NECESSARY AND SUFFICIENT CONDITIONS FOR THE OPTIMALITY OF DEBT CONTRACT

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ABSTRACT

This paper aims to explain that the optimality of debt contract assessed based only on the asymmetric information condition may lead to serious consequences in terms of negatively affecting the financial stability and the government tax revenue. We address the issue by explaining that the existence of corporation's threshold for debt as proved in the debt contract literature is based on rigid assumptions. In practice, the corporations fulfil the promises regardless of the financial position but the corporations also claim tax reductions on the interest payments to lender. The debt contract may apparently come with a financial obligation but in reality the tax benefits associated to debt contract can be considered as an insurance against risk associated to debt. We explain the Subchapter C and S corporations from the corporate tax regulation perspective and highlight the loopholes in the tax system that help corporations in avoiding tax payments. In addition to it, we explain that the tax benefits reduce government tax revenue and financial stability via flow charts.

Keywords: Debt contract, Asymmetric information, financial stability, Economic welfare, corporate tax

Introduction

In a financial loan contract wherein the borrower is in control of the project and the lender has limited or no access to information the standard debt contract turns out to be optimal. Otherwise, in an ideal or first-best contract the lender is supposed to assume the full risk. However, due to asymmetric information problem, the borrower has full access to information therefore the borrower has an incentive to cheat. Therefore, the lender does not submit to assume full risk. Thus, the question arises what contract solves the said risk-sharing problem. Townsend (1979) solved this problem by identifying a feasible region in which the corporation as borrower promise constant repayments regardless of its financial position. According to a Townsend (1979), this is possible because the corporation has threshold for risk associated to debt.[2] However, the debt contract is assessed for optimality only for solving the asymmetric information problem whereas the consequences that emerge due excessive corporate debt levels that corporations choose are not taken into consideration. The excessive corporate debt are not only considered as a potential threat to financial stability but also shrink the government tax base.

In this paper we aim to establish a link between optimality of debt contract and its consequences in the following two aspects. Firstly, we explain that the assumption for the existence of corporations' threshold for debt is rigid. Because, in practice corporations do fulfil their promises as it is claimed in the debt contract literature, but the corporations also claim tax benefits that are allowed in the corporate tax regulations. We explain this by assessing the corporate tax regulations for Subchapter C and S corporation that help the two corporations in using debt as means for tax avoidance. Secondly, we highlight the facts that the tendency of corporations towards high debt levels affect economy adversely in terms of lowering the economic growth, shrinking the government tax revenue and turning into a financial threat to financial stability. Finally, we emphasis to evaluate the optimality of debt contract not only on the ability of solving asymmetric information problem but also to study the spill over and residual effects on the economy in general.

The rest of the paper is organized as follows. Section 2 presents the optimality of standard debt contract. Section 3 explains that the standard debt contract is conditionally optimal that requires a debt-bias corporate tax system. Section 4 outlines the consequences of debt-bias corporate tax system. Finally, section 5 concludes the paper.

Optimality Of Standard Debt Contract

A contract between two parties is a mutual agreement or a set of promises and pledges that are legally enforceable between the parties. It creates an obligation upon parties 'to perform' certain duties or 'not to perform' certain actions. A contract is worthless in a spot market however it becomes essential in a temporal setting, such as a loan contract, otherwise, one party might not know

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[2] However, the returns or interest paid to lender should be minimum for two reasons. First, higher interest rate induce borrowers to turn into bad borrowers and take risky actions (Diamond, 1991, 1996). Secondly, because the interest rate is used as a monitoring tool, a bank as delegated monitor rejects borrowers who offer interest rate higher than the interest rate fixed by bank (Diamond, 1984).

