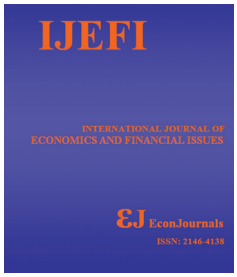

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Study on the Relationship of Firm's Performance with Capital Structure-Evidence from Taiwan

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ABSTRACT

The purpose of this study is to investigate the relationship between capital structure and firm's financial performance by using 5 years data from 2011 to 2016 of Taiwan exchange listed companies. The data has been analyzed by using descriptive statistics, correlation analysis to find out the association between the variables and t-statistics to test the hypothesis. The findings at overall market as well as sector levels were unspectacular but remarkably consistent. Capital structure and various financial parameters exhibit correlation coefficients that were mixed in signs with relatively weak correlation strength. Further the results suggest that t-test statistics registered statistical insignificance for the three research objectives.

Keywords: Capital Structure, Financial Performance, Leverage Ratio, Taiwan Exchange
JEL Classifications: C32, C180, F43

1. INTRODUCTION

The central domain of Corporate Finance literature encompasses three key and interrelated considerations. These are namely "financing," "investing" and "distribution." "Financing" decision dictates by the firm's cost of capital and its related challenges; which impacts its long term capital structure orientation and funding mix preference. "Investing" decision essentially focuses on utilization and maximization returns of surplus cash and capital via various financial appraisal techniques. 'Distribution' decision relates to discretionary (dividend payment) and fixed (interest payment) obligations to both ordinary shareholders and bondholders or creditors.

This paper focuses on the relevant of "financing" decision and its impact on firms' financial performance and profile. Though there are many research papers dedicated to the study on firms' capital structure or leverage impact, most of these revolve using economic theory and econometric models (via sophisticated statistical packages). Few papers linked capital structure impact on firms' financial performance (directly via financial statements components and ratios) in local Taiwan context. This study seeks to address this imperative issue.

2. LITERATURE REVIEW

The relationship between capital structure and firm's financial performance has been the subject of considerable debate, both theoretically and empirically. The hot debates concerning the issue of capital structure and firm performance has been started since the influential work of Miller and Modigliani and Miller (1958). He stated that capital structure of the firm have no effect on market value of the firm if the firm treating in perfect market. But this theory based on several assumptions and have not exist in real sense due to the brokerage cost and individual taxes which are not remain in perfect market situation, and it is impossible for the investors to take the same rate that are practiced in companies.

After M.M theory there were five main theories of capital structure introduced by different researcher. Jensen and Meckling (1976) 1st time gave the agency theory in corporate world. According to the agency theory the principal or the shareholders have given the authority to run the operations of companies to agents or managers of the companies. In particular manager's work in companies for their own interests not for the welfare or value maximization of the companies and this may include in agency problem. In order to reduce the conflict, the firms should give ownership to

the managers in companies. In this way equity will increase and firm take debt in lesser amount, moreover the managers avoid the leverage for minimizing the risk of the companies. Ross (1977) developed signaling theory in which he argued that managers make the capital structure as the signal of the company to the investors. If the company takes debt the investors influence and interrupt it by giving signal that in future out flow of cash will be increased. In this way this is showing that company has the attractive options in near future. Ross assumes that if the company issues shares then the shareholders think out that the company shares its losses and it becomes a signal.

In addition, based on the implications of capital structure theories, many researchers have studied the relationship between capital structure and firms' financial performance from different perspectives in different environments and found mixed results. The study by Gill and Nahum (2012) who extended the work of Abor (2005) examined the relationship between capital structure and firm profitability by taking evidence from USA manufacturing and service industry firms. The findings of the study showed a positive relationship between short-term debt to total assets, total debt to total assets, and profitability of service industry and short term debt to total assets, long term debt to total assets, total debt to total assets and profitability of manufacturing industry. Gansuwan and Onel (2012) tested the influence of capital structure on firm's performance of 174 nonfinancial Swedish firms. The results of the study revealed that there is a significant negative relationship between capital structure and firm performance of listed Swedish firms. Ebaid (2009) investigated the impact of capital structure choice on firm performance in Egypt and result of the study exposed that firm performance has weak to no relationship with capital structure choice. Abu-Rub (2012) also analyzed the impact of capital structure on firm performance of firms in Palestine, the results showed that firm's capital structure had a positive impact on the firm's performance measures, in both the accounting and market's measures.

