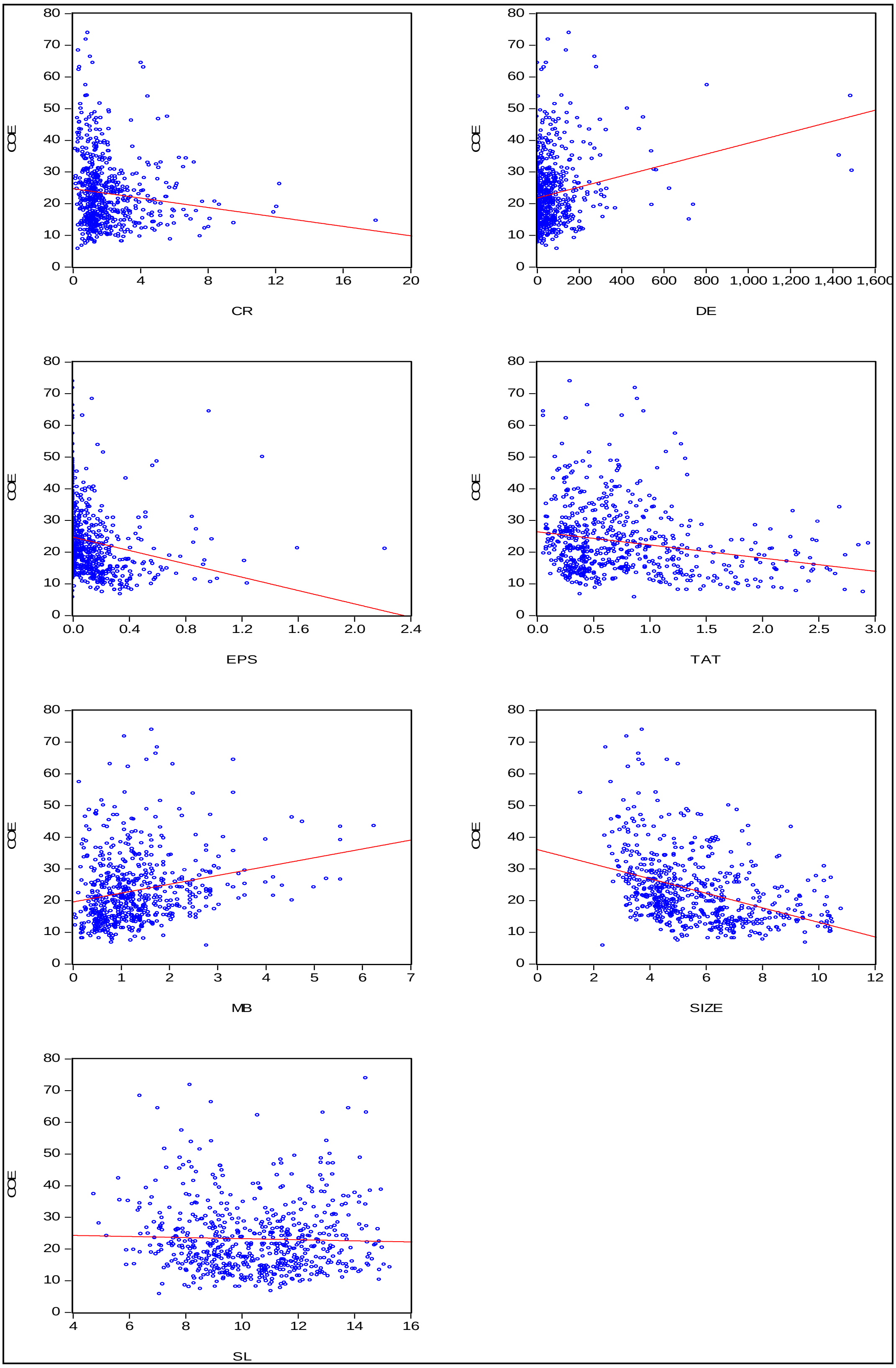

Figure 5.8 Scatter Plots (with trend line) of Pooled Determinant Series and Cost of Equity for Trading/Services Sector

5.4 Unit Root Properties of the Pooled Series for Full Sample and Across Industries

The stationary properties of all the variables need to be established before the panel regression models can be estimated. We conducted four unit root tests with two different model settings, namely, model with intercept only, and model with intercept and trend. All the four tests have a null hypothesis of a unit root. The unit root test of Levin *et al.* (2002) is based on a common unit root in the cross-section units. The tests of Im *et al.* (2003) together with ADF-Fisher and PP-Fisher tests which are proposed by Maddala and Wu (1999) and Choi (2001) respectively, allow each cross-section units to have a varying unit root process.

Table 5.10 reports the unit root test results for the full sample. The results for the models with intercept only are reported in panel A, while the results for the models with intercept and trend are reported in panel B. For most part, the results indicate no unit root process. In panel A for models with intercept, all four tests consistently reject the null hypothesis of unit root except for one case, that is, the unit root test of Im *et al.* (2003) on SIZE. In panel B for models with intercept and trend, again the unit root test of Im *et al.* (2003) fails to reject the null hypothesis of individual unit root in four cases (CR, TAT and SIZE), while the ADF Fisher test do not reject the null hypothesis of individual unit root for DE and TAT. Taking into consideration all the results of the different settings, we can conclude that each of these panel series are stationary at level, implying they are all I(0) series in general.

Table 5.11 to Table 5.17 report the unit root test results for the seven sectors. Overall, the unit root tests show a relatively weaker result against unit root as compared to the full sample. In panel B of most of the tables, the unit root tests of Im *et al.* (2003) and

ADF Fisher fail to reject the null hypothesis of individual unit root for many variables. This is true for all sectors, except for Consumer Products and Industrial Products, to a lesser extent. For the common unit root test of Levin *et al.* (2002) with the model with intercept only, almost all of the sectoral panel series are found to be stationary. A few exceptions include EPS and SIZE in Table 5.14 for the Plantation sector, MB in Table 5.15 for the Properties sector and COE in Table 5.16 for the Technology sector. However, these panel series are all shown to be stationary when the model with intercept and trend is used. For the individual unit root tests, on all the variables across all the seven sectors, at least one of the tests rejected the null hypothesis of individual unit root. The only exception is the Plantation sector, where EPS and SIZE do not show evidence of stationarity under the individual unit root tests. However, both the series still show stationary property under at least one common unit root test setting. All in all, we can still conclude that the panel series of each of the sectors is stationary at level, and they can be treated as I(0) series. The results allow for the use of variables in level for the panel regression analysis at the sectoral level.

