

An In-Depth Analysis of Complex Industry's Effective Tax Rates

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[Abstract] This study is an in-depth analysis of complex industry's remarkably lower tax rates. Our data is from China's publicly listed firms of 2010-2018. We analyze whether company performance and investment returns are improved by lower tax rates. Our analysis indicates that complex industry's lower tax rate is likely to be the result of lower earnings management, which leads to lower income and lower tax. Investors are rewarding complex industry the same as other industries even though complex industry has significantly lower net income and income growth, indicating that investors base their decisions on multiple factors and reward high-quality earnings, even though they might appear lower on the books.

[Keywords] effective tax rates, earnings management, investment return

Introduction

Companies' effective tax rates (ETRs) are an important area of research. Abundant studies have been conducted in the US and around the world. According to the Tax Policy Center, the Tax Cuts and Jobs Act (TCJA 2017) reduced the top corporate income tax rate to 21% from 35%. It also eliminated the graduated corporate rate schedule. The Tax Foundation (2018) reported the statutory corporate income tax rate in the United States (U.S.) as 25.7%. This includes an average state corporate income tax. This puts the United States slightly above the OECD average of 24%. The Congressional Research Service reported that the U.S. average effective tax rate is 27.1%. This is slightly lower than other OECD countries' 27.7%. China is not currently an OECD member. However, China, as the second largest economy in the world, is a very important investment destination. To have a thorough understanding of the Chinese tax system and tax rates is very important for investment success in China.

Deferred tax liability (DTL) results in lower taxable income in the current period and is typically created by temporary differences in depreciation. A deferred tax asset (DTA) is typically created when a firm has previous year losses that can be carried forward for five years in China or temporary book tax differences in impairment loss. From a cash management point of view, it is more desirable to have DTL than DTA due to the tax deferral nature of DTL. It's more favorable to delay paying taxes. In our previous research, Wang, Campbell, Gai, and Johnson (2016), we documented that publicly listed Chinese companies' median GAAP effective income tax rate, cash effective tax rate, and sales tax and addition rate are 12.95%, 26.29%, and 4.06%, while they are 1.49%, 5.10%, and 0.85% for complex industry. The numbers using more recent years' data show that China's effective corporate tax rates are rising in all categories and all industries. However, complex industry's tax rates are still significantly lower than other industries. This study investigates whether complex industry's lower tax rates are associated with earnings management and whether the lower tax rates are rewarded by the investors, both short and long term. There is significant amount of literature that examines the interaction of effective tax rate (ETR) to firm size, firm industry,

firm leverage, capital concentration, political affiliations, ownership structure and deferred taxes in various countries. Our research takes into account most of these factors.

China taxes are classified into three major categories. The first category is income tax. It is currently 25%. It can be as low as 15% for eligible high-tech companies and 20% for eligible small businesses. The second category is sales tax and addition. It is between 3% to 20% based on industry. The third category is value added tax. It is 13% for domestic products, 17% for imported products, and 0% for exported products. Since a value added tax is separately paid by the customers and not reported by companies, this paper only analyzes income tax and sales tax and addition of publicly listed companies.

Literature Review

There has been extensive research on ETRs, earnings management, and stock returns. Our research is a comprehensive research that looks at all three factors as a whole. We believe the three factors can have impact on each other and an integral study of their relationships sheds light on managements' and investors' behavior.

Effective Tax Rates Research

There have been numerous studies on the impact of various factors on ETR. Industry and size are generally proved to have impact on ETRs. Heshmati, Johansson, and Bjuggren (2010) concluded larger firms had a lower ETR than smaller firms using Swedish firms. Time and industry were also part of the study. ETRs differ by industry, firm size, and over time. Olhoft (1999) found that higher income induces income tax avoidance. Firm size does not affect tax avoidance. He also suggested that multinational companies avoid more tax for every dollar of income compared to the U.S. only companies. Sebastian (2010) found that ETR was consistently less than the statutory rate, and the energy sector had the highest ETR, while general commerce had the lowest ETR. Various other studies have also considered the impacts of size and industry on tax rates (Liu & Cao, 2007; Stickney & McGee, 1982; Noor, Mastuki, & Bardai, 2008; Wu, Wang, Luo, & Gillis, 2012).