Luper and Isaac (2012) examined the impact of capital structure on the performance of 15 Nigerian manufacturing companies. The results show that there is a negative and insignificant relationship between short-term debt to total assets, long term debt to total assets and return on asset (ROA) and profit margin; while total debt to equity is positively related with ROA and negatively related with profit margin. Short-term debt to total assets is significant using ROA while long term debt to total assets is significant using profit margin. The work concludes that statistically, capital structure is not a major determinant of firm performance.

Cai and Ghosh (2003) further deploy empirical evidence to claim the "stickiness" (inelastic) optimal capital structure of a firm. The thrust of their study pivots on the notion that optimal capital structure usually lies within a planned range of values, instead of an absolute value. Firm shall only adjust this leverage ratio when it is out of the acceptable range. Myers (2001) also supports this dynamic capital structure existence, in responding to ever-changing capital market environment. The relevance of capital structure hence translates into possible strong correlation relationship with firms' shareholders wealth maximization potential.

In summary, there is no single theory of capital structure choice and empirical studies have given inconclusive results regarding the capital structure choice and its effect on firms' financial performance. Thus, this study attempts to seek the effect of capital structure on financial performance of firm.

3. RESEARCH OBJECTIVES

In this study, firms' leverage profile and their financial performances are further dissected and analyzed into three key dimensions. These three key parameters are translated into research questions and examined further to verify their respective correlation and statistical significance.

The three research questions which this paper attempts to study are:

Research Question 1 - Does Capital Structure possess a significant correlation with firms' Profitability measurement?
Research Question 2 - Does Capital Structure possess a significant correlation with firms' Shareholders Wealth Maximization?
Research Question 3 - Does Capital Structure possess a significant correlation with firms' Capital Market Perception?

In the first key research question, capital structure is investigated against its impact on firms' profitability. Two popular profitability indicators are explored; namely ROA and return on equity (ROE) perspective. Quantitative bi-variate data (hence their possible relationship) are first tested on its correlation strength and subsequently assessed statistically at 5% level of significance:

1. Capital structure versus ROA
2. Capital structure versus ROE

In the second key research question, capital structure is investigated against its impact on firms' shareholders wealth maximization. The key indicator used here refers to absolute share price. Economic value added and total shareholders return were initially explored at proposal stage but were subsequently aborted due to both, on-availability of public data (particularly on weighted average cost of capital - WACC) and costly data compilation of interim dividend at September cut-off. These quantitative bi-variate data (hence their possible relationship) are first tested on its correlation strength and subsequently assessed statistically at 5% level of significance:

3. Capital structure versus share price

In the third key research question, capital structure is investigated against its impact on firms' capital market perception. Two frequently used price multiples are calibrated and further investigated. They are price-to-earnings ratio (PER) and price-to-book ratio (PBR). Again these quantitative bi-variate data (hence their possible relationship) are first tested on its correlation strength and subsequently assessed statistically at 5% level of significance:

4. Capital Structure versus PER
5. Capital Structure versus PBR

3.1. Research Framework

This research work focuses on collection of sample data from Taiwan Exchange (TWSE) over 5-years horizon. A sample is a subset of a population. The paper assumes normal distribution characteristics exist as the sample chosen for various key and

sub tests are reasonably large. 172 qualified stocks that fulfill the selection criteria of this study were selected from the total TWSE universe of 768 entities. Instead of using conventional December calendar year-end as financial cut-off, the period under review commenced from September 2011 and ended in September 2016.

Respective year-ends were defined as below.

a. Year ended 2016: 30 September 2016 - 01 October 2015
b. Year ended 2015: 30 September 2015 - 01 October 2014
c. Year ended 2014: 30 September 2014 - 01 October 2013
d. Year ended 2013: 30 September 2013 - 01 October 2012
e. Year ended 2012: 30 September 2012 - 01 October 2011.

