

Effect of Tax Rate Cut on Financial Performance of Electronic Firms

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ABSTRACT

This study assesses the effect of tax rate cut on the financial performance of Taiwanese-listed firms using data from 2009 to 2012. This study hypothesizes that income tax rate cuts affect financial performance using selected financial ratios as indicators. This study finds that the hypotheses on the Debt-Equity Ratio, Return on Equity, and Return on Invested Capital are supported. However, there is no support for the hypothesis on the Current Ratio, Price-Earnings Ratio, Equity Ratio, and Operating Profit Margin. Using a pooled sample, the capital structure tends to adjust resulting in lower debt and, accordingly, higher equity. In particular, the electronic group reacts differently with a significant and negative relationship between debt-equity ratio and tax, moreover, it finds lower production and wages relevant.

Keywords—Business taxes; Financial ratios; Leverage

INTRODUCTION

Financial ratios offer valuable information for timely and informed decision-making to stakeholders. The owners assess firm performance on the returns generated; and the investment opportunity of various resources accumulated. The creditors are well-informed of their claims on the resources and the ability of the firm to settle obligations. The government is apprized on the taxable revenue, deductible expenditures, and taxes due. The employees are attentive to the benefits and retirement information.

However, the financial ratios may significantly be affected by changes in local and International Financial Reporting Standards (IFRS) and tax regulations. Taxation is devised to encourage the conduct of taxpayers to attain the monetary requirements of a state. In turn, the tax rate offers a tax shield. Accordingly, a higher tax rate motivates firms to higher tax shield that comes in incurring additional interest-paying debts that generate more interest expense. The greater the tax shield, the lesser the tax expense. More debts likely allow more available cash and increase the Current Ratio (CR), so does, a lower taxable income and income tax expense. Higher interest-paying debts increase Debt-Equity Ratio (DR) and reciprocally, lower the Equity Ratio (ER). Studies on the consequence of tax on leverage show inconsistent results. An upward trend effect on leverage [14], [13], [7], [18], and [20], the negative link between tax and leverage [22], and no association at all [21] are noted. Likewise, a tax rate is associated with a capital increase [18]. Reciprocally, tax rate cuts offer a lower tax shield which is associated with a decrease in investments and productivity [19], thus, it may motivate changes in investments arising either from capital or borrowings [2],

with direct links to production and wages [2] and [4]. Studies on the influence of income tax on financial performance show varying results, too. Reference [5] finds tax is adversely linked to financial performance while [16] and [1] finds a positive connection between tax and financial performance. There is evidence that firms exhibit lesser expenses before rate cuts [6]. A positive effect on net income increases the Operating Profit Margin (OPM), Return on Equity (ROE), and Return on Invested Capital (ROIC), and lowers the Price-Earnings Ratio (P/E).

The cited related literature on studies on financial ratios, income tax rate cut, research subjects are noted. However, the researchers have no knowledge of studies in the English language on the effect of income tax rate cut on the financial performance of listed Taiwan firms using financial ratios. To address this gap in the literature, this study examines whether income tax rate cut in 2010 affected the financial performance of listed Taiwan firms using the 2009 to 2012 sample. This study in a single country conserves institutional factors, tax and financial reporting environment, and the conditions in the Taiwan Stock Exchange Corporation (TSEC) market. This study hypothesizes that tax rate cut affect the financial performance of listed Taiwan electronic firms. Contrary to prediction, this study finds a significantly positive relationship between Tax and CR. The CR does not differ in the period of tax rate cut (CUT), thus, the hypothesis on CR is not supported. The Price-Earnings Ratio (P/E) has no relationship with Tax and does not differ in the period of the CUT, thus, the hypothesis on P/E is not supported. This study predicts that income tax rate cut may demotivate more debt, thus, lessening the DR and raising the ER. However, the result of this study is contrary to the prediction. The Tax has a negative and significant association with DR, consistent with the findings of [22]. Moreover, a positive and significantly connected with ER is noted. The result specifies the ER does not differ in the period of CUT but the DR does. Thus, the capital structure tends to adjust resulting in lower debts and, accordingly, higher equity. Thus, the hypothesis on ER is not supported while the hypothesis on DR is confirmed. Finally, there is a significantly positive link between Tax and the three measures of profitability. While the ROE and ROIC are significant in the period of CUT, the OPM is insignificant. Thus, hypotheses on ROE and ROIC are supported but the hypothesis on OPM is not. Particularly for electronic group, the DR is negative and significantly associated with TAX. The result of the test on ER, OPM, ROE exhibits that lower production and wages are relevant for electronic groups, whereas the DR is insignificant and the result of the test on OPM exhibits lower capital stocks are relevant for non-electronic firms.

