Public Finance II.

Lecture X - **Taxation and Revenue**

Matej Lorko
matej.lorko@euba.sk
www.lorko.sk

Office Hours (Room 5C.30)
Tue 10:00 – 10:45
Thu 12:30 – 13:15

Readings:

- Gruber, J. (2005). Public finance and public policy. Macmillan.
- Congdon, W. J., Kling, J. R., & Mullainathan, S. (2011). Policy and choice: Public finance through the lens of behavioral economics. Brookings Institution Press.

Running a government is expensive

- Correcting for market failures, providing public goods, guaranteeing social insurance, and redistributing income and sustaining antipoverty efforts—functions of government within the purview of public finance—all involve various expenditures.

- In order to spend, governments have to raise revenue. While there are other means, primarily borrowing by issuing debt, governments finance their operations mainly through taxation.

- Raising revenue through taxes on goods, income, and so on, changes the prices of nearly every economic activity that people engage in.

- Because taxes change the terms of such choices, taxes affect how people act and behave. The standard economic analysis of taxation starts from understanding the relationship between taxes and behavior.

- The real consequences of taxation are largely a function of the magnitude and nature of the response to taxes. When taxes are imposed on income, do people work less? How much less? How are the impacts related to the level or rate of the tax? How are they related to its form and relationship with other elements of the tax code or broader policy?

- The questions are similar for effects on saving and investment, consumption, and so on. This margin of response—the elasticity of supply or demand with respect to the tax—is the key parameter for analysis.

Behavioral perspective on taxes

- Taking a behavioral perspective on the economic analysis of taxation may be important because behavioral tendencies will mediate the response to taxes.

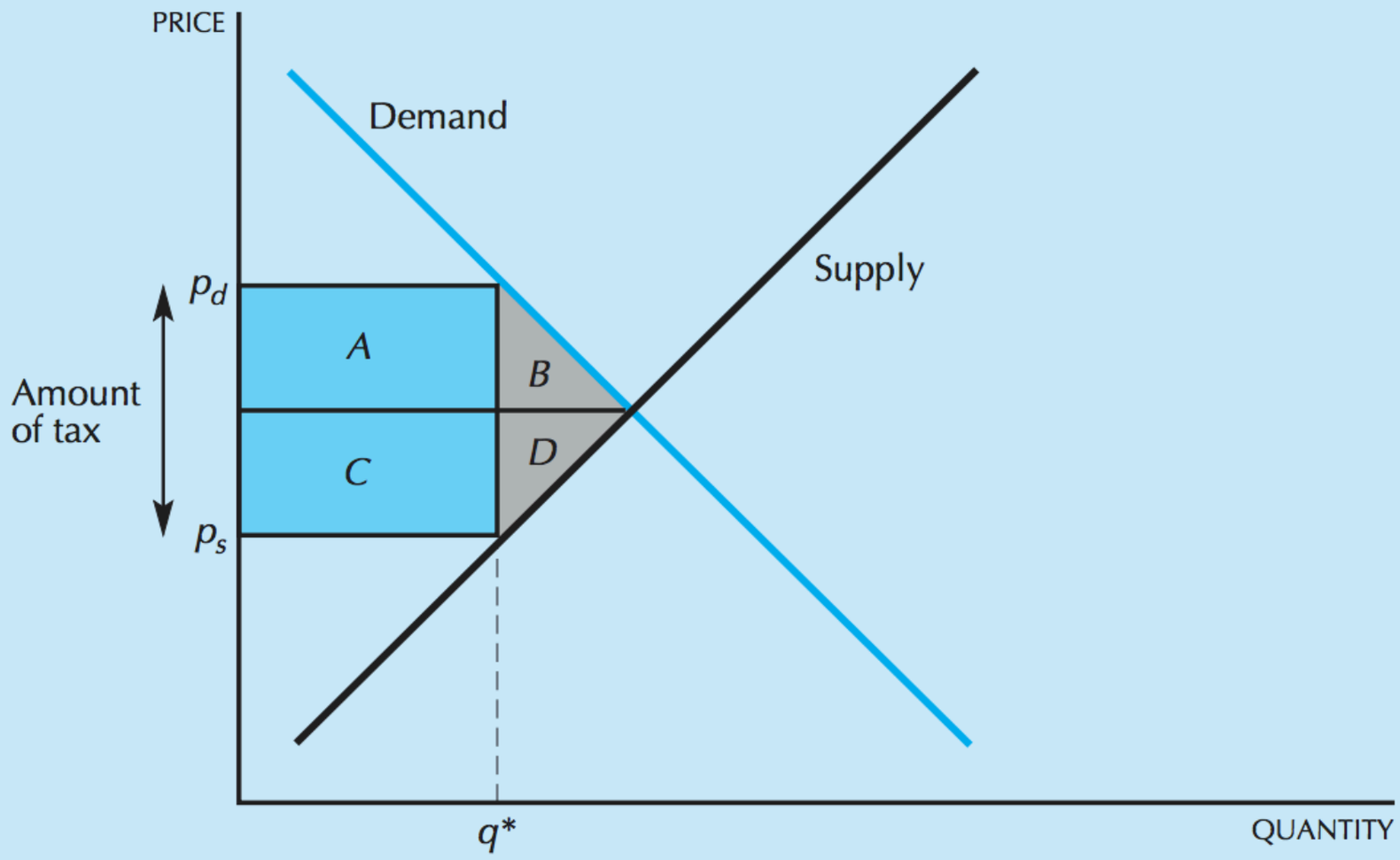
- The key implication is that individuals will respond to taxes as they perceive them, not necessarily as they are set. As a result, the relationship between taxes and behavior may become much less straightforward than in the standard model.