Ownership structure can impact tax rates. Wu, Wang, Luo, & Gillis (2012) found that state-controlled firms have a lower ETR than privately controlled firms. They analyzed public companies listed in China's A-share market. Their analysis excluded financial firms. Liu & Cao (2007) also analyzed ownership structure. They concluded that the larger the biggest shareholder's ownership, the higher the ETR.

Capital intensity (asset mix) can impact depreciation and, thus, tax rates. Liu & Cao (2007) found that ETR tended to be lower for firms with higher labor employment. This can be the effect of government policies that encourage employment. Stickney and McGee (1982) found capital intensity, leverage, and natural resources involvement are variables indicating lower ETR. Hsieh (2012) found return on assets, capital intensity, inventory intensity, and leverage have a lowering impact on ETR.

Auditor and company management can influence tax rates. McGuire, Omer and Wang (2012) found that tax-specific industry expertise by the external audit firm is a large variable in lowering a company's ETR. Dyreng, Hanlon, and Maydew (2010) found that individual executives play an important role in determining ETR. The study followed the movement of 908 executives moving through 1,138 U.S. firms between 1992 to 2006.

Liquidity (leverage) is important for a company's survival. Stanfield (2011) found lower ETR for firms with inadequate cash, including those firms that meet or just beat the consensus cash flow forecast. Noor,

Mastuki, and Bardai (2008) found that highly leveraged and highly capital-intensive companies had lower ETRs. Also, companies used international operations to reduce their income tax burdens. Deferred tax asset and deferred tax liability by nature affect ETR. The United States Government Accountability Office (GAO) (2016) published that bigger firms were more likely to owe tax than smaller firms. Nineteen and a half percent of the large corporations that reported a financial profit did not pay federal income tax. At least two-thirds of all active U.S. corporations reported zero federal income tax obligations. Both losses carry forward and tax incentives contributed to profitable corporations paying no federal tax in a given year.

Corporate Governance and Earnings Management

Corporate governance has been documented in research as being impacted by large investors, while other research contradicted this theory. Gillan and Starks (2003) found that increased information was generated by institutional investors and would result in improved monitoring of corporations and in healthier corporate governance structures. Their study also found that institutional investors increase the liquidity, volatility, and price transparency of the markets in which they invested. Li (2010) research results determined that the primary mechanism of communication and governance in China is the state and informal networks. Sueyoshi, Goto, and Omi (2010) concluded that unchanging shareholder ownership is a significant aspect of traditional Japanese corporate governance and that unchanging shareholder ownership only improves operational performance when the ratio of shares held by the constant shareholder group is more than 61.21%.

Chung et al. (2002) found that managers receiving incentive compensation increase or decrease reported profit using accruals. However, if the ownership also consisted of institutional investors, these institutional investors would hinder managers' ability to use discretionary accounting accruals to their advantage. Various researches, however, conclude that corporate governance was not impacted by large investor ownership. Leuz, Nanda, and Wysocki (2003) found that earnings management appears to be reduced in countries with dispersed ownership, larger stock markets, strong investor rights, and legal enforcement. Smaili and Labelle (2016) concluded irregularities were more prevalent when there were individuals owning a significant portion of company shares.

Management entrenchment impacts corporate governance. Shleifer and Vishny (1989) found that entrenched managers make specific investments to gain larger freedom in determining corporate strategy. These managers also chose investments that increase their value to shareholders, including steps to reduce the probability of being replaced, and obtaining higher wages and greater perks from shareholders. Elyasiani and Zhang (2015) found a positive relationship between lines of credit and management entrenchment. Smaili and Labelle (2016) found irregularities occurred more often when the CEO and the Chair of the Board were the same person. Stenheim and Madsen (2016) concluded companies are more likely to report fewer and reduced impairment losses when the Chair of Board and CEO are the same individual.

Board size and outside directors can affect tax rates. Davidson, Goodwin-Stewart, and Kent (2005) documented that a BOD that made up mostly by non-executive directors minimize the amount of earnings management. A non-executive director is somebody who is not employed in the company. Its role is to provide an outsider's contribution and oversight to the BOD. They also documented reduced earnings management when audit committees are made up by mostly non-executives. Beasley (1996) found that firms with no fraud instances have a significantly higher percentages of outside members on their boards. Xie, Davidson, and DaDalt (2003) found that earnings management occurs less frequently in companies whose boards include more independent outside and experienced directors.