The result of the study enriches the discussion on the study of financial ratios. The financial ratios are useful as indicators of firm performance in terms of liquidity, leverage, equity, and profitability. Secondly, the result of the study complements the studies on the influence of income tax rate cut. The tax rate cuts in an Asian setting are connected to the capital structure. Thirdly, the results offer evidence of a link between tax, investment, productivity, and wages. The results of this study benefit the practitioners of corporate finance, shareholders, tax and capital market regulators, auditors, academia, and researchers. This study is limited to the period from 2009 to 2012 in a single country. Future research may consider the consequence of tax rate cuts before and after the implementation of the cuts by firm size, or long-term and short-term debts.

The paper commences with Section 2 on a literature review on financial ratios and corporate income tax. Section 3 shows the research methodology followed by the results and discussion in Section 4 and the conclusion in Section 5.

RELATED LITERATURE

Background

Disclosure of the financial ratios of a going-concern firm offers valuable information to stakeholders. The

ratios exhibit the financial strengths and weaknesses of the firm. The results of firm performance, its impact on equity, resources available for reinvestment, and the claims of the outstanding obligations are reflected. Specifically, profitability ratios indicate the capability of the management to generate returns on invested capital. The leverage ratios notify various claims on the firm's resources, the risk of distressed accounts, and the coverage of loan interest. The liquidity ratios reflect the ability to meet obligations in the short term. The ratios offer the government values on taxable revenue, deductible expenditures, and taxes due. The employees are interested in the benefits and retirement data. The financial ratios may significantly be affected by tax regulations and the changes thereto. A change in tax rate is probable to affect a firm's performance [22]. Several studies pay attention to leverage because of a tax shield. A higher income tax rate motivates firms to higher tax shield that comes in incurring higher interest-bearing debts [10]. Higher-income tax expense results in lower net income after tax. Thus, a tax rate hike generates a lower Operating Profit Margin, Return on Equity, and Return on Invested Capital but an increased Price-Earnings Ratio. A higher tax shield motivates more debts, resulting in an increased Current Ratio, increased Debt-Equity Ratio, and decreased Equity Ratio. In contrast, generating capital from equity offers no tax shield. Pecking order theory professes that equity financing is the last option after all sources of funds have been fully explored. On the other hand, tax rate cut offers a lower tax shield. Changes in investments arising either from capital or borrowings may likely be motivated by the 2017 corporate tax cuts of the United States of America (U.S.) [2]. Thereafter, [2] links higher investments to higher production and wages. There are pieces of evidence of the outcome of the tax rate on increases in capital [18], and on real and labor investments in German firms [4]. On the other hand, there are suggestions of the effect of the tax rate on decreases in investments and productivity in firms under the Organisation for Economic Co-operation and Development (OECD) economies from 1996 to 2004 [19].

Results of studies on financial ratios and taxes are noted. References [1] and [16] used Return on Investment as a proxy for financial performance in a study on financial performance in Pakistan and Kenyan firms, respectively. Reference [5] uses Return on Total Assets for the financial performance of Ghana firms. Reference [20] reports that corporate income taxes are positively linked to total debt and short-term debt ratios but negatively associated with long-term debt ratios. Reference [18] finds a significantly positive connection between tax and leverage, capital, leverage, inventory, and research and development expenditure. Specifically, a change in tax rate has an upward effect on leverage [7], [13], [14], [18], and [20]. However, [14] noted that upward corporate tax rates positively affect leverage after one year in large firms and after two to three years in medium firms. On the contrary, [22] finds a significantly negative association between tax and leverage. However, [21] does not find a link between leverage and tax. The effects of corporate income tax on financial performance have inconsistent outcomes. While [16] and [1] document a significantly positive relationship between financial performance and corporate income tax, [5] shows a negative link. On the other hand, a study on the effect of corporate tax rate cuts on the cost behavior of companies in OECD economies by [6] reveals that expenses went down.

This study examines the effect of tax rate cut in 2010 on financial performance using financial ratios as a proxy. Similarities and differences between this study and the previous studies are identified.

- Differences in the direction of change in tax rates

Both studies by [14] and [20] cover the effect of upward tax rates, however, this study covers the influence of tax rate cuts.

- Firm size

The study by [14] identifies firms by size while this study does not.

- Total debts are broken into components short-term and long-term debts

The study by [20] identifies debts by total debts, short-term, and long-term debts while this study does not classify debts into short-term and long-term debts.

- Sample period

This study uses a sample of Taiwan firms from 2009 to 2012 while [14] uses a U.S. sample for the period from 1926 to 2009; [20] uses Pakistan firms from 1972 to 2010; [13] uses an international sample from 84 countries for the period from 1993 to 2013; [7] uses a U.S. sample for the period between 1989-2011.

- The effect of tax rate cut on different variables

This study on income tax on financial performance is similar to [16] and [5]; and the effect of tax rate cuts on leverage is similar to [20], [22] and [18].

- Research subject

This study on corporate rate cut is related to [19], [4], [2], and [6]. However, this study differs from that of [6]. This study focuses on one-country data and the after-effect of the tax rate cuts on financial performance while the findings of [6] deals with changes in financial items before the tax rate cuts by multiple countries in OECD.