Table 5.10: Unit Root Tests for Pooled Series for Full Sample

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	-31.1745	-53.9969	-463.6670	-484.6880	-218.8140	-12.8065	-15.2534	-33.4216
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null: Individual Unit Root								
Im, Pesaran and Shin	-10.2917	-7.8300	-52.5862	-27.4722	-8.9582	-2.6490	0.2263	-11.2711
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0040)***	(0.5895)	(0.0000)***
ADF - Fisher	1373.6900	1127.8100	1150.3400	1068.0200	912.7040	989.3950	812.3490	1350.9800
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0039)***	(0.0000)***
PP - Fisher	1819.8200	1111.0900	1099.7400	1242.9600	880.4520	1183.7800	940.7060	1894.9400
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-56.5789	-50.1411	-1167.5600	-498.4320	-34.0974	-53.2909	-39.1393	-51.5855
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	-4.0933	-0.7085	-26.4178	-11.0797	1.1788	-2.8383	-0.9284	-5.0849
	(0.0000)***	(0.2393)	(0.0000)***	(0.0000)***	(0.8808)	(0.0023)***	(0.1766)	(0.0000)***
ADF - Fisher Chi-square	1197.0500	836.4570	718.8580	950.7870	696.1300	1030.7700	877.2740	1246.7800
	(0.0000)***	(0.0006)***	(0.1344)	(0.0000)***	(0.6177)	(0.0000)***	(0.0000)***	(0.0000)***
PP - Fisher Chi-square	2357.3700	1395.5100	1165.8600	1555.7300	1168.4200	1832.8800	1577.6000	2304.7000
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

Table 5.11: Unit Root Tests for Pooled Series for Construction Sector

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	-6.2561	-14.8385	-23.3571	-3.3447	-7.4634	-8.3495	-4.7035	-7.5058
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0004)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null: Individual Unit Root								
Im, Pesaran and Shin	-0.7311	-3.5334	-6.5753	0.6100	-1.7950	-2.5306	-0.4117	-2.2370
	(0.2324)	(0.0002)***	(0.0000)***	(0.7291)	(0.0363)**	(0.0057)***	(0.3403)	(0.0126)**
ADF - Fisher	75.8696	111.7700	145.6680	66.7684	79.7011	95.5607	64.8920	89.2926
	(0.0397)**	(0.0000)***	(0.0000)***	(0.0816)*	(0.0204)**	(0.0008)***	(0.1944)	(0.0031)***
PP - Fisher	98.9221	116.5580	121.2230	86.9254	80.9642	104.6120	82.5811	130.6820
	(0.0004)***	(0.0000)***	(0.0000)***	(0.0017)***	(0.0162)**	(0.0001)***	(0.0120)**	(0.0000)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-11.2871	-9.3923	-15.6338	-6.7790	-8.3395	-16.0279	-12.9939	-16.5877
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	0.3248	0.1820	-0.1235	0.9981	0.5699	-1.0489	-0.8189	-1.8901
	(0.6273)	(0.5722)	(0.4509)	(0.8409)	(0.7156)	(0.1471)	(0.2064)	(0.0294)**
ADF - Fisher Chi-square	61.2293	58.9758	67.6020	45.3321	46.3636	86.5592	81.2792	111.1270
	(0.2939)	(0.3673)	(0.1377)	(0.7934)	(0.8172)	(0.0055)***	(0.0153)**	(0.0000)***
PP - Fisher Chi-square	121.1440	111.0160	112.4030	68.3196	63.2357	154.2310	148.9380	208.0840
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0909)*	(0.2362)	(0.0000)***	(0.0000)***	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

Table 5.12: Unit Root Tests for Pooled Series for Consumer Products Sector

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	-22.4708	-10.0597	-276.8540	-8.9691	-12.7777	-3.7529	-1.7850	-13.8513
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0001)***	(0.0371)**	(0.0000)***
Null: Individual Unit Root								
Im, Pesaran and Shin	-7.4209	-1.4500	-33.9116	-1.7656	-0.3714	-0.3734	2.0953	-4.2389
	(0.0000)***	(0.0735)*	(0.0000)***	(0.0387)**	(0.3552)	(0.3544)	(0.9819)	(0.0000)***
ADF - Fisher	269.9310	148.7170	150.8810	166.8490	115.9000	135.7300	86.3082	200.3830
	(0.0000)***	(0.0057)***	(0.0002)***	(0.0000)***	(0.2843)	(0.0367)**	(0.9385)	(0.0000)***
PP - Fisher	329.3030	151.3440	161.4940	213.8860	86.6124	171.4480	110.5690	269.6120
	(0.0000)***	(0.0038)***	(0.0000)***	(0.0000)***	(0.9355)	(0.0001)***	(0.4134)	(0.0000)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-28.5530	-30.6896	-278.2320	-16.8518	-14.3674	-16.3588	-15.5850	-23.0742
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	-3.3066	-1.3133	-12.2184	-1.1623	0.3119	-0.8649	-0.2298	-2.3627
	(0.0005)***	(0.0945)*	(0.0000)***	(0.1226)	(0.6224)	(0.1935)	(0.4091)	(0.0091)***
ADF - Fisher Chi-square	236.3060	148.5500	110.5620	161.2470	111.0640	152.3610	125.9750	202.2330
	(0.0000)***	(0.0059)***	(0.1817)	(0.0003)***	(0.4006)	(0.0032)***	(0.1139)	(0.0000)***
PP - Fisher Chi-square	434.5420	261.9070	177.6930	316.2250	188.8370	263.2050	218.4250	356.4590
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

Table 5.13: Unit Root Tests for Pooled Series for Industrial Products Sector

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	-17.7461	-48.6274	-113.0390	-59.4871	-10.0385	-15.2898	-15.4287	-25.4949
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null: Individual Unit Root								
Im, Pesaran and Shin	-6.5663	-7.0789	-17.9682	-8.2754	0.6667	-2.9136	-2.3648	-9.9324
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.7475)	(0.0018)***	(0.0090)***	(0.0000)***
ADF - Fisher	525.2160	419.2670	432.4230	420.3480	306.2650	375.6420	351.3770	586.4150
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0210)**	(0.0000)***	(0.0001)***	(0.0000)***
PP - Fisher	691.0720	408.2650	410.3950	509.2860	297.1360	382.0590	392.1050	786.7120
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0473)**	(0.0000)***	(0.0000)***	(0.0000)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-34.2713	-23.0874	-28.0486	-56.2081	-16.0930	-27.3046	-25.3687	-27.6059
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	-3.0969	-0.2008	0.3741	-2.7423	1.1149	-1.4020	-0.8669	-2.9391
	(0.0010)***	(0.4204)	(0.6458)	(0.0031)***	(0.8675)	(0.0805)*	(0.1930)	(0.0016)***
ADF - Fisher Chi-square	472.4190	304.9790	263.3000	393.8740	228.6710	365.4810	334.2860	459.3910
	(0.0000)***	(0.0237)**	(0.2410)	(0.0000)***	(0.9056)	(0.0000)***	(0.0010)***	(0.0000)***
PP - Fisher Chi-square	946.7320	483.5690	442.1920	648.2530	422.1660	661.9410	603.6640	870.6960
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

Table 5.14: Unit Root Tests for Pooled Series for Plantation Sector

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	-4.7422	-7.1595	-1.7931	4.2206	-240.5420	-2.2708	4.8584	-4.8853
	(0.0000)***	(0.0000)***	(0.0365)**	(1.0000)	(0.0000)***	(0.0116)**	(1.0000)	(0.0000)***
Null: Individual Unit Root								
Im, Pesaran and Shin	-0.2075	-1.9218	-0.6815	3.7683	-30.1098	0.9804	6.3664	-0.6262
	(0.4178)	(0.0273)**	(0.2478)	(0.9999)	(0.0000)***	(0.8366)	(1.0000)	(0.2656)
ADF - Fisher	54.5273	77.8146	46.0327	28.6622	61.4828	37.0576	10.2580	55.9560
	(0.0931)*	(0.0006)***	(0.0816)*	(0.9092)	(0.0265)**	(0.6874)	(1.0000)	(0.0733)*
PP - Fisher	69.0174	63.1018	43.5101	26.6037	44.4090	74.3919	7.4274	80.9049
	(0.0054)***	(0.0192)**	(0.1272)	(0.9485)	(0.3705)	(0.0015)***	(1.0000)	(0.0003)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-6.5441	-5.4735	-22.3956	-4.6919	-9.2320	-34.1729	-3.9558	-11.9014
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	1.0302	0.8247	-0.7573	0.8439	0.2708	-3.4871	1.1609	-1.1857
	(0.8486)	(0.7952)	(0.2245)	(0.8006)	(0.6067)	(0.0002)***	(0.8772)	(0.1179)
ADF - Fisher Chi-square	33.1506	35.6759	41.9764	33.4258	36.7115	95.7305	23.7424	72.4602
	(0.8337)	(0.7435)	(0.1635)	(0.7593)	(0.7018)	(0.0000)***	(0.9896)	(0.0024)***
PP - Fisher Chi-square	79.7564	62.4563	60.9976	47.7202	49.8571	145.8450	32.2782	139.1960
	(0.0004)***	(0.0218)**	(0.0030)***	(0.1876)	(0.1892)	(0.0000)***	(0.8603)	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

