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Two Essays on Corporate Income Taxes and Organizational Forms in the United States

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Two Essays on Corporate Income Taxes and Organizational Forms in the United States

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[To my wife Jialin Yi]

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LIST OF SYMBOLS AND ABBREVIATIONS

m	Shareholder's marginal tax rate on dividend
τ	Effective corporate income tax rate
z	Shareholder's accrual capital gain tax rate
ρ	Shareholder's required rate of return
D_t	Dividend at time t. $D_t \geq 0$
V^N_t	New share issued at time t
K_t	Capital stock at time t
I_t	Capital investment at time t
$\pi(\ )$	Pretax profitability function
$\overline{V}^N$	Minimum level of new share issues
μ, λ, η, and ξ	Lagrange multipliers
g	Relative of nonprofit firm over for-profit firm

SUMMARY

Corporate income taxation has a profound impact on economic behavior in the United States. This dissertation focuses on two aspects: the impact of dividend taxation on investment and the impact of corporate income tax exemption on nonprofit organizations activity. The first essay compares dividend payout ratios of C and S corporations to test the validity of the traditional and the new views on dividend taxation. Average corporate income tax rate is used as an instrumental variable. The results support the traditional view. The second essay focuses on whether the exemption of nonprofit organizations from the corporate income tax affects the competition between for-profit and nonprofit hospitals. Time series and panel data analysis show that tax subsidies to nonprofit organizations have a positive impact on nonprofit hospitals' market share.

CHAPTER 1

INTRODUCTION

Corporate income tax rules in the United States are complicated and always controversial. Economic entities with different organizational forms are taxed differently. High corporate income tax rates drive corporations to convert into tax-exempted forms. Economists and policy makers are keen to find out how the relationship between various forms and tax rules influences the general economy and social welfare. Empirical research in this field can provide insights in economic modeling of income taxes and generate deep policy implications for corporate income tax reform.

One heatedly debated topic is whether the double taxation of dividends negatively affects investment in the corporate sector. Managers of profitable corporations have to decide whether to distribute those after-tax profits to shareholders as dividends or to retain the earnings to finance new investments. The traditional view holds that dividends have the extra function of profit signaling. Therefore, corporate managers tend to distribute more dividends than they would if dividends only served as a way of profit distribution. Thus corporations do not have adequate retained earnings to finance marginal investment and have to issue new shares to raise capital for new projects. The double taxation of dividends increases the cost of capital and thus reduces the overall investment level in the corporate sector. Therefore, supporters of the traditional view call for tax reforms to integrate the corporate income tax and personal income tax on dividends.

However, the new view holds that dividends do not serve any extra function of profit signaling, so managers of profitable corporations always retain enough after-tax profits to finance marginal investment and distribute the residual profits to shareholders. Thus, dividends are distributed regardless of the tax cost, and double taxation of dividends does not negatively reduce the investment in corporate sector. Rather, firms distribute profits as dividends only if they have no more profitable investment opportunities; the tax is not foreclosing any profitable investments. Therefore, supporters of the new view object to a reform to eliminate tax on dividends, fearing such elimination would greatly reduce federal tax revenue.

A second controversial topic is the corporate income tax's impact on for-profit and nonprofit organizations (NPOs). NPOs play an indispensable role in the United States. They provide goods and services to the society when the government fails to provide enough to its people. Researchers have been inquiring whether the government's tax subsidies to the nonprofit organizations are important to their existence and to competition with for-profit counterparts. If they do not respond to the exemption of various taxes, then taxing them in the same way as for-profit organizations will both increase tax revenue and level the playing field. On the other hand, the proof of a positive relationship between tax exemption and nonprofit activities helps policy makers to determine the right measure to regulate NPOs in their desired direction.

This dissertation studies these two topics in two essays. The first essay explores the different tax treatment of C and S corporations and shows that the dividend payout ratios of C and S corporations should differ under the traditional view but not under the new view. Thus it examines the validity of the traditional and new views by comparing

the dividend payout ratios in C and S forms. Applying the test on a confidential tax return dataset provided by Georgia Department of Revenue, I find empirical results supporting the traditional view. The second essay focuses on the impact of federal corporate income tax exemption on the market shares of nonprofit hospitals. The study of national level and state level aggregate market shares provided in *Hospital Statistics* published by the American Hospital Association shows that the tax exemption does positively affect nonprofit hospitals' market shares.

CHAPTER 2

ESSAY ONE: THE IMPACT OF THE CORPORATE INCOME TAX ON THE COST OF CAPITAL—NEW EVIDENCE FROM CHOICE OF C VS. S CORPORATE FORMS

2.1 Introduction

U.S. business and personal income tax rules subject corporate income first to the corporate income tax (CIT) at the corporate level and then to the personal income tax when dividends are distributed. If corporations do not distribute the profits as dividends, shareholders pay taxes on their capital gains when they sell their shares. Therefore, corporate income is taxed twice. Economists and policy makers are eager to find out whether this double taxation of dividends increases the cost of capital and distorts investment behavior in the corporate sector. Some scholars believe that it does and call for dividend tax cut, while others disagree. However, despite decades of debate, no agreement has been reached. Empirical research on this topic will not only contribute to the establishment of a correct theoretical framework, but also will have policy implications on tax reforms.

There are two competing views on the taxation of dividends. The traditional view argues that dividends are not only a way of distributing corporate profits to shareholders, but also have other utilities such as signaling profit to build up investors' confidence and satisfying investors' preference to have cash in their hands rather than in the corporations. Therefore, corporations have the tendency to distribute the profits to shareholders despite

the double taxation of dividends. However, the dividend tax increases the cost of profit signaling and decreases the rate of return of capital for corporate investors. As a result, it increases the cost of capital and lowers overall investment level in the corporate sector. Therefore its supporters have proposed the integration of corporate and personal income tax to reform the U.S. income tax system. Hubbard (1993) states that the U.S. Treasury holds the traditional view and advocates integration of corporate income tax and individual income tax on dividends.

However, the new view, proposed by King (1977) and Auerbach (1983a, 1983b) believes that mature firms only distribute dividends when they have retained enough earnings to finance the marginal investment and dividends are only the residuals of profits after retained earnings; these dividends are distributed anyway no matter how high the dividend tax is. Therefore dividend tax is neutral and does not affect corporations' dividend distribution and investment behavior; thus integration of corporate income tax and individual income tax on dividends will not increase investment by much but will reduce federal tax revenue. Sinn (1991) states that the major reason Congress did not follow the Treasury Department proposal to integrate CIT and individual income tax in 1986 was that it feared that the integration would substantially lower revenue without creating significant efficiency gains.

Each view is appealing under its assumption about the function of dividends, and it is not possible to judge the views' validity by only looking at their theoretical frameworks; we have to resort to empirical evidence to determine which view is more correct. However, empirical analysis that tests these competing views is limited due to the lack of appropriate data.

The comparison of dividend policy among different organizational forms may shed some light on how to test these competing theories. The S corporation, a relatively new but mushrooming organizational form, is different from the traditional corporation (which is hereafter called a C corporation), the noncorporate forms, and other hybrid forms. It enjoys the limited liability of a C corporation, which means that its shareholders only risk the amount of money they invest in the corporation rather than all of their wealth, but it is taxed similarly to a partnership, which means that it does not pay CIT and all its profits and losses are passed though to shareholders and are only subject to individual income tax. The comparison of dividend policy in S and C corporations provides a good test of competing views on taxation of dividends.

This paper focuses on C and S corporations and studies the impact of corporate income tax on investors' choice between S and C forms by using individual firm-level time-series information from a confidential tax return dataset in Georgia. It first derives the cost of capital for C and S corporations under different views within the neoclassical economic framework. Then it tests the competing views about dividend taxation. If the traditional view more accurately reflects the fact than the new view, then the choice of an S or a C organizational form should affect the dividend payment and S corporations should pay a higher proportion of profits as dividends. However, if the new view is correct, then dividends are just the residual of corporations' profits after new investment, and dividend payment is not affected by the organizational form. Thus, this paper tests the hypothesis that S corporations have higher dividend payout ratios than C corporations because they avoid the double taxation of corporate income.

However, there is an endogeneity problem in that corporations with higher dividend payout ratios might select to be S corporations in order to avoid CIT. Thus instrumental variables are necessary. The literature has shown that average CIT rate affects organizational forms. Empirical analysis of the data provides evidence that the higher the effective CIT rate is, the more likely a corporation is to choose the S form in order to minimize income tax payment. Therefore, the average CIT rate in the preceding year is used as an instrumental variable. The final empirical results confirm the traditional view.

Following the logic in the above paragraph, section 2.2 reviews the literature about the competing views on the dividend taxation. Section 2.3 gives a comprehensive description of S corporations' tax rules and history. Section 2.4 shows the theoretical framework using the cost of capital and sets up the hypothesis. Section 2.5 describes the data from the Georgia tax return files and the adjustments made to fit it for the analysis in this paper. Section 2.6 tests the hypothesis that organizational form affects dividend payout ratio and shows findings that S corporations pay higher proportion of profits as dividends. Due to the endogenous relationship between organizational forms and dividend payout ratio, average CIT rate is used as an instrumental variable. Section 2.7 draws support from the literature, showing that average CIT rate affects the decision of organizational forms. Section 2.8 tests whether average tax rate affects the choice of organizational form in my data. Section 2.9 re-tests the relationship between organizational form and dividend payout ratio, correcting for the endogeneity problem and section 2.10 concludes this paper.

2.2 Literature Review

Different theories about dividend taxation provide different guidelines and evaluation of federal income tax reform. Numerous studies have examined why corporations pay dividends despite the tax penalties on dividends from the double taxation, but no consensus has emerged. The most influential theories are categorized into two groups: the traditional view and the new view. The literature is abundant with articles summarizing these theories and studies testing them (e.g., Poterba, 1987; Sorensen, 1995; and Carroll et al., 2003).

The dispute between the traditional and new views centers on the different assumptions about the function of dividends: whether dividends have more functions than that of distributing profits to shareholders. If dividends have more functions than serving as a means of profit distribution, as the traditional view assumes, then corporations will distribute a higher proportion of profits to shareholders and the remaining retained earnings will not be enough to finance new investments. According to the new view, mature corporations finance marginal investments from retained earnings; after they run out of investment opportunities, they distribute the remaining profits to shareholders as dividends. Scholars on both sides use the neoclassical economic framework of user cost of capital initiated by Jorgenson (1963) and Hall and Jorgenson (1967) to explain and justify their arguments. The user cost of capital is defined as the required rate of return on the capital investment; the higher the cost, the lower the capital investment and the smaller the capital stock in the corporate sector. Supporters of the traditional view believe that the double taxation of dividends increases the cost of capital, while the new view supporters believe that it does not.

The discussion of the traditional and new views is limited to mature firms, which are defined as firms to having limited investment opportunities so that their profits are high enough to cover all those opportunities. However, this definition does not explicitly include growing corporations that do not have enough profits to finance their desired investment. To make up this gap, Sinn (1991) follows the line of argument used by the new view and proposes the nucleus theory that growing corporations are established with limited initial capital but are expanded through retained earnings. No dividend is distributed before corporations reach the mature phase. After entering the mature phase, corporations distribute dividend out of the profit that remains after the firms deplete all of the investment opportunities, as predicted by the new view.

Empirical tests of the two views are limited and the results are mixed. There were six influential empirical studies in the 1980s by Gordon and Bradford (1980), Poterba and Summers (1984), Poterba (1987), Nadeau (1988), Auerbach (1984), and Bagwell and Shoven (1989). However their conclusions are mixed, with some supporting the traditional view and others supporting the new view. Moreover each study is flawed, with some dubious results or interpretation (Zodrow, 1991).

Two additional studies were done in 1994 and 2000. Gentry (1994) exploits the different tax treatment of publicly traded partnerships (PTP) and corporations and uses firm-level data to study the relationship between the dividend payout ratio and PTP versus corporation forms. He argues that the tax cost of dividends is lower for PTP firms than for corporations. According to the nucleus theory and the new view, dividend payment is not affected by dividend tax cost because dividend is paid only as remaining profit after the corporations deplete their investment opportunities. However, the

traditional view predicts that dividend payout ratio is affected by the cost of dividend tax. His result shows that PTP firms pay a significantly higher proportion of their profits as dividends than corporations so that the traditional view is more likely to be correct. Gentry (1994) explains that dividend payout ratio should differ for PTPs and corporations under the traditional view because the cost of signaling of dividend is lower for PTP than corporations. However, his explanation is more intuitive than theoretically sound and more rigorous proof is necessary.

In 1987, Australia and New Zealand adopted similar dividend imputation systems to allow dividend taxes on the personal level to be offset by some credits derived from corporations' CIT payment. The new dividend imputation systems reduced the tax cost of dividends and are expected to increase capital investment under the traditional view but to have no significant impact under the new view. Black, Legoria and Sellers (2000) find evidence that dividend imputation increases corporate capital investment, supporting the traditional view.

More empirical evidence using different methodology is necessary to test the validity of the traditional and new views. The difference of C and S forms provides another angle to examine the theories and design an empirical test. This paper compares the dividend payout ratios in C and S corporations to test the competing views.

2.3 A Brief Introduction of S Corporations

In the United States, economic entities take various organizational forms, including corporations, typical noncorporate entities (i.e., sole proprietorships and partnerships), and hybrids of noncorporate and corporate forms, (e.g., publicly traded partnerships). Congress created the S corporation in 1958. According to U.S. Code (1958,

page 4876), Congress believed that it "is desirable to permit businesses to select the form of business organization desired, without the necessity of taking into account major differences in tax consequence. . . . Also, permitting shareholders to report their proportionate share of the corporate income, in lieu of a corporate tax, will be a substantial aid to small business. . . . The provision will also be of substantial benefit to small corporations realizing losses for a period of years where there is no way of offsetting these losses against taxable income at the corporate level, but the shareholders involved have other income which can be offset against these losses."

Therefore, Congress enacted the Technical Amendments Act of 1958, requiring the IRS to give small businesses an option to choose whether to have their net business income exempted from the CIT. According to IRS regulations, an S corporation begins its existence as a general for-profit corporation upon filing the articles of incorporation at the state level. However, after the corporation has been formed, it may elect "S Corporation Status" by submitting IRS form 2553 to the Internal Revenue Service. Once this filing is complete, the IRS refers to the business as an S corporation Corporations which do not file IRS form 2553 are referred as C corporations. An S corporation is taxed similarly to a partnership rather than as a C corporation. Thus, its net income or loss is passed through to its shareholders for the purpose of computing tax liability. Net income, whether the corporation actually distributes it or not, is passed through to the shareholders and taxed based on their personal income tax rates. Losses are passed through to shareholders who can use it to offset personal income from other sources. In certain circumstances, the S form saves more money in taxes than the C form for businesses with profits or losses. However, Congress set several requirements for small

corporations to qualify as S corporations. Those major requirements included the following:

—The corporation can have no more than 10 shareholders.

—All shareholders must be either U.S. citizens or permanent resident aliens, and non-resident aliens are not acceptable.

—The corporation must have issued only one class of stock.

—No more than 80% of its gross receipts can be from sources outside the Untied States.

—No more than 20% of the corporation's gross receipts can be derived from passive investment activities.

However, S corporations were not taxed in the same way as partnerships at that time because S corporation shareholders were not allowed to carry losses over, while partnership shareholders were. The Subchapter S Revision Act of 1982 increased the maximum number of shareholders to 35, eliminated the requirement of no more than 80% of gross receipts from abroad, and mandated that S corporations be taxed in the same way as partnerships. The S form started to be a real option for small businesses.

The S form has benefits over the C form in various circumstances. Scholes et al. (2002) created a simple example to illustrate that the double taxation of the corporate income means that a dividend-paying C corporation must pay a higher before-tax rate of return than a similar S corporation. The longer the time span of the investment, the lower the difference in required rates of return; but a difference persists even when the time span increases to fifty years.

However, Hulse and Pope (1996) argue that if both C and S corporations do not pay any dividend and use all of their profits to finance similar new projects, then C shareholders will pay less income tax than S shareholders. Their argument is true in the years when the CIT rate is lower than individual income tax rate. Even though C shareholders are taxed by capital gain tax when they sell their shares years later, they still pay a combined income tax less than S shareholders because the capital gain tax rate is low compared with the individual tax rate and is taxed only on the realization date, which means that its accrual rate (i.e., its yearly equivalent rate) is negligible. For example, taxing the income from selling currently held stocks in ten years with the capital gain tax rate of 28% is equivalent to taxing the income with a rate of 1.4% every year ([1-0.28]=[1-accrual rate]^{10}). If the CIT rate is 35% and the individual income tax rate is 39%, then C shareholders combined yearly income tax rate is 36% (=1-[1-0.35]*[1-0.014]), while the S shareholders yearly income tax rate is 39%. However, with the Jobs and Growth Tax Relief Reconciliation Act of 2003, which cuts the top tax rate on dividends from 35% to 15%, Hulse and Pope's argument becomes weak.

Plesko (1995) explains the tax advantage of the S form for corporations bearing losses. He argues that immediate use of the loss to offset individual income tax payments yields a higher present value of tax savings than the C form, which has to carry losses forward to offset future profits in the corporation. Also, if the shareholders' personal tax rate is higher than the firms' corporate income tax rate, losses passed through to the shareholders could offset a greater amount of tax liability at the individual level than at the corporate level, even without present value considerations.