Spearman's rank correlation coefficient ('SRCC' hereafter) is used to ascertain the strength of correlation relationship between two variables under investigation, followed by testing the significance of these correlation relationships at 5% level of significance using test-statistic. Profitability is represented by ROA and ROE. Shareholders Wealth Maximization is measured by absolute share price movement. Capital market perception is defined by PER and price-to-book (PTB) ratios. Assessment on correlation coefficient relationship was based on yoy (year-on-year) rate of percentage (%) change between two variables. The analytic of ascertaining the strength of correlation relationship using SRCC and two tailed t-statistics test to ascertain whether there is a significant relationship, were further expanded to cover below sub-analytic:

i. By overall market analysis
ii. Analysis on 4 key market sectors (i.e., consumer, financial, industrial and others)

3.2. Hypothesis Formulation

- **Hypothesis 1:**
  H_0: There is no significant correlation relationship between capital structure (leverage ratio) and profitability.
  H_A: There is a significant correlation relationship between capital structure (leverage ratio) and profitability.

- **Hypothesis 2:**
  H_0: There is no significant correlation relationship between capital structure (leverage ratio) and shareholders wealth maximization.
  H_A: There is a significant correlation relationship between capital structure (leverage ratio) and shareholders wealth maximization.

- **Hypothesis 3:**
  H_0: There is no significant correlation relationship between capital structure leverage ratio) and capital market perception.
  H_A: There is a significant correlation relationship between capital structure (leverage ratio) and capital market perception.

4. RESULTS

The empirical findings were systematically analysed and presented, the three key Research Questions were translated into three quantifiable hypotheses where data were meticulously collated, screened and categorically computed. Correlation results were then calibrated on yoy rate of percentage (%) change between leverage and five key financial parameters (i.e., ROA, ROE, share price, PER and PTB).

4.1. Capital Structure (Leverage Ratio) and Profitability

4.1.1. Overall market analysis

Two vital financial ratios (ROA and ROE) were used to represent proxy for profitability. At overall market level, a total of 172 qualified firms were systematically assessed.

From Tables 1 and 2, the illustrated results from this correlation analysis (via 2-tailed statistical test) were unspectacular but remarkably consistent. Using both ROA and ROE as proxies, these correlation coefficients ("r") registered weak but mix relationships (i.e., 5 positive and 3 negative) between leverage and profitability. Using only ROA (Table 1), the results generally exhibited positive relationship (except 1 negative pair) for the period under review from 1st October 2011 to 30th September 2016 (i.e., years horizon). Their values between −0.01 and +0.03 led to t-test results of between −0.18 and +0.42. These fell within the critical values of ±1.96 range, hence null hypotheses are accepted. From ROA proxy, findings concluded that there was no significant correlation relationship between capital structure (leverage ratio)

Table 1: Leverage ratio and ROA

S/N	YOY % change	Correlation coefficients (r)	Sample size (n)	Critical value (2 tailed)	t-test results	Statistical decision
1	2015-2016	+0.02081	172	±1.96	+0.27144	Accept null (Ho)
2	2014-2015	+0.03213	172	±1.96	+0.41908	Accept null (Ho)
3	2013-2014	+0.01421	172	±1.96	+0.18524	Accept null (Ho)
4	2012-2013	+0.00388	172	±1.96	+0.05054	Accept null (Ho)

Overall results (yoy rate of percentage (%) change) - ROA (Hypothesis 1). ROA: Return on asset

Table 2: Leverage ratio and roe

S/N	YOY % change	Correlation coefficients (r)	Sample Size (n)	Critical value (2 tailed)	t-test results	Statistical decision
1	2015-2016	+0.03318	172	±1.96	+0.43280	Accept null (Ho)
2	2014-2015	+0.00865	172	±1.96	+0.11278	Accept null (Ho)
3	2013-2014	+0.00788	172	±1.96	+0.10276	Accept null (Ho)
4	2012-2013	+0.01050	172	±1.96	+0.13675	Accept null (Ho)

Overall Results (yoy rate of percentage (%) change) - ROE (Hypothesis 1). ROA: Return on asset

and profitability. Using only ROE (Table 2), the results exhibited mix relationships (i.e., 2 positive and 2 negative) in the equivalent period under review. The "r" values between less than −0.01 and +0.03 led to t-test results of between −0.10 and +0.43. These fell within the critical values of ±1.96 ranges, hence null hypotheses were accepted. From ROE proxy, result reveals that there was no significant correlation relationship between capital structure (leverage ratio) and profitability. Cross examination between these 2 proxies, "r" values for both ROA and ROE were fairly comparable with each other. Both indicated a consistently weak correlation relationship with leverage. From the total 8 pairs (ROA and ROE each 4 pairs) of correlation coefficients and their t-test results, study shows that though mix (i.e., no unanimous positive or negative) correlations exist; there was generally no significant correlation relationship between capital structure (leverage ratio) and profitability at 5% level of significance.