Table 5.15: Unit Root Tests for Pooled Series for Properties Sector

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	-6.7062	-9.5800	-525.6130	-21.3213	-7.7687	0.6704	-5.9237	-7.9410
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.7487)	(0.0000)***	(0.0000)***
Null: Individual Unit Root								
Im, Pesaran and Shin	-2.4398	-2.3098	-78.7850	-3.2059	-2.9297	-2.0663	-1.0193	-1.8111
	(0.0073)***	(0.0104)**	(0.0000)***	(0.0007)***	(0.0017)***	(0.0194)**	(0.1540)	(0.0351)**
ADF - Fisher	114.2870	106.3270	95.3277	88.6036	118.2770	123.9550	85.1292	109.7770
	(0.0002)***	(0.0012)***	(0.0067)***	(0.0036)***	(0.0001)***	(0.0000)***	(0.0566)*	(0.0006)***
PP - Fisher	138.8810	112.9110	66.7940	97.5926	109.2080	161.5990	103.7430	160.7950
	(0.0000)***	(0.0003)***	(0.3812)	(0.0005)***	(0.0007)***	(0.0000)***	(0.0021)***	(0.0000)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-11.9742	-12.6440	-1345.2100	-23.4613	-8.6831	-12.9368	-12.7809	-19.4491
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	-0.3761	-0.3185	-69.2221	-0.5438	0.6039	-0.5872	-1.0154	-1.7368
	(0.3534)	(0.3751)	(0.0000)***	(0.2933)	(0.7271)	(0.2785)	(0.1549)	(0.0412)**
ADF - Fisher Chi-square	91.8590	81.2263	38.0576	81.8791	59.6551	90.6847	97.0836	117.8400
	(0.0194)**	(0.0981)*	(0.9977)	(0.0654)*	(0.6958)	(0.0236)**	(0.0076)***	(0.0001)***
PP - Fisher Chi-square	183.5840	147.4830	54.1929	133.2540	110.0480	170.4000	175.6930	210.5130
	(0.0000)***	(0.0000)***	(0.8502)	(0.0000)***	(0.0005)***	(0.0000)***	(0.0000)***	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

Table 5.16: Unit Root Tests for Pooled Series for Technology Sector

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	2.0473	-6.9433	-5.5993	-565.5250	-2.9824	-4.9366	-2.1725	-2.3932
	(0.9797)	(0.0000)***	(0.0000)***	(0.0000)***	(0.0014)***	(0.0000)***	(0.0149)**	(0.0084)***
Null: Individual Unit Root								
Im, Pesaran and Shin	0.1656	-1.2462	-1.7803	-110.2000	-0.1889	-1.0043	0.7256	-0.2130
	(0.5658)	(0.1063)	(0.0375)**	(0.0000)***	(0.4251)	(0.1576)	(0.7659)	(0.4157)
ADF - Fisher	38.0715	33.9727	40.1097	85.5668	23.6976	37.1708	21.7594	27.2585
	(0.0341)**	(0.0852)*	(0.0208)**	(0.0000)***	(0.4790)	(0.0421)**	(0.5936)	(0.2925)
PP - Fisher	51.0167	30.1742	40.0691	72.8255	16.8490	41.8705	17.8093	45.5317
	(0.0010)***	(0.1790)	(0.0210)**	(0.0000)***	(0.8550)	(0.0133)**	(0.8122)	(0.0050)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-5.0750	-8.3209	-6.9724	-534.9740	-8.3384	-11.4233	-6.1655	-11.6746
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	0.2470	0.0413	-0.0236	-46.9221	-0.4358	-0.6164	-0.0164	-0.9354
	(0.5976)	(0.5165)	(0.4906)	(0.0000)***	(0.3315)	(0.2688)	(0.4934)	(0.1748)
ADF - Fisher Chi-square	25.2749	25.5138	26.1205	67.0439	35.8157	38.8223	29.5690	38.7816
	(0.3909)	(0.3783)	(0.3471)	(0.0000)***	(0.0572)*	(0.0285)**	(0.1995)	(0.0288)**
PP - Fisher Chi-square	53.9122	33.4697	41.4000	81.8802	61.9262	72.7201	57.2349	46.9336
	(0.0004	(0.0945)*	(0.0150)**	(0.0000)***	(0.0000)***	(0.0000)***	(0.0002)***	(0.0034)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

Table 5.17: Unit Root Tests for Pooled Series for Trading/Services Sector

Unit Root Test	COE	CR	DE	EPS	TAT	MB	SIZE	SL
Panel A: Model with Intercept								
Null: Common Unit Root								
Levin, Lin & Chu	-15.4835	-12.3475	-23.3716	-17.3765	-7.3462	-7.0819	-12.5061	-13.2980
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null: Individual Unit Root								
Im, Pesaran and Shin	-5.2896	-1.3031	-4.5249	-1.6458	-0.8259	-1.0748	-0.9255	-4.8406
	(0.0000)***	(0.0963)*	(0.0000)***	(0.0499)**	(0.2044)	(0.1412)	(0.1774)	(0.0000)***
ADF - Fisher	295.7900	229.9420	239.8980	211.2260	207.3800	211.4370	192.6250	281.8960
	(0.0000)***	(0.0001)***	(0.0000)***	(0.0002)***	(0.0027)***	(0.0015)***	(0.0189)**	(0.0000)***
PP - Fisher	441.6040	228.7370	256.2500	235.8380	245.2730	276.4040	226.4710	420.7030
	(0.0000)***	(0.0001)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0001)***	(0.0000)***
Panel B: Model with Intercept and Trends								
Null: Common Unit Root								
Levin, Lin & Chu	-31.7905	-27.7089	-29.4526	-49.8247	-20.0002	-19.9590	-17.4976	-22.5420
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***
Null : Individual Unit Root								
Im, Pesaran and Shin W-stat	-2.5842	-0.5076	-0.4052	-1.0970	0.1148	-1.1626	-0.1173	-1.8548
	(0.0049)***	(0.3059)	(0.3427)	(0.1363)	(0.5457)	(0.1225)	(0.4533)	(0.0318)**
ADF - Fisher Chi-square	276.8080	181.5360	171.2390	167.9850	177.8490	224.2290	185.3380	244.9420
	(0.0000)***	(0.0640)*	(0.1361)	(0.1497)	(0.0914)*	(0.0002)***	(0.0432)**	(0.0000)***
PP - Fisher Chi-square	537.7020	295.6070	276.9840	260.0770	272.3540	406.0150	341.3720	472.8230
	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. For unit root tests that involve regressions on lagged difference terms (Levin, Lin and Chu; Im, Pesaran and Shin; and Fisher-ADF), the optimal lag length included in all the test equations is selected based on Schwarz information criterion. For the tests involving kernel weighting (Levin, Lin and Chu, and Fisher-PP), the Bartlett kernel is employed with Newey-West (Newey and West, 1987) selected bandwidth. Probabilities for the Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality. See Table 5.1 for definition of variables.