Despite the theoretical expectation of tax advantages for the S form and policy makers' intentions to favor small business by creating the S form, not many corporations took the S form in the early 1980s because there were a lot of tax loopholes sheltering C corporations' income, which made the S form less attractive than the congressmen had desired. The Tax Reform Act of 1986 (TRA86) eliminated a lot of loopholes that allowed C corporations to avoid CIT payments and stimulated the expansion of the S form further, making it more important in the economy. For example, TRA86 set up the Alternative Minimum Tax (AMT), so that corporations could no longer avoid tax payment through the tax shelters of debt financing and accelerated depreciation. The AMT calculates taxable income differently than the CIT, adding back part of the benefit of accelerated depreciation and other tax-reducing items. Those other tax-reducing items include some interest receipts from tax-exempt municipal securities and taxes deferred by use of completed contract accounting. (The completed contract method allows a manufacturer to postpone reporting taxable profits until a production contract is completed. Since contracts may span several years, this deferral can have a substantial positive net present value. [Brealey & Myers, 1991, p. 732]) Then the AMT equals 20 percent of the AMT taxable income. Because the AMT makes the corporation income tax an effective burden for corporations, it made the S form more attractive.

In 1996, Congress believed that "increasing the maximum number of shareholders of an S corporation will facilitate corporate ownership by additional family members, employees and capital investors" (US Code 1996, p. 1519). Thus, it increased the maximum number of shareholders from 35 to 75 in the Small Business Job Protection Act. The law also removed barriers preventing banks from organizing as S corporations.

According to Plesko (1994), S corporations accounted for less than 20% of all corporations, less than 2% of all corporate assets, and about 5% of corporate business receipts prior to 1986. In 1989, those percentages increased to 39% of corporations, 3.9% of assets, and 13% of business receipts. In 1996, 58.2% of corporations in the US were S corporations, with 18.6% of total receipts and 3.8% of total assets. (Bennett, 2001). The prevalence of the S form and the difference of its tax treatment from that of the C form provide a test of the dividend taxation theories.

2.4 Methodology: Cost of Capital and C versus S Corporations

The most prominent work summarizing the traditional and new views is done by Poterba and Summers (1984). In order to apply their framework in the C and S forms scenario, I reiterate their mathematical derivations briefly here. They set a profit-maximizing firm's objective function as maximizing the present value of after-personal-income-tax dividend income minus reinvestment,

$$Max\ V_t = \sum_{j=0}^{\infty}\left(1+\frac{\rho}{1-z}\right)^{-j}\left(\frac{1-m}{1-z}D_{t+j}-V_{t+j}^{N}\right),$$

subject to four constraints: capital stock accumulation, cash flow equality, minimum new share issues, and non-negative dividends. Thus, they set the Lagrange function as

$$\sum_{t=0}^{\infty}\left(1+\frac{\rho}{1-z}\right)^{-t}\left\{\left[\frac{1-m}{1-z}D_t-V_t^N\right]-\lambda_t\left[K_t-K_{t-1}-I_t\right]-\mu_t\left[(1-\tau)\pi(K_t)+V_t^N-D_t-I_t\right]-\eta_t\left(V_t^N-\bar{V}^N\right)-\xi_t D_t\right\},$$

where

m = shareholder's effective tax rate on dividend

τ = effective corporate income tax rate

z = shareholder's accrual capital gain tax rate

ρ = shareholder's required rate of return

D_t = dividend at time t. $D_t \geq 0$

V^N_t = new share issued at time t

K_t = capital stock at time t

I_t = capital investment at time t

$\pi(\,)$ = pretax profitability function

$\overline{V}^N$ = minimum level of new share issues. $\overline{V}^N \leq 0$ when it is less than zero, it indicates share repurchase. $V^N \geq \overline{V}^N$

$\mu, \lambda, \eta,$ *and* ξ = Lagrange multipliers

Holders of the traditional view believe that dividends offer extra benefits such as signaling profitability that outweigh their tax disadvantages so that corporations distribute them despite the double taxation. Therefore, shareholders' required rate of return is a function of dividend payout ratio—α:

$$\rho_{t+1} = \rho\left(\frac{D_t}{(1-\tau)\pi_t}\right) = \rho(\alpha_t)$$

where $\rho' < 0$, which means the higher the dividend payout ratio, the lower rate of return shareholders request.

Manipulation of first order conditions (as shown on page 21 of Poterba and Summers's paper) gives the user cost of capital under the traditional view:

$$c = \pi'(K) = \frac{\rho}{(1-\tau)[\alpha(1-m)+(1-\alpha)(1-z)]}$$

The math formula of the user cost of capital shows that dividends are doubly taxed because both the corporate income tax rate, τ, and the individual income tax rate, m,

appear in the denominator. The double taxation of dividends increases the cost of capital in the corporate sector. Correspondingly, shareholders require that the return from marginal investment be high enough to cover the tax loss from the double taxation. Thus, dividend taxation increases the cost of capital, lowers investors' incentive, and reduces corporate capital accumulation, and therefore dividend taxation should be reformed through the integration of CIT and personal income tax.

However, the holders of the new view believe that dividends offer no extra benefits but are only a means of distributing profits to shareholders. Thus, the shareholders' required rate of return is irrelevant to the dividend payout ratio. Manipulation of the first order conditions with the assumptions under the new view (as shown on page 11 of Poterba and Summers's 1984 paper) gives the user cost of capital under the new view:

$$c = \pi'(K) = \frac{\rho}{(1-\tau)(1-z)}$$

The individual income tax rate, *m*, does not appear in the denominator and dividends are taxed only once if we ignore the negligible capital gain taxation. Therefore, the user cost of capital under the new view is lower than that under the traditional view. The holders of the new view believe that the old view exaggerates the distortion; they worry that integrating the corporate and personal income taxes will significantly reduce government tax revenues without increasing the incentive to invest by much.

No work has been done to relate the dispute between the traditional and new views to the C versus S forms and to derive the cost of capital for S firms. The cost of capital for S corporations can be easily derived using the same framework as Poterba and Summers (1984). The maximization function for the S corporation shareholders is

different from that for the C corporation shareholders. Shareholders of S corporations firms receive their return to investment through dividends and appreciated equity value; however, no matter what proportion of profit is distributed as dividends, all the profit is subject to personal income tax. Because all the profit has been taxed by the personal income tax, dividends are "tax-free." However, when shareholders receive income by trading shares or by dissolving the corporation, that income is subject to capital gain tax. Therefore, their shareholders' rate of return is

$\rho = \frac{D_t}{V_t} + (1-z)\frac{V_{t+1} - V_t^N - V_t}{V_t}$, where V_t^N denotes new share issues. And the capital asset value is

$$V_t = \left(1 + \frac{\rho}{1-z}\right)^{-1}\left[V_{t+1} - V_t^N + \frac{1}{1-z}D_t\right].$$

Solving the value equation forward and assuming the transversality condition,

$\lim_{T\to\infty}\left(1 + \frac{\rho}{1-z}\right)^{-T} V_T = 0$, we can get the current value

$$V_t = \sum_{j=0}^{\infty}\left(1 + \frac{\rho}{1-z}\right)^{-j}\left[\frac{1}{1-z}D_{t+j} - V_{t+j}^N\right].$$

Maximizing the current value subject to four conditions—capital accumulation, cash flow equality, minimum new share issues requirement, and minimum dividend distribution requirement, we have the Lagrange function:

$$\sum_{t=0}^{\infty}\left(1+\frac{\rho}{1-z}\right)^{-t}\left\{\left[\frac{1}{1-z}D_t - V_t^N\right] - \lambda_t\left[K_t - K_{t-1} - I_t\right] - \mu_t\left[(1-m)\pi(K_t) + V_t^N - D_t - I_t\right] - \eta_t\left(V_t^N - \bar{V}^N\right) - \xi_t D_t\right\}$$

Using derivation similar to the work of Poterba and Summers (1984) as follows leads to the user cost of capital functions under the new view and traditional view, respectively.

The same as the traditional view in the C corporation scenario above, shareholders' required rate of return is a function of the dividend payout ratio—α:

$$\rho_{t+1} = \rho\left(\frac{D_t}{(1-m)\pi_t(K_t)}\right) = \rho(\alpha_t),$$

where ρ' < 0, which means the higher the dividend payout ratio, the lower the rate of return shareholders request. In equilibrium, $\rho_t = \rho_{t+1}$.

First order conditions give the following equations:

I_t: $\quad \lambda_t + \mu_t = 0$

$$K_t: \; -\lambda_t + \left(1+\frac{\rho_{t+1}}{1-z}\right)^{-1}\lambda_{t+1} - \mu_t(1-m)\pi'(K_t) - \frac{\rho'\left(\frac{D_t}{(1-m)\pi_t}\right)\frac{D_t}{(1-m)\pi_t}\frac{\pi'_t}{\pi_t}}{(1-z)\left(1+\frac{\rho_{t+1}}{1-z}\right)}\Omega_{t+1} = 0$$

V^N_t: $\quad -1 - \mu_t - \eta_t = 0$

$$D_t: \quad \frac{1}{1-z} + \mu_t - \xi_t + \frac{\rho'\left(\frac{D_t}{(1-m)\pi_t}\right)\frac{1}{(1-m)\pi_t}}{(1-z)\left(1+\frac{\rho_{t+1}}{1-z}\right)}\Omega_{t+1} = 0$$

where

$$\Omega_t = \left[\frac{1}{1-z}D_t - V_t^N\right] - \lambda_t\left[K_t - K_{t-1} - I_t\right] - \mu_t\left[(1-m)\pi(K_t) + V_t^N - D_t - I_t\right] - \eta_t\left(V_t^N - \overline{V}^N\right) - \xi_t D_t$$

The traditional view assumes corporations will distribute too many dividends despite the dividend tax and not accumulate enough internal funds for new investment opportunities; therefore, corporations will have to issue new shares to finance new investments. Thus $V^N > \overline{V}^N$ which leads to $\eta_t = 0$ and $\mu_t = -1$. Therefore, $\lambda_t = 1$ which is

a constant and leads to $\lambda_t = \lambda_{t+1}$. Also, because corporations distribute dividends, $D_t > 0$ and thus $\xi_t = 0$.

Further manipulation of first order condition of K gives

$$(1-m)\pi'(K_t) + \frac{z}{(1-z)}\frac{D_t}{\pi(K_t)}\pi'(K_t) = 1 - \left(1 + \frac{\rho_{t+1}}{1-z}\right)^{-1} \approx \frac{\rho_{t+1}}{1-z},$$

where the last approximation comes from Taylor's expansion. Thus, the user cost of capital under the traditional view is

$$c = \pi'(K) = \frac{\rho}{(1-m)(1-z+\alpha z)}.$$

However, the holders of the new view believe that dividends offer no extra benefits but are only the means of distributing profits to shareholders. The shareholders' required rate of return is irrelevant to the dividend payout ratio. The first order conditions become

I_t: $\lambda_t + \mu_t = 0$

K_t: $-\lambda_t + \left(1 + \frac{\rho}{1-z}\right)^{-1}\lambda_{t+1} - \mu_t(1-m)\pi'(K_t) = 0$

V^N_t: $-1 - \mu_t - \eta_t = 0$

D_t: $\frac{1}{1-z} + \mu_t - \xi_t = 0$

As there is no non-tax benefit of dividends, mature corporations—those whose retained earnings are enough to finance their limited investment opportunities—always finance new investment through retained earnings and distribute the remaining profits to shareholders. Thus $D_t > 0$, which leads to $\xi_t = 0$ and $\lambda_t = -\mu_t = \frac{1}{1-z}$. Obviously, λ_t is

constant if accrual capital gain tax rate does not change and thus $\lambda_t = \lambda_{t+1}$. Further manipulation of the first order condition of K gives

$$(1-m)\pi'(K_t) = 1 - \frac{1}{1+\frac{\rho}{1-z}} \approx \frac{\rho}{1-z},$$

where the last approximation comes from Taylor's expansion. Thus, the user cost of capital under the new view is

$$c = \pi'(K_t) = \frac{\rho}{(1-m)(1-z)}.$$

Table 2.1: Comparison of Cost of Capital under Different Views for Different Forms

	C corporations	S corporations
Traditional view	$c = \pi'(K) = \frac{\rho}{(1-\tau)[\alpha(1-m)+(1-\alpha)(1-z)]}$	$c = \pi'(K) = \frac{\rho}{(1-m)(1-z+\alpha z)}$
New view	$c = \pi'(K) = \frac{\rho}{(1-\tau)(1-z)}$	$c = \pi'(K_t) = \frac{\rho}{(1-m)(1-z)}$

For ease of comparison, Table 2.1 puts together the cost of capital under two different views for two types of corporations. For C corporations, the cost of capital under the traditional view is higher than that under the new view, as long as C corporations pay dividends (i.e., $\alpha > 0$); on the other hand, for S corporations, the cost of capital under the traditional view is lower than that under the new view. Two reasons account for the difference. First, dividends to S corporations' shareholders are tax-free, but capital gain is not. If S corporations save excessive profits without distributing them,

shareholders will have to pay capital gain tax when they either trade their shares or liquidate the business. Second, under the traditional view, dividends distribution provides more benefit than only that of distributing profits. This unmeasured benefit helps reduce the cost of capital. Therefore, the best dividend policy for S corporations under the traditional view is to distribute all the profits to shareholders and issue new shares to finance marginal investment. However, because the accrual capital gain tax rate is negligible, the cost of capital does not differ much from one view to the other.

Figure 2.1 illustrates demand and supply of corporations' capital stock if we can assume that the marginal corporate income tax rate, the marginal individual income tax rate, and the capital gain rate are fixed. Figure 2.1a illustrates the demand and supply for C corporations. Curve *ab* represents the demand for capital; each point on it stands for the marginal rate of return of the investment. Line *cd* represents the cost of capital under the traditional view and line *ef* represents the cost of capital under the new view. To maximize their profits, corporations keep investing until capital's rate of return equals the cost of financing. Obviously, under the traditional view, the double taxation of dividends imposes a larger dead weight loss and reduces overall capital stock in the corporate sector. Similarly, Figure 2.1b illustrates the demand and supply for S corporations. The cost of capital under the traditional view, *c′d′*, is lower than the cost of capital under the new view, *e′f′*. However they are very close to each other.

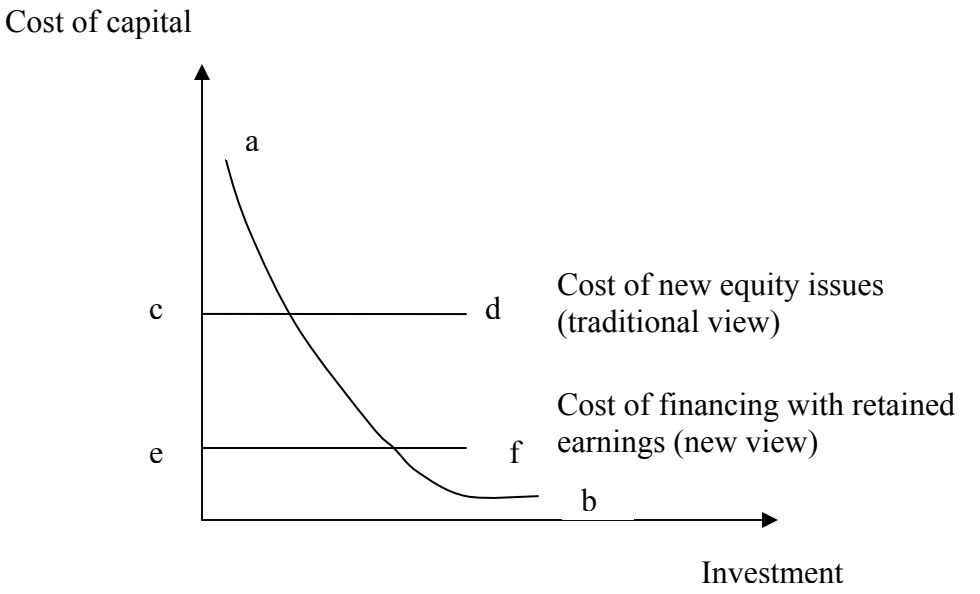


Figure 2.1a: traditional versus new views under C corporations' scenario

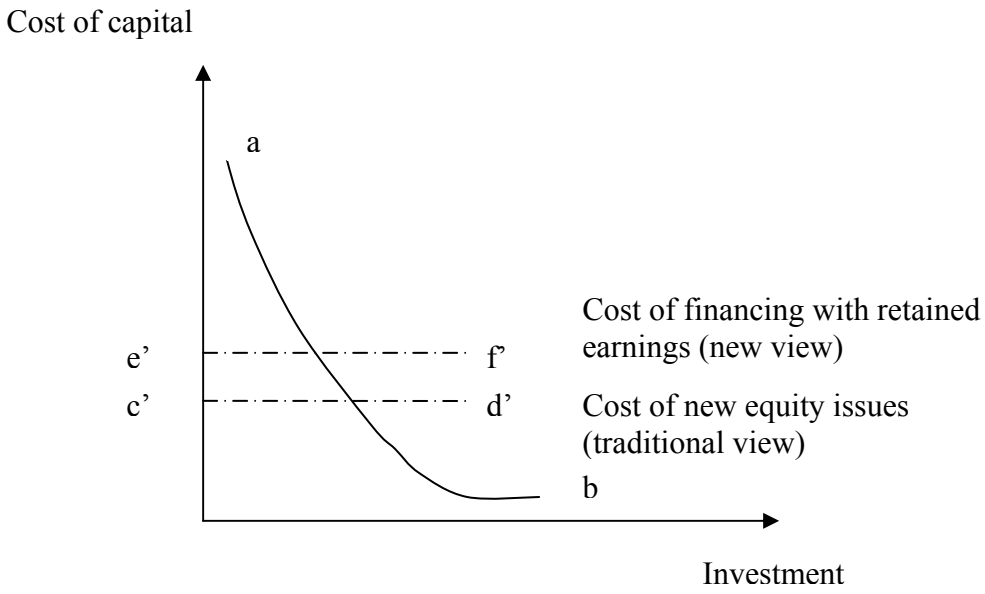


Figure 2.1b: traditional versus new views under S corporations' scenario

Figure 2.1: Cost of Investment Financing

An important finding from table 2.1 is that the dividend payout ratio, α, appears in both formulas for C and S corporations under the traditional view; however, higher payout ratios increase the cost of capital for C corporations but lower the cost of capital for S corporations. Nevertheless, α does not appear in both cost formulas under the new view. If we take it for granted that investors always choose to have the lowest cost of capital, this comparison of cost formulas provides a test on the two views. If the traditional view is correct, then S corporations will distribute a significantly higher proportion of profits as dividends than C corporations. However, if the new view is correct, then dividend payout ratio is irrelevant to the cost of capital and we cannot observe any difference in dividend payout ratio between C and S corporations. Thus, I set up my first hypothesis:

Hypothesis 1: S corporations pay higher percentage of profit as dividend than C corporations.