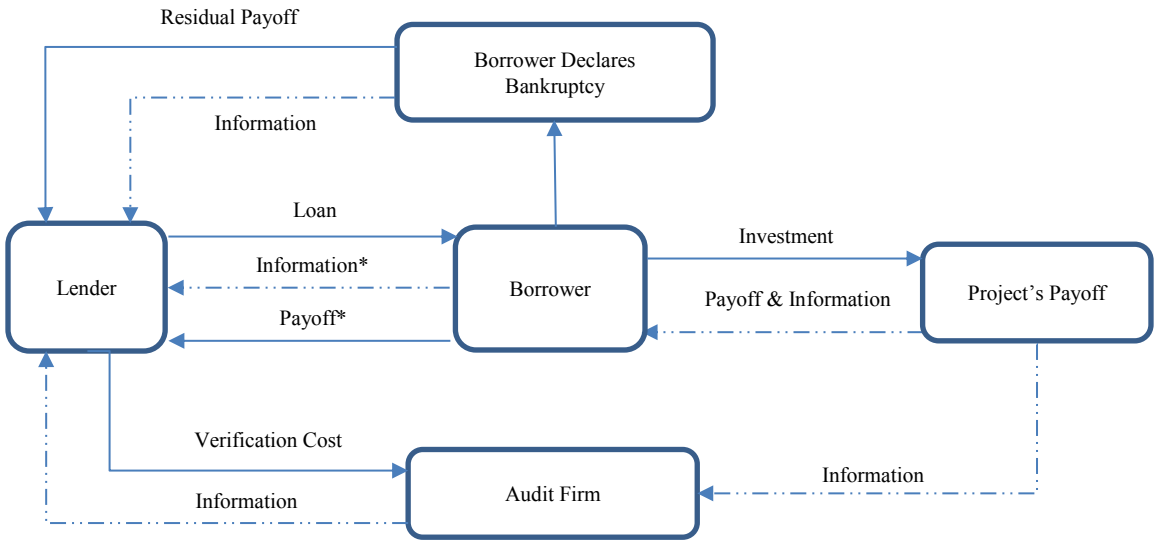
what the other party intends to do (Hermalin, Katz, & Craswell, 2007). Ideally, in a first-best solution the lender has full access to information therefore, the lender is supposed to undertake the full risk. The reward and punishment in this case are justified and are thus conditional on borrower's choice of action (Bolton & Dewatripont, 2005). However, debt contracts in practice are incomplete and remains silent for some set of events regarding reward and punishment due to inability of lenders to observe. Such imperfection due to asymmetric information problem generate risk sharing problem (Jensen & Meckling, 1976; Ross, 1973). Therefore, the lender, may no longer submit to the risk. The lender can access the information either by paying cost or if the borrower declares bankruptcy. The former is impractical due to high cost of information while the latter is the last thing the lender would want to see because the residuals after bankruptcy are far less than the initial investment.

Thus, it becomes important to know, what is an optimal governing contract that determines the optimal state of risk and profit sharing between the borrower and lender? Townsend-1979, solves the risk-sharing problem by identifying that the corporations possess threshold for risk associated to debt because in practice corporations issue bonds and fulfill their promises regardless of their financial position. The costly state verification (CSV) model of Townsend holds an important place in debt contract literature and has proven to be useful in a variety of economic problems to date (Krasa & Villamil, 1994) (Gale & Hellwig, 1985). Townsend solved the risk-sharing problem, in a constraint optimization contract by identifying a feasible region wherein the borrower agrees to pay fixed constant returns to the lender upon the maturity of the contract.

In the debt contract literature, a contact is characterized by allowing borrower to maximize his expected utility subject to lender's expected utility (Bolton & Dewatripont, 2005; Garino & Simmons, 2006). The lender is endowed while the borrower is dependent on lender's funds in order to undertake the investment project. The endowments and lender's preference for the risky project due to high expected returns compel the parties for trade. The borrower has to ensure that the lender is at least as well off as if the lender were to choose risk-free security (Garino & Simmons, 2006).[3]