4.1.2. By industry sectors analysis

The finding from overall market above was supported by results from industry sectors analytic. From the total sample of 172 firms, 4 key industry sectors were studied. Consumer, financial and industrial sectors accounted for a combine total of 138 firms (or 80% of 172 firms were represented). The balance 34 firms were classified under "others" sector. All sectors result were generally consistent to overall market level with correlation between leverage and profitability remained statistically insignificant.

Out of the combined (ROA and ROE) total of 32 pairs of correlation from Tables 3 and 4, 30 pairs pointed to acceptance of null hypotheses. Only 2 pairs correlations (i.e., ROA and ROE each 1 pair) registered significant correlation at 5% of statistical significance, hence support rejection of null hypothesis. Table 3 summarized ROA results by 4 key sectors. Apart from Consumer sector which pointed to persistently weak negative correlation, rest of the sectors (Financial, Industrial and Others) listed weak but mix (both positive and negative) correlation coefficients. Tables 4 analyzed ROE results by 4 key sectors. These 4 key sectors (i.e., consumer, financial, industrial and others) listed weak but mix (both positive and negative) correlation coefficients. These sectors were again consistent to the overall market results.

4.2. Capital Structure (Leverage Ratio) and Shareholders Wealth Maximisation

4.2.1. Overall market analysis

Key financial parameter (share Price) was used to represent proxy for shareholders wealth maximization. At overall market level, a total of 172 qualified firms were assessed.

From Table 5, the illustrated results from this correlation analysis (via two-tailed statistical test) again were unspectacular but remarkably consistent. Measured by correlation coefficients ("r"), the correlation relationships between Leverage and Shareholders Wealth Maximisation exist but statistically insignificant. Using share price proxy (Table 5), the results generally exhibited negative relationship in the period of 1st October 2005-30th September 2010 (i.e., 5 years horizon). The "r" values between less than −0.01 and −0.08 led to t-test results of between −0.03 and −1.11. These fell within the critical values of ±1.96 range hence null hypotheses were accepted. From share price proxy, study reveals that there was no significant correlation relationship between capital structure (leverage ratio) and shareholders wealth maximisation. based on these 4 pairs of correlation coefficients and their t-test results, results

Table 3: Capital structure and profitability

S/N	YOY % change	Correlation coefficient (r)	Sample size (n)	A	B	Statistical decision
				Critical value (2 tailed)	t-test results	
Hypothesis 1A - Sector 1: Consumer (ROA)						
				A	B	
1	2015-2016	−0.11953	41	±2.02	−0.75184	Accept null (Ho)
2	2014-2015	−0.06656	41	±2.02	−0.41622	Accept null (Ho)
3	2013-2014	−0.19943	41	±2.02	−1.27101	Accept null (Ho)
4	2012-2013	−0.05025	41	±2.02	−0.31418	Accept null (Ho)
Hypothesis 1A - Sector 2: Financial services (ROA)						
				A	B	
1	2015-2016	−0.15163	40	±2.02	−0.94564	Accept null (Ho)
2	2014-2015	−0.06196	40	±2.02	−0.38268	Accept null (Ho)
3	2013-2014	+0.49406	40	±2.02	+3.50295	Reject null (Ho)
4	2012-2013	−0.25194	40	±2.02	−1.60480	Accept null (Ho)
Hypothesis 1A - Sector 3: Industrial (ROA)						
				A	B	
1	2015-2016	+0.08698	57	±2.02	+0.64755	Accept null (Ho)
2	2014-2015	+0.10096	57	±2.02	+0.75261	Accept null (Ho)
3	2013-2014	−0.05823	57	±2.02	−0.43257	Accept null (Ho)
4	2012-2013	+0.00536	57	±2.02	+0.03976	Accept null (Ho)
Hypothesis 1A - Sector 4: Others (ROA)						
				A	B	
1	2015-2016	+0.26233	34	±2.02	+1.53784	Accept null (Ho)
2	2014-2015	−0.02182	34	±2.02	−0.12340	Accept null (Ho)
3	2013-2014	−0.05228	34	±2.02	−0.29617	Accept null (Ho)
4	2012-2013	+0.12494	34	±2.02	+0.71235	Accept null (Ho)