5.5 Estimates for Static Panel Regression Models

The three estimated static panel regression models (pooled, fixed-effect and random-effect) are reported in Table 5.18 for the full sample. The results for the different sectors are given in Table 5.19 to Table 5.25. For the full sample static panel regression, the sign of the coefficients estimated from all three static models are highly consistent. Most of the estimated coefficients from the three models are quite close in value. Both R^2 and adjusted R^2 suggest that all the static models have reasonably good explanatory power on the cost of equity of Malaysian firms, but the fixed-effect models has the strongest explanatory power among the trio. Based on adjusted R^2, the fixed-effect model explains about 59 percent of the variation of the cost of equity. The pooled and random-effect models only manage to produce an adjusted R^2 value of 27 percent and 18 percent, respectively.

The model selection tests show that the fixed-effect specification is the better model as compared to the simple pooled regression model and random-effect model. First, the test for redundant fixed effect rejects the null hypothesis suggesting the need of fixed effect over a simple pooled regression. Then, the Breusch-Pagan LM test also rejects the null hypothesis and shows that the random-effect model is also preferred over the pooled model. Finally, the Hausman test that compares fixed-effect against random-effect model rejects the null hypothesis of random effect model, suggesting that the fixed-effect specification is preferred.

Table 5.18: Estimates of the Static Panel Models for Full Sample

Variable	Pooled		**Fixed**		Random	
C	30.1458	(0.0000)***	33.1146	(0.0000)***	30.4557	(0.0000)***
CR	-0.2869	(0.0000)***	-0.1186	(0.1221)	-0.1930	(0.0012)***
DE	0.0102	(0.0000)***	0.0058	(0.0068)***	0.0084	(0.0000)***
EPS	4.7283	(0.0000)***	2.6426	(0.0092)***	2.0555	(0.0201)**
TAT	-2.9863	(0.0000)***	-2.0697	(0.0030)***	-2.7634	(0.0000)***
MB	0.7945	(0.0002)***	0.4292	(0.1740)	0.3467	(0.1196)
SIZE	-4.1657	(0.0000)***	-3.7520	(0.0000)***	-3.9895	(0.0000)***
SL	1.5777	(0.0000)***	1.0622	(0.0000)***	1.5279	(0.0000)***
No. of Firms	354		354		354	
No. of Observations	2832		2832		2832	
R^2	0.2754		0.6429		0.1859	
Adjusted R^2	0.2736		0.5897		0.1839	
Diagnostic Test						
Redundant Fixed Effects Test			7.0447	(0.0000)***		
Breusch and Pagan Lagrangian Multiplier Test					449.9300	(0.0000)***
Hausman Test for Random Effect					24.97261	(0.0008)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

The estimates of the three static panel models for the full sample show that five of the determinant variables are statistically significant at 1% level in the fixed-effect model, while all determinant variables are found to be statistically significant at the 1% level for the pooled model. As for the random-effect model, six statistically significant determinant variables are found including EPS which is significant at the 5% level.

The five coefficients that are statistically significant based on robust standard errors in the fixed-effect model are DE, EPS, TAT, SIZE and SL. Their signs are consistent with those of their correlation with COE in Table 5.2, except for SL where an opposite sign is found. At this point, we shall not draw any conclusion on whether these are the significant determinants for the cost of equity of Malaysian firms. Instead we examine further the results from sectoral based estimations in Table 5.19 to Table 5.25 to obtain a more robust conclusion on the significance of the determinants using the static panel regressions.

The results reported by sector in Table 5.19 to Table 5.25 show some variations in the panel estimation, where the number of significant determinants varies from sector to sector, as well as the magnitude of the significant coefficients. In addition, the best model selected for each sector is also different. However, the fixed-effect model has consistently been able to explain 50 percent to 70 percent of the variation in cost of equity while the other two panel models, that is, the pooled and random-effect models explain less than 40 percent as indicated by the value of R^2 and adjusted R^2. The results of the model selection tests are split between random effect and fixed-effect models. For four sectors, namely, Construction, Consumer Products, Properties and Trading/Services, random effect model is suggested by the model selection tests. On the other hand, fixed-effect model emerges to provide better specification for the Industrial Products sector, the Plantation sector and the Technology sector.

For the three sectors with the fixed-effect model, EPS is statistically significant at the 5% level and SIZE is statistically significant at 1% level for the Industrial Products sector. For the Plantation sector, CR and TAT, are statistically significant at the 10% level. The variables SIZE and SL for the Technology sector are statistically significant at the 5% level and 1% level, respectively. Among the significant variables, the sign for TAT and SL are not according to expectation. This finding will be discussed again in the later part of this chapter.

For the other four sectors where the random effect model is selected, the determinant variables that are statistically significant vary according to sectors. The Construction sector has three significant determinants, that is, TAT, SIZE and SL. SIZE is significant at the 1% level while TAT and SL are significant at the 10% level. The Consumer Products sector has four significant determinants and they are DE, TAT, SIZE and SL. Among them, SIZE and SL are significant at the 1% level, DE is significant at the 5% level and TAT is significant at the 10% level. Four significant determinants, namely CR, DE, SIZE and SL, are found for the Properties sector. SIZE, SL and CR are significant at the 1% level, while DE is significant at the 5% level. The Trading/Services sector has five significant determinants (CR, DE, TAT, SIZE and SL). Except for CR which is significant at the 10% level, the rest are significant at the 1% level. All of the statistically significant coefficients have consistent sign across sector and the signs are according to expectation with the exception of SL.

Table 5.19: Estimates of the Static Panel Models for Firms in Construction Sector

Variable	Pooled		Fixed		**Random**	
C	39.8348	(0.0000)***	29.2293	(0.0170)**	38.6637	(0.0000)***
CR	-0.0906	(0.7372)	0.0431	(0.8549)	0.0553	(0.8022)
DE	0.0069	(0.4163)	-0.0015	(0.8929)	0.0023	(0.7859)
EPS	6.7368	(0.2000)	-6.3145	(0.1972)	-4.1655	(0.3587)
TAT	-5.6310	(0.0505)*	-4.6482	(0.1223)	-4.7433	(0.0693)*
MB	-0.8370	(0.3069)	0.9962	(0.4710)	-0.5676	(0.5142)
SIZE	-5.0041	(0.0000)***	-1.8013	(0.3414)	-4.0313	(0.0000)***
SL	1.4138	(0.0089)***	0.6946	(0.3044)	1.0769	(0.0545)*
No. of Firms	28		28		28	
No. of Observations	224		224		224	
R^2	0.1795		0.6084		0.1274	
Adjusted R^2	0.1529		0.5202		0.0991	
Diagnostic Tests						
Redundant Fixed Effects Test			5.8639	(0.0000)***		
Breusch and Pagan Lagrangian Multiplier Test					20.2500	(0.0000)***
Hausman Test for Random Effects					8.3214	(0.3051)

