# Instructor’s Solutions Manual

Taxes and Business Strategy

## A Planning Approach

## *Fifth Edition*

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NOTE TO INSTRUCTORS

Much care and attention has gone into the preparation of this Solutions Manual. Despite these efforts, some minor errors may have escaped our notice. We would appreciate your apprising us of any errors you encounter. Please email us at tshevlin@uci.edu.

We would also appreciate any comments or feedback on your experiences using the book and on suggestions for revising the text.

## Chapter 1

## Introduction to Tax Strategy

# **Discussion Questions**

1. When facing a business decision in which taxes play a role, a planner employing efficient tax planning considers all of the costs, tax and nontax, that will be incurred by all of the parties to the transaction. In addition to the explicit tax payments that will result from the transaction, the planner considers implicit taxes that parties will pay in the form of lower before-tax rates of return on tax-favored investments as well as any other non-tax costs associated with the transaction such as the costs of restructuring an organization to obtain favorable tax treatment. A planner whose criterion is tax minimization, on the other hand, ignores many of these costs. A tax minimizer considers only explicit tax costs. It is easy to see that such a criterion may not result in desirable business strategies when one considers that zero taxes are paid on unprofitable investments.

2. Social planners should encourage taxpayers to engage in costly tax planning when no alternative means of attaining the same social goals is less costly. For example, consider the social goal of providing low-income housing. A system of tax subsidies to providers of this housing may require some taxpayers to incur costs in considering the explicit taxes, implicit taxes, and nontax costs that would affect them and other parties if they were to build low-income housing. If the next-best alternative means of providing low-income housing is for the government to build it directly, the social costs associated with providing this housing may be higher.

3. a. Implicit taxes arise because before-tax rates of return on tax-favored assets are less than those available on tax-disfavored assets. Examples of tax-favored investments include tax-exempt bonds, business equipment eligible for accelerated depreciation, energy-related investments, research and development, agricultural production, foreign export activities, retirement saving, and entrepreneurial risk-taking activities.

b. High tax-bracket taxpayers should undertake these investments rather than paying high explicit taxes on investments with higher before tax rates of return but lower after-tax rates of return. Many of these investors do indeed undertake these investments, but nontax considerations also impede their propensity to do so. Later chapters elaborate on how taxpayers determine whether they are in this clientele.

c. The issuer or seller of the tax-favored asset receives the implicit taxes. Issuers benefit because they receive higher prices for the securities they are issuing or alternatively they raise funds at a lower before-tax rate of return. Sellers of tax-favored assets receive the implicit taxes via higher selling prices of the asset.

4. a. This statement is correct since municipal bonds are tax-favored.

b. This statement is not correct. For example, suppose (1) your tax rate is 30% and you can invest in municipal bonds that yield 10% or equally risky taxable bonds that yield 16%. You should invest in the taxables and pay explicit taxes of 4.8% to earn an after-tax return of 11.2% (which exceeds the 10% after-tax return on munis).

c. This statement is correct when the business assets are eligible for favorable tax treatment to owners. This is the case in most countries. When owning is tax-favored, it gives rise to high implicit taxes. Low-tax-rate investors do not value the tax benefits as much as high-tax-rate investors do. The low-tax-rate investors can effectively sell the tax benefits to ownership by renting at reduced rental rates.

d. This statement is not necessarily correct. Suppose that employers’ tax rates are going to fall more than employee tax rates. In this case, the tax benefit of deferral to employees may be swamped by the cost of deferral to the employer. By adjusting the level of current compensation, employees can be made to prefer current payment. Nontax considerations may also be important. To the extent employees have a strong preference for current consumption and they cannot borrow funds at favorable interest rates, current compensation may be preferred even when taxes can be saved by deferring compensation. We will analyze this problem more formally in chapter Eight.

5. a. Salary and wages, interest and dividend income, gains on sale of securities (may qualify for favorable capital gains treatment). An individual’s income from operating a business is included in gross income after deducting the cost of good sold. All items of income are included in gross income from whatever source unless specifically excluded by the Tax Code.

b. Municipal bond income is excluded from gross income (it is tax exempt).

c. In calculating adjusted gross income, some items are deducted from gross income (called Deductions for AGI). Examples include trade or business expenses such as advertising, depreciation, etc for taxpayers operating a business. For employees, payments by the employer to reimburse the employee for certain expenses such as travel, transportation and entertainment expenses incurred by the employee are deductible. Moving expenses and losses from the sale or exchange of property are also classified as deductions for AGI.

