SOURCES OF PUBLIC REVENUE THAT MAKE NATIONS RICHER

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Abstract
Among sources of public revenue that make nations richer, the most beneficial are charges for harms, such a pollution and congestion, and charges for the private benefits from public services. Increases in the money supply sufficient to keep price changes in line with expectations are also beneficial. Taxes on concentrations of wealth are beneficial if wealth inequality is considered harmful. Properly administered taxes on land do no harm and are beneficial when markets are imperfect. Among taxes that cause harm, the combination of a tax on labour income and a tax on inheritances is probably the least damaging.

JEL codes: H20, H21.

Keywords: public revenue; taxation.

1. Introduction

Most of the ways in which governments contribute to the well-being of their citizens require money. The process of raising public revenue generally has harmful effects that increase the cost of raising public revenue beyond the amounts that citizens pay. For example, if raising $1 of public revenue causes an additional $0.50 of economic damage, then a project that costs $1m in public revenue is socially worthwhile only if its social benefits are at least $1.5m. Thus, public officials need to take account of these harmful effects when deciding which public expenditures are worthwhile, and governments that ignore the harmful effects of raising public revenue will implement public projects that reduce their citizens' well-being.

Some ways of raising public revenue actually improve economic efficiency. Economists describe these sources of revenue as offering a 'double dividend' because they not only provide revenue but also increase efficiency at the same time (Stiglitz 2000, pp. 226–7). Governments should make the greatest possible use of these beneficial sources of public revenue before using those with harmful consequences.

This paper explains why most ways of raising public revenue have harmful consequences and how it happens that the beneficial ones are beneficial. It then identifies the set of taxes that are best for an economy.

2. The five costs of raising public revenue

The costs that arise in the process of raising public revenue can be divided into five categories. We illustrate these costs primarily as they apply to a value added tax (VAT), and we refer to other taxes only where additional examples are needed.

2.1. Direct burden

The first cost category is the loss to taxpayers of the money that is transferred to the government. This is the 'direct burden' of the tax. In the case of a VAT, this cost is the tax receipts that sellers send to the government. Nearly all sources of public revenue have this cost. The exception is putting new currency into circulation, because doing so does not require citizens to transfer money to the government. However, raising public revenue by adding to the money supply does have a cost that is like a direct burden: putting new currency into circulation causes the value of existing money to be lower than it otherwise would be.

2.2. Collection cost

Collection cost is the cost to the government of collecting revenue and enforcing the tax law.[1] In the case of a VAT, this is the cost of the salaries, offices, and expenses of the public officials who administer the tax and try to ensure that citizens pay the taxes they owe. All sources of public revenue that require money transfers have this cost.

2.3. Compliance cost

Compliance cost is the cost to the taxpayer related to the requirement to pay taxes. This has three parts. The first part is the cost of the time and resources involved in fulfilling the requirement to pay taxes. This is the cost to taxpayers of learning the tax code, keeping tax records, filling out tax forms, and transferring money to the government (see e.g. Pitt and Slemrod 1989). In the case of a VAT, this is the cost to sellers of learning their duties under tax law, keeping records that they would otherwise not keep and completing the forms that they send to the government with tax payments. The second part of compliance cost is the cost to taxpayers of spending time and hiring tax experts to find legal ways of reducing or avoiding their tax obligations (Slemrod and Yitzhaki 2002). The third part of compliance cost is the resources that taxpayers spend trying to evade taxes without being caught (Slemrod 2007). A proprietor might spend time and effort seeking to hide the fact that he sold to some customers

without registering the sales, thereby not charging those customers VAT and evading his obligation to pay taxes on his income from these sales.

An unfortunate aspect of compliance cost is that this cost tends to be greater as a percentage of revenue for small enterprises than for large ones. Thus, the introduction of a tax with high compliance cost can lead to the demise of small enterprises.

2.4. Demoralisation cost

Demoralisation cost is the loss that people feel when they believe that the tax falls on people unfairly.[2] Demoralisation cost has four parts. The first part is the loss that people may feel because the poor are taxed too heavily. In the case of a VAT, people might feel such a loss because the tax is collected on necessities that the very poorest people buy. The second part of demoralisation cost is the loss that people may feel because the rich are taxed too lightly. In the case of an income tax, people might feel such a loss because the rich are able to escape taxation by getting wealthier through rises in the value of assets that are not taxed because they are not sold, or by using other loopholes. The third part of demoralisation cost is the loss that people may feel because, irrespective of income, the tax is levied unfairly. In the case of a car registration tax to finance road construction and maintenance, this is exemplified by the cost that people may feel because three-wheeled cars are taxed as motorcycles rather than cars. The fourth part of demoralisation cost is the loss that people feel when a tax is susceptible to fraud, and they know that others are not paying what they are supposed to pay.

2.5. Excess burden

The fifth and final cost of raising public revenue is the ‘excess burden’ or ‘deadweight loss’ of taxation. This is the reduction in the benefits from exchange that occurs because some economic activities that are worthwhile in the absence of a tax cease to be worthwhile when there is a tax. In the case of a VAT, the excess burden is the loss in overall welfare that results when people consume fewer taxed goods and enjoy more leisure. The excess burden of a tax is usually the second greatest cost of a tax, after the direct burden. However, some sources of public revenue, such as fees for the use of opportunities whose value is not the result of efforts of their owners, have no excess burdens. Others, such as pollution taxes, have ‘negative excess burdens’, that is, they improve efficiency, because they discourage activities that are worth less than they cost. Therefore it is very important to understand excess burdens.