OLS regressions of dividend payout ratio on organizational forms can directly test this hypothesis. However, organizational form may be endogenous to dividend payout ratio because firms that pay a higher proportion of their profits as dividends might select the S form. An instrumental variable for the organizational form is necessary for unbiased estimation. I will use each firm's average CIT rate in the preceding year as an instrument. User cost of capital formulas in table 2.1 show that under the traditional view or the new view, the cost of capital for S corporations can be higher or lower than that for C corporations, depending on the corporate income tax rate τ and the personal income tax rate m. However, one thing is clear—that the higher the corporate income tax rate, τ, the more likely that the cost of capital for C corporations is higher than that for S

corporations. If the cost of capital for the C corporations is higher than that for the S corporations, C corporations will elect the S status; otherwise, they will remain in the C form. Thus I set up my second hypothesis:

Hypothesis 2: A high average CIT rate causes corporations to take the S form.

If hypothesis 2 is proven to be correct, then I will use it as an instrumental variable for organizational forms and use instrumental variable method to test hypothesis 1, presuming CIT rate is not related to dividend payout ratio.

2.5 Data

I will use confidential Georgia Tax Return data provided by the Georgia Department of Revenue. Corporations that own property or do business in Georgia are subject to the state corporate income tax and net worth tax. The Department of Revenue uses shares of sale receipts, property values, and compensation in Georgia to calculate the apportionment ratio, which determines what percentage of the nationwide corporate income is subject to state corporate income tax. (See Edmiston [1996] for a detailed description of the apportionment formula.) Georgia also imposes a net worth tax on the equity of corporations. For U.S. corporations, all equity in the United States is taxed; however, for foreign corporations, only the equity in Georgia is taxed. (See Grace [2002] for a description of the net worth tax in Georgia.) C corporations file the Georgia Form 600 Corporation Tax Return, reporting federal taxable income, sales receipts, compensation, property value within Georgia and the United States, and equity value. S corporations file Georgia Form 600S Corporation Tax Return. Even though the IRS exempts S corporations from federal corporate income tax, Georgia does not recognize the S status. Therefore, instead of reporting federal taxable income as C corporations do,

S corporations report federal ordinary income, together with net worth, sale receipts, compensation, and property values in Form 600S. Unfortunately, the Georgia Department of Revenue does not provide complete information regarding S corporations, so I only know their ordinary federal income and net worth but do not have information about sales receipts, compensation, and property values.

My dataset includes all the corporations doing business in Georgia between 1990 and 1999. The tax laws on CIT were relatively stable in this period. The tax reform acts in 1993 and 1997 did not make large changes in corporation income taxation and made negligible changes in non-tax restrictions on the conversion from C into S. Therefore, investors' decisions on what organizational forms to elect were purely determined by the tax rates, which change due to economic fluctuation and different phases in the business cycles of individual firms.

The tax data does not provide the dividend payout ratio directly; however, it provides net worth tax information. We can use the net worth to find the dividend payout ratio. The net worth is defined as the sum of total capital stock, paid in or capital surplus (i.e., shareholders' overpayment to the corporation when they purchase the shares), and retained earnings. The increase of net worth from the previous year to the current year is a good proxy of net earnings retained in current year; given that corporations earn profits in the current year. Subsequently, corporations' after-tax profits minus the amount of earnings retained are the paid-out dividends, and dividends divided by the after-tax profits give the dividend payout ratio of interest. The other variables used in the analysis include equity, before-tax earnings, and age. Because I needed two consecutive years to

figure out the dividend payout ratio, I used the average equity and average before-tax earnings in the two years.

An initial check of the dataset showed that a portion of the C corporations had foreign shareholders; a small number of corporations filed both 600 and 600S tax forms in the same year or switched between the forms more than once within five years; a fractional percentage of corporations either had one year tax information missing or had several records in one single year. As the IRS does not allow S corporations to have foreign shareholders and forbids corporations to switch back and forth within five years, I excluded those corporations with foreign shareholders and those that switched several times within five years. As I needed continuous years' information to derive the dividend, I excluded corporations with one tax year's record missing or with several records for a single year.

After the initial data-cleaning work, I made two important adjustments to fit the data to my analytical framework. First, this paper studies the dividend policy of comparable C and S corporations and the conversion from the C form into the S form. Ideally, I should screen all the C corporations in the sample and filter out those C corporations which do not meet the IRS requirements for the S form stated in the earlier section. However, there is no information about the corporations' shareholders in the tax forms. Nevertheless, I believe that eligible C corporations (even though they did not convert into the S form) should have an equity size similar to those S corporations, because C corporations with too large a size usually have too many shareholders and are not eligible to convert into the S form. Therefore, I limited my pool of C corporations to those whose equity size does not exceed $5,774,859, the 99th percentile of equity size of

S corporations. The reason that I do not set the criterion to be the maximum equity size of S corporations is that corporations with the maximum equity might be an outliers due to inputting errors.

Second, the theoretical discussion in this paper focuses on profit-making corporations. However, the S form is also attractive to investors in loss-bearing corporations because S shareholders can use the loss to offset their individual income, whereas C shareholders cannot (Plesko, 1995). Furthermore, this paper tests the theories on dividend taxation, which concerns how corporations deal with profits rather than losses. Therefore, the regression is limited to corporations with positive net earnings.

Table 2.2 lists the means and standard deviations of variables in the final sample. There are over ten times as many S corporations as C corporations in the sample, which indicates that the S form dominates among small corporations. Apparently, C corporations on average distribute 33% of their profits as dividends compared with the 67% dividend payout ratio among S corporations. Also, C corporations have larger equity size, earn more profits, and have a little longer history than S corporations. However, the standard deviations of those variables are very large, indicating large variation among each group.

Table 2.2: Mean and Standard Deviation of Variables in the Sample

N	dividend payout ratio	equity ($K)	profits ($K)	age (year)	average CIT rate
C corporations					
5784	33%	235	749	10	23%
	(34%)	(535)	(776)	(9)	(20%)
S corporations					
63044	67%	184	109	8	.
	(33%)	(568)	(388)	(8)	.

Note: Standard deviations are in the parentheses.

2.6 Findings: Dividend Payout Ratio and C versus S Forms

The difference between C and S forms provides a good chance to examine the validity of the different views. If the new view and the nucleus theory are correct then corporations will always finance their new investment through retained earnings as long as the CIT rate is lower than the personal income tax rate; dividend payout is the residual of net earnings subtract retained earnings and is paid out regardless of the tax cost. Therefore, there should be no significant difference in dividend payout across the forms. On the other hand, if the traditional view is correct, then we should observe a higher payout ratio for S corporations than C corporations.

I used OLS regression to test the traditional versus the new view. The regression takes the following form:

$$Div\_ratio = \beta_0 + \beta_1 \times S\_dummy + \beta_2 \times \ln(Equity) + \beta_3 \times \ln(Earning) + \beta_4 \times Age$$

where *Div_ratio* stands for the dividend payout ratio.

I took the log transformation of both equity and earning in order to downsize their scales and normalize them. Another benefit of log transformation is that it makes the explanation of the coefficients more sensible in that the coefficients show the change of dividend payout ratio in terms of percentage points in response to percentage change of equity and earnings.

Depending on the information available in my sample, the other control variables include age, the log function of two years average of equity, and the log function of two years average of before-tax net earnings. I expected age to have a positive impact on dividend payout ratio because mature firms have limited investment opportunities and are more likely to distribute net earnings as dividends. I expected before-tax net earnings to

have a positive effect on dividend payout ratio because the remaining net earnings minus further investment over net earnings is an increasing function of net earnings. The impact of equity is expected to be negative because large corporations are expected to have more investment opportunities and will retain more profits.

There are three regression models on three different samples. The first regression analyzes the dividend payout ratio difference before and after a C corporation converted into the S form. For example, assume a corporation exists in periods one through six. It elects C status in periods one through three and changes to S status in period four and remains there through period six. I use the tax information in periods one and two to calculate the dividend payout ratio before conversion and the information in periods five and six for the payout ratio after conversion. I do not use information in periods three and four because tax information in transition periods might not be reliable. Similarly, the second regression analyzes the difference before and after an S corporation converted into the C form. The third one makes horizontal comparisons on C and S corporations in the same year to see if S corporations distribute a higher portion of profits than comparable C corporations, given their size, earning and age controlled.

I ran the regressions on corporations which have positive earnings and distribute no more than their total net earnings. There are a few corporations distributing dividend despite negative net earnings or decreasing equity despite positive net earnings. However, these firms are irrelevant to the study of the relationship between organizational forms and dividend policy because according to IRS rules, distribution in case of loss in the current year and extra distribution exceeding current year earnings are treated as “return of capital” which is not taxed (Scholes et al. 2005, p. 352). Therefore, I exclude them

from the sample. Table 2.3 summarizes the regression results. Models 1 and 2 make vertical comparisons of the dividend payout ratio before and after the conversion. Model 1 is for those C corporations which converted into the S form and model 2 is for those S corporations which converted into the C form. Model 3 makes a horizontal comparison of dividend payout ratio among comparable C and S corporations. Model 4 also makes horizontal comparisons, as model 3 does, but adds additional year dummy variables in the regression in an attempt to control the specific time effect of each year, using 1998 as the control year. However, those yearly dummy variables hardly add any more information in the explanation of corporations' dividend payout ratio as the *R* square does not increase in model 4 and there is little difference between coefficients in model 3 and model 4.

Across the models, the coefficient of the S status dummy variable is significantly positive, which suggests that S corporations pay out a higher proportion of profits as dividend than C corporations. As shown in model 1, after those C corporations convert into the S form, they pay 30.7% more of their profits as dividends than they did before the conversion. Similarly, model 2 shows that after those S corporations convert into the C form, they pay 24.0% less of their profits as dividends than they did before the conversion. The coefficient of the S dummy in model 3 is interpreted as showing that S corporations are expected to distribute 23.0% more of their profits than comparable C corporations. These results conform to the prediction of traditional view that dividend payment is influenced by the cost of dividend tax.

Table 2.3: OLS Regression Results on Dividend Payout Ratio

Dependent variable: dividend payout ratio	Model 1	Model 2	Model 3	Model 4
Intercept	0.507***	0.416	0.241***	0.248***
	(0.080)	(0.314)	(0.007)	(0.008)
S dummy	0.307***	0.240**	0.230***	0.227***
	(0.024)	(0.084)	(0.004)	(0.004)
Ln(equity)	-0.063***	-0.058***	-0.054***	-0.055***
	(0.004)	(0.012)	(0.000)	(0.000)
Ln(earning)	0.041***	0.047	0.065***	0.065***
	(0.009)	(0.035)	(0.001)	(0.001)
Age	0.005**	-0.001	0.002***	0.002***
	(0.001)	(0.008)	(0.000)	(0.000)
Year 1991				-0.017**
				(0.006)
Year 1992				-0.010
				(0.005)
Year 1993				-0.017**
				(0.005)
Year 1994				-0.005
				(0.005)
Year 1995				-0.005
				(0.005)
Year 1996				0.003
				(0.004)
Year 1997				0.018***
				(0.005)
Adjusted R Square	0.42	0.39	0.39	0.39
N	597	54	68828	68828

Note:
*significant at 5%; **significant at 1%; ***significant at 0.1%
Standard deviations are below the estimated coefficients.
Model 1: compares dividend payout ratio before and after C corporations converted into S.
Model 2: compares dividend payout ratio before and after S Corporations converted into C.
Model 3: compares dividend payout ratio of C and S corporations.
Model 4: compares dividend payout ratio of C and S corporations with additional yearly dummies in the independent variable list; 1998 is the control year.

The equity size has a significant negative impact, which means that large firms tend to distribute lower proportion of earnings. For example, the coefficient of log equity in model 3 means that as equity size increases by 1%, corporations distribute 0.054% less of their profits. The effects of earnings and age are significantly positive, implying that older and more profitable firms are more likely to distribute higher proportions of profits. More specifically, model 3 shows that as profits increase by 1%, the dividend payout ratio tends to increase by 0.065 percentage points; as age increases by additional year, dividend payout ratio tends to increase by 0.2 percentage points.

2.7 CIT Rate and the Choice of the C versus S Forms

The dividend payout ratio regression results shown in Table 2.3 seem to support the traditional view on dividend taxation. However, those regression estimates are biased due to endogeneity because corporations that want to distribute more dividends will select the S form. An instrumental variable which is related to organizational form but unrelated to dividend payout ratio in theory is necessary for unbiased estimation. However, despite the rapid expansion of the S form since the end of the 1980s, very little empirical research has been done on the choice between C and S corporation form due to the lack of appropriate data. The primary research interest focuses on how various financial characteristics such as leverage ratio and Net Operating Loss (NOL) are related to the choice of S versus C organizational form. Even though some of them are flawed by defective research designs, the general results are that corporations respond to different tax treatment by selecting different organizational forms.

Plesko (1994) takes a sample of newly incorporated C and S corporations in 1983 which met the S form requirements from the 1984 Statistics of Income corporation file.

He compares the financial characteristics of S and C corporations to find which financial characteristics affect a firm's decision to choose the C rather than the S form. His results show that larger, more profitable firms with higher compensation, fewer retained earnings, and lower debt-to-asset ratio are more likely to be C corporations. However, some of the results are counterintuitive. First, firms with higher debt-to-asset ratios should choose to be C corporations because high leverage provides an interest shield to reduce CIT (interest payments are deductible from corporate taxable income) and should reduce the incentive to choose the S form. Second, fewer retained earnings implies higher dividend distribution and more double taxation, which should be associated with a higher probability of choosing the S form. As Plesko himself points out, there is an endogeneity problem with his analysis because he analyzes the impact of those characteristics conditional on the corporations' already having chosen their organizational forms. The choice of C versus S forms might have already had an impact on the financial characteristics.

Ayers et al. (1996) examine a sample of firms from the National Survey of Small Business Finances conducted in 1988 and 1989. Their sample includes partnerships and sole proprietorships, as well as C and S corporations. They apply multinomial logistic regression to examine the impact of certain characteristics on organizational form. Their results suggest that if we only compare C and S corporations, corporations with higher losses and higher corporation tax payments (if they have chosen to be C corporations) are more likely to be S corporations. Their explanation is that loss could help shareholders to offset their other personal income, so corporations with higher losses will choose the S form; and if potential CIT payments are low, the corporate income will be taxed at a

lower CIT rate rather than the maximum personal income tax rate, so shareholders will choose to hide their profit in C corporations. However, their analysis is also troubled with the endogeneity problem and their findings should be viewed with caution.

To avoid the endogeneity problem, some scholars rely on the times when tax rules change and collect information before and after the change. The Tax Reform Act of 1986 (TRA86) provided a good chance for analysis. Plesko (1995) collects a sample of C corporations eligible to convert into S in 1986 and examines the impact of certain corporation characteristics on the decision to convert between 1986 and 1988. His variables capture a number of financial and legal factors, including gross corporate tax payment, undistributed income, interest paid, and carryover tax attributes. His regression results are consistent with the expectation that tax shields reduce the incentive to convert into the S form. In particular, debt has a negative impact on the conversion from C to S (contradictory to his 1994 finding).

Before 1986, there was a loophole that C corporations could purchase capital assets with retained earnings, use the cost of purchase to deduct corporate taxable income, and sell those assets after they elected the S status later so that they could avoid CIT. Then the IRS created a built-in-gain tax which taxes the sales of capital assets if S corporations sell the assets within a certain period of time after conversion. Omer, Plesko and Shelley (2000) focus on a sub-sample of firms in the natural resource industry from the same data as in Plesko (1995) did to examine the impact of such built-in-gain tax on the decision of C to S conversion. They conclude that the potential for built-in-gain realization significantly reduces the probability of converting from the C into the S form, conforming to their predictions.

The Small Business Job Protection Act of 1996 allowed banks to convert to S corporations for the first time. Hodder et al. (2003) use logit regression on a series of banks' tax-relevant variables before the allowed conversion date to see whether banks made a conversion between 1996 and 1998. Consistent with the tax incentive theory, they find that banks are more likely to convert when conversion saves dividend taxes, avoids alternative minimum taxes, and minimizes state income taxes, and they are less likely to convert when conversion nullifies Net Operating Loss carry-forwards and creates potential penalty taxes on unrealized gains existing at the conversion date.

In spite of inherent defects in some of the research, the general finding conforms to the theoretical prediction that shareholders respond to corporate income tax and choose to elect the S status in order to pay fewer taxes. Therefore, the literature supports the argument that corporations with a higher CIT rate are more likely to elect the S form. If I can prove the relationship between CIT rate and organizational forms with my data, I can use CIT rate as an instrumental variable for unbiased regression of dividend payout ratio, presuming that CIT rate is not correlated with dividend payout ratio.