Next the taxpayer deducts the maximum of itemized deductions or the standard deduction and exemptions to arrive at taxable income. Itemized deductions are expenses of a personal nature which the Tax Code allows the taxpayer to deduct. Examples include home mortgage interest, property taxes, state and local income taxes, charitable contributions, and medical expenses above a certain limit. The total of itemized deductions is compared to the standard deduction (determined by the filing status of the taxpayer – single, married filing jointly, married filing separately, head of household, and surviving spouse) allowed by the Tax Code – the standard deduction is a fixed amount used to simplify the preparation of the tax return for taxpayers with relatively low itemized deductions. Finally each taxpayer is entitled to a personal exemption (provided the taxpayer is not eligible to be claimed as a dependent on another taxpayer’s return).

d. A credit is a dollar-for-dollar reduction in the taxpayer’s tax liability (and thus is worth more than a deduction, because a deduction of $1 only reduces the tax liability by the taxpayer’s marginal tax rate). Examples of tax credits for individuals are the earned income credit, child tax credit, credit for elderly, dependent care credit, general business credit, and foreign tax credit (for individuals with foreign earnings and foreign taxes paid).

(The reader interested in a more technical discussion is referred to any technical tax textbook.)

6. a. Revenue less cost of goods sold from operations, dividend and interest income, royalties, rental income. Similarly to individuals, all items of income are included in gross income from whatever source unless specifically excluded by the Tax Code. Generally appreciation in the value of assets held is not taxable until the gain is realized by sale or exchange of the asset.

b. Tax exempt interest on municipal bonds.

c. All expenses incurred in conducting the trade or business (§ 162). Depreciation of plant and buildings, wages and salaries, interest expense, rental expense, advertising and marketing expenses, research and development expenditures, charitable contributions (within limits), deductions for past tax losses (a net operating loss carryforward deduction), deduction for dividends received from other corporations (the dividend received deduction) and utilities.

d. Research and development credit, foreign tax credits, the alternative minimum tax credit.

7. Effective tax planning requires the tax planner to consider the tax positions of all parties to the transaction. By considering the other party, the tax planner can negotiate better terms-of-trade for his client. That is, having more information about the other parties’ position can help the tax planner in either structuring the transaction or in pricing the transaction. For example, in negotiating the purchase price of another business, the buying firm can better determine the purchase price if it knows how much the gain on sale will be to the selling party and whether it will be taxed as ordinary income or capital gains. The total gain to the other party depends not only on the price the business is sold for but the basis (defined here simply as the depreciated cost of the assets sold) that the taxpayer has in the assets. The higher the basis, the lower the taxable gain to the seller and the less the buyer might have to reimburse the seller for taxes. This real-world transaction is discussed in more detail in chapters 13-18 (the mergers and acquisitions chapters).

Note that if the taxpayer is buying goods and services in a competitive market place and is a price taker (the taxpayer takes the price as given and cannot negotiate a different price) then there is less benefit to the taxpayer knowing the other (selling) party’s tax position.

8. After-tax rates of return are not always lower than pretax rates of return. For example, for a tax exempt municipal bond the after-tax rate of return equals the pretax rate of return. Consider also the following counter-example. The taxpayer invests $1,000 in some activity with the investment being immediately tax deductible. At the end of the year the activity gives rise to a gain of $800 taxed as a capital gain. The taxpayer faces a tax rate of 39.6% on ordinary income and 20% on capital gains.

The pre-tax rate of return in this simple example is (800 – 1,000)/1,000 = -20%.

The after-tax rate of return is [800(1-.20) – 1,000(1-.396)]/1,000(1-.396) = (640 – 604)/604 = 5.96%.

9. Tax avoidance is another label for effective tax planning. See the quote in the text attributed to Judge Learned Hand. The courts have upheld taxpayers’ rights to arrange their affairs in ways to maximize their after-tax rates of return, provided the arrangements are within the law. Tax evasion denotes activity that is outside the law such as not reporting income that is taxable, or falsely claiming or overstating deductions. Tax evasion represents fraudulent activity and is illegal. Tax evasion is also labeled as deliberate noncompliance. A taxpayer facing a high marginal tax rate who buys a tax-exempt municipal bond and thus faces no explicit taxes is practicing tax avoidance but a taxpayer who buys a taxable corporate bond but omits the interest income on his tax return is practicing tax evasion.

**Exercises**

1. Taxpayer A invests in corporate bonds: after-tax rate of return = .125(1-.28) = .09. Taxpayer B invests in tax-exempt municipal bonds: after-tax rate of return = .09.

Thus both taxpayers are earning 9% per annum after-tax. Taxpayer B is not paying any explicit taxes but is paying implicit taxes in the form of a lower pre-tax rate of return compared to the 12.5% pretax rate of return on the fully taxable bond.