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

Table 5.20: Estimates of the Static Panel Models for Consumer Products Sector

Variable	Pooled		Fixed		**Random**	
C	31.3504	(0.0000)***	40.9345	(0.0000)***	31.4557	(0.0000)***
CR	-0.4856	(0.0170)**	-0.0608	(0.8650)	-0.2420	(0.3221)
DE	0.0062	(0.4782)	0.0337	(0.0086)***	0.0223	(0.0225)**
EPS	3.4350	(0.0197)**	1.6590	(0.4316)	2.0141	(0.2224)
TAT	-2.5669	(0.0197)**	-1.3131	(0.5458)	-2.4633	(0.0742)*
MB	0.8634	(0.1716)	-1.2979	(0.1238)	-0.1337	(0.8375)
SIZE	-3.8490	(0.0000)***	-5.3945	(0.0000)***	-4.0111	(0.0000)***
SL	1.2389	(0.0002)***	1.0303	(0.0393)**	1.3333	(0.0006)***
No. of Firms	54		54		54	
No. of Observations	432		432		432	
R^2	0.3460		0.6747		0.2143	
Adjusted^2	0.3352		0.6148		0.2013	
Diagnostic Tests						
Redundant Fixed Effects Test			6.1315	(0.0000)***		
Breusch and Pagan Lagrangian Multiplier Test					67.2300	(0.0000)***
Hausman Test for Random Effects					10.1545	(0.1800)

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

Table 5.21: Estimates of the Static Panel Models for Industrial Products Sector

Variable	Pooled		**Fixed**		Random	
C	33.6229	(0.0000)***	47.5649	(0.0000)***	37.2531	(0.0000)***
CR	-0.2145	(0.0492)**	-0.0958	(0.5573)	-0.1991	(0.1077)
DE	0.0079	(0.0122)**	-0.0026	(0.4975)	0.0022	(0.4965)
EPS	5.2479	(0.0122)**	4.9596	(0.0143)**	2.9756	(0.1114)
TAT	-1.4934	(0.0339)**	-1.3499	(0.2758)	-1.5134	(0.0743)*
MB	2.1081	(0.0000)***	0.4062	(0.5363)	1.0397	(0.0255)**
SIZE	-4.3717	(0.0000)***	-5.6267	(0.0000)***	-4.5135	(0.0000)***
SL	0.9825	(0.0000)***	0.4171	(0.1979)	0.8977	(0.0004)***
No. of Firms	129		129		129	
No. of Observations	1032		1032		1032	
R^2	0.2447		0.6184		0.1504	
Adjusted^2	0.2395		0.5575		0.1446	
Diagnostic Tests						
Redundant Fixed Effects Test			6.4495	(0.0000)***		
Breusch and Pagan Lagrangian Multiplier Test					184.3400	(0.0000)***
Hausman Test for Random Effects					15.8575	(0.0265)**

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

Table 5.22: Estimates of the Static Panel Models for Plantation Sector

Variable	Pooled		**Fixed**		Random	
C	24.1576	(0.0000)***	11.1532	(0.2033)	19.1111	(0.0086)***
CR	-0.2288	(0.0265)**	0.1814	(0.0759)*	0.1573	(0.0957)*
DE	0.0101	(0.6051)	0.0228	(0.1913)	0.0210	(0.2017)
EPS	10.8737	(0.0001)***	3.2672	(0.1212)	3.2419	(0.1123)
TAT	-1.2660	(0.5403)	4.2477	(0.0657)*	5.3376	(0.0092)***
MB	-0.8236	(0.2042)	0.8645	(0.1572)	0.5023	(0.3732)
SIZE	-4.9686	(0.0000)***	0.7637	(0.5312)	-0.9593	(0.2859)
SL	2.6037	(0.0000)***	-0.0545	(0.9098)	0.2098	(0.6358)
No. of Firms	21		21		21	
No. of Observations	168		168		168	
R^2	0.3978		0.8746		0.0760	
Adjusted^2	0.3715		0.8426		0.0356	
Diagnostic Tests						
Redundant Fixed Effects Test			18.7315	(0.0000)***		
Hausman Test for Random Effects					12.8546	(0.0757)*
Breusch and Pagan Lagrangian Multiplier Test					45.2400	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

Table 5.23: Estimates of the Static Panel Models for Properties Sector

Variable	Pooled		Fixed		**Random**	
C	27.7262	(0.0000)***	29.5735	(0.0009)***	26.3983	(0.0000)***
CR	-0.2427	(0.0902)*	-0.2698	(0.0828)*	-0.2306	(0.0800)*
DE	0.0159	(0.0530)*	0.0117	(0.2093)	0.0163	(0.0369)**
EPS	-4.3301	(0.5134)	-2.2862	(0.7610)	-9.0842	(0.1551)
TAT	-2.6589	(0.1979)	-0.0026	(0.9991)	-0.5591	(0.7667)
MB	0.8643	(0.1111)	0.9677	(0.1890)	0.8854	(0.1030)
SIZE	-3.8830	(0.0000)***	-3.5355	(0.0083)***	-3.6451	(0.0000)***
SL	1.6690	(0.0001)***	1.2295	(0.0385)**	1.6306	(0.0002)***
No. of Firms	33.0000		33.0000		33.0000	
No. of Observations	264.0000		264.0000		264.0000	
R^2	0.2603		0.6597		0.2187	
Adjusted^2	0.2400		0.5875		0.1973	
Diagnostic Tests						
Redundant Fixed Effects Test			6.5305	(0.0000)***		
Hausman Test for Random Effects					6.4154	(0.4922)
Breusch and Pagan Lagrangian Multiplier Test					26.2800	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

Table 5.24: Estimates of the Static Panel Models for Technology Sector

Variable	Pooled		**Fixed**		Random	
C	18.7363	(0.0611)*	37.7276	(0.1214)	21.5809	(0.0301)**
CR	-0.5265	(0.5813)	0.7924	(0.4257)	0.3644	(0.6659)
DE	-0.0114	(0.6182)	0.0104	(0.7382)	0.0088	(0.6703)
EPS	8.4211	(0.0253)**	2.6090	(0.4542)	3.3589	(0.2858)
TAT	-4.4252	(0.0581)*	-2.0441	(0.5248)	-4.2440	(0.0424)**
MB	1.4446	(0.5416)	-6.2724	(0.1050)	-2.3502	(0.3275)
SIZE	-4.7485	(0.0001)***	-8.5940	(0.0109)**	-4.5408	(0.0001)***
SL	3.1659	(0.0000)***	3.5005	(0.0006)***	2.9308	(0.0000)***
No. of Firms	12		12		12	
No. of Observations	96		96		96	
R^2	0.3841		0.7005		0.3448	
Adjusted^2	0.3351		0.5936		0.2927	
Diagnostic Tests						
Redundant Fixed Effects Test			4.1086	(0.0000)***		
Hausman Test for Random Effects					5.0486	(0.6540)
Breusch and Pagan Lagrangian Multiplier Test					0.6300	(0.4272)

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

Table 5.25: Estimates of the Static Panel Models for Trading/Services Sector

Variable	Pooled		Fixed		**Random**	
C	30.7511	(0.0000)***	25.2342	(0.0000)***	29.8045	(0.0000)***
CR	-0.5321	(0.0143)**	-0.2296	(0.4073)	-0.3623	(0.0931)*
DE	0.0114	(0.0001)***	0.0107	(0.0002)***	0.0117	(0.0000)***
EPS	4.7842	(0.0171)**	2.5929	(0.1829)	2.4500	(0.1657)
TAT	-4.4753	(0.0000)***	-5.6036	(0.0001)***	-4.7343	(0.0000)***
MB	0.3683	(0.4249)	0.1232	(0.8550)	-0.1834	(0.6934)
SIZE	-3.7002	(0.0000)***	-2.9488	(0.0004)***	-3.6812	(0.0000)***
SL	1.5049	(0.0000)***	1.7186	(0.0000)***	1.6693	(0.0000)***
No. of Firms	77		77		77	
No. of Observations	616		616		616	
R^2	0.3153		0.6777		0.2620	
Adjusted^2	0.3074		0.6225		0.2535	
Diagnostic Tests						
Redundant Fixed Effects Test			7.1151	(0.0000)***		
Hausman Test for Random Effects					4.0668	(0.7721)
Breusch and Pagan Lagrangian Multiplier Test					84.4300	(0.0000)***

Notes: Figures in the parentheses are p-values. *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The p-value is based on panel robust standard errors. The random effect model is based on Wallace and Hussain (1969). Redundant Fixed Effects test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of fixed effect model. Breusch and Pagan LM test has the null hypothesis in favour of the pooled regression against the alternative hypothesis of random effect model. The Hausman test has the null hypothesis in favour of the random effect model against the alternative hypothesis of the fixed effect model. Details on these diagnostic tests are reported in Chapter 3, section 3.4.5.