3. The excess burden of a tax

Economists analyse the excess burden of a tax with the help of supply and demand schedules. Demand schedules measure the consumers' willingness to pay for additional quantities of a good, and therefore describe the marginal benefit that consumers receive from any unit of the good that they consume during a given time period. Supply schedules measure the marginal cost of producing different quantities of a good. In Figure 1, *S* is the supply schedule for a commodity and *D* is the demand schedule for this commodity. In the initial equilibrium, the quantity bought and sold per period is Q_0 and the price is P_0. At this combination of price and quantity the marginal benefit that consumers obtain from the last unit that they consume equals the marginal cost of producing this last unit. Increasing the quantity bought and sold beyond Q_0 would mean that the marginal cost of producing additional units would exceed their marginal benefit. Reducing the quantity bought and sold below Q_0 would mean that the marginal loss of benefit from the units not produced would exceed the marginal saving of cost from not producing them. Economists therefore call the combination of Q_0 and P_0, at the intersection of demand and supply schedules, 'efficient'.

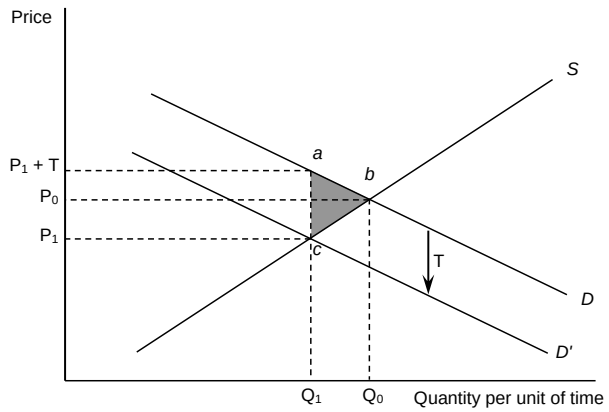

Figure 1: Excess burden of a tax.

When buyers are required to pay a tax of T for each unit of the good that they buy, the amount that they are willing to pay to the seller for any given quantity of the good falls by the amount of the tax that they have to pay to the government. The demand schedule therefore shifts down by the amount T, to *D'*. The intersection of the new demand curve with the supply

curve occurs at the quantity Q_1. The price that sellers receive falls to P_1 while the price that buyers pay rises to $P_1 + T$. The sales that are lost with the tax in place (the difference between Q_0 and Q_1) represent those units for which the difference between the value to the buyer and the value to the seller is less than the tax. The loss of economic value entailed in the reduction in the quantity sold is the difference between the value that the lost sales would have had to the buyers (area Q_1abQ_0) and the cost of these units to suppliers (area Q_1cbQ_0). The difference between these two areas is the shaded triangle *abc*. The area of this triangle measures the excess burden of the tax, that is, the amount by which the sum of the marginal benefits of consuming the units between Q_1 and Q_0 exceeds the sum of the marginal costs of producing these units.[3]

If the tax were cut in half, then the excess burden would fall by a factor of four, since the areas of similar triangles are proportional to the squares of their sides. Thus, when demand and supply curves are straight lines, the excess burden of a tax is proportional to the square of the tax per unit bought and sold.

The excess burden is the same regardless of whether the buyer or the seller is required to remit the tax to the government. If the seller is required to remit the tax, then the supply curve shifts upwards by the amount of the tax, T, and the new equilibrium quantity and the size of the excess burden are the same as in Figure 1.

The excess burden of a tax arises from the possibility of reducing the tax that is owed by changing what one does, so the magnitude of the excess burden of a tax depends on how responsive consumers and producers are to changes in price.[4] The steeper the demand and supply schedules are, the smaller is the response of quantity bought and sold to the tax, and the lower is the excess burden.

If the excess burden of any tax was not affected by other taxes, then it would be possible to calculate, from the supply and demand schedules, the excess burden from collecting the last dollar of revenue of any given tax, and arrange the taxes so that the additional excess burden from the last dollar of revenue was the same for all taxes (Ramsey 1927). However, each new tax affects the excess burden of other taxes because, in discouraging the consumption of a newly taxed commodity, each new tax induces consumers to go back to consuming more of the commodities that previous taxes had discouraged them from consuming, thereby reducing the excess burden of previous taxes. Thus, when an economy has more than one tax, the second tax generally reduces the excess burden of the first tax. When the base of the second tax overlaps that of the first, as with a VAT that is added to an income tax, then the excess burden from using both taxes on the overlapping base depends on the sum of the two tax rates.

Because the excess burden is roughly proportional to the square of the tax rate, the excess burden is greater than when the taxes fall on separate bases.

If two different taxes have essentially the same base, such as a sales tax and a VAT, then the excess burden depends on the sum of the two tax rates and is unaffected by how the direct burden is divided between the two taxes. Having only one tax has the advantage of lower total compliance and enforcement costs.

To achieve an optimal mix of taxes, one needs to consider the ratio of extra cost to extra revenue for each tax. If two taxes could be either expanded or contracted and they have different ratios of extra cost to extra revenue, then it is efficient to expand the tax with the lower marginal cost–revenue ratio and contract the tax with the higher marginal cost–revenue ratio. Thus with an optimal mix of taxes, all taxes that are in use at rates below their maximum feasible rates have the same marginal cost–revenue ratio. This shared ratio of extra cost to extra revenue is the 'marginal cost of public funds', and it indicates the cost of raising an additional dollar of public revenue (Browning 1976).