Hypotheses

This study hypothesizes that income tax rate cut affect the financial performance of Taiwanese-listed firms. Tax rate cuts may motivate numerous changes such as a shift of investments from the corporate to the non-corporate sector, an adjustment in fund source from capital stock or borrowing, stimulate production, and drive wages [2]. Tax rate cut allows firms a lesser tax shield in terms of lower income tax expense resulting in higher net income after tax. Thus, a tax rate cut may generate a higher Operating Profit Margin, Return on Equity, and Return on Invested Capital but a decreased Price-Earnings Ratio. A lower tax shield discourages higher debts, resulting in a decreased Current Ratio, lower Debt-Equity Ratio, and increased Equity Ratio. The literature on studies on financial ratios, income tax rate cut, research subjects are noted. However, the researchers have no knowledge of studies in the English language on the effect of corporate income tax rate cut in 2010 on the financial performance of Taiwanese-listed firms using financial ratios. Thus, the effect of income tax rate cut on the financial performance of Taiwanese-listed firms is an empirical question. The statements of hypotheses are:

H1: The current ratio differs significantly after a corporate income tax rate cut.

H2: The price-to-earnings ratio differs significantly after a corporate income tax rate cut.

H3: The equity ratio differs significantly after a corporate income tax cut.

H4: The debt-equity ratio differs significantly after a corporate income tax cut.

H5: The operating income margin differs significantly after a corporate income tax rate cut.

H6: The return on equity differs significantly after a corporate income tax rate cut.

H7: The return on invested capital differs significantly after a corporate income tax cut.

RESEARCH METHOD

Measure of performance

To test the hypotheses on the effect of corporate income tax rate cut on financial performance, this study constructs Equation (1):

$$Y = \alpha + \beta_1 \text{TAX} + \beta_2 \text{SIZE1} + \beta_3 \text{SIZE2} + \Sigma \text{Control} + \text{CUT} + \text{IND} + \text{YR} + \varepsilon \quad (1)$$

where: Y alternatively takes the variable CR, P/E, ER, DR, OPM, ROE, and ROIC as a measure of financial performance. For comparability across studies on financial ratios, this study uses seven financial ratios consistent with [9], namely, Current ratio, Price-to-earnings ratio, Equity ratio, Debt-equity ratio, Operating income margin, Return on equity, and Return on invested capital.

The independent variables are TAX, SIZE1, and SIZE2. The variable TAX is used as a proxy for Total tax to Earnings before Tax; the SIZE1 refers to the log of Total Assets [22]; and SIZE2 is the log of Total Revenue [22] and [5]. Reference [22] uses two proxies for size, SIZE1, and SIZE2, and find that SIZE1 is significantly and positively related to corporate income tax. Reference [21] uses a natural log of total assets for size and finds no relationship between tax and size. On the other hand, [5] uses a natural log of revenue as a proxy for size and find a negative relationship between tax and size.

Drawing from [2], this study uses investments, production and wages as control variables for this study. In addition, the effect of industries, year-fixed effects, and the period of tax rate cut are controlled. The variable CS is a measure of capital stock, and the EMP is the number of employees as a proxy for production and wages. The dummy variable IND takes the value of one if the firm is in the industry; and zero if otherwise. The dummy variable YR takes the value of one if the firm is in the specified year; and zero if otherwise. The dummy variable CUT takes the value of one if the firm is in the period between 2010 to 2012; and zero if otherwise. The ε is an error term. The equation is tested using least square regression. Table 1 displays the variables and the description used in the study.

TABLE 1 DESCRIPTION OF THE VARIABLES

Variable	Description
CR	Refers to the Current Ratio computed as Current assets over by Current liabilities
P/E	Denotes to Price-Earnings Ratio estimated as the Market Value of common shares over Net income net of Preferred dividends per share.
ER	Refers to Equity Ratio calculated as Equity over Total assets.
DR	Denotes to Debt-Equity Ratio calculated as Debt over by Equity.
OPM	Refers to Operating Profit Margin computed as Net Operating Income over by Total Operating Revenue.
ROE	Denotes to Return on Equity computed as Net Income over by Total Shareholders' Equity.
ROIC	Refers to Return on Invested Capital computed as Net income after dividends over by Invested Capital (Total assets).
TAX	Refers to Total tax to Earnings before Tax.

SIZE1	denotes the log of Total Assets of the firm.
SIZE2	Measured as the log of Total Revenue.
CS	Refers to a measure of capital stock.
EMP	Refers to the number of employees as a proxy for production and wages.
IND	Is a dummy variable used to control the industry’s fixed effects.
YR	Is a dummy variable used to control the year-fixed effects. The dummy variable YR takes the value of one if the firm is in the specified year; and zero if otherwise.
CUT	Is a dummy variable used to control the year of effectivity of corporate income tax rate cut. The dummy variable takes the value of one if the firm is in the period between 2010 to 2012; and zero if otherwise

Research subject

The TSEC participants comprise local individuals, domestic institutions, and foreign investors. Local individual investors account for the majority of the market participants. However, both local individual and institutional investors are deemed unreliable in restraining management’s interest [8]. Foreign investors are considered Qualified Foreign Institutional Investors (QFII) of which U.S. investors cover the biggest share and exercise influences on the market prices of Taiwan firms [12]. The QFII enjoyed higher investment performance in a specific period [11]. Overall, shareholder protection is inadequate, and Taiwanese firms are weak in corporate governance [8].