5.6 Estimates for Dynamic Panel Regression Models

The estimates of the GMM models are reported in Table 5.26 to Table 5.33. Generally, the cost of equity panel model can fit into a dynamic setting if at least one of the lagged dependent variables, that is, the lagged cost of equity is significant. We find this is true for the full sample and the dynamic panel model for all the sectors. This suggests evidence of persistency in the cost of equity.

Since there are two model settings under the dynamic GMM method, a selection needs to be made. Three diagnostic tests, that is, Arellano and Bond (1991) autocorrelation tests of first order and second order, and the Sargan test were considered.[12] However, if both difference-GMM and system-GMM models passed all the three diagnostic tests, we shall refer to the results of the system-GMM that has superior finite sample properties, especially for the sub-sector analysis which involves a smaller number of firms (see Chapter 3, Section 3.4.4).

For the full sample estimates reported in Table 5.26, both the two dynamic panel specifications, that is, the difference-GMM and system-GMM models, passed the diagnostic tests on autocorrelation of order one and order two. We can reject the absence of first order serial correlation (m_1) but do not reject the absence of second order serial correlation (m_2), which is consistent with our expectation.[13] However, the Sargan test rejects the null hypothesis of no over-identification for both the models, implying over identification, and the estimates are not acceptable. Since both difference-GMM and system-GMM models are not acceptable, the fixed-effect model, selected as the best specification from the static models will be used for the full sample.

[12] Explanation on the three diagnostic tests can be found in Chapter 3, Section 3.4.5.

[13] As discussed in Chapter 3, Section 3.4.5, m_1 statistic should be significant but not m_2 (see also Arellano, 2003, p. 121).

The sectoral estimates are reported in Table 5.27 to Table 5.33. The diagnostic test results are first examined. The autocorrelation tests of order one and order two are performing according to expectation. In all the tables, the absence of first order serial correlation (m_1) is rejected while the absence of second order serial correlation (m_2) is not rejected. For each of the sectors, the Sargan test does not reject the null hypothesis that all the instruments used are uncorrelated with the error, implying that the estimates from both the difference-GMM and system-GMM are valid and acceptable. As both the difference-GMM and system-GMM passed all the three diagnostic tests, the estimates from the system-GMM model shall be referred to. There is, however, one more criterion to be fulfilled. If at least one of the lagged dependent variables in the system-GMM model is significant, concurring to the objective of modelling the dynamics of the cost of equity process, the estimated system-GMM model will be chosen. Otherwise, the best static model selected for each sector as reported in Section 5.5 will be used for reference.

Based on the aforementioned criterion, significant lagged dependent variable(s) has(have) been identified for four sectors, which are Construction, Consumer Products, Plantation and Properties. For these sectors, the system-GMM model is selected. On the other hand, no significant lagged dependent variable is found for the Industrial Products sector, the Technology sector and the Trading/Services sector. For these sectors, the best static model selected in Section 5.5 is the fixed-effect model for Industrial Products and Technology and the random effect model for Trading/Services.

Table 5.26: Estimates of the Dynamic Panel Models for Full Sample

Variable	Difference GMM			System GMM		
Intercept	28.0029	(0.0000)***	[0.0000]***	28.8581	(0.0000)***	[0.0000]***
Lag(1)	-0.0977	(0.0000)***	[0.0190]**	-0.0060	(0.4530)	[0.9110]
Lag(2)	-	-	-	0.0381	(0.0000)***	[0.3520]
CR	-0.0517	(0.0140)**	[0.5790]	-0.1899	(0.0000)***	[0.0890]*
DE	0.0007	(0.0630)*	[0.8630]	0.0048	(0.0000)***	[0.3330]
EPS	0.6973	(0.0550)*	[0.5720]	1.7490	(0.0000)***	[0.1390]
TAT	-1.9739	(0.0000)***	[0.1380]	-3.9317	(0.0000)***	[0.0000]***
MB	0.6667	(0.0000)***	[0.2310]	0.3070	(0.0110)**	[0.6460]
SIZE	-2.1976	(0.0000)***	[0.0280]**	-4.7975	(0.0000)***	[0.0000]***
SL	0.6656	(0.0000)***	[0.0340]**	1.7424	(0.0000)***	[0.0000]***
No. of firms	354			354		
No. of observations	2124			2124		
m_1	-5.2277		[0.0000]***	-5.5401		[0.0000]***
m_2	-1.5463		[0.1220]	-1.5650		[0.1176]
Sargan Test	243.8745	(0.0493)**		281.7733	(0.0366)**	

Notes: Lag(1) and Lag(2) are the lags of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

Table 5.27: Estimates of the Dynamic Panel Models for Construction Sector

Variable	Difference GMM			**System GMM**		
Intercept	32.9499	(0.0000)***	[0.0420]**	27.4402	(0.0580)*	[0.4200]
Lag(1)	-0.0519	(0.1370)	[0.4890]	0.6568	(0.0000)***	[0.0010]***
Lag(2)	-	-	-	0.5142	(0.0000)***	[0.0250]**
CR	0.1138	(0.0120)**	[0.2700]	0.4515	(0.0000)***	[0.0000]***
DE	-0.0133	(0.2370)	[0.4090]	-0.0340	(0.0030)***	[0.0810]*
EPS	-7.0918	(0.0200)**	[0.1530]	-11.1985	(0.0420)**	[0.2370]
TAT	-10.2262	(0.0000)***	[0.0070]***	-12.1568	(0.0000)***	[0.0200]**
MB	-0.3684	(0.5830)	[0.8480]	-2.8988	(0.0190)**	[0.3190]
SIZE	-3.7115	(0.0150)**	[0.1320]	-2.8633	(0.0260)**	[0.4610]
SL	1.4018	(0.0000)***	[0.0740]*	-0.1603	(0.8480)	[0.9260]
No. of firms	28			28		
No. of observations	168			168		
m_1	-1.6484		[0.0993]*	-1.8925		[0.0584]*
m_2	0.4463		[0.6554]	-0.9770		[0.3286]
Sargan Test	10.2448	(0.4193)		11.8354	(0.2227)	

Notes: Lag(1) and Lag(2) are the lags of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