As shown in the figure 1, the lender issues loan to borrower which is invested in a project. The borrower has full access to information and thus has an incentive to cheat by revealing payoff less than the actual payoff. This is indicated by the dotted line in the figure 1, labelled as 'Information*'. The lender can have full access to information in two cases. First, as shown in the figure 1, if the borrower declares bankruptcy, the lender in this case takes control of the project however the residuals are smaller than the loan (Gale & Hellwig, 1985). Second, again as shown in the figure 1, if the lender hires an audit firm and pays the verification cost the investigation might reveals the information because the verification is not certain. In the CSV model, the cost of verification is high therefore the lender submit to recognize the observed and unobserved region as a function of project output. As the lender can verify the borrower's truthfulness only in the observed region therefore, a contract is consistent only if the borrower agrees to pay fixed and constant return in both the observed and an unobserved region. It is possible only if the corporation possesses a tolerance for risk associated to debt. In the next section, we argue that the corporations are not inbred with the threshold for risk associated to debt and identify the factors that help corporations.

FIGURE 1 Standard Debt Contract and the Costly State Verification.

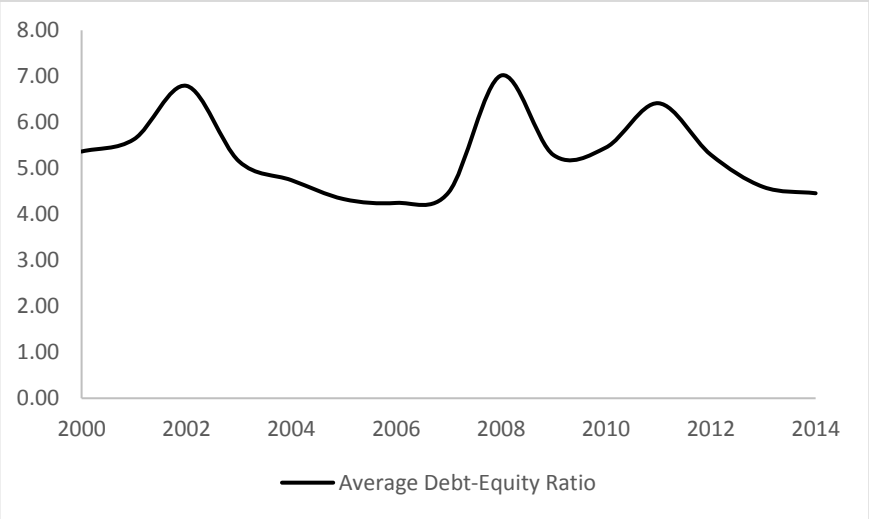


[3] Risk-free securities could be the government treasury bonds

Conditional Optimality Of Standard Debt Contract

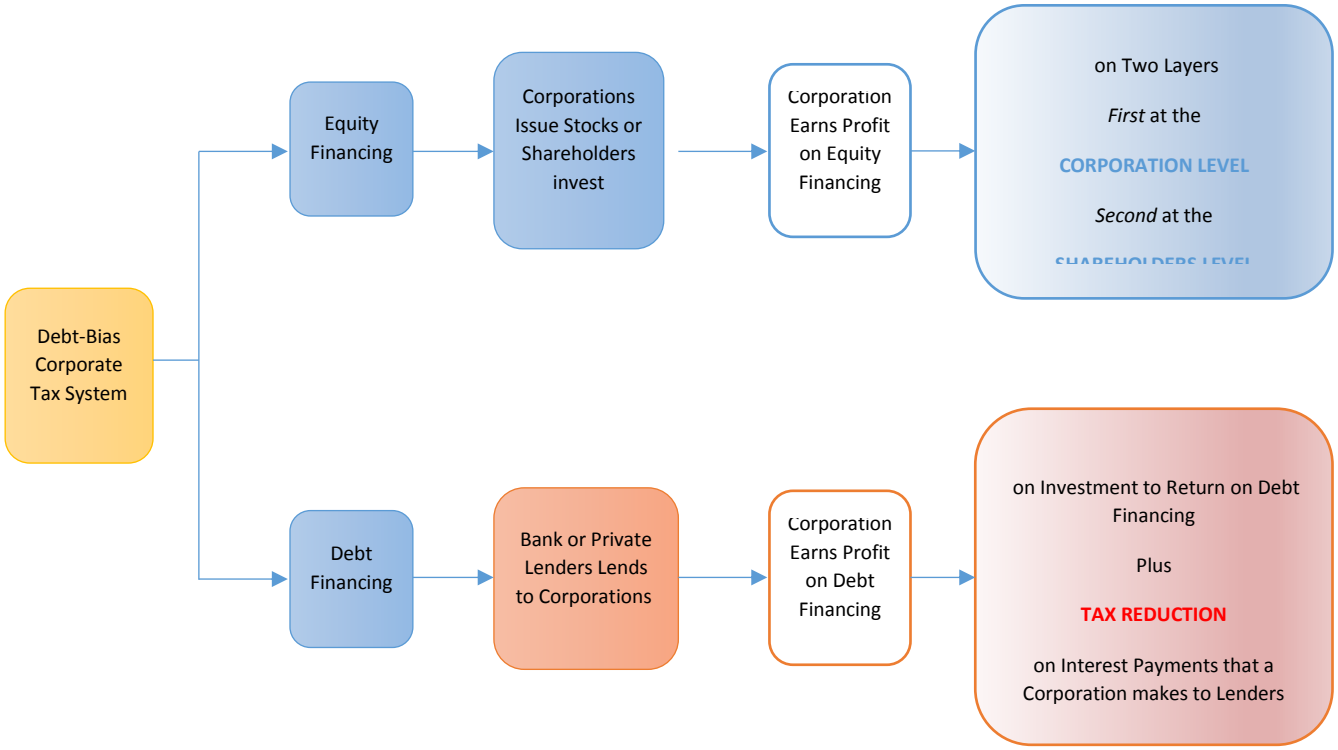
In practice, the corporations rely on debt financing and fulfill their promise of financial obligation irrespective of their financial position. In fact, Townsend's positive intent is based on the fact that corporations issue bonds and promise constant returns unlike state contingent claims (Arrow, 1964; Debreu, 1959). The financial corporations in the OECD countries held debt on average five times more than the equity during 2000-2014 as shown the figure 2. The question thus arises, do corporations really possess a threshold for risk associated