Taiwan tax authority decreased the corporate income tax rate from 25% to 17% in 2010 [17]. Consequently, the effect of income tax rate cut on the financial performance of Taiwanese-listed firms is an empirical question. Therefore, this study assesses whether the corporate income tax rate cuts implemented in 2010 affect the financial performance of Taiwanese-listed firms. The study covers the period from 2009 to 2012. A study preserves institutional factors by covering one state. The stock market condition, the dynamic market participants, tax and financial reporting environment comprise the core forces in Taiwanese firms. This study does not include the effect of change in tax rates implemented in 2018 mainly due to two differences. First, the different direction of changes in tax rates. The corporate income tax rate was hiked in 2018 while the corporate income tax rate cut in 2010. Second, a change in financial reporting standards. An implementation of the mandatory adoption of IFRS in 2013 likely affects the presentation and measurement of financial items in 2013 and onwards. Thus, post-IFRS data after the tax rate hike in 2018 are likely dissimilar from the pre-IFRS data from 2009 to 2012 and are incomparable.

Selection criteria of sample

Firms with unconsolidated financial reports (a), financial firms (b), and firms with incomplete data necessary to calculate the ratios (c) are excluded from the sample following the selection criteria by [15].

TABLE 2 SAMPLE (N=2,210)

	Pooled	2009	2010	2011	2012
Total	3,174	745	769	822	838
(a)	228	61	57	57	53
(b)	112	29	29	27	27
(c)	624	155	102	164	203

Sample	2,210	500	581	574	555
Percentage	70%	67%	76%	70%	66%

Table 2 reflects the selection criteria and the details of the composition of the final sample from 2009 to 2012. The pooled sample has a total 2,210 firm observations representing 70% of the listed companies for 27 industries under the TSEC market. The exact problem that calls for the need for this study is to capture the effects of income tax rate cut in 2010 in Taiwan on the financial performance of electronic firms. The study selects the data starting from 2009 to isolate from the direct impact of the financial crises in 2008. Further, a dummy variable CUT is used to control the year of effectivity of corporate income tax rate in the period between 2010 to 2012. On the other hand, the study chooses data up to 2012 is to separate the potential effect of the adoption of IFRS in 2013.

The Taiwan Economic Journal database, a data vendor for all Taiwanese firms, is the source of data. This study uses EViews to run the tests using Equation (1). Further, the sample is segregated into electronic and non-electronic groups because the groups react differently. Electronic firms may respond differently from non-electronic firms because many electronic firms serve as original equipment manufacturers to foreign customers, offer stock-based compensation, and exercise competitive advantage with management approach and cost strategies [3]. Thereby, growth opportunities, capital requirement, production, and wages are dissimilar compared to non-electronic firms. Capital structure is relevant for electronic firms while growth is for non-electronic firms [3]. The final sample of 2,210 firms are composed of 1,082 electronic firms representing 47% of the total sample and 1,128 non-electronic firms accounting for 53%.

RESULTS AND DISCUSSION

Descriptive statistics

Table 3 shows the descriptive statistics of the variables. The mean CR of 258% specifies that the firms in the sample are liquid. The mean ER and DR indicate that firms raise 59% from equity and 42% from debts. The OPM stands at 9%, ROE at 12%, and ROIC at 2%. The mean P/E of 127% demonstrates high investors' confidence.

TABLE 3 DESCRIPTIVE STATISTICS (N=2,210)

Ratio	Mean	Median	Max	Min
CR	258	185	18,790	15
ER	59	58	97	2
DR	42	26	643	0
OPM	9	7	63	(94)
ROE	12	10	112	(46)
ROIC	2	2	41	(52)
P/E	127	15	206,910	0
TAX	0.39	0.10	26.51	(0.38)
SIZE1	7	7	9	6
SIZE2	7	7	10	4
CS	6.47	2.34	259.00	0.02

MP	7,282	1,440	961,000	12
EMP	7,282	1,440	961,000	12

*, **, *** indicates significant at the $p < 0.10, 0.05, 0.01$ level

Max=Maximum; Min=Minimum; and the TAX and CS are in NT\$ million

Table 4 presents a correlation of the financial ratios of the sample using the Spearman Rank. No correlation coefficient is exceptionally high, thus, multicollinearity is not a serious concern.