Sectors analytic [yoy rate of percentage (%) change] - consumer, financial services, industrial and others - ROA (Hypothesis 1). ROA: Return on asset

Table 4: Capital structure and profitability

S/N	YOY % change	Correlation coefficient (r)	Sample size (n)	A Critical value (2 tailed)	B t-test results	Statistical decision
Hypothesis 1B - Sector 1: Consumer (ROE)						
				A	**B**	
1	2015-2016	+0.01636	41	±2.02	+0.10221	Accept null (Ho)
2	2014-2015	−0.05324	41	±2.02	−0.33295	Accept null (Ho)
3	2013-2014	−0.10448	41	±2.02	−0.65605	Accept null (Ho)
4	2012-2013	−0.05039	41	±2.02	−0.31509	Accept null (Ho)
Hypothesis 1B - Sector 2: Financial services (ROE)						
				A	**B**	
1	2015-2016	+0.01645	40	±2.02	+0.10140	Accept null (Ho)
2	2014-2015	−0.02624	40	±2.02	−0.16182	Accept null (Ho)
3	2013-2014	+0.36342	40	±2.02	+2.40467	Reject null (Ho)
4	2012-2013	+0.06780	40	±2.02	+0.41891	Accept null (Ho)
Hypothesis 1B - Sector 3: Industrial (ROE)						
				A	**B**	
1	2015-2016	+0.07199	57	±2.02	+0.53526	Accept null (Ho)
2	2014-2015	+0.05384	57	±2.02	+0.39989	Accept null (Ho)
3	2013-2014	−0.01482	57	±2.02	−0.10993	Accept null (Ho)
4	2012-2013	−0.04441	57	±2.02	−0.32967	Accept null (Ho)
Hypothesis 1B - Sector 4: Others (ROE)						
				A	**B**	
1	2015-2016	+0.30801	34	±2.02	+1.83141	Accept null (Ho)
2	2014-2015	−0.00679	34	±2.02	−0.03841	Accept null (Ho)
3	2013-2014	−0.14422	34	±2.02	−0.82447	Accept null (Ho)
4	2012-2013	+0.09038	34	±2.02	+0.51335	Accept null (Ho)

Sectors analytic [yoy rate of percentage (%) change] - consumer, financial services, industrial and others - ROE (Hypothesis 1). ROE: Return on equity

Table 5: Leverage ratio and share price

S/N	YOY % change	Correlation coefficients (r)	Sample size (n)	Critical value (2 tailed)	t-test results	Statistical decision
1	2015-2016	−0.08472	172	±1.96	−1.10862	Accept null (Ho)
2	2014-2015	−0.00232	172	±1.96	−0.03028	Accept null (Ho)
3	2013-2014	−0.05671	172	±1.96	−0.74061	Accept null (Ho)
4	2012-2013	−0.00806	172	±1.96	−0.10514	Accept null (Ho)

Overall results (yoy rate of percentage (%) change) - share price (Hypothesis 2)

shows that though unanimous negative correlations exist, there was generally no significant correlation relationship between capital structure (leverage ratio) and shareholders wealth maximisation.

4.2.2. By industry sectors analysis

The results were consistent to overall market level with correlation between leverage and shareholders wealth maximization largely weak and insignificant.

Out of total 16 pairs of correlation (yoy rate of percentage change over past 5 years data) from Table 6, all sectors result pointed to acceptance of null hypotheses at 5% of statistical significance. Table 6 summarised the analysed results by 4 key sectors. All sectors registered weak (statistically insignificant) and mix correlation; with no unanimous positive or negative results throughout (i.e., a total of 9 negative and 7 positive "r" for period under review).

4.3. Capital Structure (Leverage Ratio) and Capital Market Perception

4.3.1. Overall market analysis

Two vital financial ratios (PER and PTB) were used to represent proxy for capital market perception. At overall market level, a total 172 qualified firms were assessed.