to debt. In order to address this question it is important to understand the organization of corporation with respect to corporate tax regulations. A corporation can be registered as closely held corporations, such as, sole proprietorship, partnership, Subchapter S-Corporation or Regular Corporation such as Subchapter C corporation. The corporate tax regulations handle the subchapter S and subchapter C corporation differently, thus we explain the relationship between debt and tax regulations for both the S and C corporation.

FIGURE 2 OECD Financial Corporation's Debt-Equity Ratio



Subchapter C Corporations

The overwhelming preference to debt financing by C corporations apparently strengthens Townsend's argument, however, empirical evidences suggest that corporations prefer debt due to 'Tax Benefits'. For instance, a dollar paid as interest payment 'r' relieves corporations by not paying '*TrD*' worth of corporate tax 'T' where 'D' is debt as shown in the figure 4. It is argued that the corporations increase their value by merely preferring debt to equity due to debt-bias corporate tax regulations (Graham, 2000, 2001; Myers, 1984). According to literature there exist an optimal debt-equity ratio that maximizes the value of corporation. The corporations identify the optimal capital structure by increasing the value of corporation due to tax benefits on debt and minimizing the cost of capital and financial distress. The incentive of tax benefits on debt is an important factor in generating corporation's threshold for risk and thereby making debt as optimal. This makes the standard debt contract is conditionally optimal because it requires the existence of debt-bias corporate tax regulations. Any reduction in the corporate tax rate decrease the tax benefits on debt. This is observed in the recent studies by (Dwenger & Steiner, 2014; Gordon & Lee, 2001) for the U.S. and Germany. According to (Gordon & Lee, 2001) a 10% reduction in the corporate tax rate reduces the corporation's inclination towards debt financing by 3%. Likewise, (Dwenger & Steiner, 2014) claim that a 10% decreases in the corporate income tax will be followed by 5% decrease in the debt financing.