Even though the excess burden of a small tax in isolation is very small, it will not be efficient to use all sources of public revenue, partly because of the start-up costs of adding a tax, and partly because there is a high cost of the first dollar collected when the tax base is already used by another tax. It is efficient to use a tax only if its average cost of public funds is no greater than the marginal cost for other taxes.

If it were possible to tax *everything* at the same rate, then taxes would have no excess burden because people would pay the same total amount in taxes regardless of what they did. However, one of the things that would need to be taxed in this case is leisure, which always escapes taxation under a broad-based tax (Harberger 1964). Thus, all taxes on what people spend or on what people receive from either working or saving generate excess burdens. The excess burden arises because such taxes reduce the incentive to work below the value of what people produce, and they reduce the incentive to save below the productivity of investments financed by saving.[5]

Still, systems of 'broad-based' taxes (sales taxes, VATs and income taxes) that tax a wide variety of goods and activities at a uniform rate generally have lower excess burdens than tax systems in which individual goods and services are taxed at different rates, because such taxes come reasonably close to the condition of taxing everything at the same rate. However, the numerous exceptions and non-uniformities of *actual* broad-based taxes cause such taxes to have higher excess burdens than necessary.

Taxes that discourage saving (and therefore investment, which requires saving) may cause a substantial reduction in an economy's stock of capital. A reduced stock of capital generally means that labour is less productive and wages are lower. A tax system that taxes only the income that is consumed and not the income that is saved does not have this component of excess burden. However, raising a given amount of revenue without taxing saving requires a higher tax rate on consumption and therefore generates a greater distortion of the work–leisure decision than a tax system that does tax saving.

4. Sources of public revenue without excess burdens

The sources of public revenue without excess burdens can be characterised as levies (whether taxes, prices or fees) on the use of opportunities whose value is not the result of efforts of their (original) owners. As an example, consider a fee for operating a taxicab in a city when the number of taxicabs is limited to say, 200, to avoid overcrowded streets. If there are more than 200 persons who wish to operate taxicabs in this city, then taxicab permits are scarce and have value that is not the result of the efforts of those who own the permits. If the fee for a taxicab permit is set at a level at which at least 200 permits are still requested, then public revenue has been raised without any reduction in the number of taxicabs and therefore without excess burden. Another example is a fee for the opportunity to park on a street with limited parking space. If people would like to use more parking spaces than are available, then parking spaces are scarce and have value that is not generated by those who obtain parking spaces. If all parking spaces are still used when drivers must pay the fee, then public revenue has been raised without discouraging the use of parking spaces, and therefore without excess burden.

The same logic shows that taxes on land do not have an excess burden. Consider a privately owned parcel of land on which 100 cars can park, in a place where drivers are willing to pay $5 per day to park. If the owner of the parcel must pay the parking attendant a wage of $100 per day and the parking lot does not require any maintenance, then the owner can receive $400 per day by owning the parcel. The land has value that is not the result of its owner's efforts. The government can therefore raise up to $400 per day in public revenue by imposing a tax on ownership of the parcel.

Figure 2 shows the effect of a tax on land graphically. The supply of land (the acreage that is taxed) is fixed, so the supply curve is a vertical line. The initial equilibrium combination of price and quantity without the tax is P_0 and Q_0. The tax lowers the value of the opportunity of owning the land by the amount of the tax, and therefore shifts the demand curve downwards to *D′*. Because the quantity of land used remains unchanged ($Q_1 = Q_0$), there is no triangle of

excess burden. Economists therefore call a tax on land ‘neutral’. A tax on land does not discourage economic activity under two conditions. First, the tax must be independent of how productively the land is used. That is, owners must still pay the tax even if they leave their land vacant or use it inefficiently. If the owner refuses to pay the tax, the government can seize the land for non-payment of the tax and transfer it to someone who is willing to pay. Second, the tax must not exceed the value of using the land. If these two requirements are met, then all land that can be used productively will continue to be used when land is taxed, and those who use land will continue to have an incentive to use it as productively as they can. (Smith 1776, V. ii. 30–56). A tax on land that is independent of how efficiently the land is used can collect up to the full rental value of land without creating any excess burden.

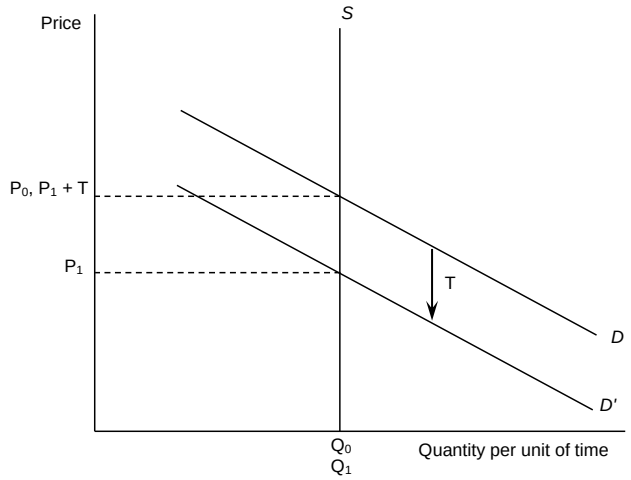

Figure 2: Zero excess burden of a tax on land.

