

# EMPIRICAL TAX POLICY ANALYSIS AND EVALUATION

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## Introduction

The main objective of our paper is to formulate an agenda for empirical tax policy analysis and evaluation. We will set the background for this by sketching a framework for how to approach empirical tax policy analysis in Sweden. Our idea is to present an agenda for tax analyses on the borderline between what is done in economic research and what is done by ministries of finance and other government bodies. The program is more of a way to organize our thoughts than to present novelties. There are many individual efforts in different areas of empirical tax policy analysis. But there is also a need to think about the overall picture. When doing this there is a lot to learn for empirical tax analysis from empirical labor economics. Our discussion is nearsighted in the sense that Swedish experiences and needs will very much be in the center.

The fundamental questions are: What do we need to know? What do we know? What do we have to find out?

On the way we will cite some of the available empirical and theoretical evidence. Our ambitions are, however, limited. We will by no means provide a complete survey.

Our starting point is the following: Suppose that the ambitions concerning public sector activities are given. This yields a public sector tax revenue requirement (including a possible budget surplus). When designing the tax system there are several policy *instruments* available. Some of the important instruments are:<sup>1</sup>

- tax rates
- bracket limits
- tax expenditures: exemptions, deductions, reductions, credits.

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The opinions expressed in this paper are our own and are not those of the authorities with which we are affiliated.

<sup>1</sup> We do not consider fiscal federalism issues here.

Tax rates are direct policy instruments while tax bases are both directly and indirectly affected by policy. Tax expenditures, for example, exemptions, affect the tax bases.

There are several, often conflicting, normative *criteria* for the tax design. As always, any normative statement will, of course, depend on the value judgments about what is socially desirable. The traditional Musgravian roles of the public sector are:

- *distribution*, in tax policy analysis, equity considerations are focused on the incidence of the tax burden,
- *efficiency*, the excess burden of taxation is the crucial efficiency issue in tax policy analysis, there also exist Pigouvian taxes which, contrary to other fiscal taxes, improve efficiency,
- *stabilization*, an important issue here is how well the taxes work as automatic stabilizers.

In the end there is no one else except the households that pay taxes. Either households pay taxes as wage earners and consumers or they pay in their role of final owners of capital. The question is how the tax burden is distributed among households. There is, however, not a one-to-one correspondence between Swedish tax revenue and Swedish households. Some of the Swedish tax revenues are paid by foreign households and some of the tax payments of Swedish households go abroad.

The more fiscal taxes affect the patterns of consumption and production, the more efficiency is reduced thus creating excess burdens of taxation. Taxes may also be levied to improve economic efficiency, so called Pigouvian taxes. This may, for example, concern taxes that make economic agents internalize environmental costs and negative externalities.

It is not, however, necessarily the case that fiscal taxes should be uniform in the sense that tax rates should be the same. The excess burden of a fiscal tax depends on demand and supply elasticities. If taxes do not affect incentives much, elasticities will be low. A low elasticity implies that the tax base is stable and the excess burden low.

There also exist several constraints that affect the possible tax design. Some of what we might call *taxation failures* are:

- tax rates usually affect tax bases
- tax competition between countries
- some goods and services are not possible to tax, for example, leisure and household production
- information costs, collection costs, enforceability
- social norms
- tax avoidance and tax evasion
- compliance costs of the tax payers

- political economy, interest groups
- international agreements.

This introduction, so far, suggests what we need to know. Our method in the paper is, first, to exploit the tension from our own differing experiences. This is the tension between the academics desire to simplify and the practitioner's wish to find useful help for actual tax design.<sup>2</sup>

Second, we will frequently refer to the recent report by the Official Swedish Government Committee on Tax Base Mobility, SOU 2002:47 (2002). This suggests what presently is on the political agenda in Sweden. The objective of this committee was to study how to design the Swedish tax system when the Swedish economy becomes more integrated with other economies. New technologies also affect tax design. In addition, demographic trends put new pressures on the tax system.