- The impact of taxes on behavior might be determined in part by reference-dependence. For example, depending on how taxes are structured, they may be perceived as losses or as gains from some reference point, which might have consequences for behavior.

- The importance of such insights for understanding the economics of taxation and tax policy is likely to be substantial. It is not much of an exaggeration to say that all of the standard economic analysis of taxation is built around the analysis of how individuals respond to taxes.

- The fundamental question in this analysis is understanding the efficiency costs of taxation. While raising revenue, taxes impose a burden on society. When taxes change prices and so lead individuals to not undertake activities that they otherwise would have, economic efficiency is impaired.

- Similarly, the relative magnitudes of responses to taxation determine the distributional features of taxes, or the incidence of taxes. That is, who bears the burden of the tax depends on who responds to the tax. The less individuals change their behavior in response to a tax, the more of the tax they typically end up paying.



The deadweight loss of a tax. The area $B + D$ measures the deadweight loss of the tax.

Optimal Taxation and Psychology

- The challenge that taxes pose for policy is that while they make beneficial expenditures possible, they also impose costs and trade-offs. At the most straightforward level, taxes redistribute welfare from those who pay taxes to those who benefit from what taxes fund.

- Taxes also create a drag on overall economic efficiency by creating wedges between the prices paid by consumers of goods and services and the prices received by suppliers. Moreover, taxes are costly to administer and enforce.

- The economic analysis of taxation seeks to identify the terms and nature of the trade-offs required, both to locate where the terms are more and less favorable and to inform judgments about when and under what conditions the benefits of taxes might be thought of as worth the costs.

- In each of the trade-offs, behavior plays a key role. In the standard model, the terms of the trade-offs are delineated under the usual assumption of optimal decisionmaking and perfect self-interest. A behavioral perspective introduces new evidence and logic regarding how individuals respond to taxes and so changes the terms and forms of the trade-offs. Thus a behavioral perspective can inform our understanding of tax efficiency, incidence, compliance, and avoidance.

Behavioral Response and Welfare

- In general, taxes depress economic activity below its efficient level, leading to a welfare cost. In addition, because different groups are differentially sensitive to price changes, welfare costs are borne differentially across groups.

- As a result, when considering how and how much to tax, society must consider both the efficiency costs of taxation —usually called the excess burden of taxation, or the deadweight loss—and the distributional and equity consequences of taxation, or what is called tax incidence.

- In the standard approach, public finance models deadweight loss and incidence as functions of elasticities, or parameterizations of the change in behavior in response to the tax.

- This approach allows statements about the efficiency costs of taxes on, for example, earned income in terms of the distortions that the taxes create in incentives to work and earn. Similarly for commodity taxes, the magnitude of the deadweight losses of those taxes is a function of the relative decrease in consumption that they cause. Likewise, the incidence of taxation can, in the standard approach, be identified in terms of the relative sensitivity of the response of affected parties to taxes.