There are many other opportunities whose value is not the result of their owners’ efforts: agricultural quotas, import quotas, fishing licences, liquor-selling licences, electromagnetic spectrum licences, government-prescribed monopolies, and bank charters are a few of them. In all these cases, it is possible to collect government revenue without excess burden by charging market-clearing prices for socially efficient quantities.

One important difference between land and the other opportunities in this category is that each parcel of land is unique, because no two parcels are at the exact same location and have the exact same surroundings. Each parcel therefore requires separate assessment. In addition,

the value of land is often mixed with the value of improvements that are the result of efforts of landowners. As a consequence, collection costs will be somewhat greater for land taxes than for taxes on other opportunities whose value is not the result of their owners' efforts.

5. Sources of public revenue with negative excess burdens

5.1. Taxes on activities that are worth less than they cost

If the collection of public revenue discourages activities that are worth less than they cost, then taxes on such activities have negative excess burdens, that is, they reduce inefficiency. One example is a tax on polluting, of a magnitude no greater than the cost of the pollution. Just as a tax on sales results in fewer sales, a tax on polluting results in less pollution. But in the case of a tax on polluting (of a magnitude no greater than the cost of pollution), the gain to those who no longer bear the cost of the pollution that is deterred by the tax is greater than the cost to the polluter of reducing his polluting. Therefore the efficiency of an economy is improved by such a tax.

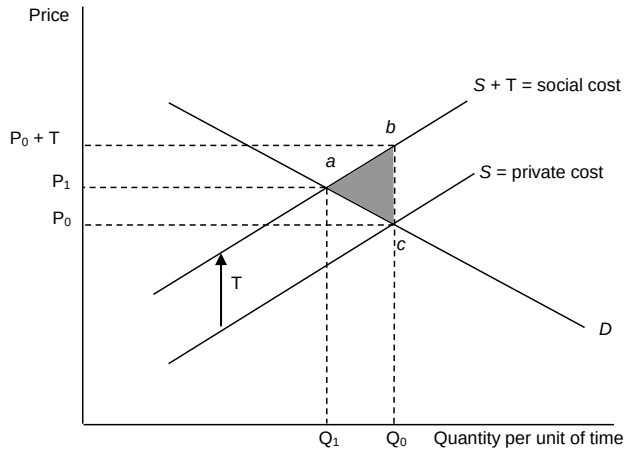

Figure 3: Negative excess burden of a tax on polluting.

Figure 3 provides a graphical example. When there is no tax on polluting, the supply and demand curves for a good whose production causes pollution intersect at quantity Q_0 and price P_0. But the true social cost of the good, including the pollution cost, at the quantity Q_0 is

$P_0 + T$. The introduction of a tax that reflects the social cost of pollution shifts the supply curve upward, so that the supply and demand curves intersect at quantity Q_1 and price P_1. The area Q_1abQ_0 measures the social cost of the units no longer produced, while the area Q_1acQ_0 measures the value of these units to consumers. The social cost of the units no longer produced exceeds their social benefit, and the area of the triangle *abc* measures the efficiency saving from no longer producing these units. As Fullerton and Metcalf (1998) emphasise, the generation of government revenue is only a by-product of a tax on pollution, because the tax rate is set to reduce or eliminate the distortion caused by pollution rather than to raise public revenue (see also Goulder 1995).

A similar increase in efficiency can be achieved by ensuring that the prices of things provided by governments are not too low. Often governments provide services to their citizens at prices below the cost of providing additional units (the 'marginal cost'). If all citizens pay less than the cost for these services, then there is a loss of economic efficiency without any gain in social equity. Consider the case when the marginal cost of producing a kilowatt hour of electricity is 10 cents and a government sells the electricity for 2 cents per kilowatt hour to all citizens. If the government raises the price of electricity to the marginal cost of providing electricity, then the electricity that people no longer use because of the higher price has less value to them than the savings to the government from not providing it. Thus, increasing the price of a public service up to its marginal cost improves the efficiency of the economy.

5.2. Taxes on land

Increases in efficiency can also be attained by taxing land. Above we showed that taxes on land that are less than, or equal to, the rental value of land and independent of how efficiently land is used have no excess burden and therefore do not harm economies. But land taxes are actually better than that. First, a nation's economic resources will be used more efficiently whenever the nation substitutes a tax on land or one of the other sources of public revenue that has no excess burden for a source with an excess burden. In addition, taxes on land lower the value of land and can thereby discourage two types of activity whose costs generally exceed their social benefits, and also help to correct for an inefficiency caused by imperfections in the lending market.

5.2.1. Reducing the profit from land speculation. If people had perfect information about the future, then they would know which parcels will become valuable at which times in the future, and all owners would improve their parcels at efficient times. But without such perfect information, land speculation occurs when people have different beliefs about how fast land

prices will rise. Those who expect a rapid rise buy land and wait. This reduces efficiency for two reasons. First, because buying and holding land does not require management skills, those who speculate in land are generally not the persons who are most talented in managing the land while waiting for the price to rise. Second, when speculation is attractive, land is most valuable to those who expect the most rapid price rise. Such extreme beliefs are generally wrong, and economists refer to the fact that often those persons acquire a good who hold the most inflated beliefs about the good's value as the 'winner's curse' (see e.g. Thaler 1988). But the landowners who hold these beliefs think it is important not to improve land, so that it will be available for even greater improvements later. Thus, the pursuit of speculative profit leads to a bias against improving land. By reducing or eliminating the profit from land speculation, taxing land reduces or eliminates this bias and leads to more intensive land use (Brown 1927).