TABLE 4 SPEARMAN RANK CORRELATION

Ratio	CR	P/E	ER	DR	OPM	ROE	ROIC	TAX	CS
CR	1.0								
P/E	0.1	1.0							
ER	0.8	0.2	1.0						
DR	(0.7)	(0.1)	(0.8)	1.0					
OPM	0.2	(0.3)	0.2	(0.1)	1.0				
ROE	0.0	(0.5)	(0.1)	(0.1)	0.6	1.0			
ROIC	0.1	(0.5)	0.1	(0.1)	0.5	0.7	1.0		
TAX	(0.2)	(0.4)	(0.2)	0.1	0.2	0.4	0.3	1.0	
CS	(0.3)	(0.0)	(0.2)	0.3	(0.1)	(0.0)	(0.0)	0.6	1.0
EMP	(0.3)	(0.1)	(0.3)	0.2	(0.1)	0.1	0.1	0.6	0.5

Results of the test on the effect of IFRS on firm performance

This study estimates whether tax rate cuts influence financial performance using the CR, P/E, ER, DR, OPM, ROE, and ROIC as indicators. Thus, this paper presents results for pooled sample, electronic firms, and non-electronic firms.

Table 5 documents the result of the test on CR as an indicator of financial performance. A prediction on a lower tax shield discourages higher debts, resulting in a decreased Current Ratio. However, the result is contrary to prediction because the CR is significant and positively related to TAX and SIZE1 but negatively associated with SIZE2 for electronic and non-electronic groups. A positive connection between TAX and SIZE1 is matched with the findings of [22]. The positive relationship between CR and TAX is stronger in electronic groups. Reference [2] documents a link between TAX, CS, and EMP, however, the result of the test on CR exhibits no such link. The Current Ratio has an insignificant connection with CUT, thus, hypothesis 1 is not supported.

TABLE 5 ESTIMATION RESULTS ON CURRENT RATIO

	Pooled sample (N=2,210)	Electronic firms (N=1,082)	Non-electronic firms (N=1,128)
	Coefficient	Coefficient	Coefficient
Constant	1,407.24	1,239.17	1,865.33
	9.16***	14.03***	5.76***

TAX	0.00	00.00	00.00
	1.70*	3.02***	1.64*
SIZE1	207.22	121.83	258.48
	5.13***	4.04***	3.76***
SIZE2	(380.68)	(265.51)	(508.48)
	(10.76)***	(10.39)***	(8.15)***
CS	0.00	(0.00)	(0.00)
	0.93	(1.18)	(0.00)
EMP	0.00	(0.00)	0.00
	0.18	(1.06)	0.25
CUT	23.89	18.46	29.51
	0.99	0.81	0.39
IND	Yes	Yes	Yes
YR	Yes	Yes	Yes
R ²	0.07	0.25	0.07

*, **, *** indicates significant at the p<0.10, 0.05, 0.01 level

Numbers below the coefficient are asymptotic t-values.

Table 6 documents evidence of the test on P/E as an indicator of financial performance. A prediction that a tax rate cut may generate a higher Operating Profit Margin, Return on Equity, and Return on Invested Capital but a decreased Price-Earnings Ratio. However, the result of the test generates no significant connection between the variables and the Price-Earnings Ratio in the CUT period for both groups. Hypothesis 2 is not carried out. [2] Auerbach (2018) documents a link between TAX, CS, and EMP, however, the result of the test on P/E exhibits no such link.

TABLE 6 ESTIMATION RESULTS ON PRICE-EARNINGS RATIO

	Pooled sample (N=2,210)	Electronic firms (N=1,082)	Non-electronic firms (N=1,128)
	Coefficient	Coefficient	Coefficient
Constant	2,251.58	5,209.27	231.03
	1.55	1.73*	2.25
TAX	0.00	(0.00)	(0.00)
	0.05	(0.22)	(0.57)
SIZE1	(445.89)	(817.71)	1.85
	(1.17)	(0.79)	0.08
SIZE2	127.73	180.98	(26.80)
	0.38	0.21	(1.35)

CS	0.00	0.00	0.00
	0.52	0.82	1.26
EMP	0.00	0.00	0.00
	0.07	0.23	0.05
CUT	117.15	(737.16)	(34.44)
	0.52	(0.95)	(1.42)
IND	Yes	Yes	Yes
YR	Yes	Yes	Yes
R2	0.00	0.01	0.01

*, **, *** indicates significant at the p<0.10, 0.05, 0.01 level

Numbers below the coefficient are asymptotic t-values.

Table 7 documents the evidence of the tests on ER as an indicator of financial performance. A prediction that a lower tax shield discourages higher debts, resulting in a lower Debt-Equity Ratio and increased Equity Ratio. The ER is significant and positively associated with TAX and CS, indicating that higher (lower) equity is related to higher (lower) taxes and bigger (lower) capital stock. The link between positive TAX and positive CS supports the finding of [18]. Reference [2] documents a link between TAX, CS, and EMP, however, the result of the test on ER exhibits that lower production and wages are relevant for electronic groups in support for the TAX-EMP link of [4]. Further, the ER in electronic groups tends to be associated with SIZE1 comparable to the outcomes of [22]. On the contrary, SIZE2 is a significantly negative variable consistent with the findings of [5]. However, the Equity Ratio has an insignificant connection with CUT, thus, hypothesis 3 is not confirmed.