2.8 Findings: CIT and C versus S Forms

Investors who maximize economic profit from investment will choose the appropriate form to minimize their cost of capital. Hypothesis 2 states that C corporations with higher CIT rates will choose the S form because the CIT increases the cost of capital for C corporations but not S corporations. To test this hypothesis, it seems that we can simply run a logistic regression on a pool of corporations including both C and S forms, with whether a corporation elects S form as the dependent variable and the CIT rate as one of the independent variables. If the firm was an S corporation in the preceding

period, then the CIT rate is the rate if it would have taken the C form. However, such regression suffers from an endogeneity problem because CIT rates (potential for S corporations) depend on the forms. For example, the potential CIT rate for an S corporation might be higher than the CIT rate would have been had the business been a C corporation because there is less incentive for the S corporation to take various strategies to shields its income from CIT. We can circumvent this endogeneity problem by looking at the decision on the conversion from C into S form. Thus the statement of hypothesis 2 (on p. 24) becomes:

Hypothesis 2a: A high average CIT rate causes C corporations to convert into the S form.

It can be tested with a logistic model with the CIT rate and other financial variables as regressors on a pool of C corporations. There is no formal theoretical justification to determine which independent variables should be included and which should not. As mentioned in the literature review, all researchers in this field have selected variables depending on their datasets. Similarly, depending on variables available in my dataset and according to previous work (e.g., Hodders, 2003), I included three variables: equity, net earnings before NOL deduction, and age. It is necessary to emphasize that the critical independent variable of interest, average CIT rate, is not a linear transformation of another independent variable, net earnings before NOL deduction. They differ in two aspects: first, when calculating average CIT rate, I used the net earning after NOL rather than before NOL; second, the average CIT rate incorporates the progressiveness of statutory tax rates (i.e., the statutory tax rate increases as income increases). I expected the equity size to have a negative impact on the conversion from C

into S for two reasons. First, the IRS requires unanimous agreement among shareholders on the conversion into the S form; thus, the more shareholders there are, the more difficult it is to reach an agreement to elect the S form. Second, IRS limited the number of shareholders for S corporations (35 before 1997 and 75 after 1997); thus it is difficult for C corporations with large equity to downsize the shareholder numbers to below 35 or 75. Also I expected that net earnings before NOL would have a negative impact on the conversion because higher net earnings imply more tax savings in the C form. I expect age to have a negative impact because the longer the history of the corporation, the more difficult it would be to switch its way of operation (e.g., to change leverage ratio and other tax shields) to utilize the benefits of the S form. The logistic regression model takes the following form:

$$\Pr obability(of\ C \Rightarrow S) = \beta_0 + \beta_1 \times CITrate + \beta_2 \times \ln(Equity) + \beta_3 \times \ln(Earning) + \beta_4 \times Age$$

Table 2.4 shows the logistical regression results. The first column shows the regression result for hypothesis 2 on a pool of C and S corporations. The dependent variable is whether the corporation takes the S form and the critical independent variable is its average CIT rate in the same year. (If the corporation takes the S form, the average CIT rate is its potential CIT rate, had it been a C corporation.) The coefficient of the CIT rate is significantly negative, suggesting that corporations with higher CIT rates are more likely to take the C form, which is contradictory to the theoretical prediction that corporations choose organizational form to reduce tax payment. However, as mentioned, this regression suffers from an endogeneity problem and the results are biased.

The second column shows results for hypothesis 2a on a pool of C corporations which are suitable to convert into the S form. The dependent variable is whether a C

corporation converts into the S form and the critical independent variable is its average CIT rate in the previous year. Coefficients of the CIT rate are positive and significant, suggesting that the higher the CIT rate in current year, the more likely the corporation will convert in the next year.

The effect of equity size is significantly positive, which is contradictory to my initial expectation. However, according to Bennett (2001), over 90% of all S corporations have less than 10 shareholders, which suggests that the number of shareholders condition is not very restrictive. The positive effect of equity indicates that larger (but not too large) C corporations tend to convert into the S form compared with the smaller ones. The reason might be that shareholders of large corporations are wealthier and may value the provision to S corporations that allows S shareholders to pass S corporations' losses to offset their income from other sources.

The effect of earning is significantly negative. The reason could be that because all the net earnings of S corporations are subject to personal income tax regardless of whether they are distributed, corporations which usually retain some earnings and reinvest will prefer to stay as C corporations. The benefit of avoiding personal taxation on retained earnings may overwhelm the benefit of avoiding double taxation on dividends. The coefficient of age is also significantly negative, conforming to the prediction that the longer the corporation operates, the less likely it is to convert.

Table 2.4: Logistic Regression Results

	Model (1)	Model (2)
	dependent variable: prob(corporation being an S firm)	dependent variable: prob(C converts into S)
intercept	-0.087	-0.807***
	(0.088)	(0.165)
CIT tax rate	-0.083	3.579***
	(0.083)	(0.595)
Ln(equity)	-0.028***	0.035***
	(0.008)	(0.010)
Ln(earning)	0.547***	-0.125***
	(0.011)	(0.020)
age	-0.026***	-0.057***
	(0.002)	(0.005)
Concordant prediction	77%	65%
Count R Square	92%	84%
Adjusted Count R Square	-2%	0%
McFadden Adjusted R Square	10%	4%
N	66048	6212

Note:
*significant at 5%, **significant at 1%, ***significant at 0.1%

2.9 Regression with an Instrumental Variable

As mentioned earlier the OLS regression analysis of the dividend payout ratio suffers from an endogeneity problem, because corporations elect S status if they want to distribute a higher proportion of profits. The CIT rate in the preceding year can serve as an instrumental variable. Previous sections already provide empirical evidence supporting the theoretical prediction that corporations are more likely to convert from the C into the S form when they had faced a higher CIT rate in the previous year. On the other hand, the dividend payout ratio is the proportion of the current year's after-tax profits distributed to shareholders, and theoretically, it should not be affected by the CIT rate the corporations had in the previous year. Therefore, I use the CIT rate of the preceding year as the

instrument. I confined my analysis to the pool of C corporations which meet the conditions for the S form and compared the dividend payout ratio between those which converted into the S form and those which did not. Following Heckman (1978), I first worked with a pool of C corporations (about 12% of them converted into the S form) and ran a logistic regression of whether the C corporation converts into S status based on its average CIT rate in the previous year to predict the probability of converting into an S corporation in the current year; then I ran an OLS regression of the dividend payout ratio in the current year with the organizational form dummy replaced by the predicted probability.

Table 2.5 summarizes the regression results with instrumental variables. Column 1 shows the OLS regression on another pool of C and S corporations, where all the C corporations meet the conditions to convert into the S form and all the S corporations were converted from the C form. Without controlling for the endogeneity problem, I found that S corporations on average distribute 26.7% more of after-tax profits as dividends than C corporations do.

Column 2 shows the instrumental variable regression results when I substituted the predicted probability of converting into the S form for the S dummy variable, as derived from the logistic regression of model 2 in Table 2.4. With the instrumental variable, S corporations on average distribute 62% more of their profits to shareholders than comparable C corporations. The larger the equity size, the lower the dividend payout ratio. The more profits the firms earn, the higher the dividend payout ratio. The older the firms are, the higher dividend payout ratio. As column 2 shows, increasing equity size by 1% is expected to reduce dividend payout ratio by 0.071 percentage points; increasing

profits by 1% is expected to increase dividend payout ratio by 0.058 percentage points; and corporations that are one year older are expected to distribute 0.6% more of their profits as dividends than their counterparts that are a year younger. The significant positive coefficient of the S dummy variable suggests that organizational form does have a significant impact on dividend payout ratio, which is what was predicted by the traditional view on dividend taxation. Therefore, the evidence in this paper supports the traditional view.

Table 2.5: Regression Results with Instrumental Variables

Dependent variable: dividend payout ratio	Model 1	Model 2	Model 3
Intercept	0.539***	0.357***	0.343***
	(0.025)	(0.034)	(0.030)
S_dummy	0.267***	0.622***	0.433***
	(0.011)	(0.099)	(0.066)
Ln(equity)	-0.066***	-0.071***	-0.072***
	(0.001)	(0.001)	(0.002)
Ln(earning)	0.043***	0.058***	0.067***
	(0.003)	(0.003)	(0.003)
Age	0.004***	0.006***	0.003***
	(0.000)	(0.001)	(0.001)
Adjusted R square	47%	40%	42%
N	4910	4910	3640

Note:
*significant at 5%; **significant at 1%; ***significant at 0.1%
Model 1: The OLS regression focuses on a pool of C corporations and compares dividend payout among those C corporations which chose not to convert into S and S corporations which were converted from C form.
Model 2: The IV regression uses the CIT rate as the instrumental variable for the S_dummy, substitutes the predicted probability of conversion into S for the S_dummy and re-runs model 2.
Model 3: The IV regression with the sample size shrunk to the pool of corporations with net worth less than the 75th percentile of S corporations.
Standard deviations are in parentheses below the estimated coefficients.

One key assumption in the analysis is that C corporations with net worth less than the 99th percentile of that of S corporations are comparable to S corporations. The 99th percentile criterion is rather arbitrary and might over-count the number of C corporations eligible to switch into the S form. To check how sensitive my regression results are to the sample selection criterion, I shrank the sample to only C corporations whose net assets are less than the 75th percentile of S net worth. As shown in column 3 in Table 2.5, the impact of being an S corporation on dividend payout ratio decreases by one third but is still significantly positive, indicating that S corporations on average distribute 43.3% more of their profits than comparable C corporations. The impacts of equity size and net earnings do not change much from the results in column 2; the impact of age drops by half but is still positive and significant.

2.10 Conclusions

The debate of dividend tax reform centers on competing theories about the effects of dividend taxation on investment incentives. The traditional view supports the elimination of dividend tax, while the new view worries about the loss of federal tax revenue without stimulating much investment. Comparison of dividend payout ratio between C corporations and S corporations provides a good test of which view is more accurate. Simple regression of the dividend payout ratio on organizational forms seems to support the traditional view because S corporations pay significantly higher proportions of profits as dividends. However, such regression suffers from an endogeneity problem because it can be the case that corporations with high dividend payout ratios select the S form. This paper first shows that the CIT rates in preceding year affect investors' decision about organizational forms. Then it uses the average CIT rate as an instrument

for organizational form and re-runs the regressions. The impact of organizational form is even larger. The empirical results in this paper confirm the traditional view, which suggests that dividends are more than just a way of distributing profits to shareholders and that corporations always try their best to distribute dividends even at the cost of investment opportunities. Therefore, the double taxation of dividends does have a significant negative effect on the total investment in the corporate sector.

The Bush administration pushed for the Jobs and Growth Tax Relief Reconciliation Act of 2003, in which the top tax rate on dividends is set to be 15% (far less than the top tax rate on personal income—35%). The aim is to encourage corporate investment and stimulate economic growth. The findings of this paper support the traditional view and thus confirm the Bush administration's efforts to stimulate corporate investment. However, despite the decrease in the dividend tax rate, corporate income is still taxed at a rate of 45% (=1-[1-0.35]*[1-0.15]), under the highest corporate income tax rate of 35% and highest dividend tax rate of 15%. It is still higher than the highest personal income tax rate of 35% faced by noncorporate entities. It seems that further reduction of dividend tax rate is necessary. On the other hand, the reduction of dividend tax causes the loss of large amounts of federal tax revenue. Further study is necessary to evaluate the appropriateness of the degree of reduction in dividend taxation and its overall impact on the general economy by combining the results from the increase in corporate investment and the loss in federal tax revenue.

CHAPTER 3—ESSAY TWO

CORPORATE INCOME TAX AND NONPROFIT VERSUS FOR-PROFIT ORGANIZATIONS: EVIDENCE FROM THE HOSPITAL INDUSTRY

3.1 Introduction

In the United States, nonprofit organizations (NPOs) and for-profit organizations (FPOs) coexist and compete with one another in certain industries, such as health care and education. Compared with their for-profit competitors, NPOs receive favorable tax treatment. The Internal Revenue Service (IRS) exempts NPOs' mission-relevant income from the federal corporate income tax (CIT). Some states also exempt them from state income, property, and sales taxes. Economists and policy makers have been debating whether NPOs should be granted tax exemption. However, up till now, it has not been clear whether tax exemption affects the NPOs' activities. Empirical evidence is limited and inconclusive. If tax exemption does not affect NPOs' activities and their competition with FPOs, then the debate on tax exemption to NPOs is less meaningful and tax exemption may be repealed. New findings of whether such impact exists have direct policy implications in three aspects.

First, as Simon (1987) argues, one use of the tax laws is to regulate the extent to which NPOs can operate in the business and public sectors by competing with for-profit or governmental entities. The proof of a positive relationship between tax exemption and nonprofit activities would help policy makers to determine whether Simon's claim is

correct that tax law is an effective measure to regulate the extent of NPOs' activities. Due to their different objectives, NPOs and FPOs may perform differently, and it is necessary for the government to regulate their competition to achieve optimal social and economic benefits. On the one hand, the efficient operation of FPOs serves as a benchmark of operational efficiency; on the other hand, NPOs provide benchmarks for quality and prices. The extent of NPOs' activity affects social welfare. For example, Kessler and McClellan (2002) suggest that controlling the shares of for-profit and nonprofit cardiac hospitals within a certain range can effectively reduce care expenditure without reducing care quality. Given the positive impact of tax exemption, policy makers can encourage nonprofit activity by increasing their tax subsidies if they find out that more nonprofit activities improve social welfare, or reduce tax exemption otherwise.

Second, one rationale for Congress to exempt NPOs from corporate income tax is that such tax subsidy will alleviate the difficulties NPOs have in accessing capital market, so that they can compete with FPOs. However, tax exemption may be unnecessary because NPOs may be able to survive without it, since customers may choose to patronize NPOs rather than FPOs. For example, Arrow (1963) argues that consumers select nonprofit rather for-profit organizations because they trust NPOs. Thus NPOs may continue to exist without tax exemptions. However, Steinberg (1987) argued that NPOs generally operate less efficiently than their for-profit counterparts because nonprofit administrators lack the incentive for efficient operation and the owners of NPOs do not have effective measurements to evaluate and monitor nonprofit administrators' performance. If these arguments are true, then such tax exemption does not encourage NPOs' activity and may be wasted by their inefficient operation. The federal government

has never provided an estimate on how much tax revenue is foregone due to tax exemptions to NPOs because the Congressional Budget Act of 1974 did not mandate the inclusion of such tax expenditures (Brody 1998). However, it should not be negligible nowadays, as NPOs have taken an important place in the economy. For example, Meckstoth and Arnsberger (1998) found that NPOs' revenue amounted to 12% of the GDP in 1995. Gentry and Penrod (2000) estimated that the corporate income tax subsidies to nonprofit hospitals were $4.6 billion in 1995. Empirical evidence of positive impact of tax subsidy to NPOs' activities will justify the tax exemption. However, even if we cannot find a positive impact of tax exemption to NPOs, we should not rush into the a decision to impose taxes on NPOs to increase tax revenue because NPOs may change their behavior by reducing prices or improving employee compensations; the ultimate impact on tax revenue is unknown (Congressional Budget Office 2005).

Third, as competing for-profit organizations are not exempted from taxes, policy makers and law researchers are concerned with the unfair competition between NPOs and FPOs. Proprietary business owners complain that such unfair competition lowers their market share. However, it is not clear whether FPOs suffer from the different tax treatment. If FPOs' market share does not change with the CIT rate, the claim that tax exemption help NPOs to drive FPOs out of market may be undermined. Thus, empirical research is necessary to show whether FPOs market shares are related to the tax exemption.

Empirical evidence of the impact of tax exemption on nonprofit activities is inadequate due to limited access to appropriate data. Researchers focus on property taxes, sales tax, and state CIT. No conclusive evidence has been found on whether tax

exemption helps NPOs increase their service provisions. In particular, no study has been made specifically on the impact of federal CIT exemption. This paper uses aggregated market share data to examine the relationship between different federal CIT treatments and market shares.

Three clarifications are necessary before proceeding with my analysis. First, although NPOs can take a variety of legal forms (e.g., charitable trust and unincorporated associations), almost all choose the corporate form because it limits the liability of the owners and provides other benefits (Hansmann, 1981). Thus even though exemption from CIT extends to NPOs with various forms, this paper confines its analysis to incorporated NPOs.

Second, this paper focuses on commercial NPOs, which gather their capital almost completely on a fee-for-service basis, rather than donative NPOs, which receive a large proportion of their capital from private donations or government grants. (See Hansmann [1981, 1987a] for definitions and examples of these two types of NPOs.) Goods or services provided by donative NPOs are generally public goods (which means that their goods and services have positive externalities exceeding their costs) and there are relatively fewer for-profit competitors. There are fewer disputes on the tax subsidies to donative NPOs. However, a significant proportion of goods and services provided by commercial NPOs, such as hospitals and nursing homes, are also provided by their for-profit competitors. According to the Congressional Budget Office (CBO, 2005), commercial NPOs in the health care sector received 92% of their revenue from selling their services in 2001; the value of private goods and services provided by all commercial

NPOs made up 3.4% of the net domestic product in 2002. This paper focuses on commercial NPOs, rather than donative NPOs.

Third, NPOs and FPOs coexist in health services, education, social services, culture and entertainment, and research, among other industries. As health service is the industry most interesting to researchers from various perspectives, its data are more readily available compared with the other industries. For the ease of data collection, I confined my analysis to the hospital industry. Therefore, it is important to note that the findings especially related to the hospital industry.