Tables 7 and 8 illustrated that the results from this correlation analysis and two-tailed statistical test were unspectacular but remarkably consistent. Using both PER and PTB as proxies, weak correlation relationships between leverage and capital market perception exist. Using only PER (Table 7), the results generally exhibited mix relationship for period under review from 1st October 2005 to 30th September 2010 (i.e., 5 years horizon). The "r" values between −0.05 and +0.05 led to t-test results of between −0.68 and +0.67. These fell within the critical values of ±1.96 range, hence null hypotheses were accepted. From PER proxv, there was no significant correlation relationship between capital structure (leverage ratio) and capital market perception. Using only PTB (Table 8), the results exhibited mix relationship on the yoy rates of change (%) in the same period under review (i.e., 5 years horizon). The "r" values between less than −0.01 and +0.09 led to t-test results of between −0.87 and +1.21. These fell within the critical values of ±1.96 range hence null hypotheses were accepted. From PTB proxv, there was no significant correlation relationship between capital structure (leverage ratio) and capital market perception. Cross examination between these 2 proxies' "r" values also indicated generally consistent comparable correlation relationship with leverage. From the total 8 pairs of correlation coefficients and its t-test results, study reveals that though mix

Table 6: Capital structure and shareholders wealth maximization

S/N	YOY % change	Correlation coefficient (r)	Sample size (n)	A Critical value (2 tailed)	B t-test results	Statistical decision
Hypothesis 2A - Sector 1: Consumer (share price)						
				A	B	
1	2015-2016	−0.11790	41	±2.02	−0.74146	Accept null (Ho)
2	2014-2015	+0.09571	41	±2.02	+0.60044	Accept null (Ho)
3	2013-2014	−0.18163	41	±2.02	−1.15349	Accept null (Ho)
4	2012-2013	−0.05102	41	±2.02	−0.31905	Accept null (Ho)
Hypothesis 2A - Sector 2: Financial services (share price)						
				A	B	
1	2015-2016	−0.19873	40	±2.02	−1.24997	Accept null (Ho)
2	2014-2015	+0.08671	40	±2.02	+0.53656	Accept null (Ho)
3	2013-2014	+0.06304	40	±2.02	+0.38937	Accept null (Ho)
4	2012-2013	−0.12815	40	±2.02	−0.79651	Accept null (Ho)
Hypothesis 2A - Sector 3: Industrial (share price)						
				A	B	
1	2015-2016	+0.00389	57	±2.02	+0.02885	Accept null (Ho)
2	2014-2015	−0.08131	57	±2.02	−0.60498	Accept null (Ho)
3	2013-2014	−0.09768	57	±2.02	−0.72791	Accept null (Ho)
4	2012-2013	+0.02162	57	±2.02	+0.16040	Accept null (Ho)
Hypothesis 2A - Sector 4: Others (share price)						
				A	B	
1	2015-2016	−0.10846	34	±2.02	−0.61717	Accept null (Ho)
2	2014-2015	+0.01572	34	±2.02	+0.08891	Accept null (Ho)
3	2013-2014	−0.02424	34	±2.02	−0.13717	Accept null (Ho)
4	2012-2013	+0.03585	34	±2.02	+0.20292	Accept null (Ho)

Sectors analytic (yoy rate of percentage (%) change) - consumer, financial services, industrial and others - share price (Hypothesis 2)

Table 7: Leverage ratio and PER

S/N	YOY % change	Correlation coefficients (r)	Sample size (n)	Critical value (2 tailed)	t-test results	Statistical decision
1	2015-2016	−0.01765	172	±1.96	−0.23018	Accept null (Ho)
2	2014-2015	−0.02846	172	±1.96	−0.37133	Accept null (Ho)
3	2013-2014	−0.05246	172	±1.96	−0.68499	Accept null (Ho)
4	2012-2013	+0.05144	172	±1.96	+0.67162	Accept null (Ho)

Overall results (yoy rate of percentage (%) change) - PER (Hypothesis 3). PER: Price-to-earnings ratio

Table 8: Leverage ratio and PTB

S/N	YOY % Change	Correlation Coefficients (r)	Sample size (n)	Critical value (2 tailed)	t-test results	Statistical decision
1	2015-2016	−0.01087	172	±1.96	−0.14176	Accept null (Ho)
2	2014-2015	+0.09259	172	±1.96	+1.21238	Accept null (Ho)
3	2013-2014	−0.06640	172	±1.96	−0.86771	Accept null (Ho)
4	2012-2013	+0.01656	172	±1.96	+0.21595	Accept null (Ho)

Overall results (yoy rate of percentage (%) change) - PTB (Hypothesis 3)

(both positive and negative) correlation exists, there was generally no significant correlation relationship between capital structure (leverage ratio) and capital market perception.