Table 5.28: Estimates of the Dynamic Panel Models for Consumer Products Sector

Variable	Difference GMM			**System GMM**		
Intercept	20.9205	(0.0000)***	[0.1750]	36.1235	(0.0000)***	[0.0010]***
Lag(1)	-0.2508	(0.0000)***	[0.0010]***	-0.1153	(0.0020)***	[0.0800]*
CR	-0.2669	(0.4050)	[0.5420]	-1.1013	(0.0510)*	[0.1460]
DE	0.0202	(0.0000)***	[0.1670]	0.0176	(0.1030)	[0.2510]
EPS	-1.0236	(0.3850)	[0.5820]	-1.1977	(0.3540)	[0.4730]
TAT	-2.1826	(0.1760)	[0.5290]	-2.7429	(0.2730)	[0.4460]
MB	0.6029	(0.3450)	[0.6660]	-0.2104	(0.8450)	[0.8850]
SIZE	-0.7780	(0.4410)	[0.7220]	-3.7746	(0.0000)***	[0.0040]***
SL	0.6518	(0.1610)	[0.5170]	0.8870	(0.1620)	[0.3530]
No. of firms	54			54		
No. of observations	324			378		
m_1	-1.7729		[0.0762]*	-2.0184		[0.0435]**
m_2	-1.3055		[0.1917]	-1.1014		[0.2707]
Sargan Test	24.1111	(0.2376)		16.2699	(0.1314)	

Notes: Lag(1) is the lag of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

Table 5.29: Estimates of the Dynamic Panel Models for Industrial Products Sector

Variable	Difference GMM			System GMM		
Intercept	27.4403	(0.0100)**	[0.0800]*	31.6497	(0.0000)***	[0.0000]***
Lag(1)	-0.2867	(0.0030)***	[0.0460]**	0.0216	(0.0890)*	[0.8620]
Lag(2)	-0.1423	(0.0090)***	[0.1090]	0.0456	(0.0010)***	[0.6070]
CR	0.0309	(0.9090)	[0.9360]	-0.0939	(0.2200)	[0.7930]
DE	-0.0054	(0.2890)	[0.4660]	-0.0058	(0.0000)***	[0.4990]
EPS	3.5013	(0.0640)*	[0.2030]	4.2260	(0.0000)***	[0.0900]*
TAT	-1.6167	(0.2800)	[0.4330]	-1.0334	(0.0070)***	[0.5120]
MB	2.9576	(0.0470)**	[0.1300]	0.6843	(0.0010)***	[0.5910]
SIZE	0.3781	(0.8320)	[0.8830]	-5.1194	(0.0000)***	[0.0000]***
SL	-0.1788	(0.6730)	[0.7640]	1.1843	(0.0000)***	[0.0490]**
No. of firms	129			129		
No. of observations	645			774		
m_1	-1.9872		[0.0469]**	-2.9907		[0.0028]***
m_2	-1.2433		[0.2137]	-1.5896		[0.1119]
Sargan Test	21.9113	(0.2359)		99.2719	(0.3351)	

Notes: Lag(1) and Lag(2) are the lags of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

Table 5.30: Estimates of the Dynamic Panel Models for Plantation Sector

Variable	Difference GMM			**System GMM**		
Intercept	10.6810	(0.2620)	[0.2090]	2.9020	(0.5550)	[0.6170]
Lag(1)	-0.0354	(0.6870)	[0.6990]	0.3894	(0.0000)***	[0.0120]**
Lag(2)	-	-	-	0.2760	(0.0000)***	[0.0200]**
CR	0.1446	(0.1440)	[0.2200]	-0.0294	(0.7200)	[0.8250]
DE	0.0114	(0.6820)	[0.7550]	-0.0115	(0.5130)	[0.7710]
EPS	1.2981	(0.5590)	[0.4820]	0.0420	(0.9820)	[0.9890]
TAT	4.2989	(0.0730)*	[0.0920]*	-0.7028	(0.6830)	[0.7270]
MB	0.3173	(0.7370)	[0.6990]	-0.5152	(0.4530)	[0.4690]
SIZE	1.3892	(0.3040)	[0.1350]	-1.0911	(0.0650)*	[0.0830]*
SI	-0.4576	(0.3530)	[0.3800]	0.6995	(0.0830)*	[0.1380]
No. of firms	21			21		
No. of observations	126			126		
m_1	-1.7697		[0.0768]*	-2.1617		[0.0306]**
m_2	-0.2332		[0.8156]	-1.2082		[0.2270]
Sargan Test	122.2729	(0.1484)		154.9717	(0.1677)	

Notes: Lag(1) and Lag(2) are the lags of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

Table 5.31: Estimates of the Dynamic Panel Models for Properties Sector

Variable	Difference GMM			**System GMM**		
Intercept	37.6854	(0.0030)***	[0.0080]***	3.3482	(0.8300)	[0.6940]
Lag(1)	-0.0807	(0.4230)	[0.4470]	0.2660	(0.0670)*	[0.0200]**
Lag(2)	0.0023	(0.9790)	[0.9910]	0.1697	(0.0850)*	[0.1960]
CR	-0.1948	(0.3070)	[0.0440]**	-0.0989	(0.6990)	[0.4570]
DE	-0.0038	(0.7350)	[0.7980]	0.0044	(0.7660)	[0.6400]
EPS	-2.1195	(0.8040)	[0.7340]	3.0842	(0.7950)	[0.6780]
TAT	-1.3146	(0.6880)	[0.6830]	8.9611	(0.0610)*	[0.0950]*
MB	0.8743	(0.3650)	[0.3590]	1.3508	(0.2500)	[0.3400]
SIZE	-5.0903	(0.0080)***	[0.0030]***	-0.1011	(0.9690)	[0.9500]
SL	1.2594	(0.1090)	[0.2840]	0.5243	(0.6460)	[0.6690]
No. of firms	33			33		
No. of observations	165			198		
m_1	-2.6089		[0.0091]***	-2.8026		[0.0051]***
m_2	-0.9837		[0.3253]	-1.5522		[0.1206]
Sargan Test	169.9952	(0.1041)		17.1946	(0.2460)	

Notes: Lag(1) and Lag(2) are the lags of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

Table 5.32: Estimates of the Dynamic Panel Models for Technology Sector

Variable	Difference GMM			System GMM		
Intercept	29.7973	(0.3180)	[0.4500]	20.7436	(0.0180)**	[0.0650]*
Lag(1)	-0.2690	(0.0400)**	[0.1350]	-0.1795	(0.0640)*	[0.1210]
Lag(2)	-0.1404	(0.1990)	[0.1550]	-0.1427	(0.0820)*	[0.1170]
CR	1.7824	(0.1190)	[0.0560]*	1.8006	(0.0220)**	[0.0620]*
DE	-0.0056	(0.8650)	[0.8950]	0.0027	(0.8810)	[0.9350]
EPS	3.7102	(0.4110)	[0.6580]	5.0823	(0.1170)	[0.3440]
TAT	-0.9978	(0.7580)	[0.8030]	-6.2361	(0.0010)***	[0.0660]*
MB	-9.9317	(0.0130)**	[0.0340]**	-4.5456	(0.0230)**	[0.2140]
SIZE	-11.7171	(0.0040)***	[0.0270]**	-6.4459	(0.0000)***	[0.0000]***
SL	6.7541	(0.0000)***	[0.0000]***	4.5668	(0.0000)***	[0.0000]***
No. of firms	12			12		
No. of observations	60			72		
m_1	-2.2302		[0.0257]**	-2.2905		[0.0220]**
m_2	0.0996		[0.9207]	0.3917		[0.6953]
Sargan Test	55.0649	(0.1027)		102.1476	(0.2656)	

Notes: Lag(1) and Lag(2) are the lags of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