In the following sections, section 3.2 reviews the literature on the coexistence phenomena of commercial NPOs and FPOs and the impact of tax exemption on NPOs' market share. Section 3.3 justifies the appropriateness of the regression model to examine the impact of federal CIT exemption on NPOs market share. Section 3.4 describes the datasets and historical background of tax rules. Section 3.5 presents the analysis at both the national level and the state level. Section 3.6 makes the conclusion and discussions.

3.2 Literature Review

Voluminous literature discusses the reason of the presence of commercial NPOs and their dominance in industries such as health care. The arguments can be divided into two strands. One focuses on the consumer's trust in nonprofit form; the other emphasizes the subsidies NPOs receive.

3.2.1 The Contract Failure Theory

Hansmann (1980) and Nelson and Krashinsky (1973) extend Arrow's (1963) principal-agent theory in economics and propose the contract failure theory to explain why NPOs can compete with FPOs. They argue that NPOs and FPOs coexist in industries

where it is difficult for consumers to get full information in order to evaluate and monitor the goods or services (e.g., hospital or nursing home services). Customers are principals and the services providers are agents. Due to asymmetric information, providers can potentially use that advantage to benefit themselves. For example, they can provide services of lower quality but charge higher prices, and consumers do not have enough knowledge to find it out. Because FPOs' objective is to maximize their profits, they may have the motive to provide goods or services of disproportionately low quality. On the other hand, NPOs cannot pay any cash dividend to their owners; nonprofit managers cannot add profits to their salaries ex post; and even when NPOs are sold or liquidated, all revenue must be directed to another NPO, rather then distributed among owners. Therefore, restricted by the non-distribution constraint, NPOs do not have such incentives to cheat the consumers and are deemed more trustworthy than FPOs by some customers. Customers' preference to patronize NPOs helps them survive in the face of competition from FPOs. The contract failure theory is influential and is the fundamental assumption of many economic models of NPO behavior (e.g., Glaeser & Shleifer, 2001). However, it has not passed the empirical test (e.g., Permut 1981; David & Malani 2003; and Philipson 2000).

3.2.2 The Tax Subsidy Theory

The subsidy theory, which is proposed by Hansmann (1987b), states that commercial NPOs are able to compete with FPOs because they receive various subsidies from the government, such as tax exemption and a preferred postal rate. The major subsidies consist of three types of tax exemption. First, NPOs are exempted from both corporate income tax and property tax. Second, they can issue tax-exempt bonds; lenders

do not pay personal or corporate income taxes on received interest, allowing NPOs to borrow at a lower interest cost. Third, donors can deduct donations to NPOs from their taxable income. According to Gentry and Penrod (2000), the aggregated value of corporate income tax exemption for nonprofit hospitals in 1995 was $4.6 billion, and the value of property tax exemption was $1.7 billion; in 1994, the benefit to nonprofit hospitals from issuing tax-exempt bonds was $354 million and government tax loss due to deduction of donations nonprofit hospitals equal $1.1 billion.

Very limited empirical work examines the impact of tax exemptions on the activities of NPOs. Hansmann (1987b) estimates the impact of differentials in state taxes (including sales, property, and corporate income taxes) on NPOs' market shares in nursing homes, hospitals, primary and secondary schools, and vocational schools, using cross-sectional aggregated state data from 1975. He defines NPOs' market share in different industry differently. In particular, he defines the market shares of hospitals and nursing homes as the percentage of non-governmental beds in the nonprofit sector and defines the market shares of nonprofit primary, secondary, and vocational schools as the percentage of non-governmental enrollment in nonprofit sector. He examines the tax effect in two aggregate levels: the state level and the largest city of each state level. He tries several different specifications of his regressions. He does not find unanimous evidence showing that tax exemption significantly increases nonprofit institutions' market share. In particular, in his separate regressions for each industry and at each aggregate level, only 5 of the 21 tax coefficients are statistically significant. When he pools the industries together at the state level, state corporate income tax and sales tax significantly increase nonprofit market share, while property tax does not have any

significant impact; however, when he pools the industries at the biggest city level, only state corporate income tax's impact is significant.

Chang and Tuckman (1990) examine whether the difference in property tax rates in various counties in Tennessee affects the nonprofit hospitals' activities. They test three hypotheses: 1) higher property tax rates increase nonprofit hospitals' market share, where the market share is measured as total nonprofit inpatient days per year divided by total annual hospital inpatient days for all types of hospitals—nonprofit, for-profit and government hospitals; 2) higher property tax rates increase the probability that a county will have a single hospital; and 3) higher property tax rates increase the probability that the single hospital in a county will be nonprofit. Surprisingly, their regression results show that higher property tax rates do not just fail to increase nonprofit hospitals' market share, but rather statistically significantly reduce their share. Also, even though higher tax rates increase the probability that a county in Tennessee has a single hospital, they have no significant impact on whether the hospital is nonprofit. In sum, the overall impact of a higher tax rate is to reduce nonprofit hospitals' market share. However, Chang and Tuckman's results should be accepted with caution because counties with higher property tax rates are rich counties where for-profit hospitals are eager to serve and expand.

Gulley and Santerre (1993) employ panel data covering 50 states plus the District of Columbia at 5-year intervals from 1967 to 1987. They define market share as the percentage of hospital beds and run simultaneous regressions for nonprofit hospitals' market share, for-profit hospitals' market share, and governmental hospitals' market share with the cross-equation constraint that the corresponding regression coefficients from all the three regressions sum to zero (because the sum of the changes in market

share must equal zero). In contrast to previous scholars' results, Gulley and Santerre find that both the state corporate income tax rate and the property tax rate positively influence NPO market share, but that only the corporate income tax rate negatively affects FPO market share. They explain the asymmetric impact of the property tax rate on NP and FP hospitals with the ad hoc reason that FP hospitals have already capitalized on the property tax ever since their establishment, and thus are not affected by its change, while NP hospitals do not capitalize on the tax. However, this explanation deserves more scrutiny.

In summary, the current empirical work is not conclusive on whether tax subsidies have a positive impact on nonprofit hospitals' market share. Moreover, all the studies focus on state level taxes. No work has been done to investigate the federal corporate income tax impact. As Steinberg (1991) points out "Hansmann and Chang and Tuckman are unable to estimate the impact of federal tax differentials because they employ a single cross-section of state-, county-, or city-level data. Federal tax differentials simply don't vary across these samples, so their impact is not estimatable. This gap could be filled by a similar study utilizing nationwide time-series data." This essay attempts to fill the research gap by focusing on aggregated time series in both national and state levels to study the impact of exemption of federal corporate income tax.

3.3 A Regression Model

Little work in the literature has explicitly explained the mechanism through which the change of corporate income tax rates affects the market share of nonprofit organizations. However, the relationship can be justified through at least two theoretical frameworks—the competition framework and the entrepreneurs' framework. Within the

competition framework, NPOs and FPOs compete with each other and the tax exemption gives NPOs competitive edges through three facets. First, tax exemption allows NPOs to accumulate net earnings at a faster speed than comparable FPOs, thus making NPOs more financially robust. As the CIT rate increases, the relative robustness of NPOs becomes more significant. Second, the cost of capital for for-profit investors increases with the CIT rate. As shown in the previous chapter, the cost of capital formulas for ordinary for-profit corporations (i.e., C corporations) under the traditional view and new view of double taxation are

$$c = \pi'(K) = \frac{\rho}{(1-\tau)[\alpha(1-m)+(1-\alpha)(1-z)]}$$

and

$$c = \pi'(K) = \frac{\rho}{(1-\tau)(1-z)},$$

where ρ is the investors' required rate of return, τ is CIT rate, α is dividend payout ratio, m is the individual income tax rate, and z is the accrual capital gain tax rate.

The CIT rate—τ, appears in the denominators of both cost-of-capital formulas, which means that as the CIT rate increases, the cost of capital increases. As the cost of capital increases, investment in for-profit corporations declines and capital stock within FPOs declines. Therefore, for-profit corporations face higher financial pressure; as a result, they may either stop expansion or exit the industry. For example, Culter and Horwitz (2000) recorded a case where a financially depressed for-profit hospital first suspended construction on a partially completed tower at the hospital complex and later sold all the hospital assets to a nonprofit hospital established by doctors and community members.

Third, as Newhouse (1970) argues, tax subsidies, together with philanthropic donations, allow nonprofit hospitals to undersell for-profit hospitals and forestall the entry and expansion of for-profit hospitals, even though they may operate less efficiently by pursuing too high a quality of their services. A higher CIT rate gives NPOs more capability to implement such a strategy against FPOs. On the other hand, expansion and entry of NPOs are not affected by the increase of the CIT rate. Therefore, competing NPOs will gain larger market share with a higher corporate income tax rate.

Within the entrepreneurial framework, the CIT rate affects entrepreneurs' decision on nonprofit versus for-profit forms. Here, the term "entrepreneurs" represents all the people who can influence the organizational status and operation. In nonprofit hospitals, they can include the trustees, board of directors, administrators, doctors and medical staffs. All these people differ in their objectives and make combined decisions with compromises to one another. However, we can assume that there is a "virtual" single entrepreneur in each hospital making the final decision.

Mackie-Mason and Gordon (1997) analyzed the impact of CIT exemption on noncorporate firms on the market share of noncorporate and corporate firms. They built up a model showing that the CIT rate affects the market share of noncorporate firms because entrepreneurs choose the appropriate form to maximize their after-tax income. They measure the market shares of noncorporate and corporate firms in terms of asset size and taxable income and regress the market shares on the CIT rate to measure its impact. I borrowed their idea to model entrepreneurs' decision on nonprofit versus for-profit forms. However, there is an obstacle to borrowing their model. In their model, the entrepreneurs' objective is to maximize after-tax income; however, this may not be true

for nonprofit entrepreneurs, so that I do not know under what conditions entrepreneurs will choose nonprofit or for-profit forms.

There has been no agreement on what nonprofit entrepreneurs seek to maximize. Newhouse (1970) postulates a model of constrained quantity-quality maximization; Brooks (2005) proposes service maximization; Danzon (1982) puts up dividend-in-kind maximization because nonprofit entrepreneurs cannot put cash into their pockets. In her output aalysis, Rose-Ackerman (1982) even assumes that NPOs maximize profits as FPOs do in an oligopoly market consisting of nonprofit and for-profit competitors.

Despite the diverse apparent objectives in the literature, I assumed that nonprofit entrepreneurs achieve their objectives through two steps. In the first step, they maximize the net income in the same way that for-profit entrepreneurs do; in the second step, they use the earned profits to achieve their objectives. Nonprofit entrepreneurs may maximize their utilities by spending the maximized net income on purchasing various perquisites, such as pleasing subordinates as listed by Sternberg (1987), "buying" their reputations through quality improvement or fulfilling their altruistic nature through fees reduction. I assumed that the entrepreneurs' utility from the achievement of their objectives increases monotonically with the profits they can earn in the first step. The net earnings of the nonprofit form is denoted as π and the utility to nonprofit entrepreneurs as $U_{np}(\pi)$. The for-profit form can earn net income $\pi+g$, where g represents the net benefit of the for-profit form. It is positive when the advantage of the for-profit form, such as easy access to the capital market exceeds the disadvantage, such as customers' trust in nonprofit organizations as the contract failure theory predicts; it is negative otherwise. As the for-profit form is subject to CIT with the rate of τ, for-profit entrepreneurs' net income is (1–

$\tau)(\pi+g)$ and denote the utility to for-profit entrepreneurs as $U_{fp}([1-\tau][\pi + g])$. Entrepreneurs choose the for-profit form when $U_{fp}([1-\tau][\pi + g]) > U_{np}(\pi)$. Under the classical assumption of utility function, i.e., $U' > 0$, the probability of $U_{fp}([1 - \tau][\pi + g]) > U_{np}(\pi)$ decreases as τ increases, which means that entrepreneurs are less likely to choose a for-profit form when corporate income tax is higher.

If we can assume the utility functions of nonprofit and for-profit entrepreneurs are the same, i.e. $U_{fp}(.) = U_{np}(.)$, entrepreneurs choose the for-profit form when $(1 - \tau)(\pi + g) > \pi$, i.e., $g > \pi\tau/(1 - \tau)$. Conditionally on net income's (π's) being positive, which is the case in the hospital industry, entrepreneurs choose a for-profit form when $g/\pi > \tau/(1 - \tau)$. Otherwise they choose a nonprofit form. If we can further assume that the random variable g/π has certain probabilistic distribution, then the integration from negative infinity to $\tau/(1 - \tau)$ represents the nonprofit share and integration from $\tau/(1 - \tau)$ represents the for-profit share. In Figure 3.1, the area to the left of $\tau/(1 - \tau)$ under the probability density curve is the nonprofit share and the area to the right is the for-profit form. Increasing the crucial value $\tau/(1 - \tau)$ reduces the area to the right but increases the area to the left. More specifically, because $\tau/(1 - \tau)$ increases monotonically with τ, a higher CIT rate increases nonprofit market share.

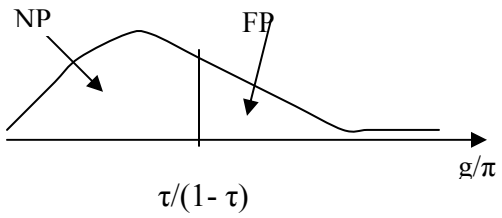


Figure 3.1 Market Share of Nonprofit versus For-profit Organizations

Both frameworks suggest that as CIT rates increase, the NPOs' market share will increase. In the subsequent sections, I empirically examine whether federal corporation income tax increases the market share of NPOs. However, this examination must be done carefully due to the CIT rules which seem to undermine the validity of this model. These two confusing rules concern the tax difference on corporate versus noncorporate firms and the Unrelated Business Income Tax on NPOs. Further explicit justifications are necessary.

First, according to IRS tax regulations, only for-profit corporations are taxed by federal corporate income tax, but for-profit noncorporate organizations are exempted from CIT. It appears that we should focus on nonprofit corporations and for-profit corporations in order to correctly estimate the impact of federal corporate income tax. It is very difficult to find such kinds of datasets to make the examination. Even in the intensively studied hospital industry, no publicly available source has shown whether there exists any noncorporate hospital. Fortunately, at least in theory, all the NPOs should take the form of corporations because the noncorporate form does not give them any benefit, while the corporate form gives them benefits like limited liability. With regard to FPOs, even though there could be corporations and noncorporate entities, the profitability of various organizational forms should be similar, after controlling advantages and disadvantages of corporate and noncorporate forms; otherwise FPOs will change organizational forms, expand, or go out of business until equilibrium in profitability is reached. Therefore, even though federal income tax only applies to for-profit corporations, it implicitly also influences for-profit noncorporate entities. It would not be

a big problem if I examined federal income tax's impact on NPOs versus FPOs market share without accounting for the possible noncorporate forms.

Second, the IRS does not exempt NPOs' income received from unrelated business. In fact, many NPOs do unrelated business. For example, in the hospital industry, selling medication to ambulatory patients or patients of affiliated physicians but not the hospitals themselves is unrelated business and the revenue should be taxed by UBIT (McDaniel & Fink, 1985). Hines (1999) found that nonprofit entrepreneurs' willingness to do unrelated business increases with their financial pressure. Cordes and Weisbrod (1998) found that the decision to do unrelated business is also influenced by the size of the excess return created by differential taxation of NPOs and FPOs; in areas with more favorable tax treatment to NPOs, NPOs are more likely to do unrelated business.

In 1950, Congress created the Unrelated Business Income Tax (UBIT), a tax system very similar to the corporate income tax, with two objectives: to prevent unfair competition, because NPOs' cost of capital would be less than that of FPOs if the unrelated business income were not taxed, and to increase tax revenue (U.S. House, 1950). This suggests that we would have to focus on the sub-industries where only the NPOs' mission goods and services are marketed. For example, if only the nuclear radioactive treatment of NPO hospitals is tax-exempt, we might have to focus only on the nuclear treatment market, rather than the general hospital market. This would create data collection difficulties because few datasets provide specific detailed information of sub-industries.

Fortunately, abundant evidence has shown that UBIT does not effectively tax NPOs' unrelated business income, because NPOs can easily shift the cost for producing NPO mission goods or services to unrelated goods or services. Sansing (1998) provides theoretical framework explaining the inefficacy of UBIT. Yetman (2001), Yetman (2003), and Omer and Yetman (2001) provide empirical evidence showing NPOs allocate disproportionately higher expense from their mission-related business to unrelated business; in particular, nonprofit hospitals are more likely to report near zero taxable income than other NPOs.

Besides the ineffectiveness due to easy cost manipulation in NPOs' accounting practice, some important income from unrelated business such as rents, dividends, and royalties are exempted from UBIT in current tax rules. Therefore, there should not be a big problem if we overlook the impact of UBIT and just look at the general industries, as if all of NPOs' activities were not taxed.

3.4 Hospital Data and CIT History

3.4.1 Hospital Data

It is very difficult to get a comprehensive dataset including various industries where NPOs and FPOs compete. However, data on the hospital sector are available for public use because the type of ownership in the hospital sectors has been an interest to many economists and policy makers for a long time. Therefore, I focused on the hospitals sector in the health care industry and used data from *Hospital Statistics* published by the American Hospitals Association (AHA).