The study also found that the structure of the audit committee impacts earnings management. Musteen, Datta, and Kemmerer (2010) found that firms with a larger percentage of outside directors and larger boards had better reputations. Alves (2013) found larger board size reduced earnings management. Duchin, Matsusaka, and Ozbas (2010) found when information acquisition cost is low, performance increases when outsiders are increased within the board of directors. Smaili and Labelle (2016) found increased financial reporting irregularities when the firms changed auditors. More irregularities happen when the firm had fewer directors that were outside directors or with financial experience.

CEO changes are associated with big bath behavior and impairment recognition in an effort to manage earnings. The big bath or cookie jar approach means firms that take big losses in one period to avoid continued annual losses. AbuGhazaleh, Al-Hares, and Roberts (2011) found goodwill impairment more likely to be connected with recent CEO changes, income smoothing, and big bath reporting behaviors. The results indicate that goodwill impairments are greatly related with effective governance mechanisms. Hassine and Jilani (2017) found that CEO change, financial crisis, earnings smoothing, and big bath accounting incentivize managers to exaggerate annual goodwill impairment losses. Zang (2008) found recent management changes resulted in larger impairment charges.

Investment Returns

Investment returns is a complicated issue. The capital asset pricing model (CAPM), which was first introduced by J. Treynor in 1961, is widely used in securities pricing. Monetary and fiscal policy can significantly affect returns (Qureshi, Khan, Rehman, Qureshi, & Ghafoor, 2019; Apergis, 2015). Industry, ownership structure and trading volume are other considerations (Al-Fayoumi, Abuzayed & Arabiyat, 2019; Desban & Lajili Jarjir, 2018; Kudryavtsev, 2019). Fama and French (2015) developed a five-factor asset pricing model which captures size, value, profitability, and investment patterns. Artmann, Finter, and Kempf (2012) developed a four-factor model, including market factor, book-to-market, earnings-to-price, and momentum. Our research is focused on the accounting side of investment returns, specifically, tax rates and earnings management.

Methodology

Our inspiration for this study is to investigate what characteristics companies in complex industry have that make their tax rates significantly lower than other industries. Our data is from the China Stock Market and Accounting Research Database (CSMAR). The data range is from 2010 to 2018. Overall, 538 out of 15,937 company years listed in Shanghai and Shenzhen stock exchanges are classified as complex industry. We first randomly selected ten companies from complex industry to illustrate the range of businesses

complex industry companies conduct. We then generated a summary of the general financial indicators for complex industry in comparison to other industries. We analyzed various investment return measures. Since higher investment return can be a result of earnings management instead of better company performance, we analyzed earnings management of complex industry compared with other industries. To take into consideration short term fluctuations, we looked at both annual and five-year average results. Finally, we performed logistic analysis to further analyze complex industry. Stepwise discriminant analysis was used for predictor selection.

Definition of Tax Rates

Effective tax rate means average tax rate. Income tax expense or tax paid is used as the numerator. Earnings before tax is used as the denominator (Dyreng, Hanlon, & Maydew 2010; Dyreng, Hanlon, & Maydew 2008). If income tax expense is used, it represents a tax rate for financial reporting purpose (hereafter, GAAP EITR). If the tax paid is used, it is the cash basis tax rate (hereafter, cash EITR). We added a third measure, which is sales tax and addition rate. It is calculated as sales tax and addition divided by earnings before tax (hereafter, ESTAR). We assume sales tax and addition expense equals cash paid, so ESTAR serves as both cash and GAAP ESTAR. A company's overall tax burden takes into consideration both income tax and sales tax and addition. Overall GAAP ETR is sales tax and addition and income tax expense divided by earnings before tax. Overall cash ETR is total cash paid for taxes divided by earnings before tax.