4.3.2. By industry sectors analysis

The finding from overall market level was further supported by results from industry sectors analytic. The results were consistent to overall market level with correlation between leverage and capital market perception largely statistically insignificant.

Out of the 32 pairs of correlation from Tables 9 and 10, 29 pairs pointed to acceptance of null hypotheses while only 3 pairs rejected null hypotheses. One point to note was that these 3 rejected pairs came from "others" sector. The risk of Types 1 and 2 errors were potentially higher from "others" sector (compared to the rest of the sectors) due to its relatively smaller sample size (n). This also implied potentially weaker power of test (i.e., 1-Type 2 error). However, these rejection results were not material in the wake of holistic analysis.

4.4. Tables 9 Analyzed PER Results on 4 Key Sectors

Apart from industrial consumer sector which pointed to unanimously weak negatively correlation, rest of the sectors (consumer, financial and others) generally registered weak and mix (both positive and negative) correlation coefficients.

4.5. Table 10 Analyzed PTB results on 4 Key Sectors

All sectors (i.e., consumer, financial and industial) recorded mix (both positive and negative) correlation coefficients which were statistically insignificant at 5% of significance. Except for "others"

Table 9: Capital structure and capital market perception

S/N	YOY % change	Correlation coefficient (r)	Sample size (n)	A	B	statistical decision
				Critical value (2 tailed)	t-test results	
Hypothesis 3A - Sector 1: Consumer (PER)						
				A	B	
1	2015-2016	−0.03067	41	±2.02	−0.19160	Accept null (Ho)
2	2014-2015	+0.09174	41	±2.02	+0.57536	Accept null (Ho)
3	2013-2014	−0.12699	41	±2.02	−0.79950	Accept null (Ho)
4	2012-2013	−0.04526	41	±2.02	−0.28292	Accept null (Ho)
Hypothesis 3A - Sector 2: Financial services (PER)						
				A	B	
1	2015-2016	+0.08847	40	±2.02	+0.54748	Accept null (Ho)
2	2014-2015	+0.07092	40	±2.02	+0.43836	Accept null (Ho)
3	2013-2014	−0.15263	40	±2.02	−0.95199	Accept null (Ho)
4	2012-2013	+0.12021	40	±2.02	+0.74646	Accept null (Ho)
Hypothesis 3A - Sector 3: Industrial (PER)						
				A	B	
1	2015-2016	−0.09318	57	±2.02	−0.69403	Accept null (Ho)
2	2014-2015	−0.05278	57	±2.02	−0.39197	Accept null (Ho)
3	2013-2014	−0.13521	57	±2.02	−1.01205	Accept null (Ho)
4	2012-2013	−0.05398	57	±2.02	−0.40090	Accept null (Ho)
Hypothesis 3A - Sector 4: Others (PER)						
				A	B	
1	2015-2016	−0.12248	34	±2.02	−0.69809	Accept null (Ho)
2	2014-2015	+0.00142	34	±2.02	+0.00805	Accept null (Ho)
3	2013-2014	+0.04303	34	±2.02	+0.24366	Accept null (Ho)
4	2012-2013	+0.93415	34	±2.02	+14.80659	Reject null (Ho)

Sectors analytic (yoy rate of percentage (%) change) - consumer, financial services, industrial and others - PER (Hypothesis 3). PER: Price-to-earnings ratio

sector which reported inconclusive findings, most results were consistent to the overall market result.

5. CONCLUSION

This paper has analysed and examined 172 TWSE listed firms. The prime objective is to ascertain firms' possible relationships between leverage and their respective financial performance indicators. Data collected for the period under review extracted from 1st October 2011 to 30th September 2016 (i.e., 5 full financial years). From these, 4 sets of year on year rate of change (%) were calibrated to ascertain correlation statistical strength and sign, as well as significance between these relationships.