- Given the central role of individuals' response to taxes in determining their welfare consequences, a behavioral approach may change standard conclusions about taxes and welfare. A behavioral approach allows that how people respond to taxes may be less straightforward than the standard model supposes—their responses might reflect imperfect decisionmaking processes, nonstandard preferences, and so on.

- As a result, the efficiency and incidence consequences of their responses may be different from those in the standard model. The first step to a behavioral approach to issues of taxation and welfare is, then, to consider the ways in which behavioral tendencies mediate how individuals respond to taxes. The logic of tax efficiency and tax incidence can then be reconsidered from a behavioral perspective.

Psychology and Behavioral Response

- The traditional approach to understanding the welfare consequences of taxation is to take the relevant price elasticities as sufficient for describing the response to a tax.

- So, for example, in the case of a commodity tax on good x, the formula for the own-price elasticity of demand, ηd , can be written as:

$$\eta_d = \frac{\partial x}{\partial p_x} \cdot \frac{p_x}{x}$$

- that is, the elasticity is the percentage change in quantity demanded for a 1 percent change in the price.

- This approach is straightforward as far as it goes, but it embeds a number of assumptions about behavior that often are left implicit. One key assumption is that individuals correctly perceive and understand the change in price due to taxes, so that their responses to taxes reveal something about their underlying preferences or the cost-benefit calculus involved in deciding whether or not to take an action.

Psychology and Behavioral Response

- A behavioral approach to understanding how individuals respond to taxes calls the standard assumptions into question.

- Perhaps the major implication of behavioral economics for understanding people's response to taxes is the fact that individuals can no longer be assumed to perceive taxes correctly—even when they perceive net-of-tax prices correctly. Instead, individuals will respond not to the tax rate as it is set, but as they construe it.

- **Inattention and Salience**. Individuals respond only to taxes that they see or think about. Limited attention means that when taxes are not obvious or salient, they may be either fully or partially ignored. As a consequence of inattention, an observed low elasticity of demand may be a consequence of individuals failing to notice a tax rather than of actually having preferences that make them insensitive to it. Evidence suggests that salience effects are present with respect to both commodity and labor taxes.

- **Complexity and Error**. A different way in which individuals may respond to taxes imperfectly is to misperceive the magnitude or form of the tax. That is, even when individuals attend to the tax problem, they may respond to an inaccurate construal of the tax. When taxes are complex or obscure, responses may be based on inaccurate perceptions of taxes due to either outright error or adoption of rules of thumb. Put simply, a behavioral approach allows that tax schedules are complicated and that people make mistakes. Those mistakes, depending on the particular form that they take, might lead individuals to respond to taxes more or less than they would if they perceived tax schedules precisely. For example, individuals do not respond identically to income and consumption taxes with equivalent terms

- **Preferences**. Finally, nonstandard preferences may interact with tax schedules to affect behavioral response. Individuals may perceive and evaluate taxes relative to reference points rather than in absolute terms; as a result, equivalent tax schemes may not generate identical responses if they are construed relative to different reference points. Individuals might, for example, consider changes to tax rates relative to the status quo or respond differentially to increases and decreases in taxes. That might lead to asymmetric responses to changes in tax rates depending on how increases or decreases are framed. For example, tax cuts presented as a "bonus" might be more likely to be spent than tax cuts presented as a "rebate."

Tax Efficiency

- Starting from a traditional approach to understanding tax efficiency, the cost of taxation can be written as a function of elasticities. In a simple, partial equilibrium analysis, the formula for the excess burden of a tax is as follows:

$$EB = -\frac{1}{2} \cdot \frac{p \cdot q}{\frac{1}{\eta_d} - \frac{1}{\eta_s}} \cdot t^2,$$

- where t is the tax rate, ηs is the elasticity of supply, and ηd is the elasticity of demand.

- A familiar set of results can be derived from this equation. First, the excess burden increases with more elastic market participants—that is, the greater the reduction in quantities transacted due to a tax, the larger the excess burden that it creates. Second, the excess burden increases with the square of the tax rate—as a result, the efficiency costs of taxes rise quickly with tax rates. These qualitative relationships are very general, and they hold for both labor and commodity taxes.

- That yields two rules of thumb about how to design tax policies so as to minimize distortions. The first is that taxes on inelastic goods are generally preferred for the way that they generate a smaller excess burden. The second is that holding the revenue requirement constant, lower tax rates on wider tax bases lead to less excess burden than higher rates on narrower bases.