The results of this study offer evidence that electronic and non-electronic groups react differently as support to [3]. The result of the test on ER exhibits a TAX-EMP link [4]; and lower production and wages are relevant for electronic group but not for non-electronic group.

TABLE 7 ESTIMATION RESULTS ON EQUITY RATIO

	Pooled sample (N=2,210)	Electronic firms (N=1,082)	Non-electronic firms (N=1,128)
	Coefficient	Coefficient	Coefficient
Constant	176.81	160.06	183.85
	37.14***	27.55***	23.32***
TAX	0.00	0.00	0.00
	2.69***	4.12***	2.18**
SIZE1	(8.74)	11.11	(15.60)
	(6.98)***	5.60***	(9.32)***
SIZE2	(8.36)	(25.69)	(2.68)
	(7.62)***	(15.28)***	(1.77)*
CS	0.00	0.00	0.00

	9.53***	4.19***	6.61***
EMP	(0.00)	(0.00)	0.00
	(2.05)**	(3.46)***	1.02
CUT	(1.00)	0.45	(1.48)
	(1.35)	0.30	(0.80)
IND	Yes	Yes	Yes
YR	Yes	Yes	Yes
R ²	0.25	0.43	0.21

*, **, *** indicates significant at the p<0.10, 0.05, 0.01 level

Numbers below the coefficient are asymptotic t-values.

Table 8 documents evidence of the test on DR as an indicator of financial performance. A prediction that a lower tax shield discourages higher debts, resulting in a lower Debt-Equity Ratio and increased Equity Ratio. The DR is positively associated with SIZE1 while it is negatively associated with SIZE2, and CS. The result suggests that lower (higher) debts are associated with small (larger) firms, higher (lower) revenue, and higher (lower) capital stock. The DR is negatively associated with TAX in the pooled sample and electronic group. The result suggests that lower (higher) debts are related to higher (lower) taxes which is inconsistent with the prediction. The negative connection between DR and TAX is consistent with the results of [22] but dissimilar to the conclusions of [14], [20], [13], and [7] that corporate tax rates positively affect leverage.

Reference [2] documents a link between TAX, CS, and EMP. The result of the test on DR exhibits that lower capital stocks are relevant for both electronic and non-electronic groups. The negative association between DR and CS confirms that higher debts are associated with lower capital stock. Moreover, a positive link between a negative TAX and a negative CS supports the finding of [18]. But there is no significant link on production and wages inconsistent to the report of [4].

A positive relationship between SIZE1 and TAX is consistent with the findings of [22]. The second measure of size, SIZE2, is a significantly negative affecting DR is the same as the conclusions of [5].

A combined analysis of the results of Tables 6 and 7 reveals that the result is contrary to the prediction. Hypotheses 3 and 4 predict that corporate income tax rate cut may motivate greater debt, where a positive effect on debt raises the Debt-Equity Ratio and, reciprocally, lowers the Equity Ratio. However, the result of this study indicates a positive and significant link between tax and ER, suggesting higher (lower) taxes is related to higher (lower) equity ratio but the Equity Ratio has an insignificant connection with CUT (Table 6), thus, hypothesis 3 is not supported. On the other hand, there is a positive and significantly associated with DR (Table 7) in the pooled sample, signifying that the DR differs significantly in the CUT period, supporting hypothesis 4. Using the pooled sample, the capital structure tends to adjust resulting in lower debt and, accordingly, higher equity.

This portion of this study offer evidence that electronic and non-electronic groups react differently as support to [3]. Particularly for electronic group, the DR is negative and significantly associated with TAX, whereas for non-electronic group, the DR is insignificant.

TABLE 8 ESTIMATION RESULTS ON DEBT-EQUITY RATIO

	Pooled sample (N=2,210)	Electronic firms (N=1,082)	Non-electronic firms (N=1,128)
	Coefficient	Coefficient	Coefficient
Constant	(226.39)	(197.50)	(252.18)
	(13.54)***	(9.27)***	(8.82)***
TAX	(0.00)	(0.00)	(0.00)
	(2.02)**	(1.91)*	(1.61)
SIZE1	72.23	53.57	70.84
	16.45***	7.38***	11.66***
SIZE2	(34.50)	(21.10)	(28.30)
	(8.96)***	(3.42)***	(5.13)***
CS	(0.00)	(0.00)	(0.00)
	(5.16)***	(3.35)***	(3.35)***
EMP	0.00	0.00	(0.00)
	0.73	1.56	(1.12)
CUT	6.05	6.15	8.28
	2.31**	1.13	1.23
IND	Yes	Yes	Yes
YR	Yes	Yes	Yes
R ²	0.14	0.11	0.14

*, **, *** indicates significant at the p<0.10, 0.05, 0.01 level

Numbers below the coefficient are asymptotic t-values.