Earnings Management

Earnings management is an important issue with abundant current researches. Healy and Wahlen (1999) define earnings management as the alteration of a firm's financial reports by insiders to either mislead shareholders or influence contractual outcomes that are dependent on financial results. We adopt this definition. Earnings management measure is quantified using Leuz, Nanda, and Wysocki (2003) method. The method calculates accruals and cash flow from operations and the earnings management measure is the ratio of the two. The larger the ratio, the larger the implicated use of discretion to alter accounting results.

Results

We randomly select ten companies from complex industry to illustrate the business a complex industry company could be involved in. The information is extracted from www.reuters.com. The business scope is broad and includes mining, agriculture, construction, real estate, technology, and pharmaceutical.

Company Name	Company Description
Soyea Technology Co Ltd	Soyea Technology Co., Ltd. is a China-based company principally engaged in merchandise trading business, as well as the development and sales of real estates. The Company is also engaged in the manufacture and sales of electronic equipment, as well as the provision of information system integration services.
China Baoan Group Co Ltd	China Baoan Group Co., Ltd. is a China-based company principally engaged in high technology enterprise industry, biological pharmacy, and real estates.
Beijing Zodi Investment Co	Beijing Zodi Investment Co., Ltd. is principally engaged in the development and operation of properties. The Company primarily operates first-phase development of

Ltd	land in southwestern China through its subsidiaries. The Company is also involved in the modern fast food chain business.
Hefei Fengle Seed Co Ltd	Hefei Fengle Seed Co., Ltd. is a China-based company principally engaged in the production and sales of seeds, agrochemical products and spices.
Shandong Denghai Seeds Co Ltd	ShanDongDenghai Seeds Co., Ltd is a China-based company principally engaged in the production, sub-packaging and distribution of crop seeds.
Aviation Sanxin Co Ltd	Aviation Sanxin Co., Ltd. is principally engaged in the design and undertaking of curtain wall projects, as well as the manufacture and distribution of glass and deep processed products. The Company also involves in aeronautical materials business.
Yunnan Yuntou Ecology and Environment Technology Co Ltd	Yunnan Yuntou Ecology and Environment Technology Co., Ltd. is principally engaged in the plantation, sale, leasing and placing of greening plants, as well as the designing and undertaking of greening projects.
JiangSu Yabaite Technology Co Ltd	JiangSu Yabaite Technology Co., Ltd., is a China-based company principally engaged in research, development, manufacture and distribution of dry-type transformers and mobile substations.
Zhejiang Yasha Decoration Co Ltd	Zhejiang Yasha Decoration Co., Ltd is principally engaged in the design and construction of decoration engineering of buildings.
Shanghai Huili Building Materials Co Ltd	Shanghai Huili Building Materials Co., Ltd. is a China-based company principally engaged in the leasing of plants and the trading of floors. The Company is also engaged in the decorative building materials business through its subsidiaries.

Table 1 summarizes various tax rates for complex and other industries. China's tax rates are rising across all categories compared with our previous research results. However, complex industry's tax rates are still significantly lower than other industries in all categories. Complex industry's median GAAP EITR, Cash EITR, and ESTAR are 8.56, 9.67%, 3.27% compared with other industries' 14.93%, 31.16%, and 5.26%. Complex industry's overall GAAP and Cash ETR are 13.36% and 16.89% compared with other industries' 20.72% and 38.91%.

Table 1
Tax Rates Summary

Industry		GAAP EITR	Cash EITR	ESTAR	Overall GAAP ETR	Overall Cash ETR
Complex	Mean	10.34%	14.10%	9.52%	19.86%	23.62%
	Median	8.56%	9.67%	3.27%	13.36%	16.89%
Other industries	Mean	14.82%	28.16%	7.97%	22.79%	36.13%
	Median	14.93%	31.16%	5.26%	20.72%	38.91%

The mean and median are all significantly different for the two groups at $p < 0.05$.

Table 2 summarizes basic financial indicators. The first thing we notice is complex industry's sales and earnings before tax is significantly lower. Complex industry's median sales is about 1.3 billion compared with other industry's 1.4 billion. Complex industry's median earnings before tax is 94 million compared with other industry's 153 million. Complex industry's leverage is significantly higher at 44% compared to other industry's 38%. Lower earnings and higher leverage could lead to lower tax rates for complex industry.