The first research question was in relation to whether capital structure possesses a significant correlation with firms' profitability measurement. Findings registered generally no significant statistical relationship exists between firms' Leverage and Profitability. Using both ROA and ROE as profitability proxies have derived consistent results, hence acceptance of null hypothesis. At overall market, as well as sector analytic, results were generally consistent in acceptance of null hypothesis. Cross examination between ROA and ROE results further reinforced this consistency. This study did not support various earlier studies outlined from respective domains that encompass "cash flow hypothesis;" "agency cost theory" and "trade-off theory."

The second research question probed into vital issue whether capital structure possesses a significant correlation with firms' shareholders wealth maximization. Using share price as a proxy for the latter, research results again listed no significant statistical relationship exists between Leverage and Shareholders Wealth Maximisation. Study did not support various post-MML studies that highlight the relevance of leverage on shareholders wealth maximization (i.e., researches from "optimal structure theory" and proponents of "pecking order theory"). However, findings of the study are consistent with "MM1 original proposition;" i.e., there is no statistical significance relationship between firms' capital structure and value of firms.

The third research question explored whether capital structure possesses a significant correlation with firms' capital market perception. Using both PER and PTB as proxies for the latter, results are generally stable and consistently pointed to acceptance of null hypothesis. Both overall market, as well as sector analytic registered similar results. Cross examination between PER and PTB further reinforce the evidenced findings of the study. This did not support "market timing hypothesis" but consistent with "transaction cost theory." The latter emphasizes leverage decision does convey vital signaling impact, as well as pragmatic management of transaction cost (particularly on listed firms). As a result, findings seem to reconcile with this deliberate gradual and prudence change in firms' leverage profile.

Findings of the study also supported Cai and Ghosh (2003) studies highlighted by Myers (2001), they deploy empirical evidence to claim the existence of "stickiness" (inelastic) optimal capital structure of a firm. The thrust of this study pivots on the notion that optimal capital structure usually lies within a planned range of values, instead of an absolute value. Firm shall only adjust

Table 10: Capital structure and capital market perception

S/N	YOY % change	Correlation coefficient (r)	Sample size (n)	A	B	Statistical decision
				Critical value (2 tailed)	t-test results	
Hypothesis 3B - Sector 1: Consumer (PTB)						
				A	B	
1	2015-2016	−0.00574	41	±2.02	−0.03582	Accept null (Ho)
2	2014-2015	+0.08962	41	±2.02	+0.56194	Accept null (Ho)
3	2013-2014	−0.07921	41	±2.02	−0.49620	Accept null (Ho)
4	2012-2013	−0.08011	41	±2.02	−0.50191	Accept null (Ho)
Hypothesis 3B - Sector 2: Financial services (PTB)						
				A	B	
1	2015-2016	−0.02627	40	±2.02	−0.16203	Accept null (Ho)
2	2014-2015	+0.22362	40	±2.02	+1.41433	Accept null (Ho)
3	2013-2014	−0.06572	40	±2.02	−0.40602	Accept null (Ho)
4	2012-2013	−0.01003	40	±2.02	−0.06181	Accept null (Ho)
Hypothesis 3B - Sector 3: Industrial (PTB)						
				A	B	
1	2015-2016	−0.09433	57	±2.02	−0.70270	Accept null (Ho)
2	2014-2015	+0.01241	57	±2.02	+0.09206	Accept null (Ho)
3	2013-2014	−0.12066	57	±2.02	−0.90139	Accept null (Ho)
4	2012-2013	−0.10989	57	±2.02	−0.81997	Accept null (Ho)
Hypothesis 3B - Sector 4: Others (PTB)						
				A	B	
1	2015-2016	−0.02573	34	±2.02	−0.14563	Accept null (Ho)
2	2014-2015	+0.44601	34	±2.02	+2.81891	Reject null (Ho)
3	2013-2014	−0.05197	34	±2.02	−0.29441	Accept null (Ho)
4	2012-2013	+0.86361	34	±2.02	+9.69001	Reject null (Ho)

Sectors analytic (yoy rate of percentage (%) change) - consumer, financial services, industrial and others - PTB (Hypothesis 3)

this leverage ratio when it is out of the acceptable range. Myers (2001) also supports this dynamic capital structure existence, in responding to ever changing capital market environment.

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