Table 8 documents evidence of the test of Operating Profit Margin, Return on Equity, and Return on Invested Capital as indicators of financial performance. A prediction that a tax rate cut may generate a higher OPM, ROE, and ROIC. Panel A of Table 9 illustrates the outcome of the test on the relationship between the variables and OPM. The OPM is positively associated with TAX and SIZE1 but is negatively associated with SIZE2. The result suggests that higher profitability is linked to large firms, higher taxes, and lower revenue. The positive connection between OPM and TAX supports the prediction of this study, and is consistent with the conclusions of [16] and [1]. However, the outcome conflicts with the results of [5]. Lower production and wages are relevant for electronic groups in support for the TAX-EMP link of [4]. Lower capital stocks are for non-electronic firms in support of the TAX-CS link of [18]. Reference [2] documents a link between TAX, CS, and EMP, however, the result of the test on OPM exhibits no such link.

The OPM is positively connected with SIZE1 but has a negative link to SIZE2, indicating that higher profits are associated with higher total assets but lower revenue. On the other hand, a positive relation between TAX and SIZE1 is the same as the outcomes of [22]. A negative relation between TAX and SIZE2 is similar to the conclusions of [5]. Further, the Operating Profit Margin has an insignificant connection with CUT, thus, hypothesis 5 is not supported.

This portion of this study offer evidence that electronic and non-electronic groups react differently as support to [3]. The result of the test on OPM exhibits a TAX-EMP link [4] and lower production and wages are relevant for electronic groups. Whereas, the result of the test on OPM exhibits that lower capital stocks are relevant for non-electronic firms in support of the TAX-CS link of [18].

TABLE 9 ESTIMATION RESULTS ON PROFITABILITY RATIOS

	Pooled sample (N=2,210)	Electronic firms (N=1,082)	Non-electronic firms (N=1,128)
Panel A OPM	Coefficient	Coefficient	Coefficient
Constant	15.86	18.05	5.01
	5.65***	5.94***	0.96
TAX	0.00	0.00	0.00
	8.27***	9.76***	4.13***
SIZE1	9.19	12.46	8.75
	12.44***	12.01***	7.93***
SIZE2	(10.32)	(13.98)	(8.34)
	(15.95)***	(15.91)***	(8.33)***
CS	(0.00)	(0.00)	(0.00)
	(1.85)**	(1.62)	(3.77)***
EMP	(0.00)	(0.00)	(0.00)
	(6.41)***	(8.78)***	(1.17)
CUT	(0.22)	0.73	0.30
	(0.51)	0.93	0.24
IND	Yes	Yes	Yes
YR	Yes	Yes	Yes
	0.13	0.30	0.08
Panel B ROE	Coefficient	Coefficient	Coefficient
Constant	1.39	1.98	(2.10)
	0.51	0.54	(0.46)
TAX	0.00	0.00	0.00
	11.14***	10.74***	6.58***
SIZE1	(3.05)	(4.18)	(2.75)
	(4.23)***	(3.33)***	(2.86)***
SIZE2	4.61	5.41	4.57
	7.32***	5.09***	5.23***
CS	(0.00)	(0.00)	(0.00)
	(7.86)***	(6.70)***	(6.29)***
EMP	(0.00)	(0.00)	(0.00)
	(7.33)***	(8.90)***	(0.33)

CUT	(0.27)	1.60	2.34
	(0.63)	1.69*	2.20**
IND	Yes	Yes	Yes
YR	Yes	Yes	Yes
	0.10	0.16	0.09
Panel C ROIC	Coefficient	Coefficient	Coefficient
Constant	1.02	(0.01)	1.72
	1.09	(0.00)	1.20
TAX	0.00	0.00	0.00
	5.30***	4.35***	5.07***
SIZE1	(0.27)	(0.31)	(0.48)
	(1.11)	(0.65)	(1.58)
SIZE2	0.40	0.52	0.51
	1.87*	1.30	1.83*
CS	(0.00)	(0.00)	(0.00)
	(3.54)***	(2.38)**	(4.66)***
EMP	(0.00)	(0.00)	0.00
	(2.05)**	(3.15)***	2.07**
CUT	0.29	0.65	0.53
	1.94**	0.86	1.58
IND	Yes	Yes	Yes
YR	Yes	Yes	Yes
R ²	0.02	0.04	0.05

*, **, *** indicates significant at the $p < 0.10, 0.05, 0.01$ level

Numbers below the coefficient are asymptotic t-values.

Panel B of Table 9 illustrates the outcome of the test on the relationship between the variables and ROE. A prediction that a tax rate cut may generate a higher OPM, ROE, and ROIC. The ROE is positively associated with TAX and SIZE2 while it is negatively associated with CS, EMP, and SIZE1. The result suggests that higher profitability is linked to large firms, higher taxes, lower capital stock, lower productivity and wages, and lower revenue. The positive relationship between ROE and TAX supports the prediction of this study and is comparable to the findings of [16] and [1], and contrary to the findings of [5].

This portion of this study offer evidence that electronic and non-electronic groups react differently as support to [3]. The result of the test on ROE exhibits a TAX-EMP link [4] and lower production and wages are relevant for electronic groups but not for the non-electronic firms.