Table 2

Summary of Basic Financial Indicators

	Complex Industry	Other Industries	Pr > t *	Complex Industry	Other Industries	Two- Sided Pr > Z **
	Mean	Mean		Median	Median	
Sales	2,781,711,530	6,635,265,576	<0.0001	1,301,294,247	1,425,715,597	<0.0001
Income before Income Tax	238,183,221	623,830,605	<0.0001	94,310,755	153,434,597	<0.0001
Total asset	4,862,584,799	11,102,394,134	<0.0001	2,778,447,081	2,822,783,502	0.0517
Leverage	58.86%	44.90%	0.2159	44.05%	38.44%	<0.0001

*P values takes equality of variances into consideration and uses methods accordingly.

Leverage=beginning total debt/beginning total asset.

**Wilcoxon Two-Sample Test

In addition, about 20% complex industry companies have losses in the previous year, while about 16% companies in other industries have losses in the previous year. Table 3 illustrates that complex industry has significantly lower income. While net income could be a matter of company size, the income growth for complex industry is only 2.67% when it is an impressive 13.1% for other industries. The return on asset for complex industry is only 3.43% compared with 5.51% for other industries. This indicates that complex industry's significantly lower net income can partially be explained by its significantly lower return on assets and income growth. We however do not document a significant difference of market book ratio or stock return between complex industry and other industries. We include impairment loss in our analysis since this plays a big part in a company's profitability. Even though complex industry's mean impairment loss is lower, its median impairment loss is significantly higher at 12,502,609 compared with 8,516,358 for other industries.

Table 3

Investment Return Indicators (Annual Data)

		ComplexIndustry	OtherIndustries	Pr > t *	Two-Sided Pr > Z **
Net Income	Mean	209,474,565	497,352,522	<0.0001	
	Median	78,667,167	129,909,118		<0.0001
Income Growth	Mean	-45.13%	241.16%	0.3221	
	Median	2.67%	13.10%		<0.0001
Market to Book Ratio	Mean	2.7317	3.0203	0.2354	
	Median	1.8293	1.9190		0.5357
ROA	Mean	0.0288	0.0571	<0.0001	
	Median	0.0343	0.0551		<0.0001
Stock Return(including dividend)	Mean	-0.0135	-0.0019	0.5867	
	Median	-0.0770	-0.0373		0.6414
Impairment Loss	Mean	49,510,305	59,386,500	0.0429	
	Median	12,502,609	8,516,358		0.0001

*P values takes equality of variances into consideration and uses methods accordingly.

**Wilcoxon Two-Sample Test

To take into consideration short term fluctuations, we use a five-year average for each company performance indicator and run a robust test on our results. Table 4 illustrates the results. The outcome is consistent with our results using annual data. The results confirm that complex industry has a significantly lower net income, income growth rate, and return on assets. The results also confirm that even though complex industry seems to be less efficient, its stock market performance is not significantly differently from other industries. Complex industry again has a significantly higher median impairment loss of 20,290,368 compared with other industry's 13,902,676.

Table 4

Long-Run Investment Return Indicators (Five-Year Average)

		ComplexIndustry	OtherIndustries	Pr > t *	Two-Sided Pr > Z **
Net Income	Mean	143,362,947	510,477,240	<0.0001	
	Median	58,045,606	133,419,904		<0.0001
Income Growth	Mean	-59.37%	321.11%	0.1124	
	Median	2.95%	17.25%		<0.0001
Market to Book Ratio	Mean	2.5566	2.7078	0.5937	
	Median	1.8747	1.8901		0.1677
ROA	Mean	0.0253	0.0482	<0.0001	
	Median	0.0273	0.0446		<0.0001
Stock Return	Mean	0.0942	0.1096	0.2151	
	Median	0.0709	0.0949		0.0930
Impairment Loss	Mean	49,652,974	59,384,957	0.0513	
	Median	20,290,368	13,902,676		0.0005

*P values takes equality of variances into consideration and uses methods accordingly.

**Wilcoxon Two-Sample Test

Table 5 shows earnings management scores for complex and other industries. Although our earnings management analysis is somewhat mixed, the general conclusion is that complex industry has significantly lower earnings management score compared with other industries. The results are mostly consistent using annual and five-year average data. We suspect complex industry's significantly lower income growth and return on assets could be the results of lower earnings management.