Tax Efficiency

- Because a behavioral approach modifies our understanding of how individuals respond to taxes, it is likely to affect the validity and generality of those conclusions.

- Observed elasticities may sometimes conflate preferences with salience or with errors due to complexity. Furthermore, those elasticities may depend on reference points or other elements of the choice environment usually taken to be neutral for response and welfare. They also may reflect other-regarding preferences.

- The relationship between excess burden and elasticity is likely to be complicated as a result. In addition, the relationship between the tax rate and the excess burden becomes less straightforward because tax rates and elasticities are probably no longer plausibly independent factors in the calculation of excess burden. For example, as tax rates rise, their salience rises, and elasticities may change.

Hidden Taxes

- Changes to efficiency results may occur because of the effects of tax salience. Some taxes can be partially hidden from those who face them, leading individuals to fail to fully react to those taxes.

- Note that there are a number of different ways that a tax might be considered hidden, not all of which are likely to affect an individual's response and welfare. For example, when taxes are in some way built into prices so that individuals do not realize that they are paying a tax, that tax might be said to be hidden. Value-added taxes could be considered to be largely hidden from consumers. But taxes hidden in this sense still provoke a response to the extent that they increase prices; therefore, while they may have interesting political properties due to the failure of individuals to perceive them, economically there is little effect on tax efficiency.

- Here we are concerned with taxes that are hidden in the sense that individuals may easily fail to attend to them, so that they fail to take account of the tax in making decisions about working, consuming, or saving. Sales taxes, for example, which typically are not included in prices posted to consumers, may be hidden in this sense.

- What does the lack of response mean in terms of the excess burden of the tax? It is tempting, based on the partial equilibrium analysis of excess burden calculations, to say that the lack of response to a tax is good from the perspective of social welfare—that there is less distortion due to less elastic responses and that therefore the social cost of taxation is mitigated. But that conclusion depends heavily on taking a partial equilibrium perspective; it ignores that error on the part of the individual has to be accounted for somewhere.

- When individuals fail to respond to a tax because it is not salient, in general, they move away from their private optimum. For example, if individuals spend more money for failing to perceive a tax, that money might come out of savings. In general, what happens in the next period or along other margins of adjustment is likely to be important.

Tax Mistakes

- Other changes to the standard conclusions about tax efficiency come from the fact that individuals may construe taxes imperfectly, especially when tax schedules are complex. Tax mistakes are related to hidden taxes, but they have at least two distinguishing features.

- First, while failure to attend to taxes pushes the response in one direction only (toward underresponse), tax mistakes can in principle cause a response to be greater than or less than the response expected from perfectly optimizing individuals. Second, whereas tax salience is a relatively general, single feature, tax mistakes can take many forms.

- There is only one way to ignore a tax, but there are a lot of ways to get it wrong: miscalculating taxes, mistaking average for marginal tax rates, failing to connect taxes with the benefits that they fund, and so on. As a result of the variation in both the causes and outcomes of tax mistakes, final judgments about their welfare consequences depend on the nature of the specific error.

- Take, for example, the case of individuals responding to average income tax rates rather than marginal rates. With a progressive rate structure, average tax rates are below the marginal rate, and so in general individuals making that mistake underrespond to the true tax rate and earn more and supply more labor than they would if they correctly understood the tax schedule.

- Optimal tax policy can set tax parameters not only to minimize the excess burden of taxation but also to minimize the private welfare costs due to inattention or mistakes.

Tax incidence

- In addition to understanding the magnitude of the social welfare costs associated with taxation, tax policy also is interested in the distribution of the burden of taxation. That is, who pays taxes? Producers or consumers? Capital or labor? Employers or workers? The central incidence result in public finance is that the distribution of the costs of taxation is a function of the relative elasticities of the demand and supply side of the relevant market. The simplest case of partial equilibrium tax incidence is given by the formula below for the case in which the statutory incidence of taxation falls on the supply side of the market:

$$\frac{dp^d}{dt} = \frac{\eta_s}{\eta_s - \eta_d},$$

- where pd is the price paid in the market by the demand side and dpd/dt is the change in that price for a one-unit change in the tax rate.