Subchapter S Corporations

In contrast to C corporations, the S corporations are 'Pass-through' tax entities because the profits, losses, and deductions are 'passed-through' to shareholders and are reported on their personal tax returns. On average nearly 90 S corporations are formed daily in the U.S. and almost 6 Million of the corporations returned files as S corporation (Sicular, 2014). The shareholder of S corporation can avoid paying tax as long as he/she reinvests in the corporation either in the form of increasing debt basis and stock basis. The shareholders can deduct losses that are transferred to them in their personal income tax returns, from an S corporation.[4] However, currently deductible amount of loss should not exceed the tax basis of the shareholder. The tax basis the sum of i) adjusted basis of the stock in the corporation and ii) the adjusted basis of indebtedness of corporation to the shareholder.[5]

Any loss that cannot be covered by the tax basis in current year can be carried forward indefinitely until the shareholder regains the additional basis.[6] Nevertheless, if the shareholder insists on deducting losses in current year, he/she can do so by increasing the tax basis by either increasing stock basis or debt basis. The stock basis is uncontroversial because the contribution of a shareholder to an S corporation can easily be observed. However, the debt basis remained an issue of dispute between the shareholders and courts (Fellows, 2007). Until the final regulation T.D. 9682 by the IRS in July 2015, the courts consistently rejected the shareholder's argument that the personal guarantee on behalf of the corporation should be permitted as a means to increase either stock or debt basis (Winston, 1995). The courts insisted on the standard of "Actual Economic Outlay' that required the shareholders to be "poorer in a material sense" after increasing the basis of indebtedness. However, the taxpayers succeeded in getting rid of 'actual-economic-outlay' after having battled for long. The requirement after the judgement is to prove that the indebtedness is 'bona fide' under the final regulation (T.D. 9682).[7]

This is where the value of financial distress emerges because the shareholder of S corporation by providing 'Personal Guarantee' submits to risk. However, in the case of guaranteeing on behalf of the corporation the shareholder is not only safe but the increase in the tax basis helps in reducing tax liability. As the intent is to avoid tax, therefore, the courts have been unanimously rejecting the shareholder's argument of allowing 'Guarantee' on behalf of the corporation. We have to wait for the IRS stance in tackling the issue of 'bona fide indebtedness' and expected cases in the courts, whether the final regulation proves to be useful or not. The battle of shareholders against 'actual-economic-outlay' and the flexibility in judgement of 'bona fide indebtedness' indicates that the shareholders are by no mean ready to accept any 'Personal Guarantee'. The T.D. 9682 regulation already indicates that shareholders can use back-to-back loan, for instance from one S corporation to another S corporation for tax purpose.

Thus, debt proves to be unacceptable both in the C and S corporation which shows that corporations do not possess a threshold for risk associated to debt. The cushion of tax benefits in the corporate tax regulations and the judgement of 'bona fide indebtedness' plays an important role in enabling corporations to fulfill their promises. In addition to it the corporations are fully