5.2.2. Increasing the diligence of bankers. When land value is high, bankers can limit their lending to customers who can pledge real estate as security for their loans. Bankers do not have to question whether loans will be productive; whenever a lender defaults, they can just seize the real estate. When land is taxed and land prices fall, bankers do not have this luxury. Few if any loans will be risk-free, so bankers will need to evaluate each applicant carefully and find the loans that are worth the risk entailed. As a result, the community's savings will be invested more productively.

5.2.3. Putting land into the hands of people who get greater returns. If lending markets were perfect, then everybody would face the same interest rate. But in reality some people face high interest rates while others face low rates. In response to an increase in the tax on land, each potential user of land reduces his bid for land by the present discounted value of the future taxes. This present value is greater for someone with low interest rates than it is for someone with high interest rates. Thus, an increase in land taxes reduces the value of land to people with low interest rates by more than it reduces the value to people with high interest rates. This implies that increasing the tax on land shifts the ownership of land towards persons with high interest rates. And people with high interest rates require greater returns on their assets. Thus, taxes on land shift land to uses with greater productivity (Gaffney 1961, pp. 30–49, 74–82).

6. The relative attractiveness of sources of public revenue

In this section, we compare 12 different sources of public revenue in terms of the five costs of raising public revenue. Table 1 shows how these sources compare in terms of four of these costs. The table omits the first cost, the direct burden of revenue transferred to the

government, because all sources have this cost. The costs are reported only in impressionistic terms. Any decision about actual taxes should be based on a careful inquiry into the actual circumstances, taking account of the fact that the cost of each tax generally varies with changes in all other taxes.[6]

Table 1: Costs beyond direct burden for 12 sources of public revenue

Tax	Collection	Compliance	Demoralisation	Excess burden
Tariffs	Low	Low	Low	High
Excise taxes	Low	Low	Varies	Varies
Increases in the supply of currency	0	0	Low if inflation is in line with expectations	Moderate
Cost-based prices	Low	Low	Varies	Negative
Land taxes	Low–moderate	Low	Varies	Negative
Fees for using other opportunities whose value is not the result of owners' efforts	Low	Low	Low	0
Wealth taxes	Low–moderate	Low	Varies	Moderate
Wage taxes	Low	Low	Low	Low-Moderate
VATs	Low–moderate	Low	Moderate	Moderate
Income taxes	Moderate	Moderate	Moderate	Moderate
Profits taxes	Moderate	Moderate	Low	High
Inheritance taxes	Low	Low	Varies	High

6.1. Tariffs

The main argument in favour of tariffs is that they have relatively low enforcement costs. Only ports, airports, and border crossings need to be monitored to collect tariffs. This is particularly important for less developed countries that lack the infrastructure needed to collect other taxes. Tariffs have high excess burdens because they discriminate against foreign goods. By reducing trade, tariffs also make it harder for a nation to export the goods it produces. In developed countries, tariffs are mainly a device used by inefficient but politically powerful industries to discourage citizens from buying from more efficient foreign producers. Tariffs can be recommended for a developed country only if either there is general compassion for the plight of a distressed domestic industry and a wish to maintain it despite its inefficiency, or the production of the foreign good entails some global harm, such as destruction of the atmosphere's ozone layer, for which the tariff compensates.

6.2 Excise taxes

An excise tax is a tax on the sale of a particular good or service. Like tariffs, excise taxes have relatively low compliance and enforcement costs because only the producers or importers of the taxed commodities need to comply and be monitored. But also like tariffs, excise taxes

generally have high excess burdens, because they discriminate against the taxed commodities. Excise taxes are efficient only if they are used to compensate for harms caused by particular commodities. For example, if the consumption of alcohol causes additional traffic deaths or leads to additional public expenditure for neglected children, then an excise tax on alcohol to compensate for these costs is efficient. Difficulties with excise taxes can arise if the harms for which compensation is sought become highly subjective. Does the use of cosmetics entail a social cost (by deceiving others about the users' true beauty) for which compensation is warranted? The question is debatable at best, but such a claim could be used to justify a tax on cosmetics. Excise taxes have also been used to concentrate taxes on the rich, by taxing such commodities as yachts and grandfather clocks that are purchased mainly by richer people. But if the rich are to bear special taxes, then it is better to tax them more directly. The demoralisation costs of excise taxes depend on the degree of consensus in a society that these taxes are appropriate.

6.3. Increases in the supply of currency

An increase in the supply of currency has no compliance cost and no enforcement cost because it provides revenue for a government without any transfer of money from citizens to the government. An increase in the supply of currency nevertheless imposes a financial cost on citizens, because when the supply of currency increases, the value of each unit of money in the economy is worth less than it otherwise would be worth. This cost corresponds to the money turned over to the government when taxes are levied (Bailey 1956). Such a decrease in the value of money often leads to a demoralisation cost, because the cost of a fall in the value of money is borne disproportionately by the poor, who hold larger percentages of their assets in the form of money. When citizens have not anticipated the changes in the value of money, another demoralisation cost arises from the fact that the real magnitudes of the financial obligations of debtors to creditors are different from what was expected when the obligations were contracted. There is further demoralisation cost when the population is frustrated by the government's ability to use expansion of the supply of currency to obtain resources without the discipline of obtaining consent for taxation.