- This highlights the two key results of the standard incidence analysis: First, taxes are borne by the relatively inelastic side of the market—that is, those actors whose behavior is relatively insensitive to prices tend to pay more of the tax. Second, the economic incidence of a tax is determined by how individuals respond to the tax, not by the legal incidence of the tax. That is, from the perspective of economic welfare— setting aside administrative issues—the assignment of the legal responsibility to remit a tax is a neutral feature of tax policy.

- Because tax incidence depends on elasticities in this way, allowing for behavioral tendencies to influence the way in which individuals respond to taxes has corresponding consequences for incidence calculations, much as it did for efficiency. Consider, for example, the case of tax salience and sales taxes. If individuals as consumers fail to attend to sales taxes, they become functionally insensitive to those taxes, and, other things being equal, they bear a larger share of the burden of the taxes than they would if they were perfect optimizers. Similarly, when tax mistakes lead individuals to be more or less sensitive to taxes, they may pay a lesser or greater share of the tax, respectively.

Tax Compliance and Avoidance

- Another margin of adjustment to taxation with potentially significant welfare consequences includes behaviors to comply with or avoid taxes. Other things being equal, an efficient tax is one that people comply with; avoidance is a form of distortion, and along with the enforcement and administrative costs associated with combating avoidance, it can reduce efficiency.

- Therefore, important trade-offs for tax policy are related not only to the behavioral response that comes from reductions in taxed activity—consuming fewer goods and services, working fewer hours, and so on—but also to the response that taxes generate in terms of compliance and avoidance behaviors. Part of what can make a tax inefficient in practice is if individuals can easily avoid the tax or if the costs of monitoring and administering the tax are high.

- In the standard model, individuals weigh the costs and benefits of complying with tax laws and regulations against the costs and benefits of avoidance and make a decision about how fully to comply with or how aggressively to avoid their tax liability. The optimal level of activity therefore depends on factors such as the probability of an audit and the magnitude of any sanctions relative to the gains. In response, policy can set fines and penalties high enough and with the right probability of enforcement to deter avoidance and balance the costs of enforcement against the benefits of improved revenue collection.

- This aspect of tax efficiency becomes somewhat more interesting in a behavioral world. In particular, the relatively high levels of tax compliance observed, specifically with respect to the income tax, often is judged to be an imperfect fit with the standard model. Given the actual, relatively modest probability of audits and the magnitude of the associated penalties, the hypothesis that individuals come at that decision in an optimal fashion or from a position of perfect self-interest can be difficult to support.

- A number of features of behavioral decisionmaking might contribute to higher-than-expected tax compliance. Individuals might perceive the probabilities of audits to be higher than they are, and the penalties themselves might be obscure or complex in ways that lead individuals to perceive them to be larger than they are. The loss of paying the penalty might loom large relative to the potential gains from avoidance. Such types of decisionmaking errors or nonstandard preferences might push in the direction of compliance.

- One particular behavioral tendency that is likely to be of special importance for tax compliance is other-regarding preferences, which might lead individuals to comply with taxes at a higher rate than they would under perfect self-interest. Individuals might care about outcomes in ways that lead them to comply with taxes, they also might care about process or fairness in ways that support compliance, or they may be sensitive to social norms that reinforce tax compliance. Individuals therefore may have intrinsic motivations for complying with taxes.

Tax Policy Design

- Given the need for revenue to fund the various functions of government and given some understanding of the welfare consequences of taxation, the goal of tax policy is to raise sufficient revenue in ways that have desirable welfare properties.

- That includes setting the form and parameters of tax policy so as to raise taxes efficiently, in the sense that the taxes minimize the social costs due to distortions.

- It also requires implementing tax policy so that the burden of taxes is distributed in ways that correspond to social goals and preferences for equity and incidence.

- And, finally, it is a matter of designing and implementing tax policy to promote compliance, minimize distortions due to avoidance and evasion, and minimize enforcement costs.

- The standard model identifies features of tax policy that have desirable properties along the lines of efficiency, equity, and compliance. They usually are summarized in broad terms as rules of thumb for tax design. For example, taxing relatively inelastic goods or activities tends to be efficient. Similarly, establishing low tax rates on wide tax bases generally is more efficient than setting higher rates on narrower bases.

Commodity Taxes

- Commodity taxes are levied on the transaction of goods and services. Sales and excise taxes are the largest and most common of these types of taxes. Sales taxes typically are collected at the point of retail sale, and they often are expressed as a percent of the purchase price.