1. The implicit taxes are being paid to the municipality issuing the tax-exempt bond.
2. Taxpayer B is paying implicit taxes here at a rate of 28% (= [.125-.09]/.125).

2. Price willing to pay for the corporate bond is $1,000 (the face value). The bond promises a coupon of 6% and the taxpayer requires a pretax rate of return of 6% as well. More formally

Price = present value of the coupon payments + present value of the face amount

(Pretax calculation): price = .06 x (1,000) x PVA + $1,000 x PV1

where PVA is the present value of a $1 annuity for 5 years at 6% per annum = 4.212, and PV1 = is the present value of a dollar to be received in 5 years at 6% per annum = .747.

Thus .06 x (1,000) x 4.212 + 1,000 x .747 = $1,000.

(On an after-tax basis): price = [.06 x (1,000)](1-t) x PVA + $1,000 x PV1

where the PVA and PV1 factors use an after-tax discount rate .06[1-.31] = .0414 implying a PVA factor of 4.434 and PV1 of .8164. Thus,

Price = [.06 x (1,000)](1-.31) x 4.434 + $1,000 x .8164 = $1,000.

Price willing to pay for the municipal bond. Since the taxpayer can earn 4.14% after-tax by investing in the fully taxable bond, he requires this as a minimum rate of return on the muni and thus is willing to pay a maximum of

Price = .06 x (1,000) x PVA + $1,000 x PV1

where PVA and PV1 are based on the after-tax discount rate of 4.14%. Thus

Price = .06 x (1,000) x 4.434 + $1,000 x .8164 = $1,082.44.

The taxpayer is indifferent between the fully taxable bond at a price of $1,000 and the tax-exempt municipal bond at a price of $1,082.44 because at these prices both offer an after-tax rate of return of 4.14%. This example relates to implicit taxes because the taxpayer is willing to pay more for the tax favored treatment of the municipal bond thus lowering its pretax (also equal to after-tax) rate of return. The implicit tax is the difference between the 6% pretax return on the fully taxable bond and the 4.14% pretax rate of return on the muni. The implicit tax rate is 31% [(.06 - .0414)/.06].

3.

|  |  |  |
| --- | --- | --- |
|  | Alternative A | **Alternative B** |
| Investment | $20,000 | $18,000 |
|  |  |  |
| Expected Payoff | $21,000 x .75 = $15,750 | $25,000 x .80 = $20,000 |
|  |  |  |
| Pretax rate of return | | (15,750-20,000)/20,000  = -21.25% | (20,000 – 18,000)/18,000  = 11.11% |
|  |  |  |
| After-tax rate of return\* |  |  |
|  |  |  |
| For taxpayer with 15% rate | -7.35% | 11.11% |
|  |  |  |
| For taxpayer with 35% rate | 21.15% | 11.11% |

\*Alternative A: after-tax rate of return calculation:

(expected payoff – after-tax cost of investment)/after-tax cost of investment

= (15,750 – 20,000[1-t])/20,000[1-t]. The expected payoffs represent tax savings which are tax-exempt.

Alternative B: after-tax rate of return calculation:

(expected after-tax payoff - after-tax cost of investment)/after-tax cost of investment

= (20,000[1-t] – 18,000[1-t])/18,000[1-t] = 2,000[1-t]/18,000[1-t] = 2,000/18,000 = 11.11%.

Since the payoff is ‘taxable’ (cost savings reduce the tax deduction) and the investment is tax deductible at the same tax rate, the after-tax rate of return equals the pre-tax rate of return.

The low-tax bracket taxpayer should invest in alternative B because this maximizes her after-tax rate of return. The high-tax bracket taxpayer should invest in alternative A. And note that alternative A represents tax planning activity and while the pretax rate of return is negative, for the high-tax bracket taxpayer, the after-tax rate of return is positive and higher than alternative B. This example illustrates that tax planning is a tax-favored activity which activity is more valuable for high-tax bracket taxpayers.

4. If receive bonus now: after-tax amount received is $30,000(1-.396) = $18,120. The taxpayer can invest this amount to earn 5% after-tax for the year which will cumulate to $18,120(1.05) = $19,026 at the end of next year.

If defer bonus for one year (assumed received at end of the next year, not at the start of the next year): after-tax amount received is $30,000(1-.31) = $20,700.

Thus defer receipt of bonus for one year. However, if the taxpayer can earn 15% after-tax on her investment, then $30,000 received now will accumulate to $30,000(1-396)(1.15) = $20,838 which now exceeds the amount from the one-year deferral.