The AHA surveys its members every year to collect the data for the publication of *Hospital Statistics*. Almost all the hospitals in the United States have registered with the

AHA and been counted in the yearly survey. For example, there were 2,886 nonprofit, 882 for-profit, and 8,788 state and local government short-term community hospitals registered as AHA members and counted in the hospital statistics in 1992. After referring to hospital list in the National Center for Health Statistics and various directories of the hospital industry, AHA identifies that only 13 nonprofit, 15 for-profit, and 14 state and local government hospitals were not AHA members. (Please refer to *Hospital Statistics* 1993/94, Table 1 and Table 14.) Similarly, only 16 nonprofit, 21 for-profit, and 15 state and local government hospitals were not AHA members in 1993, while a total of 3,154 nonprofit, 717 for-profit, and 1,390 state and local government community hospitals were listed as members. (Please refer to *Hospital Statistics* 1994/95, Table 1 and Table 14.)

Hospital Statistics provides aggregated hospital measurements at both national and state levels. At the national level, it provides two strings of time series. One is the 29-year time series of nonfederal short-term hospitals from 1965 to 1993. The other is the 29-year time series of short-term community hospitals from 1972 through 2000. According to AHA definition, the nonfederal short-term hospitals category is a little bit larger than the community hospitals category because the former includes special hospitals such as psychiatric hospitals and hospitals for tuberculosis. However, the number of such special hospitals is few and there is little difference between these two categories. For example, the nonfederal short-term hospitals category contained 4,934 hospitals in 2000, while the community hospital category contained 4,915 hospitals in the same year. Furthermore, the market share distributions of non-federal short-term hospitals and short-term community hospitals between 1972 through 1993 are almost identical. For example, when I compared the market share in terms of number of

hospitals from 1972 to 1993, the Pearson coefficient of correlation between these two categories was 0.999. In order to have a larger sample size of market share in the national level, I combined the two types of hospitals together so that the 1965 through 1993 time series contained market share information for non-federal short-term hospitals and the 1994 through 2000 time series contained market share information for short-term community hospitals. Thus, I have 36 years of national-level time series from 1965 through 2000. At the state level, I used the aggregate market share information for all 50 states plus the District of Columbia for 21 years from 1975 through 1995 and did a cross-sectional time series analysis.

The theoretical frameworks in the previous section have shown that nonprofit hospitals' market share will increase with the corporate income tax rate. A little more thought on how to construct the market share measurement is worthwhile. It seems natural to define the nonprofit hospitals' market share as the percentage of the total number of hospitals that are nonprofit. However, constructing the measurement in this way obscures the difference in size among nonprofit, for-profit, and governmental hospitals. Nonprofit hospitals on average are larger than for-profit hospitals. For example, David (2003, p. 4) notes that "For more than three decades, between 1928 and the early 1960s nonprofit hospitals maintained on average more than three times as many beds per hospital as their for-profit counterparts, by 2000 the average nonprofit was only 32% larger than the typical for-profit hospitals."

Moreover, merger transactions and closures are not rare in the hospital industry. For instance, Cutler and Horwitz (2000) report the merger of nonprofit hospitals in their case study of converting hospitals from nonprofit to for-profit status, and Steinwald and

Newhauser (1970) find that small hospitals are more likely to close than larger ones. Thus the percentage of total number of hospitals which are nonprofit may change while the percentages of patients or assets in nonprofit sector do not.

Given this defect of using the number of hospitals, scholars usually use the number of beds to define market share (e.g., Steinwald & Neuhauser, 1970; Hansmann 1987b; and Gulley & Santerre 1993). Chang and Tuckman (1990) use inpatient hospital days to define market share. If we can assume that inpatients' patronage to hospitals is connected to the hospitals' size (i.e., on average, larger hospitals have more inpatients), then Chang and Tuckman's measurement using inpatient hospital days should not differ much from the other measurement using beds.

Therefore, I constructed a measurement of nonprofit market share as the percentage of total hospital beds that are nonprofit. I also constructed a second measurement similar to that of Chang and Tuckman (1993). It is calculated in terms of admissions, defined as number of patients accepted for inpatient service during the reporting period, excluding newborns. Figure 3.2 illustrates the time trend of the nonprofit market share aggregated at the national level. The nonprofit market shares in terms of beds and admissions fluctuated within a small range and show similar patterns. Both market shares show obvious upward time trends before 1992, drops between 1992 and 1997, and rises again after 1997. However, the market share in terms of beds dropped dramatically between 1992 and 1997, so that the market share in 1997 was lowest across the study period. Nevertheless, the drop in market share in terms of admissions was not much between 1992 and 1997

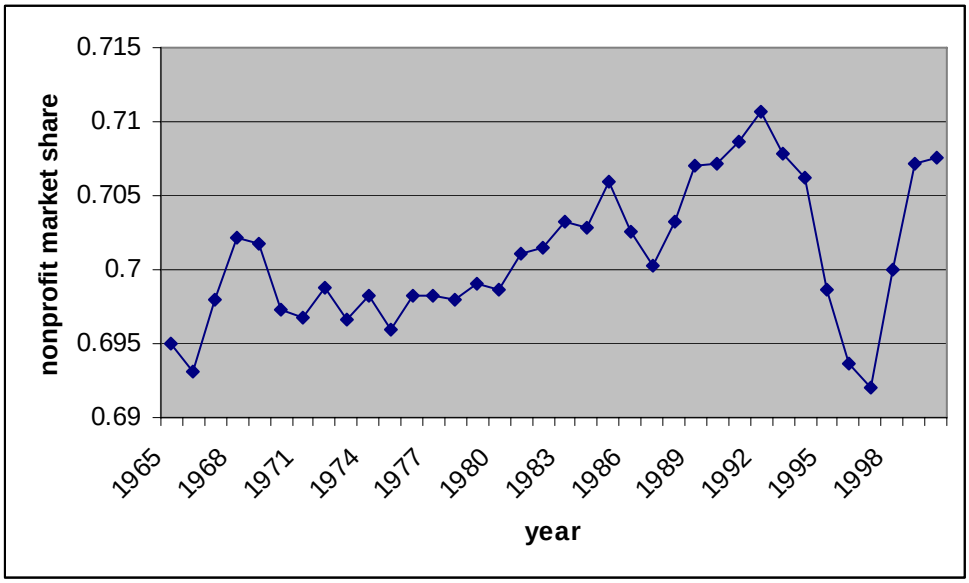
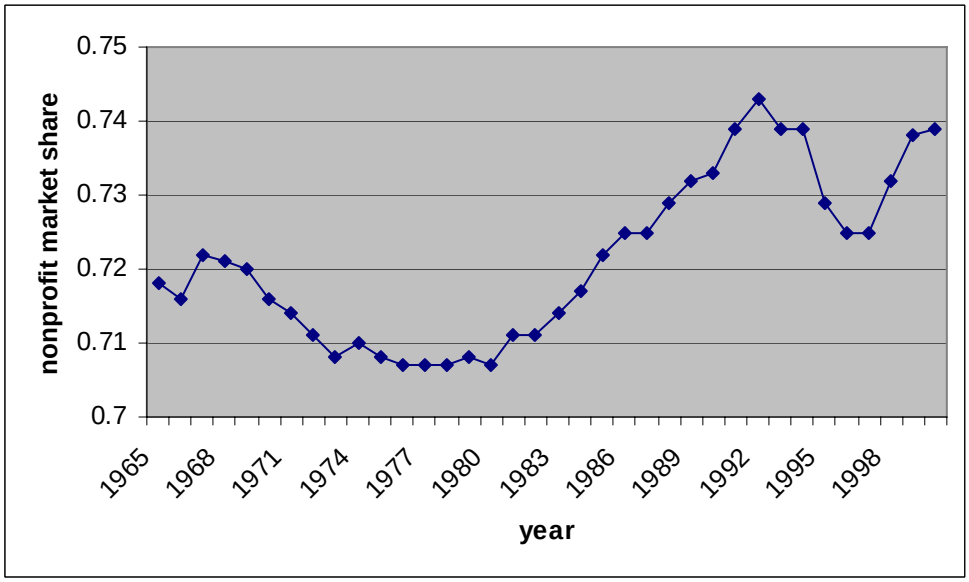


Figure 3.2a Nonprofit Hospital Market Share in Terms of Beds



Data source: Hospital Statistics by AHA

Figure 3.2b Nonprofit Hospital Market Share in Terms of Admissions

Figure 3.2: Nonprofit Hospital Market Share Time Trend

3.4.2 CIT History

The CIT rate fluctuates between 1965 and 1995. For example, the highest statutory CIT rate was 48% from 1965 through 1977; it was reduced by 2 percentage points in 1978 and remained at 46% till 1986. It was reduced further to 34% in 1987 and remained there through 1992; and it was increased to 35% in 1993 and remained at that rate till 2000. However, the highest statutory rate does not fully reflect the changes in the actual tax rate on corporate income due to dramatic changes in detailed tax provisions by major tax reform acts. For example, TRA86 reduced the highest statutory CIT rate but closed a lot of loopholes through which corporations had shielded their income, so that the effective marginal tax rates rose. During the study period of 1965 to 2000, several major tax laws were implemented to change corporate income taxation, which subsequently changed the relative federal CIT exemption enjoyed by NPOs. According to the "Changes of Law" section in the yearly publication of *Statistics of Income—Corporation Income Tax Returns*, these major law changes include:

Revenue Act of 1971— it created the Class Life Asset Depreciation Range (CLADR) System and corporations must use this system to calculate depreciation and report taxable corporate income.

Revenue Act of 1978— it reduced the highest tax rate from 48% to 46%.

Revenue Act of 1981— it replaced the CLADR system with the Accelerated Cost Recovery System, which gave firms more generous deductions.

Tax Equity and Fiscal Responsibility Act of 1982— it instituted a half-basis adjustment for investment tax credits in calculating depreciation. It repealed the

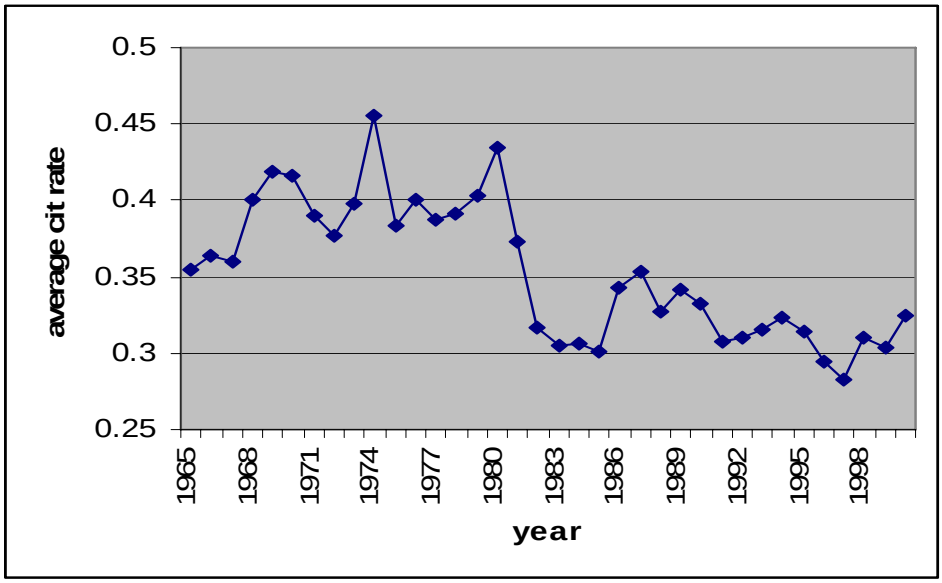
acceleration of depreciation scheduled in 1985 and 1986 by the Economic Recovery Tax Act of 1981.

Tax Reform Act of 1986— it was the most influential tax law in history. It reduced maximum corporate income tax rate from 46 percent to 34 percent, but broadened the corporate income tax base by repealing the investment tax credit, limiting depreciation deductions, restricting the use of net operating losses, etc. It also introduced the Alternative Minimum Tax.

Omnibus Budget Reconciliation Act of 1993— it increased the top tax rate of individual income to be 39.6%, and corporate income to 35%.

Taxpayer Relief Act of 1997— it removed the Alternative Minimum Tax for C corporations that earn less than $7.5 million in receipts after 1997.

Corporate income taxation in the United States is complicated because it is progressive—the marginal tax rate is higher for corporations with net income over certain thresholds and there are various provisions of exemption and deduction of the CIT (e.g., the Net Operating Loss can be carried forward to deduct from future income and carried back to claim tax refunds.). The average CIT rate comprehensively captures all such details in tax regulation and reflects the true tax rate. As I cannot get the average CIT in the hospital industry, I used the average CIT rate in the economy as a proxy. I extracted the national aggregated corporate income tax payment time series and the corporate taxable income time series from *Nation Income Produce Account* (NIPA) published by the Bureau of Economic Analysis, and I define the average CIT rate as the ratio of total corporate income tax payment divided by total corporate taxable income in the economy. Figure 3.3 illustrates the time trend of the average CIT rate across the sample years.



Source: NIPA

Figure 3.3: Average CIT Rate across the Sample Years

3.4.3 Profitability

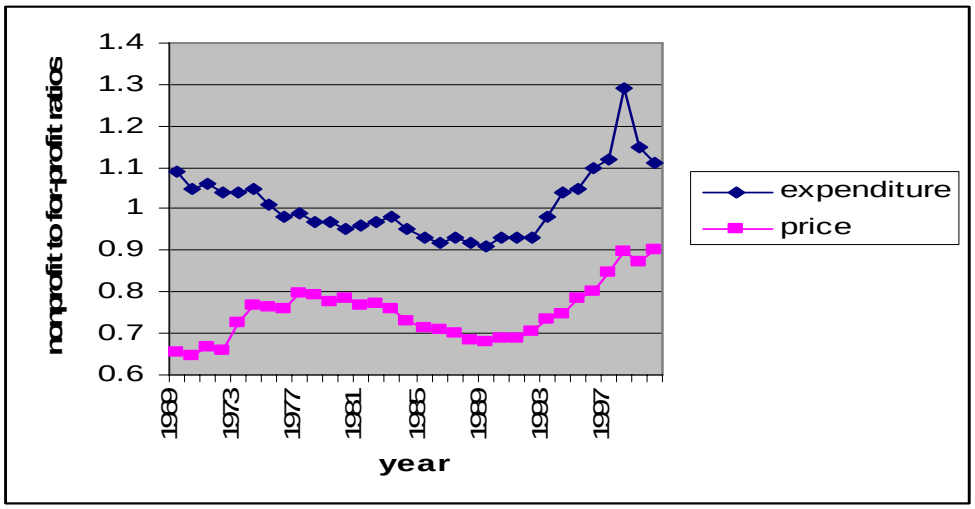
Corporate income taxation is different from property taxes or sales taxes (which are of interest in previous studies) because corporate income taxation only taxes the net profits, whereas the property taxation and sales taxation are applied regardless of hospitals' profitability. If for-profit hospitals do not earn any profits, then they do not pay any corporate income tax and it is impossible to study the impact of CIT exemption on nonprofit hospitals' market share. Therefore, I have to make sure that for-profit hospitals made profit in the study period.

AHA only provides information on hospitals' total expenditure, but does not provide information about hospitals' profitability. However, NIPA provides the total personal consumption expenditures in all hospitals by type of ownership (on NIPA Table 2.5.5). The personal consumption expenditure in various types of hospitals consists of

both households' out-of-pocket payments and third party payments including those by employer and government insurance programs. If we divide the total personal consumption expenditure by average daily census—an index of combined inpatients and outpatients each day, times the total number of days in a year—we can get the average price each patient pays for one visit or day. Similarly, if we divide the hospitals' total expenditures by the average daily census times 365, we get the hospitals' average cost per patient visit or day. Comparing the average cost and price shows the profitability of the hospitals.

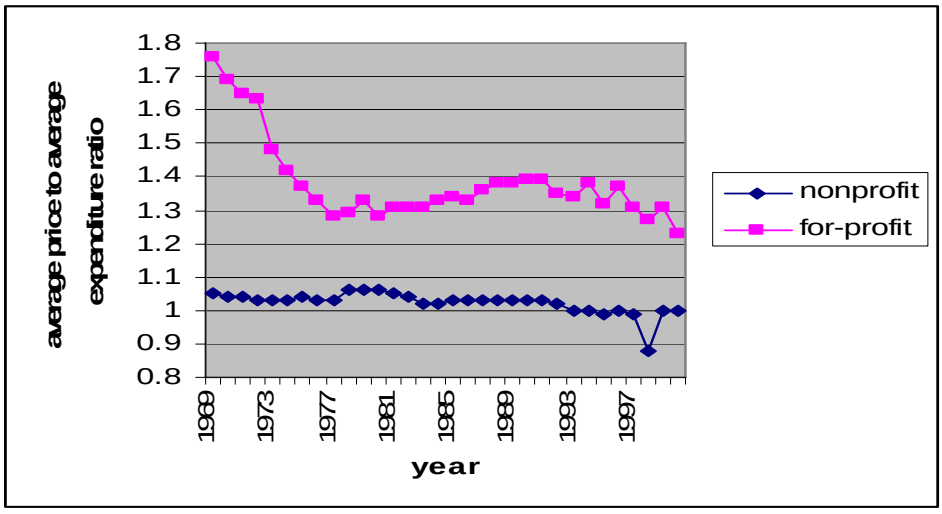
Figure 3.4 illustrates the average expenditure ratio and average price ratio of nonprofit hospitals to for-profit hospitals. The interesting finding is that the average expenditure in nonprofit hospitals does not differ much from that in for-profit hospitals (except in 1998, which is probably an outlier); however, the average price nonprofit hospitals charge is only about 70–80% of that of for-profit hospitals for most of the years, but that percentage increased to 90% in 1998 through 2000.

Figure 3.5 illustrates the difference between nonprofit and for-profit hospitals from another angle by comparing the ratio of average price to average expenditure between nonprofit and for-profit hospitals. Both nonprofit and for-profit hospitals charge more than the average expenditure (except in 1998 for nonprofit hospitals); however, in 1969, nonprofit hospitals' charge was only slightly higher than the expenditure while for-profit hospitals charged about 70% more than their expenditure. After 1974, for-profit hospitals charged 30–40% more than their expenditures.