In recent decades, economists have been recommending inflation of about 2 per cent per year, rather than price stability. This is somewhat controversial, but it has the advantage of permitting 'real' (inflation-adjusted) prices to fall when nominal prices are 'sticky' for downward movements. Thus, a worker can accede to a fall in his real wage without enduring the indignity of agreeing to a fall in his nominal wage. If there are in fact social benefits from

having prices that rise predictably, then there are social benefits from increases in the supply of currency, beyond the additional government revenue. Still, any increase in the money supply that causes the value of money to fall has an excess burden in the form of reduced usefulness of money as a store of value.

Under a system of fractional reserve banking, much of the increase in the money supply that results from an increase in currency takes the form of increases in bank loans. Expanding the money supply would be a more efficient source of public revenue if the government arranged for more of the increase to take the form of currency, which it can achieve by requiring more reserves for demand deposits. It is true that any increase in the reserve requirement raises the cost and therefore lowers the profits of banks. But when the reserve requirement is fixed at less than 100 per cent, banks can make additional loans and receive additional profits whenever the government increases the money supply.[7] An increase in reserve requirements that confines money creation to the government should therefore be viewed not as a tax on banks but rather as a decision to not continue the subsidy that banks currently receive.

6.4. Cost-based prices for public services

When consumers pay directly for public services, there are little if any compliance and enforcement costs to raising the prices of these services up to the costs of delivering additional units of them. However, if there is a service, such as a public water supply, that is currently provided without metering, then the improved efficiency in use that results from metering and billing will not necessarily justify the enforcement cost of introducing meters.

Raising the price up to marginal cost improves efficiency and therefore has a negative excess burden. If all citizens understand that they have to pay other taxes to enjoy subsidised public services, then there should be relatively little demoralisation cost of raising the price of public services to marginal cost.

Certain public services, like education, provide a general benefit to the community in addition to the private benefit to the person who consumes the service. Consumers who pay the full marginal cost of these services will consume less than the socially optimal amount. In such cases – and only in such cases – it is appropriate to charge consumers less than the full marginal cost and thereby provide them with the subsidy that causes them to consume the socially optimal amount

6.5. Land taxes

A land tax can be considered a fee for the exclusive use of an opportunity provided by nature. It has very low compliance cost. Enforcement cost is in the low-to-moderate range because each parcel requires separate assessment. Assessors must use what information they can obtain from market transactions to infer the value of parcels whose services are not traded. Land taxes have negative excess burdens because they improve economic efficiency. The demoralisation cost of a land tax depends on the perspective of the citizens. If citizens regard those who are subject to land taxes as the victims of a discriminatory tax system, then there will be demoralisation costs from a land tax. If, on the other hand, the owners of land are regarded as having got away, for years, with pocketing more than their shares of the gifts of nature, then the land tax will be regarded as righting a wrong, and will therefore have negative demoralisation costs.

6.6. Fees for other opportunities with value not the result of owners' efforts

Fees for using other opportunities whose value is not the result of their owners' efforts are a source of public revenue with both low compliance and low enforcement cost. Such fees have no excess burden if the fee is not so high as to reduce the amount of the activity below the economically most efficient amount. There are two reasons why introducing such fees, or raising them to market-clearing levels, could cause demoralisation cost. First, citizens may believe that past receipt of income from such opportunities creates an entitlement to the continuation of such special treatment. Second, they may believe that allocation mechanisms like queuing or rationing are more equitable than charging market-clearing prices.

6.7. Taxes on the value of wealth

A tax on the value of wealth discourages both the maintenance of existing wealth and the accumulation of additional wealth, and therefore generally has a significant excess burden. Nevertheless, there are at least two reasons why a tax on the value of wealth might be included in a package of efficient sources of public revenue. First, a nation's expenditure on police, courts, national defence and diplomacy increases with the amount of wealth that it needs to protect. It is reasonable to assign some portion of these costs to the owners of wealth and levy a corresponding tax on the value of wealth. A tax on wealth that simply compensates for the cost of protecting additional wealth has no excess burden.

The second possible reason for levying a tax on the value of wealth is to erode the wealth of the wealthy. An efficiency rationale for eroding the wealth of the wealthy is that it may be difficult to maintain the cohesion of a society if inequality in the distribution of wealth is too extreme. If the social benefits of the wealth of the wealthy to others than the wealthy (in the

form of a greater stock of capital in the economy) are less than the social cost of the inequality in the distribution of wealth, then a tax that reduces wealth inequality can have a negative excess burden. Whether such a tax on the value of wealth has a demoralisation cost depends on whether there is a consensus in society that those who have wealth deserve it. Even if there is a general desire to erode the wealth of the wealthy, a tax on wealth for this purpose should exempt enough wealth to permit people to provide for their old age without being taxed.

One might think that other taxes – a profits tax, an income tax or an inheritance tax – might also be used to erode the wealth of the wealthy. But all of these taxes are too easy to avoid by rearranging one's financial affairs. The most effective way to erode the wealth of the wealthy is by a steady annual charge on the value of their wealth.

To implement an annual tax on wealth, there must be some way to assess the value of wealth. While much wealth is in forms such as stocks and bonds that are widely traded and therefore easily appraised, there is also much wealth in forms such as art and privately held companies that are more difficult to appraise. One way to assess all wealth for tax purposes relatively easily is to require every taxpayer to state a price at which he or she is willing to part with the wealth that is subject to tax, and then require that the wealth be sold if anyone is willing to buy it at the stated price. If people are highly averse to risk, then they will assess their wealth at its true value to them. If they are less averse to risk, then they will tend to under-assess their wealth if the tax rate (in per cent per year) is greater than their belief of probability (in per cent per year) that someone will want to buy their property at its value to them (Tideman 1969, pp. 61–9).