**Tax Planning Problems**

1. First note that a firm with accumulated tax losses can carryforward these losses and deduct them against future taxable income. Traditionally, we think of firms with net operating loss carryforwards as facing lower marginal tax rates than a firm currently earning income (discussed in more detail in Chapter Seven).

Plan A: borrow and purchase the plant. Not very tax efficient because will not be deducting the interest on the borrowing at high corporate tax rate nor will the depreciation deductions on the plant be taken at the highest tax rates.

Plan B: issue equity and buy the plant. Issuing equity is tax efficient for low tax firms but buying the plant is not, for reasons given above.

Plan C: leasing is likely the most tax efficient. Once we analyze the tax positions of both low tax-bracket and high tax-bracket taxpayers, we might find low tax-bracket taxpayers better off passing up tax savings and renting. The reason is that low tax-bracket and high tax-bracket businesses will find it desirable to enter into a contract that arranges property rights so that the low tax-bracket businesses effectively sell their tax benefits to high tax-bracket businesses. This is accomplished by reducing the rental rate to the low tax-bracket taxpayer in exchange for the right to take rapid depreciation, for tax purposes, on the equipment.

2. You would like to meet with the CEO so as to obtain information about the CEOs tax position, the rate at which the CEO can earn on her personal investments, and her preferences for current consumption (income) and current savings (deferred income). The CEO’s tax position depends not only on the salary from the firm but also any other income arising from her investments outside the firm. By knowing the CEO’s tax position, as well as the firm’s tax position, you can design a more tax efficient compensation package where efficiency includes the tax position of both parties.

3. If the CEOs’ actions or available projects from which she can choose are unobservable to the compensation committee (a hidden information problem which is discussed in more detail in chapter 6, but which problem is common in large corporations) then the CEO has to be offered incentives to choose those projects which maximizes the value of the firm (rather than maximizes the utility of the CEO). One solution is to tie part of the CEO’s compensation to the payoffs (either accounting earnings or stock price) – this is what bonuses as a function of reported earnings and employee stock options are intended to do.

If the CEO is about to retire and is facing investment decisions that require large current outlays with large future expected payoffs, the firm is said to face an horizon problem: the CEO is looking at short-term results when the firm’s shareholders would rather a long-term focus. Again some sort of compensation package (say restricted stock or deferred bonus) that links compensation to the deferred outcomes might be desirable.

Oftentimes the CEO has much wealth (human capital and money) tied to the firm and is thus likely to be more risk averse than shareholders who are likely to hold diversified portfolios. Thus risk averse CEOs might forgo risky but positive net present value projects. Again the compensation package might include components (such as employee stock options that increase in value as the risk of the firm increases) that encourage increased risk taking by the CEO.

The firm in designing the compensation package thus must not only consider taxes but also what incentives the compensation package might offer the CEO. Oftentimes, the CEO’s compensation package is designed with incentive alignment as the first priority and taxes as the second priority. We will discuss this issue in more detail in Chapter Six.

4. Implicit taxes arise because the before-tax investment returns available on tax-favored assets are less than those available on tax-disfavored assets. Taxpayers wishing to obtain the tax-favored treatment offered by the investment bid up the price of the investment lowering the pre-tax rate of return.

Tax clienteles arise because of variation across taxpayers in tax rates. Certain taxpayers are more likely than others to own various kinds of assets or to organize production in particular ways. Taxpayers facing similar marginal tax rates are attracted to the same investments because they offer the highest after-tax rate of return to these taxpayers.

A firm that relies on long-term debt for financing likely faces a high marginal tax rate because the interest payments are tax deductible. Thus issuing debt to fund operations is tax efficient for high tax firms. The owners of distribution facilities (and other buildings and equipment) can deduct the cost of the assets (called depreciation) in calculating taxable income. These tax deductions are most valuable to high tax bracket taxpayers. If the tax depreciation schedule exceeds the rate of economic depreciation then the asset can be labeled as tax-favored and buyers are likely to compete for the asset bidding up the price (leading to the asset bearing implicit taxes). High tax rate taxpayers are the efficient owners of these types of assets. Leasing is often more efficient than buying for low tax bracket taxpayers. Thus if we look at the asset side, we might infer that ABC Corporation faces a low tax rate but when we look at the funding side of the economic balance sheet we might infer that ABC Corporation is a high tax rate corporation. Obviously both inferences cannot be right and thus it is likely that ABC Corporation is in the wrong clientele on one side of the balance sheet: if it is a low tax firm it should not have long-term debt outstanding. If it is a high-tax rate firm, it should not be leasing assets. (This solution focuses on the tax aspects of the problem – as we will learn in later chapters, there might be nontax reasons for the structure of the firm’s balance sheet, for example, nontax reasons for leasing.