Source: Hospital Statistics and NIPA

Figure 3.4 Nonprofit to For-Profit Ratios of Average Expenditure and Average Price



Source: Hospital Statistics and NIPA

Figure 3.5 Price/Expenditure Ratios for Nonprofit and For-Profit Hospitals

Figures 3.4 and 3.5 show that both types of hospitals earned profits in aggregate. This result is corroborated by the report by the Prospective Payment Assessment Commission (1995), which focused on the Medicare provision hospitals. The commission

found both nonprofit and for-profit hospitals made profits in aggregate from 1984 through 1993.

3.5 Analysis and Results

As I have national and state level data, I analyze them separately. The national-level data, which contains 35 years' worth of information, is suitable for time series analysis and the state-level data, which contains information of all 50 states and Washington DC for 21 years, is suitable for longitudinal data analysis.

3.5.1 National Level

Visual examination of both the dependent variables of market shares and the independent variable of the average tax rate in Figure 3.2 and Figure 3.3 shows a clear time trend of those variables, which means that they are nonstationary. Granger and Newbold (1974) have presented cases where two unrelated variables can show a significant statistical relationship simply because the time series of both variables are nonstationary. The usual approach to dealing with nonstationary variables is the first difference operation. (Greene 2000 provides detailed discussion on page 778.) Dickey and Fuller (1979, 1981) provided an Augmented Dickey-Fuller test on unit-root nonstationarity. Their null hypothesis is that there exists a unit-root nonstationarity in the time series. If the calculated Tau statistic is significantly negative, then we can reject the null hypothesis and conclude that the time series is stationary. Table 3.1 summarizes the testing results of the time series and their first difference. It is obvious that both market shares and average CIT rate are nonstationary; however, their first differences are stationary. For example, the Tau statistic for the dependent variable of nonprofit market share in terms of beds is –2.55 with *p*-value of 0.113, which is not significant even at a

10% significance level, suggesting that we cannot reject the null hypothesis that market share in terms of beds is unit-root nonstationary. However, after the first difference, the Tau statistic becomes –4.64, which is significant at a 0.1% significance level, suggesting that we should reject the null hypothesis that the first-differenced market share in terms of beds is unit-root nonstationary.

Table 3.1: Non-Stationarity Tests of Dependent and Independent Variables

Augmented Dickey-Fuller test of unit root non-stationarity		
	Tau	P-value
Market share-beds	–2.55	0.113
Market share-admissions	–1.00	0.743
Average CIT rate	–1.38	0.578
Market share-beds (1)	–4.64	0.001
Market share-admissions (1)	–3.15	0.032
Average CIT rate (1)	–4.36	0.002

Note:
"(1)" indicates first difference

As there is no theoretical justification on how many lags to include in the regression model, I simply assumed that the impact of CIT exemption dies off exponentially as time goes, so that, in theory, I can trace the impact infinitely into the past. Let MS_t denote the market share in year t, and $avgrate_{t-j}$ denote the average CIT rate at year t-j. (It is plausible to assume the exemption will start to show impact after j years.) Then the regression model takes the following forms. The exponential factor ρ has absolute value less than 1.

$$MS_t = \beta_0 + \beta_1 \times \sum_{n=0}^{\infty} \rho^n avgrate_{t-j-n} + \varepsilon_t$$

As both time series of the dependent and independent variables are unit root nonstationary, first difference is necessary. The one year lag equation is

$$MS_{t-1} = \beta_0 + \beta_1 \times \sum_{n=0}^{\infty} \rho^n avgrate_{t-1-j-n} + \varepsilon_{t-1}$$

.

The first difference equation is as follows and both dependent and independent variables are stationary now.

$$\Delta MS_t = \beta_1 \times \sum_{n=0}^{\infty} \rho^n \Delta avgrate_{t-j-n} + \varepsilon_t - \varepsilon_{t-1}$$

In time-series literature, scholars usually define a backshift operator L, where for any time-series variable X, $LX_t=X_{t-1}$, $L^2X_t=X_{t-2}$. . . etc. Applying the backshift operator and disregarding the error terms for simplicity of the expression, the expected value equation becomes

$$E(\Delta MS_t) = \beta_1 \times \frac{1}{1-\rho L} \Delta avgrate_{t-j},$$

and after algebra manipulation, it becomes

$$E((1-\rho L)\Delta MS_t) = E(\Delta MS_t - \rho \times \Delta MS_{t-1}) = \beta_1 \times \Delta avgrate_{t-j}$$

which is the usual Autoregressive-Integrated-Moving-Average with explanatory variables (ARIMAX) model.

Besides the stationarity requirements for both dependent and independent variables, the ARIMAX model also requires the independent variable to be non-autoregressive. (Brocklebank and Dickey [2003] provide an example showing that if the independent variable is autoregressive then the estimate is inconsistent.) If the independent variable is autoregressive, then a "prewhitening" process is necessary to remove the autoregression in the independent variable.

We can check the autocorrelation in a white noise test with the Q statistic. The first column of table 3.2 shows that the Q statistics of the differenced independent variable—the average CIT rate—are insignificant. Further inspection of the first few lags of the average CIT rate variable shows that the autocorrelation coefficients of various orders are small; for example, the first-order autocorrelation coefficient for this differenced independent variable is only –0.075. Therefore, the first-differenced average CIT rate is not autoregressive and we can apply the ARIMAX regression to analyze the relationship between nonprofit hospitals market shares and the CIT rate.

Table 3.2 Autocorrelation Check of First-Differenced Variables

	Average CIT rate (1)		Market share-beds (1)		Market share-admissions (1)	
up to lag	Q statistics	P-value	Q statistics	P-value	Q statistics	P-value
6	8.73	0.19	11.83	0.07	8.86	0.18
12	10.56	0.57	17.18	0.14	13.25	0.35
18	12.04	0.85	18.21	0.44	14.42	0.7
24	17.28	0.84	22.4	0.56	19.11	0.75

Note:
(1) indicates first difference.

I also checked the autocorrelation of the differenced dependent variable—nonprofit market share—with the Q statistics. As shown in the second column of Table 3.2, the Q statistic testing that no autocorrelation for the differenced market share variable in terms of beds is 0.07 for the first six lags. Even though it is not significant at the 5% level, it still suggests weak autocorrelation in the first-differenced variable—market share in terms of beds. The third column of Table 3.2 shows the autocorrelation check for the first-differenced market share variable in terms of admissions. The Q

statistics are not significant, suggesting insignificant autocorrelation in the first-differenced market share variable in terms of admissions; however, further inspection shows that the first-order autocorrelation coefficient for that differenced variable is 0.343. Therefore, I specified that the first-differenced dependent variable is first-order autoregressive in the ARIMAX model.

David (2003) argues that entrepreneurs need some time to adjust their market expectations and enter or exit the hospital industry; thus he collects data every four years. Similarly, Gulley and Santerre (1993) allow the adjusting period to be five years. I set the adjusting period to be five years, i.e. j=5. The first column of Table 3.3 summarizes the results from the ARIMAX regressions. The coefficients of the average CIT rate, β_1, is positive, suggesting that if the average CIT rate increases by 1 percentage point in current year, it is expected to increase nonprofit hospitals' market share in terms of beds by 0.035 percentage point in the fifth year but it is only expected to increase nonprofit market share by 0.001 (=0.035*0.041) percentage point in the sixth year. Figure 3.6 illustrates the impact on nonprofit hospitals' market share in terms of beds if the average CIT rate increases by one percentage point. The impact starts in the fifth year and then dies out quickly. The first-order autoregressive coefficient is positive, suggesting that if the nonprofit market share increases by one percentage point in the current year, it is expected to increase by 0.339 percentage point the next year, if the average CIT rate does not change. None of the coefficients is significant at a 5% significance level, but the impacts of CIT and autoregression are significant at a 10% level.

Table 3.3: ARIMAX Regression Results

	1	2	3	4
β_1	0.035	0.034	0.040	0.043
	(0.083)	(0.069)	(0.032)	(0.015)
ρ	0.041	.	–0.234	.
	(0.942)	.	(0.545)	.
AR (1)	0.339	0.325	0.515	0.538
	(0.084)	(0.085)	(0.006)	(0.003)

Note:
P-values are in the parentheses.
Columns 1 and 2 show results for dependent variable of market share in terms of beds.
Columns 3 and 4 show results for dependent variable of market share in terms of admissions.

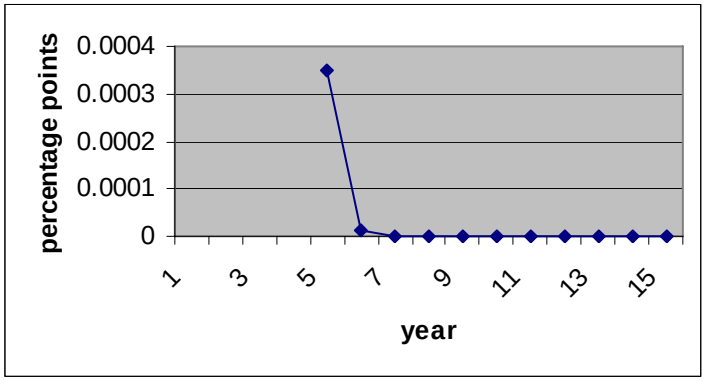


Figure 3.6 Impacts on Nonprofit Hospitals' Market Share in Terms of Beds from One Percentage Point Increase in CIT Rate

As the impact of CIT on nonprofit market share dies out very quickly and the *p*-value of ρ is almost 1, I set ρ equal 0 and assumed that CIT affects nonprofit market share only in the fifth year. Column 2 of Table 3.3 summarizes the result. The coefficients of CIT and first-order autoregression hardly change, but the impact of CIT becomes more significant.

The ARIMAX regression results for market share in terms of admissions are shown in columns 3 and 4. As shown in column 3, if the average CIT rate increases by 1 percentage point in the current year, it is expected to increase nonprofit hospitals market

share in terms of admissions by 0.040 percentage point in the fifth year, but it is expected to reduce nonprofit market share by 0.009 (=0.040*0.234) percentage point in the sixth year. However, the exponential coefficient, ρ, is not significant. After I excluded the lagged impact of CIT after 5 years (i.e. setting ρ equal 0), the impacts of CIT and the first-order autoregression do not change much.

Even though the time-series regressions of the national aggregated data show support for the argument that CIT exemption helps NPOs increase market shares, the results can be subject to suspicion because sample size is relatively small. There are only 36 yearly observations, which barely satisfy the smallest sample size requirement for ARIMAX analysis. Such a small size also prevents me from including additional control variables. Moreover, time series analysis relies on arbitrary judgment about impact lag and transfer functions, which undermines the credibility of such analysis. As I did the sensitivity analysis by allowing the adjusting period to be one through four years instead of five years, the coefficients of β_1 were not significant even at a 10% level; they were even negative in some cases. Therefore, I further investigated the state level aggregated data which contains 50 states plus Washington D.C., and 21 years for each subject.

3.5.2 State Level

The state-level data is a longitudinal data, which allows us to assume fixed effects in the regression equation. However, nonprofit market shares in the national level exhibit strong autocorrelation, with 0.81 as the autocorrelation coefficient for market share in terms of beds and 0.99 for market share in terms of admissions, which suggest that nonprofit market shares at the state level should also exhibit some autocorrelation. The Arellano and Bond (1991) method specifically deals with such panel data with fixed

effects and an autoregressive dependent variable. Therefore, I used their method in my analysis of state-level nonprofit market share.

In the literature, additional independent variables are usually included to control the impacts of other factors. Stenwald and Neuhauser (1970) only included two independent variables, percentage change in population and percentage change in per capita income between 1960 and 1967, in their cross-sectional analysis of proprietary hospital beds. Hansmann (1987b) cited their work and expanded their independent variable list. He used percentage change of population and percentage change of real per capita income over the past ten years to control the demand growth for hospital services. He also used governmental hospitals' market share to measure governmental competition and included other variables such as philanthropic support and wealth of clientele as independent variables. Chang and Tuckman (1990) used population density and per capita income to control the demand for hospital service. They also controlled factors such as religious diversity and complex illnesses. Gulley and Santerre (1993) also used state population, real per capital income, and fraction of population covered by Medicare to control the demand for hospital services and included other variables, such as number of years under certificate-of-need laws for each state.

Besides other variables, all the authors use population and per capita income as proxies for demand of hospital services. As I only have Gross State Product (GSP) and population time series for each state at hand, I include population and per capital GSP as independent variables. (I assumed that per capital GSP and per capital income do not differ much in their prediction of demand.) The population is a proxy of demand for hospital service in that greater population means more people need to go to the hospitals.

As for-profit hospitals are quicker to respond to demand (Steinwald & Neuhauser 1970), I expected that states with larger population size to have higher for-profit market shares and lower nonprofit market shares.

The per capita GSP has two opposing impacts on nonprofit market share. First, it approximates the average wealth of the residents in each state, which measures the patients' ability to pay for the hospital services. Because for-profit hospitals usually choose their location so as to serve the more profitable wealthy patients, I expected nonprofit hospitals' market shares in rich states with higher per capital GSP to be lower. Second, states with higher per capita GSP usually impose a higher property tax rate and sales tax rate. As nonprofit hospitals are exempted from such taxes, they gain a competitive edge against for-profit hospitals, which suggests that nonprofit hospitals' market share in states with higher per capita GSP is expected to be higher. The final impact of per capita GSP on nonprofit market share is not predicable, so I relied on the regression results to determine which impact is more powerful.

I took the natural log of the population and the per capita GSP for three reasons. First, the natural log function downsizes the scale of population and per capital GSP. Second, it normalizes these two variables. Third and more important, it helps interpret the coefficients in a more sensible way—i.e., the coefficients correspond to the expected change in market share from 1% increase in population or per capital GSP. Suppose the regression equation is $y = \alpha + \beta^*\ln(x)$ + other control variables + error term. Take the derivate with regard to x and we have $\partial y = \beta \times \frac{\partial x}{x}$, which means that y increases by β percentage points from 1% increase in x.

I also include government hospitals' market share, as Hansmann (1987b) does, to control the governmental competition. Governments usually provide hospital services to their people, especially the poor. In areas where the government provides hospital services, potential nonprofit enterprisers, observing that hospital service demands are met by government hospitals, might have less incentive to establish nonprofit hospitals. Therefore, the competition from governmental hospitals has a negative impact on nonprofit hospitals' market share.

I believe that the cross-state variation within each year is more important than cross-time variation within each state in affecting hospitals' market shares. Therefore, I assume that the demand variables—population and per capita GSP—and governmental competition variable have contemporary impacts on nonprofit market share, while the lagged CIT rates affect market share in the current year. The dynamic panel data model takes the following form.

$$MS_{i,t} = \alpha_o + \sum_{l=1}^{p} \alpha_l \times MS_{i,t-l} + \sum_{l=1}^{j} \beta_{1,l} \times avgrate_{t-l} + \beta_2 \times population_{i,t} + \beta_3 \times gsp\ per\ capita_{i,t} + \beta_4 \times gvsh_{i,t} + \nu_i + \varepsilon_{i,t}$$

where *gvsh* stands for the market share by government hospitals; *j* means exemption from CIT up to *j* years ago affects market shares; *p* means the market shares is an autoregressive of order *p*; v_i is the fixed unobserved individual effects; and $\varepsilon_{i,t}$ is serially uncorrelated but may be dependent across subjects, i.e. $E(\varepsilon_{i,t}) = E(\varepsilon_{i,t}\ \varepsilon_{i,s}) = 0$ for $t \sim= s$. Use first difference to eliminate the unobserved fixed effects and the differenced regression equation becomes

$$\Delta MS_{i,t} = \sum_{l=1}^{p} \alpha_l \times \Delta MS_{i,t-l} + \sum_{l=1}^{j} \beta_{1,l} \times \Delta avgrate_{t-l} + \beta_2 \times \Delta population_{i,t} + \beta_3 \times \Delta gsp\ per capita_{i,t} + \beta_4 \times \Delta gvsh_{i,t} + \Delta\varepsilon_{i,t}$$

I assumed that market shares at the state level have the same characteristics as they have at the national level. Therefore, as the ARIMAX model of the aggregated national data shows that the differenced market share is most autoregressive at order one, I only included the first lag of market share in the independent variable list. Similarly, as the ARIMAX model shows that CIT rates up to 5 years ago have impact on nonprofit market shares at the 10% significance level, I included lagged CIT rates from up to 5 years ago. Because the differenced average CIT rate at the national level is not autoregressive, omission of the differenced average CIT rate of other lags won't cause any endogeneity problem, even if CIT rates in other lagged years might also affect nonprofit market share. Thus, the first-differenced equation becomes

$$\Delta MS_{i,t} = \alpha_1 \times \Delta MS_{i,t-1} + \sum_{l=1}^{5} \beta_{1,l} \times \Delta avgrate_{t-l} + \beta_2 \times \Delta population_{i,t} + \beta_3 \times \Delta gsp\,percapita_{i,t} + \beta_4 \times \Delta gvsh_{i,t} + \Delta\varepsilon_{i,t}$$

The no serial correlation assumption for the error term implies:

$$E\left[\left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right) \times \varepsilon_{i,t-j}\right] = 0 \text{ where } j = 2,..., \text{t} - 1 \text{ and } t = 3,\ldots, \text{T}.$$

As the error term is assumed to be independent of all the independent variables, we can get the linear moment restrictions:

$$E\left[\Delta\varepsilon_{i,t} \times MS_{i,t-j}\right] = E\left[\left(\varepsilon_{i,t} - \varepsilon_{i,t-1}\right) \times MS_{i,t-j}\right] = 0 \text{ where } j = 2,..., \text{t} - 1 \text{ and } t = 3,\ldots, \text{T}.$$

We can utilize this moment restrictions and apply the Generalized Method of Moment (GMM) to estimate those coefficients.