Table 5

Earnings Management

		ComplexIndustry	OtherIndustries	Pr > t *	Two-Sided Pr > Z **
EarningsManagement	Mean	1.4557	2.2519	0.0306	0.0004
	Median	1.0165	1.0355		
Long-run EarningsManagement***	Mean	1.3619	2.3737	<0.0001	0.1004
	Median	1.0245	1.0417		

*P values takes equality of variances into consideration and uses methods accordingly.

**Wilcoxon Two-Sample Test

***Five-year average earnings management score.

After stepwise discriminant analysis, we retain nine predictors for our logistic analysis of the complex industry. Three general financial indicators, leverage, sales, and total assets are included. For every percentage increase of leverage, the company is 1.5% more likely to be in complex industry. For every two folds increase of sales, the odds that the company is in complex industry is decreased by 35.1%. We include four company performance indicators, average impairment, average stock return, net income, and return on asset. For every two folds increase of average impairment losses, the odds of it being in complex industry is increased by 33.8%. Average stock return, net income, and return on asset are not significant predictors. As we have stated in the beginning, complex industry tax rates are significantly lower than other industries. It is expected that for every percentage increase of Cash EITR, the company is 0.9% less likely to be in complex industry. In addition, for every percentage increase of GAAP EITR, the company is 1.8% less likely to be in complex industry.

Table 6

Logistic Regression Analysis of Complex Industry

Predictor	Analysis of maximum likelihood estimates				
	β	SE β	Wald's χ^2	p	Odds Ratio
Constant	3.5366	1.8233	3.7624	0.0524	N.A.
Leverage	0.0147	0.00435	11.4399	0.0007	1.015
Size	-0.4319	0.0793	29.7008	<.0001	0.649
Total Asset	0.1867	0.1471	1.6111	0.2043	1.205
Average Impairment	0.2909	0.0496	34.343	<.0001	1.338

Analysis of maximum likelihood estimates						
Predictor	β	SE β	Wald's χ^2	p	Odds Ratio	
Average Stock Return	-0.00851	0.00513	2.7491	0.0973	0.992	
Net Income	-0.242	0.1309	3.419	0.0644	0.785	
ROA	0.00771	0.0393	0.0384	0.8446	1.008	
CashEITR	-0.009	0.0023	15.3321	<.0001	0.991	
GaapEITR	-0.0182	0.00648	7.8603	0.0051	0.982	
Overall model evaluation						
R-square	0.0363		Max-rescaled R-square		0.1459	
			χ^2	p		
Likelihood ratio test			181.2768	<0.0001		
Score test			215.2005	<0.0001		
Wald test			176.1695	<0.0001		

Leverage=beginning total debt/ beginning total asset

Size is log2 of sales.

Total Asset is log2 of total asset.

Average Impairment is log2 of five-year average impairment.

Average stock return is log2 of five-year average stock return, including dividends.

Net Income is log2 of net income.

ROA is return on asset.

Conclusion

Complex industry has a significantly lower net income, income growth rate, and return on assets. It has a significantly higher impairment loss recognition. Complex industry in general has a lower earnings management score. We believe complex industry's lower net income, income growth rate, and return on asset can be partially explained by the significantly higher impairment loss and lower earnings management. Complex industry's remarkably lower tax rates can possibly be explained by the industry's proper recognition of impairment loss and low earnings management. We believe investors might already take this possibility into consideration and reward complex industry the same stock market return, even though the industry has significantly lower income growth and return on assets.

Our logistic analysis shows that general financial indicators, such as leverage, total asset, and sales are significant predictors for the industry. Impairment loss is another significant predictor for the industry, which is consistent with our mean and median analysis, which shows complex industry has significantly higher impairment loss.

Our research provides significant insight on earnings management and investors' behavior. Investors do not necessarily base their decisions on reported financial performance of a company. They take everything into account, including perceived quality of the earnings. Earnings management is not an effective tool to increase company value. Proper reporting of earnings and impairment losses thus lower taxes are rewarded in the stock market.

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