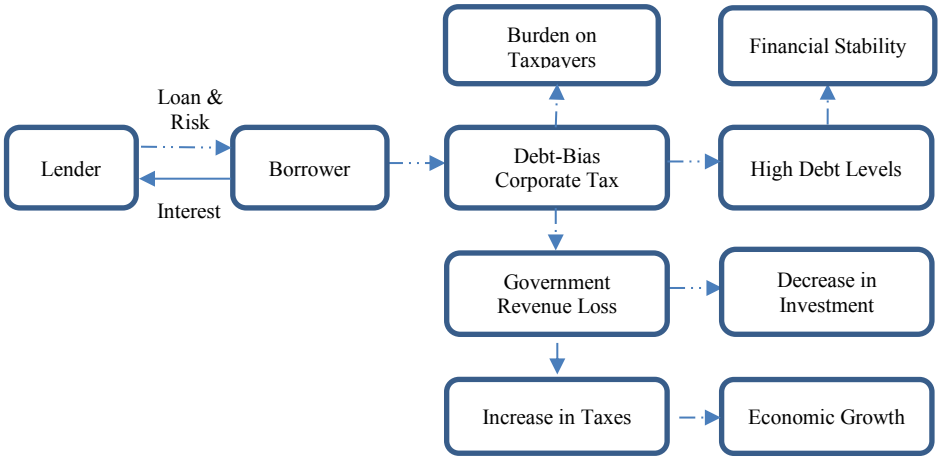
[4] IRS Code §1366(Diamond, 1991, 1996)(1)
[5] IRS Code §1366(d)(1)
[6] IRS Code §1366(d)(1)
[7] https://www.irs.gov/irb/2014-33_IRB/ar07.html (Accessed: August 2016)

insured for losses under the corporate tax regulations of carryforwards and carrybacks (McIntyre & Nguyen, 2000, 2004; Myers, 1984). Thus, by far it is clear that debt-bias tax regulations are responsible for high debt levels. In the next section we discuss the macroeconomic effects of debt-bias tax regulations.

Consequences

As discussed above both the C and S corporations use debt to save taxes. The tax savings of corporations result in problems such as reduction in government revenue, high debt levels that become threat to financial stability and decline in the economic growth as shown in the figure 4.

FIGURE 4 Second-Best Solution and Debt-Bias Corporate Tax System



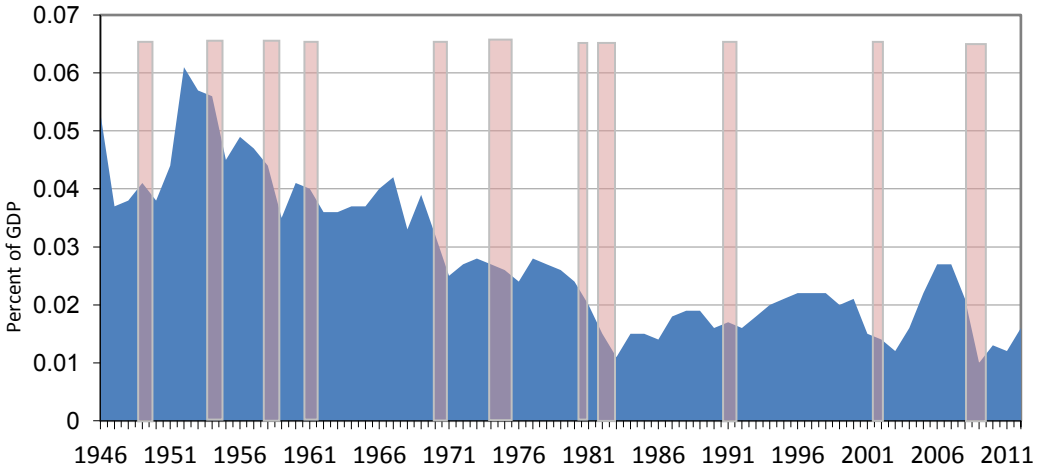
Financial Stability

The high debt levels are considered as a potential threat to financial stability and there is call for debt-bias reduction policies (De Mooij, 2012; De Mooij & Devereux, 2011; European-Commission, 2012; Fatica, Hemmelgarn, & Nicodème, 2013; IMF, 2009). These include the *Allowance on Corporate Equity* (ACE) and *Comprehensive Business Income Tax* (CBIT). In the former, the government subsidize equity by reducing the dividend tax whereas in the latter the government puts restriction on interest deductions. Both the ACE and CBIT have their pros and cons. For instance, the ACE policy works well in reducing debt-bias but it reduces government's budgetary cost. Whereas the CBIT is better in increasing the government revenue but it reduces the investment level in the economy. The policies such as ACE and CBIT shows that there is emerging concern regarding adverse effects of high corporate debt levels. (Langedijk, Nicodème, Pagano, & Rossi, 2015) recently addressed the issue of cost of bank crises and the debt-bias corporate tax system by studying a dataset of 3000 EU banks for the period 2001-2011. The empirical evidences according to (Langedijk et al., 2015) suggest that reducing debt-bias can considerably reduce the public cost of banking crises. In other words, the government by reducing debt-bias can reduce the chance of banking crises.