6.8. Property taxes (*real estate taxes*)

A property tax is a combination of a land tax and a tax on the value of improvements to land, and is best analysed in terms of its two components. As explained previously, the land tax is beneficial. The tax on improvements is a tax on a major component of wealth. It is beneficial only if it is limited to a tax that compensates for the costs of protecting improvements. Since the best uses of the two components of the property tax are so different, it is better to have separate taxes on land and improvements rather than a property tax.

6.9. Income taxes

Income can be divided into asset income and wage income, so an income tax can be regarded as the combination of a tax on the income from assets (rent, interest, dividends, royalties and capital gains) and a wage tax.

6.9.1. Taxes on asset income. It is very difficult to tax asset income fairly, because there are so many ways of manipulating one's financial affairs to avoid taxes on asset income (Slemrod 1990, pp.173–4). In some activities, asset income comes in the form of rises in the price of assets, which are not taxed until the assets are sold. Excessive depreciation shelters some asset income. Asset income can be earned as the income of a business, where additional tax-avoidance devices are available. If a business has foreign operations, internal pricing rules can make it appear that the income was earned abroad, where it may be subject to either less taxation or no taxation. Businesses can finance their activities primarily by borrowing, and deduct the interest they pay from their taxable income.

These difficulties of taxing asset income make it attractive to use a tax on the value of assets rather than a tax on the income from assets, if assets are to be taxed. A tax on the value of assets would be equivalent to a tax on the income of assets if all assets earned the same rate of return, which will tend to happen, apart from random fluctuations, if markets work well. As explained in subsection 6.7, assets can be assessed for tax purposes by requiring taxpayers to state prices at which they are willing to sell the assets subject to tax.

Some of the inefficiency of taxes on the income from assets could be avoided if those who design tax codes gave efficiency a higher priority. Still, there will be some excess burden of even the best-designed tax, coming from the disincentive that it offers for saving. When governments insist on trying to tax the income from assets, the steps that they take to reduce tax avoidance give taxes on the income from assets high compliance costs and high enforcement costs. The success of the rich in avoiding taxes on asset income gives such taxes high demoralisation costs.

6.9.2. Wage taxes. A wage tax has an interesting connection to a consumption tax. For a person with no inheritance, no bequests, and average returns on saving, the present value of lifetime spending must equal the present value of lifetime wages. So a wage tax is equivalent to a tax on the consumption that a person could afford from his wages, if he obtained average returns on his saving (Stiglitz 2000, pp. 503–4). Among persons with no inheritance and the same wages, the ones who pay more under an income tax than under a wage tax are the ones who chose to save more for consumption in their later years. It is hard to find a reason why such a choice should result in a higher tax bill. Thus, choosing a wage tax can be regarded as saying, 'We will tax people according to the present value of the consumption that they could have afforded from their wages. If we need to do something about assets that they inherited,

then we will do that separately. We will be content to tax assets as if they all received average returns, leaving deviations from average returns untaxed.'

A wage tax has an advantage over taxing consumption through a value added tax, in that it permits higher tax rates on people who earn more. By varying the tax rates on different incomes and combining a wage tax with the right tax on wealth, it should be possible to achieve very low demoralisation cost.

A wage tax will necessarily have some excess burden because it causes the reward for working more intensively to be less than the value of that effort. A wage tax will have a lower excess burden if it is a tax not just on paychecks but also on all fringe benefits such as medical care and bonuses such as stock options. Only a tax that is levied uniformly on the entire amount that employers spend on their employees creates no incentive to distort the form in which compensation is paid. Employment costs are sufficiently well defined that compliance costs and enforcement costs of a wage tax should be low. Thus, among all taxes with positive excess burdens that a developed economy might impose, a tax on wages is probably the least objectionable on efficiency grounds.

6.10. Gift and inheritance taxes

Since the rationale for a wage tax is that is equivalent to a consumption tax that can be made progressive, consistency requires that a wage tax be combined with a tax on gifts and inheritances, so that these additional sources of funds for consumption are treated equally, while still avoiding taxes on the returns to saving.

Because of the need to transfer titles of ownership, the assets that a person inherits or receives as gifts are generally easy to identify. Their value can be determined, at some cost to the inheritor, through a self-assessed tax described above. The compliance and enforcement costs of inheritance taxes are therefore reasonably low. However, the possibility of avoiding such taxes by following the advice of tax-avoidance experts gives them high excess burdens. The demoralisation cost of inheritance taxes depends on whether there is a consensus that a high concentration of wealth is costly. If there is such a consensus, then it is better to use an annual tax on the value of wealth rather than an inheritance tax to reduce the concentration of wealth.

6.11. Value added taxes (*VATs*)

A VAT is economically equivalent to a general sales tax. The only difference between the two is that a value added tax is collected at each stage of production, as value is added to things

produced at earlier stages of production, while a sales tax is collected at the time of final sale. One advantage of VATs over sales taxes is that there is less incentive to submit fraudulent information under a VAT, because the amount of the tax is a smaller percentage of the receipts of each business when more businesses pay the VAT.