Column 1 of Table 3.4 summarizes the regression results for market share in terms of beds. Population has a significant negative coefficient, which implies that as population increases by 1%, nonprofit hospitals' market share is expected to decrease by 0.038 percentage point. Per capital GSP has a significant positive impact on nonprofit

hospitals market share, suggesting that as per capita GSP increases by 1%, nonprofit hospitals' market share is expected to increase by 0.025 percentage point. The positive coefficient of per capita GSP implies that the positive impact from sales and property taxes exemption exceeds the negative impact from for-profit hospitals' choice to locate in wealthy states. The competition from government hospitals has a significant negative impact on nonprofit hospitals' market shares. If government hospitals market increases by 1 percentage point, nonprofit hospitals market share decreases by 0.908 percentage point. Therefore, nonprofit hospitals and government hospitals almost completely substitute for each other. CIT exemption has a positive impact on nonprofit hospitals' market share. The first two lags of CIT impact are not significant, but the latter three are. For example, if the average CIT rate 5 years ago increased by 1 percentage point, nonprofit hospitals market share is expected to increase by 0.039 percentage point.

Column 2 of Table 3.4 shows the results of the regression of the market share in terms of admissions. Population and governmental competition impact market share in terms of admissions similar to the way they impact market share in terms of beds. However, the impact of per capita GSP is negative, contradictory to that in the regression of market share in terms of beds; nevertheless, the negative impact is not significant. Only the CIT rate 4 years ago has significant impact on market share in terms of admissions. However, the autoregressive coefficient in column 2 is not significant, which suggests that Arellano-Bond method may not be quite appropriate. Thus, I used fixed effects method for the regression of market share in terms of admissions. As shown in column 3, the CIT from the last year and from five years ago have significant impacts on nonprofit market share in current year, while the other lags do not. The impact of per

capita GSP is significantly positive, conforming to the estimate using the Arellano-Bond method for market share in terms of beds in column 1.

Table 3.4: Arellano-Bond Regression Results

Dependent variable: nonprofit hospitals' market share	1 Beds	2 Admissions	3 Admissions
Lag 1 of dependent variable: MS_{t-1}	0.048**	0.029	.
	(0.015)	(0.018)	.
Average CIT rate 1st lag	0.027	0.026	0.096**
	(0.017)	(0.018)	(0.037)
Average CIT rate 2nd lag	0.037	0.017	– 0.004
	(0.021)	(0.022)	(0.044)
Average CIT rate 3rd lag	0.042*	0.020	0.058
	(0.021)	(0.022)	(0.047)
Average CIT rate 4th lag	0.041*	0.057**	0.058
	(0.019)	(0.020)	(0.043)
Average CIT rate 5th lag	0.039**	0.021	0.079*
	(0.016)	0.017	(0.034)
Log(population)	– 0.038***	– 0.069***	– 0.056***
	(0.010)	(0.012)	(0.015)
Log(per capita GSP)	0.025***	– 0.007	0.013*
	(0.006)	(0.006)	(0.006)
Governmental hospitals' market share	– 0.908***	– 0.865***	– 0.957***
	(0.013)	(0.016)	(0.020)
Arellano-Bond test statistic of zero 2nd order serial correlation of residuals	– 0.29 [0.78]	0.24 [0.81]	.

Notes:
Columns 1 and 2 use Arellano-Bond method, while column 3 just uses the fixed effects method.
Standard deviations are in parentheses below the coefficients
P-values are in the square brackets below the test statistics
*significant at a 5% level; **significant at a 1% level ***significant at a 0.1% level

The consistency of the Arellano-Bond GMM estimators requires the key assumption of no serial correlation in error terms. Arellano and Bond shows that we can check the plausibility of this assumption by seeing whether the first-differenced error

term is not second order serially correlated, i.e. $E(\Delta\varepsilon_{i,t}\Delta\varepsilon_{i,t-2}) = 0$. They propose an asymptotically normal statistic to test this key assumption. If the statistic is not significant then we cannot reject the null hypothesis (i.e., the key assumption) that the error term is not serial correlated and we can use the Arellano-Bond estimates with comfort. As shown in the bottom of Table 3.4, the second-order serial correlation test statistics in the regression of market share in terms of beds is – 0.29 and not significant at all, which provides confidence in the use of the Arellano-Bond method for the market share in terms of beds.

3.6 Conclusions and Discussion

The academics have been arguing why NPOs can compete with FPOs and the policy makers have been interested in finding out whether the exemption of CIT increases NPOs' competitive edge. Empirical evidence is limited to the inspection of property and sales taxes exemption; however, the findings are conflicting. No work has been done to specifically study the impact of exemption from federal CIT.

This essay examines the effect of CIT exemption on the market shares of nonprofit versus for-profit hospitals. It applies the ARIMAX regression on the national aggregated data from 1965 through 2000 and the Arellano-Bond method on the longitudinal data, which contains all the 50 states plus the District of Columbia from 1975 through 1995. The results show that the coefficients of the average CIT rate are positive and significant, suggesting that CIT exemption does have a positive impact on nonprofit hospitals market share.

Given the evidence from this paper that exemption is important to NPOs, it comes to the question—why should government only exempt the commercial NPOs but not both

NPOs and FPOs? If Steinberg's (1987) argument is true that NPO managers pursue several emoluments at the cost of efficiency, including pleasant coworkers (who may be over-paid to ensure they will remain pleasant), discriminatory hiring practices, long lunch hours, magnificent offices, and larger, more prestigious market shares, why should the government subsidize the inefficient production by NPOs?

Brody (1998) viewed the rationales for tax exemption of NPOs through a sovereignty perspective and classified the rationales into two general frameworks—base-defining theory and the tax subsidy theory. The base-defining theory believes that NPOs compose a sovereignty parallel to the sovereignty of the government. (The historical background for this belief is that NPOs originate from the sovereignty of churches, which was parallel to the sovereignty of government in the pre-colonial times.) Thus, NPOs are entitled to earn income and own property free of tax because the state considers the NPOs as composing another sovereign. Therefore, the base-defining theory deems NPOs' activity as not rising to the level of taxable activity and believes the NPOs' income and property should fall outside of the tax base. In contrast, the tax subsidy theory places NPOs within the sovereignty of the government and believes that NPOs are subordinate to the government. The government decides whether NPOs provide goods and services the government desires and thus uses tax exemption to induce NPOs activities in the government's desired way. Brody (1998) stated that the base-defining theory has difficulty in explaining why tax exemption extends to commercial NPOs, whose economic activity cannot be distinguished from that of for-profit enterprises. Several theories, falling in the tax subsidy framework, try to justify the tax exemption to commercial NPOs but not FPOs; however, none is compelling standing alone. First,

contract failure theory by Hansmann (1980) describes the failure of contract between government and FPOs. Governments want to subsidize certain goods, (e.g., hospital services) for the good of their citizens. However, it is very difficult for governments to monitor FPOs to see whether they take the subsidy into their shareholders' pockets without improving or increasing their service; however, NPOs can be trusted with the subsidy due to the no-distribution constraint. This argument is weak because we cannot measure how much, if any, of a subsidy could be captured by the owners of FPOs. If only a small fraction of subsidy is at danger to be put into the owners' pockets, we might be better off to subsidize FPOs as well and let FPOs drive NPOs out of market because FPOs operate more efficiently than NPOs. Also, in a fairly competitive market, competition will reduce FPOs' potential to appropriate subsidies to the owners' pocket.

The second theory is the public good theory that says the goods and services provided by NPOs are public goods, whose production should be encouraged (Weisbrod 1974, 1977). However his argument only justifies the subsidy to NPOs (most of them are donative NPOs) in the public good sector where there are few FPOs interested in entering; it fails to justify different tax treatment of NPOs and FPOs in the private goods sectors.

The third theory is the compensation theory by Hansmann (1981) which is derived from the failure of contract between customers and providers. Customers trust that NPOs do not over-exploit them due to the non-distribution constraint. Such assurance brings efficiency gains such as a reduction in the efforts that consumers feel impelled to make to police the provider of a service, a reduction in the disparity between cost and price which reduce overall demand, and a prevention of degeneration into the

"lemon" type of market described by Akerlof (1970). However, the no-distribution constraint precludes NPOs from issuing equity as a way of acquiring capital to engage in their production; it is the government's obligation to compensate NPOs to make up some of the disadvantages NPOs have in their access to capital (Hansmann, 1981). However, the weakness of this argument is that we simply cannot know whether the efficiency gains due to the existence of NPOs exceed the combined sum of tax revenue loss and efficiency loss from NPOs' inefficient operation.

The more serious problem with the third argument is that it is not clear whether consumers trust NPOs more than FPOs. Permut (1981) conducted a telephone survey in New Haven, Connecticut, asking for interviewees' knowledge and impression of NPOs. He found that a majority of respondents failed to recognize five local nonprofit organizations as being nonprofit and did not feel (or were uncertain) that nonprofits would treat them more fairly or honestly than for-profits. Hansmann (1981) refuted Permut's finding by pointing out the sample selection bias in his survey because many interviewees have never patronized the NPOs in the survey; he also cites findings from preliminary data from the child care decision-making survey supported by Yale University's Program on Nonprofit Organizations in 1980, showing that only 8% of users of child care services did not know the nonprofit or for-profit status of the service provider they patronized. In more recent studies, David and Malani (2003) examined a sample of nonprofit hospital Web sites and found that 87% of those websites do not explicitly indicate that their hospitals are nonprofit, which seems to suggest that nonprofit hospitals do not believe that announcing nonprofit status will bring them more customers. VanSlyke and Roch (2004) used public opinion data and find that customers have

difficulties in telling nonprofit providers from governmental agencies and are more likely to misidentify nonprofit service providers as governmental agencies when they are less satisfied with the services that they have received. If customers are incapable of identifying nonprofit providers, then their trust in NPOs as predicted by the contract failure theory is in doubt. Philipson (2000) argued that if consumers trust NPOs more than FPOs, NPOs should be able to sell their product at a premium due to customers' preference toward NPOs; however, using data in 1985 and 1995 from the nursing home industry, he finds that the price of nonprofit and for-profit nursing homes did not differ in 1995 and for-profit nursing home even charged higher prices than nonprofit nursing homes in 1985.

As none of the theories satisfactorily explains the rationale for subsidizing commercial NPOs, scholars have started comparing NPOs and FPOs empirically. If NPOs provide better service than FPOs, then tax exemption to commercial NPOs is justified as the government's encouragement of and rewards for better service. Some of scholars have found evidence supporting such argument. For example, Marmor, Schlesinger, and Smithey (1987) summarized the empirical studies in the health care industry and concluded that FPO health care providers report lower costs but lower quality than NPOs, serve richer customers, and choose only profitable locations for their facilities. They also find that virtually all FPOs appear more likely to select patients on the basis of their ability to pay, locate in areas with higher incomes, and avoid offering services used most by indigent patients. Weisbrod and Schlesinger (1986) found that nonprofit nursing homes are more likely to provide high-quality output and for-profit firms are more likely to disappoint consumers.

However, other scholars have shown evidence that NPOs do not differ much from FPOs. Take the hospital industry as an example. Nonprofit hospitals are supposed to serve more poor people and provide a higher amount of uncompensated care than for-profit hospitals. However, a series of studies (e.g., Sloan, Valvona & Perrin, 1986; Sloan 1998; Young, Desai, & Lukas, 1997; and Mann, Melnick, Bamezai, & Zwanziger, 1997) do not find impressive evidence that nonprofit hospitals provide a disproportionately higher share of uncompensated care. For example, Sloan (1998) estimated that uncompensated care accounted for 4.1% of all expenses for nonprofits and 3.1% for for-profit hospitals in 1983; and in 1994, the fractions became 5% and 4.2% for nonprofit and for-profit hospitals respectively.

The findings from this paper add another possible reason to justify the exemption. As shown in Figure 3.4 and Figure 3.5, nonprofit hospitals charge a price barely covering their average expenditure, while for-profit hospitals earn a much higher profit margin. As most of the patients are covered by certain types of insurance, private or Medicare, the over-charging practice among for-profit hospitals will increase the insurance premium in general. The subsequent chain result might be that fewer people will be able to buy any insurance and the government's Medicaid expense will soar. Therefore, the tax exemption of nonprofit hospitals is justified as a measure the government takes to limit the spread of for-profit hospitals. To extend this argument, general commercial NPOs, which concentrate in health care and education, charge less than their for-profit competitors due to reasons such as non-distribution constraints and "altruistic character." On the other hand, various entry barriers such as expertise and government regulations forestall potential FPOs from entering the industry and thus lowering the profit margin of

existing FPOs. Therefore, tax exemption is a good measure to limit for-profit market share and give consumers a “fair” price.

CHAPTER 4

FURTHER DISCUSSION

The first essay tests competing theories of dividend taxation. However, ideal data for testing the theories is always rare. Researchers have to rely on some strong assumptions to fit their data to the testing, which causes limitations on sample selection. This is also true for the first essay, which uses C and S corporations in Georgia. First, due to the qualification conditions of S corporations set by the IRS, S corporations are generally small businesses. In my research, I assumed that only C corporations with equity less than the 99th percentile of the equity of S corporations are comparable to S corporations. There is a possibility that the dividend policy of small C corporations is different from that of large C corporations. Because large corporations compose the major portion of the corporate sector, the difference of dividend payout ratio among comparable C and S corporations might not be generalized to the comparison of S corporations and the whole C corporations sector.

Secondly, there might be sample selection bias problems, because the data in the study is from the Georgia Department of Revenue and it is possible that the corporate economic activities in Georgia might not represent the whole corporate sector in the United States. More concerns about the sample come from the way I process the data. The study focuses on corporations that have been doing business continuously for several years; however, there are firms which do business in Georgia in one or another year so that they do not show up in the data for some years. As I rely on firms' consecutive appearance to decide whether they switch their forms, I have to drop those firms appearing in discrete times, which might cause further sample selection problems.

The second essay examines the exemption of CIT on nonprofit organizations' market share. Because it is difficult, if not impossible, to have data which include all types of nonprofit organizations, I used hospital data. It is possible that the hospital sector is not representative of the whole nonprofit sector, though it is a major part of it.

Second, the essay uses ARIMAX to analyze the national aggregated market shares. However, there are only 35 observations. Even though this number exceeds the minimum number of 30 observations required for ARIMAX (Brocklebank & Dickey, 2003), it is still a very small sample.

Third, the second essay also analyzes the state level aggregated data. However, the state level data may not accurately reflect the competition between nonprofit and for-profit hospitals. In some remote areas, especially the countryside, there exists only a single hospital, which means there is no competition in those areas. As there are more hospitals in the Metropolitan Statistical Area (MSA), the MSA aggregated data may reflect the competition better and future analysis with MSA level data may be necessary.

Fourth, in the regression of market shares on the CIT rate, it is ideal to have the average CIT rate in the hospital industry. However, as I cannot find specific rates in the hospital industry, I use the average CIT in the economy as a substitute. This substitute may introduce bias in the estimate of the impact if the CIT rate for hospitals differs a lot from that of average corporations.

Fifth, in the longitudinal data analysis, there are unmeasured variables which affect the market shares of nonprofit hospitals. Such variables include citizens' preference toward nonprofit and for-profit hospitals, state and local governments' support to nonprofit hospitals, and the difference in health care quality between nonprofit and for-

profit hospitals. I simply assume that the combined unmeasured effects are fixed for each state and use Arellano-Bond method to analyze the panel data. However, such assumption is very strong and the people' preference governments' attitude and quality difference may change over time. I may need to assume that the combined effects are random rather than fixed; however, current statistical software does not provide support for panel data with random effects and autocorrelation in the dependent variable.

To the extent this study was limited, more extensive studies with more appropriate datasets are necessary. For instance, a more complete dataset with information of the number of shareholders in the comparison of C and S corporations and dataset containing all types of industries, rather than just the hospital industry, in the study of nonprofit versus for-profit market shares are desirable.

The policy implications from these two essays are complicated. The first essay provides evidence supporting the traditional view on dividend taxation that the double taxation reduces capital investment in the corporate sector; thus calls for the integration of corporate income tax and personal income tax or the cut in dividend tax. The second essay proves that tax exemption does increase nonprofit hospitals' market share. If the profitability comparisons, as shown in figure 3.5, are correct that nonprofit hospitals charge a fair price while for-profit hospitals charge a price much higher than their costs, then governments should continue the tax subsidies to nonprofit hospitals in order to keep hospitalization cost low. Both essays suggest the federal government forgiving some tax revenues.

However, wise policy makers should not rush to the conclusion for dividend tax cut and further tax subsidies for NPOs. It is necessary to do a systematic cost-benefit

analysis including not only the efficiency gains from such tax cut and tax subsidies, but also the loss of social welfare due to cut in tax revenue supported social programs.

Furthermore, political considerations are also necessary. The simple repeal of dividend tax may achieve the economic optimal; however, most people will not satisfy with such repeal because it is unfair to those relatively poor, who derive most of their income from salary, pay income taxes on salary, while those relative wealthy, who derive a significant portion of their income from capital investment, do not pay dividend tax. Therefore, the findings of this dissertation only serve to provide certain empirical evidences for theoretical and practical discussions rather than guidelines for policy makers. More systematical research and comprehensive considerations are necessary in policy decisions.

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