- Excise taxes, are typically imposed at the wholesale level, and they are often imposed per unit of sale. Excise taxes target narrow categories of products, such as gasoline or alcohol, and sometimes they can be larger in magnitude than sales taxes.

- From the perspective of efficiency, the goal of these taxes is to minimize the distortion that they cause, and that distortion is completely captured by the reduction in the consumption of taxed goods caused by the tax. For that reason, commodity taxes are most efficient when located on relatively inelastic goods.

- While there are potentially many behavioral dimensions to commodity taxation, the key issue is likely to be the taxes' salience and the degree to which they are hidden from individuals. Tax policy parameters can affect the salience of taxes, which can affect how efficiently the taxes collect revenue and the distribution of their burden.

- For example, if lack of attention to taxes is bad for tax efficiency and low tax rates are easier to ignore, then there is a trade-off between keeping taxes low to keep them efficient and making them high enough to be salient. Rather than imposing many low-rate taxes, policy might favor paying the fixed costs of attention just once on a single, higher-rate tax.

- The effects of salience might be able to manipulate their incidence. In general, lowering salience tends to increase the portion of the tax paid by the group from whom it is hidden. So, for example, the decision to post tax-inclusive or tax-exclusive prices might matter for the incidence of the tax. Taxes that are included in prices to the consumer—such as by levying the tax at the wholesale level, as with excise taxes; or requiring that taxes be posted in prices, as with gas taxes; or both, as with a value-added tax—minimize the degree to which they are hidden from consumers. Increasing the salience of taxes in this way may also work to shift the tax burden away from consumers and to producers, as consumers become more responsive to after-tax prices.

Labor Taxes

- The signature feature of the income tax may be its complexity. It is calculated as a function of income, but the translation from earned income to taxable income involves numerous adjustments, due, for example, to exemptions and deductions. The tax itself can also be complex, due to the nonlinear rate schedule that makes the tax progressive.

- Perhaps the main goal of these taxes is to raise revenue in the most efficient manner possible, which is largely identified with designing the taxes to produce relatively small responses in labor supply and taxable earnings. In part, this is strictly about efficiency—not generating disincentives to participate in the labor market or to supply work hours. It also is partly about compliance, where the goal is to minimize effects on tax avoidance or evasion behaviors.

- Perhaps the major implication of behavioral economics for the design of efficient income taxes comes from the fact that imperfectly optimizing individuals can no longer be assumed to perceive taxes correctly. Individuals respond not to the tax rate as it is set but as they construe it.

- While the welfare consequences of complexity are not clear-cut, it does raise questions about whether policymakers could be improving welfare outcomes by deliberately setting the parameters of tax policy in ways that manipulate complexity in order to achieve outcomes.

- For example, the complexity of the tax code might make it difficult for individuals to respond to income taxes precisely. That effect could possibly help with efficiency if it causes individuals to not understand their marginal tax rates and therefore to supply more labor than they otherwise would. For that reason, tax policy design might seek to leave this feature of the tax code opaque or vague.

- However, while policymakers might be able to use behavioral responses to taxes to improve tax policy outcomes, firms and employers can take actions too. For example, while individuals might find it difficult to optimize with respect to complex income taxes, firms might set terms of employment in ways that are optimal for the typical worker. The direct manipulation of the complexity of the income tax schedule by tax authorities might then be less effective, because actions by firms can offset such effects.

Capital Taxes

- Capital gains taxes and taxes on dividends tax wealth accumulation and income from wealth. Capital gains and dividends are taxed like income, but in some cases according to schedules that are different from those for earned income. Estate and property taxes also tax accumulated wealth.

- A good policy seeks to implement the taxes in a manner that has desirable consequences for welfare. From the perspective of efficiency, the central task of the taxes is to not discourage saving, investing, and accumulating wealth.

- Difficulties that individuals have with planning and saving even in the absence of taxes could mean that taxes on capital and wealth accumulation might magnify those difficulties and further impair saving. That would be an additional barrier for policy to overcome in designing such taxes.

- On the other hand, policy might be able to take advantage of the fact that the implications of tax liability are far in the future to reduce the salience of those taxes for short-sighted individuals, in ways that might mitigate the welfare consequences of the taxes.