Table 5.33: Estimates of the Dynamic Panel Models for Trading/Services Sector

Variable	Difference GMM			System GMM		
Intercept	12.7150	(0.0210)**	[0.1530]	13.4635	(0.0030)***	[0.4620]
Lag(1)	-0.0251	(0.6380)	[0.8570]	0.0533	(0.2360)	[0.8440]
Lag(2)	0.0094	(0.8290)	[0.9340]	0.0699	(0.0180)**	[0.6950]
CR	-0.3129	(0.1630)	[0.3720]	-0.3156	(0.1750)	[0.4100]
DE	0.0101	(0.0000)***	[0.0010]***	0.0100	(0.0000)***	[0.0060]***
EPS	1.4787	(0.2860)	[0.4490]	0.8789	(0.4890)	[0.6750]
TAT	-2.6745	(0.1290)	[0.3890]	-4.7876	(0.0020)***	[0.4160]
MB	1.8830	(0.0010)***	[0.0190]**	2.1037	(0.0020)***	[0.2160]
SIZE	-2.0033	(0.0290)**	[0.2090]	-2.6524	(0.0010)***	[0.2100]
SL	1.7419	(0.0020)***	[0.0330]**	1.9451	(0.0000)***	[0.0580]*
No. of firms	77			77		
No. of observations	385			462		
m_1	-2.6925		[0.0071]***	-2.2314		[0.0257]**
m_2	-0.4717		[0.6371]	-0.5166		[0.6055]
Sargan Test	24.0397	(0.1537)		25.9084	(0.1019)	

Notes: Lag(1) and Lag(2) are the lags of the dependent variable. Figures in the parentheses (.) are p-values based on standard errors, while figures in the square brackets [.] are p-values based on panel robust standard errors. The robust standard errors for the two-step estimators are based on Windmeijer (2005). The asterisk signs *, ** and *** denote significance at the 0.10, 0.05 and 0.01 levels, respectively. The statistics m_1 and m_2 refer to Arellano and Bond (1991) first and second order serial correlation tests, respectively. We expect a significant first order serial correlation (reject H_0 for m_1) but not the second order serial correlation (do not reject H_0 for m_2). Sargan Test aims to test for the validity of the instrumental variables of the GMM estimators where a rejection of H_0 implies the equation is over identified.

5.7 Summary on the Determinants of Cost of Equity

This section summarizes the results on the significance of determinants of cost of equity. Reconciling the results and findings from the static panel regression models in Section 5.5 and the dynamic panel regression models in Section 5.6, the estimated coefficients of the significant variables from the selected models for the full sample and each sector are reproduced in Table 5.34 so that a conclusion can be drawn on the overall significance of each of the cost of equity determinants.

For the full sample, the cost of equity is determined by DE, EPS, TAT, SIZE and SL. Consistent with the theory that higher debt is associated with increased financial risk, firms with higher DE are expected to have a higher cost of equity as indicated by the positive relationship between DE and COE. The sign for EPS is also as expected, indicating an increased cost of equity for firms with higher EPS. The negative coefficient for TAT suggests that firms with higher asset turnover ratio have lower cost of equity, thus supporting the framework of Ang *et al*. (2000). Managerial efficiency in utilizing firm resources seems to have a positive effect on the cost of equity. In line with the findings of Hail and Leuz (2006) and Chen *et al.* (2004), SIZE is found to be negatively related to cost of equity. Our result supports the view that larger firms are able to gain economies of scale in raising funds and thus should have a lower cost of equity compared to smaller firms. Nevertheless, our observation for SL is inconsistent with the literature, and reveals unexpectedly that firms with higher stock liquidity have higher cost of equities. This could be due to the moderate collinear relationship between SL and SIZE, as the trading volume for firms with a larger SIZE tend to be higher. The other possible explanation is that higher trading volume tends to be associated with higher volatility that may increase perceived risks of the firms (see for example, Dichev *et al.*, 2011).

For the individual sectors, the Trading/Services has the highest number of variables affecting cost of equity. Five variables, namely, CR, DE, TAT, SIZE and SL, are found to be important determinants for the cost of equity of the sector. Consistent with the finding of Omran and Pointon (2004), CR is negatively related to COE. It means that firms in healthier financial position to fulfill short-term obligations will have lower cost of equity. Obviously, liquidity is likely to be more important to the Trading/Services sector than others as customers are more likely to pay by cash since firms with businesses related to utility, newspaper, food and department stores are listed under this sector. In the Construction sector, the cost of equity is significantly determined by CR, DE and TAT. In contrast to the Trading/Services sector, the sign of CR for the Construction sector is positive, suggesting that higher liquidity is related to higher cost of equity. This result, nonetheless, seems to be supported by a negative sign for DE. Higher debt in a firm seems to be viewed favorably by investors, probably as an indication of higher future growth. Therefore, high CR in this case could indicate inefficient use of funds, which is also suggested by the variable TAT that has a negative relationship with COE.

SIZE is the only significant variable for the Consumer Products sector and the Plantation sector. Some of the firms listed under the Consumer Products sector are multinational corporations (MNCs) such as British American Tobacco, Dutch Lady, Guinness Anchor and Nestle, all of which are large firms. Therefore, firm size could affect sustainability for other smaller local-based firms and the ability to borrow funds at lower cost. SIZE is also an important variable for the Technology sector along with SL. Estimates from the fixed-effect model reveal a positive sign for SL, which is not as expected. As technology firms are mostly viewed as risky, high SL could be interpreted as a negative signal. The only significant variable for the Properties sector is TAT, but the sign is not as expected. Higher managerial efficiency in utilizing firm's resources to generate sales is viewed unfavorably by investors for this sector as indicated by the positive sign for TAT. Contrary to the findings for the other sectors, EPS is found to be an important determinant for cost of equity in the Industrial Products sector apart from SIZE.

In general, with the exception of stock liquidity, the sign of the estimates produced by the full sample and across sectors is consistent with the expected sign discussed in Chapter 3, Section 3.3 for most cases. Firm size is an important determinant for most of the sectors and its effect on cost of equity is consistently negative. In addition, the results in Table 5.34 show that the determinants of cost of equity are not necessary the same across different sectors. This supports the findings of other studies (see for example, Bekaert and Harvey, 1995; Hardouvelis *et al.*, 2007) which show that the sectoral effects are becoming more important.

5.34: Summary of the Analyses on Determinants of Cost of Equity

Sector	Full Sample	Construction	Consumer Products	Industrial Products	Plantation	Properties	Technology	Trading/Services	Majority
Model	Fixed	System	System	Fixed	System	System	Fixed	Random	
Intercept	33.1146	n.s.	36.1235	47.5649	n.s.	n.s.	n.s.	29.8045	Positive
CR	n.s.	0.4515	n.s.	n.s.	n.s.	n.s.	n.s.	-0.3623	Mixed
DE	0.0058	-0.0340	n.s.	n.s.	n.s.	n.s.	n.s.	0.0117	Positive
EPS	2.6426	n.s.	n.s.	4.9596	n.s.	n.s.	n.s.	n.s.	Positive
TAT	-2.0697	-12.1568	n.s.	n.s.	n.s.	8.9611	n.s.	-4.7343	Negative
MB	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
SIZE	-3.7520	n.s.	-3.7746	-5.6267	-1.0911	n.s.	-8.5940	-3.6812	Negative
SL	1.0622	n.s.	n.s.	n.s.	n.s.	n.s.	3.5005	1.6693	Positive

Note: Only the estimated coefficients that are significant from Section 5.5 and Section 5.6 are reported;. n.s. denotes variables that are not statistically significant. CR is current assets divided by current liabilities; DE is total debt as percentage of common equity; EPS is earnings available for common stockholders divided by number of shares outstanding; TAT is total sales divided by total assets; MB is market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity; SIZE is natural logarithm of market value of a firm's outstanding common stock at the end of each year; and SL is natural logarithm of annual trading volume.