A negative link between SIZE1 and TAX is consistent with the findings of [5], however, a positive link between SIZE2 and TAX is the same as the outcomes of [22], indicating that higher tax is linked to lower total assets and greater revenue.

The Return on Equity has a significant connection with CUT for both groups but is stronger in the non-electronic group. Hypothesis 6 is confirmed.

Panel C of Table 9 illustrates the outcome of the test on the relationship between the variables and ROIC. A

prediction that a tax rate cut may generate a higher OPM, ROE, and ROIC. The ROIC is positively associated with TAX while it is negatively associated with CS. The positive relationship between ROIC and TAX supports the prediction of this study and is comparable to the findings of [16] and [1] and dissimilar to the findings of [5]. The result suggests that higher profitability is linked to higher taxes but lower capital stock. Lower capital stocks are relevant for both groups in support of the TAX-CS link of [18]. However, lower (higher) production and wages are relevant for the electronic (non-electronic) group in support of the TAX-EMP link of [4]. Accordingly, a direct link between TAX, CS, and EMP is revealed in support of [2].

A positive SIZE2 in the pooled sample and non-electronic group is consistent with the outcomes of [22], suggesting that a higher tax and ROIC are linked to higher revenue. The Return on Invested Capital has a significant connection with CUT for the pooled sample, thus, hypothesis 7 is confirmed.

CONCLUSION AND FUTURE DIRECTIONS

This study tests the effect of tax rate cuts on the financial performance of Taiwanese firms from 2009 to 2012 with the hypothesis that tax rate cut impact financial performance. This study finds that albeit with minimal coefficients of TAX, the results provide evidence of its significant relationship with financial performance indicators.

Hypothesis 1 predicts that the income tax rate cut lowers income tax expense, more cash is available, and increased Current Ratio but a prediction on a lower tax shield discourages higher debts, resulting in a decreased Current Ratio. However, the result is contrary to prediction because the relationship between CR and TAX is positively significant and is stronger in the electronic group. This indicates that the tax rate cut tends to drive the CR higher. Moreover, the CR is insignificant in the CUT period, thus, hypothesis 1 is not supported. Hypothesis 2 predicts that tax rate cut reduce income tax expense, likely resulting in a higher net income and lower P/E. The P/E does not differ in the CUT period, thus, hypothesis 2 is not carried out. Hypotheses 3 and 4 predict that income tax rate cut may demotivate more debt, thus, lessening the DR and raising the ER. However, the result of this study is contrary to the prediction. The result indicates a positive and significant link between tax and ER, suggesting higher (lower) taxes is related to higher (lower) equity ratio. Further, the result documents a negative and significant link between tax and DR advocating for higher (lower) debts are associated with lower (higher) taxes. Using a pooled sample, the capital structure tends to adjust resulting in lower debts and, accordingly, higher equity. While the DR is positive and significant during the CUT, the ER does not differ significantly during the CUT, thus, hypothesis 4 is confirmed but hypothesis 3 is not.

Hypotheses 5, 6, and 7 predict that tax rate cut decrease income tax expense, generating higher net income and raising the OPM, ROE, and ROIC. The result shows that the OPM, ROE, and ROIC are positively associated with TAX indicating that profitability tends to increase with higher tax. However, the ROE differs significantly in both electronic and non-electronic groups during the CUT period, thus, hypothesis 6 is carried out. On the other hand, the ROIC is significant in the pooled sample in the period of CUT, thus, hypothesis 7 is supported. However, OPM has an insignificant link with CUT so hypothesis 5 is not confirmed.

The results of this study offer evidence that electronic and non-electronic groups react differently as support to [3]. Particularly for electronic group, the DR is negative and significantly associated with TAX. The result of the test on ER, OPM, ROE exhibits that lower production and wages are relevant for electronic groups in support for the TAX-EMP link of [4]. Whereas for non-electronic group, the DR is insignificant and the result of the test on OPM exhibits that lower capital stocks are relevant for non-electronic firms in support of the TAX-CS link of [18].

The result enriches the discussion on the usefulness of financial ratios as proxies for financial performance

and the impact of tax rate cut on financial performance in Taiwan's experience. Secondly, the result of the study complements the studies on the impact of income tax rate cut. The tax rate cuts in an Asian setting are connected to the capital structure. Thirdly, results offer evidence of different reactions of electronic and non-electronic groups in support of [3]. Fourthly, the results offer evidence of a link between tax, investment, productivity, and wages in support of [2]. The results benefit the practitioners of corporate finance, shareholders, market and tax regulators, auditors, researchers, and academia.

This study is limited to the four years covering 2009 to 2012 because the period is immediately before and after the implementation of income tax rate cuts in 2010 in Taiwan. The study isolates the immediate effect of the financial crises in 2008 and the adoption of IFRS in 2013 on financial performance. Future research may consider a study of the influence of tax rate cuts before and after the implementation of the rate cuts by firm size, or in terms of long-term and short-term debts.

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