Government Tax Revenue

According to (Nagar, Petroni, & Wolfenzon, 2011), the corporations play an important role in the economies particularly, the U.S., Britain, Japan, Germany, and France including other countries. For instance, in the case of the U.S., the corporations produce more than 50% of the private sector output and help in employing more than 50% of the labor force. However, their contribution to government revenue is not satisfactory. For instance, the U.S. corporations share in the government tax revenue has decreased from 6% as a percentage of GDP, in 1950 to less than 2% in 2014 as shown in the figure 5. However, in contrast, the corporations before (after) tax income as a percentage of GDP has increased 10.80% (5.90%) in 1950 to 13.60% (11.40%), as shown in the figure 5. As it can be observed the after-tax income has increase (5.5% = 11.4-5.9) more than the before income tax (2.8% = 13.6-10.80). In addition, the gap between the after and before tax is consistently being decreased. In result, over time, the government seems to be shifting the corporate tax burden on other sectors. Moreover, the corporation's share of taxes is shrinking while the share of 'pay roll' and 'individual income' taxes is expanding over time which implies the burden of taxes is being shifted to other taxpayers. Figure 5, also shows that the corporate tax revenues declines considerably in the recessions and recovers by only a small portion of the actual decline.

FIGURE 5 US Corporate Income Tax as Percent of GDP, 1946-2012



Notes: Shaded areas represent recessionary periods as recorded by the National Bureau of Economic Research. Miscellaneous taxes such as estate and gift taxes are omitted for the sake of clarity, and comprise a very small fraction of total revenues in any case.

Economic Growth

The notion that taxes affect economic growth negatively and that the corporate income tax rate is the most harmful received much attention and has enough empirical evidence to support. The corporate income tax (CIT) also affect the economic growth by altering the corporation's financing-choice and by reducing government tax revenue. According to debt contract literature, the investment level due to debt financing is lower as compared to equity financing (Chang, 1999; Diamond, 1984; Gale & Hellwig, 1985; Garino & Simmons, 2006; Townsend, 1979). Thus, each dollar that a corporation obtains as debt instead of equity decreases the investment level and thereby the economic growth. Secondly, due to debt financing the government tax revenue shrinks twofold. Because, a dollar chosen as debt instead of equity financing decrease government revenue not only by allowing corporations to claim tax benefits on interest payments but also deprives government from tax on equity if the dollar was not chosen as debt.

Conclusion

The debt contract according to literature is optimal in resolving the asymmetric information problem. However, we argue that the standard debt contract—wherein the borrower is legally obliged to repay the interest payment—is conditionally optimal and requires the debt-bias corporate tax regulations. The shareholders in the S corporation have had a long battle against the requirement of 'Actual Economic Outlay' and have succeeded in securing a judgement of 'bona fide indebtedness'. Likewise, the C corporations claim tax benefits as price of financial distress and the data indicate that C corporations acquire excessive debt.
The debt contract supporting literature, particularly the costly state verification model endorses the debt contract optimality by claiming that corporations possess a threshold for risk associated to debt. However, the evidences and the existence of debt-bias tax regulations indicate that corporations are resilient to risk on the debt contract. The high debt levels reduce government tax revenue and lead to tax distortions. We propose to reassess the standard debt contract subject to a sufficient condition of economic welfare and stability along with the necessary condition of resolving asymmetric information problem.

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