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A brief introduction to tax distortions and optimum tax theory.

An allocation is first best socially efficient if it is Pareto efficient subject only to technological and resource constraints. A (first best) socially efficient allocation is characterised by marginal technical rates of substitution being equated across firms, the marginal productivity of a factor in the production of a good being the same everywhere, marginal rates of substitution being equated across consumers, and equated to marginal rates of transformation.

The purpose of taxes is to improve the allocation or distribution in society (say, departing from a minimum state). This may happen e.g. by tax-financing public provision of goods that would otherwise be under-provided. If a complete set of competitive markets, and Pigovian taxes, and *lump-sum taxes* and transfers are available, a first best socially efficient allocation is (in principle) attainable. The key to understand this result is *the law of one price* which implies that marginal trade-offs are equated to the same relative prices and hence to each other.

Lump-sum taxes:

A lump-sum tax is such that the amount of tax is unaffected by the behavior of the economic agents (consumption, work effort, etc.)

In practice suitable lump-sum taxes are not available due to information problems and possibly other constraints. A lump-sum tax policy may impose the same tax on everybody. This is usually called a poll tax. This may be possible, but there is the question of how to treat those who cannot pay. When taxes are to play a redistributive role, they will have to be differentiated between people with a high and people with a low earnings capacity. But in practice earnings capacities (skills, etc.) cannot be observed or verified. Taxes will have to be based on observable variables that can partly be attributed to innate abilities and partly to behaviour. To pursue distributive purposes taxes are imposed on income, wealth, consumption, etc. These are not lump-sum taxes.

With lump-sum taxes unavailable, it is not possible to go all the way to first best efficiency. Even if taxes all in all improve the allocation, they will also have harmful side-effects (distortions) that reduce the net social gain from

imposing taxes. Most taxes employed in practice (income taxes, VAT, excises, etc.) are distortionary.

Tax distortions:

Taxes generate distortions (are distortionary) when they cause violations of the conditions for social efficiency (e.g. making the marginal rate of substitution deviate from the marginal rate of transformation.) The law of one price no longer holds because sellers and buyers face unequal prices because of the difference between before- and after-tax prices. We say that prices are tax-distorted when, because of the taxes, they do not reflect true costs and true benefits. We also say that the resulting market allocation is distorted when it deviates from a socially efficient allocation.

The distortion problem is that people *substitute* away from (heavily) taxed goods and activities. *Income effects* pose no efficiency problem. Also lump-sum taxes, which we know are compatible with social efficiency, will have income effects. Indeed, the purpose of taxes is to generate income effects by inducing people to cut back their use of resources to make them available for the public sector.

The social loss due to tax distortions is usually called a *deadweight loss* or an excess burden. The excess burden has been defined as the amount that is lost in excess of what the government collects. It can be measured in various ways.

Which are the trade-offs that may be affected by distortionary taxes?

- Labour-leisure choice
- The consumption bundle purchased in the market
- Intertemporal allocation of consumption (the consumption-savings trade-off)
- The factor mix in production
- The choice of production method
- Choice of country to live in, invest in, save in, do shopping in,....

In brevity, the reason why taxes cause distortions is that the choices of the market agents become motivated by taxes and not only by real economic costs and benefits. One may for instance choose a commodity which is more resource-consuming to produce because it is more lightly taxed. One may

find it worthwhile to expend real resources in pursuing tax savings. Note that a tax is not a real resource cost. It is just a transfer from the private to the public sector. Nor is a tax saving a real resource saving. It only cuts back the transfer from to the public sector leaving society as a whole unaffected.

If distortions are inevitable, where do we place them? Which trade-offs do we choose to distort, and how strongly? These are topics in optimum tax theory.

Optimum tax theory:

Optimum tax theory addresses the questions:

- Which taxes/tax bases should be used?
- How should we set tax rates and design tax schedules?

Optimum tax theory assumes that there are other constraints than just technological and resource constraints, e.g. informational constraints, faced by tax designers. The objective is then to achieve social efficiency, and a desired income distribution, subject to all these constraints. This is called a *second best optimum*.

Optimum tax theory takes two different approaches.

- a) One approach directly imposes restrictions on the set of available taxes (that may be attributed to legal constraints, international agreements, possibilities for reselling, administrative and enforcement problems, etc.)
- b) The other assumes underlying constraints (e.g. informational constraints) that will have ramifications for feasible taxes.

The purpose of optimum tax theory is either to characterise taxes that are compatible with *constrained* Pareto efficiency (i.e. subject to all relevant constraints), or that maximise social welfare.