A VAT has much lower compliance and enforcement costs than an income tax because value added is easier to define and the tax is collected only from businesses. On the other hand, VATs tend to have higher demoralisation cost than income taxes because they are levied at the same rate on the poor as on the rich. At some cost in complexity, a VAT can be designed to exempt, or tax more lightly, any category of expenditure. Investment is often exempted, to avoid discouraging saving and investment. Necessities are often exempted or taxed at lower rates, to reduce demoralisation cost. Tax relief for the poor from a VAT can also be provided by combining the VAT with a tax rebate of a fixed amount per person. Any VAT has an excess burden arising from the fact that it reduces the reward from working more intensely. The excess burden of a VAT increases with the number of exceptions and variations in its rates because each exception and each variation causes people to shift their purchases artificially towards the favoured goods and services, and also causes a rise in the tax rate on unfavoured goods and services that is needed to maintain tax revenue.

6.12. Taxes on profits (*corporation income taxes*)

Profits taxes tend to have higher compliance and enforcement costs than other taxes because profit is a subtle concept, making it difficult to have a profits tax without an abundance of regulations. Even with the best regulations, a profits tax will leave ways of avoiding taxation that cause the tax to have a high excess burden. To the extent that a profits tax lowers the return to investment, it lowers the incentive to save, thereby reducing the amount of capital that a nation will have in future years. This in turn reduces wages in future years. If people insist on taxing assets despite the drawbacks of doing so, it is better to have an annual tax on the value of wealth. If people insist on taxing profits, it is best to allow all investments to be deducted from profits in the year in which the investments are made. For firms that have tax obligations, this is equivalent to exempting new investments from taxation, so that the tax becomes a tax on old investments, land, and entrepreneurial skill.

Not taxing profits is particularly valuable for a nation that seeks investment from abroad. It is not possible for a nation that is importing capital to reduce the expected returns of foreign investors, who will invest only if they expect a return as great as what they can get elsewhere. Competition tends to ensure that it is no greater. When profits are taxed, foreign investors will

reduce their investments to the point at which the return equals the ordinary return plus the amount of the tax, so that the investors receive the ordinary return after taxes that they would receive elsewhere. A nation that wishes to import capital and tax the property income of its own citizens should therefore tax its citizens directly and not impose a profits tax.

7. A general strategy for raising public revenue efficiently

Because some ways of raising public revenue improve the efficiency of an economy, a general strategy for raising public revenue efficiently begins by collecting all of this revenue. If the revenue exceeds the amount needed for public purposes, then one can always return it to citizens in the form of a 'citizens' dividend'. If a nation wants a public budget that exceeds what the sources with negative excess burden can support, then it should next tap the sources with zero excess burdens, taking account of their other costs. If citizens want a yet larger public budget, then sources with positive excess burdens need to be used, beginning with the tax with the lowest total cost and adding others only if the excess burden of the first tax rises to where other taxes offer a lower marginal cost of public funds.

Table 2: Recommendations for an efficient tax system

Tax	Recommendation
Tariffs	Only to compensate for global harm caused by foreign goods
Excise taxes	Only to compensate for harms
Increases in the money supply	Sufficient to keep prices in line with expectations of low inflation
Cost-based prices for public services	Yes, except when public services have public benefits
Land taxes	Collecting as much of the rental value of land as possible
Fees for using other opportunities whose value is not the result of owners' efforts	Corresponding to the scarcity value of the opportunities
Wealth taxes	To pay for protecting wealth and to erode the wealth of the wealthy
Property taxes	See land taxes and wealth taxes
Asset income taxes	Use wealth taxes instead
Wage taxes	As a secondary source of revenue
Gift and inheritance taxes	Use if wage taxes are used
VATs	Do not use
Profits taxes	Do not use

Table 2 summarises our recommendations for an efficient tax system. Tariffs should be used only to account for global harms that are caused by production of imported goods. Excise taxes should be used only to compensate for harms associated with the consumption of taxed goods. Expanding the money supply should be used as a source of revenue only to the extent that it is needed to keep prices stable or rising at a slow, predictable rate. Although a little inflation does not do much harm, particularly if it is anticipated, price stability has the advantage of making it easy to compare amounts of money at different times. When compliance and enforcement costs of charges for public services are not too high, charges

should equal marginal cost, unless there are significant public benefits to persons other than those receiving the service. Charges for the use of land and other opportunities whose value is not the result of their owners' efforts should equal the market value of the opportunity. A wealth tax is appropriate to pay for the costs of protecting wealth, and, if society considers the concentration of wealth a problem, also to erode the wealth of the very wealthy. A tax on asset income is less efficient than an annual tax on the value of assets. A tax on wages is the best broad-based tax, but a tax on wages should be used only after more efficient sources of revenue have been exhausted. Gift and inheritance taxes should be used to complement a wage tax but not to erode the wealth of the wealthy, because a wealth tax accomplishes that goal more efficiently. There should be no VAT because a wage tax offers better opportunities to vary taxes by income level. Similarly, there should be no profits tax because capital is best taxed by an annual tax on the value of wealth, if society considers a tax on capital appropriate.

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Notes

1. Yitzhaki (1979) shows how the presence of collection costs affects recommendations on optimal taxation.
2. The concept of demoralisation cost was introduced in Michelman (1967).
3. Hines (1999) offers a detailed discussion of the history and the development of this measure of excess burden.
4. See Feldstein (2008) for a discussion and for empirical estimates of the magnitude of the behavioural response of consumers to various taxes.
5. See Saez, Slemrod and Giertz (2012) for a review of the literature on how taxable income varies with marginal tax rates.
6. Hines (2008) discusses some of the practical difficulties of measuring excess burden.
7. See Kotlikoff (2010) for a presentation of the case for 100 per cent reserve banking.