The proposals of the committee can be viewed as a follow-up to the major Swedish tax reform 1990/91. The main principles of the tax reform were to broaden the tax bases by removing deductions, exemptions, etc. and to make taxation more uniform. The possibilities of tax arbitrage were, therefore, reduced. This made it possible to reduce tax rates. Agell *et al.* (1996) presents the major aspects of the reform.

The paper is organized as follows: The paper continues with Section 1 where we present some stylized facts concerning taxes. The academics approach to tax analysis meets the discussion in SOU 2002:47 (2002) in Section 2. In Section 3 we present the practitioner's agenda for tax analysis. Section 4 concludes the paper by trying to find areas where the two approaches can be synthesized.

## 1. Some stylized facts

Table 1 reports the aggregate tax revenue in some OECD countries. As is clear from the table, Sweden had the highest total tax revenue as percentage of GDP in 2000. The share was more than 54 per cent. A high tax pressure in Sweden has been the case for several decades. It is, of course, a gigantic task to collect such a high share of GDP as tax revenue.<sup>3</sup>

The (unweighted) average aggregate tax share in the OECD was about 37 per cent in 2000, see Table 1. If we only focus on the EU countries, the corresponding average was almost 42 per cent. Still the Swedish tax pressure is considerably higher than the tax pressure in the other EU countries.

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<sup>2</sup> Kay (1990) contrasts the evolution of ideas concerning taxation with the evolution of policy.

<sup>3</sup> The tax revenue during a year may not, of course, measure the actual revenue requirements. There may exist deficits or surpluses. We will not, however, take this into account here. We also refrain from discussing other intertemporal issues.

**Table 1****Total Tax Revenue**  
(percent of GDP)

	1965	1985	2000
Sweden	35.0	48.5	54.2
Denmark	29.9	47.4	48.8
France	34.5	43.8	45.3
Germany	31.6	37.2	37.9
Italy	25.5	34.4	42.0
UK	30.4	37.7	37.4
USA	24.7	26.1	29.6
OECD, total	25.8	33.9	37.4
EU	27.9	38.8	41.5

Source. OECD Revenue Statistics.

It was a general trend that taxes increased during the Sixties, Seventies and Eighties. The picture is much more mixed during the last decades. The aggregate tax share increases in some countries whereas it stays more constant in others.<sup>4</sup>

It is, however, difficult to compare aggregate tax shares across countries. The political choices in Sweden to select transfers instead of deductions and make transfers taxable obviously inflate the aggregate tax share as compared to if deductions had been chosen instead. Still, even if adjustments are made to make countries more comparable, the Swedish aggregate tax share is among the highest, if not the highest.

GDP is the main tax base in the sense that flow-based taxes can be related to GDP. At the tax collection level of firms, the labor share of value added is subject to payroll taxes, whereas the capital share of value added (partly) is subject to corporate income taxation.<sup>5</sup> At the tax collection level of household, labor income and capital income are subject to income taxation. And, finally, at the tax collection level of final consumption, there are value added taxes (VAT).

<sup>4</sup> Kay (1990) argues that there is a trend towards more emphasis on transaction based taxes.

<sup>5</sup> Returns to borrowed capital are not taxed.

There exists important interrelationship between the aggregate tax share and GDP. Higher GDP usually increases the aggregate tax share because of, for example, tax progression.<sup>6</sup> There is also an extensive discussion in the economic literature whether a higher aggregate tax share reduces economic growth. Temple (1999), however, summarizes the literature by concluding that it is difficult to find such a link.

There is also a literature discussing a possible relationship between the aggregate tax share and stability in economic activity. Galí (1994) and Fatás and Mihov (2001) find such a link. A high aggregate tax share works as an automatic stabilizer. There is a positive relationship between the size of the public sector and the exposure to international trade. Rodrik (1998) finds evidence that governments reduce external risks.

Widmalm (2001) shows that the composition of the tax pressure is important. The proportion of tax revenue raised by taxes on personal income seems to have a negative effect on growth.

Table 2 shows the tax structure in the selected countries. Sweden is compared to the neighboring Denmark, the four largest European economies, and the US. More than half the tax revenue in Denmark is collected by personal income taxes. France, in contrast, collects less than 20 per cent of the revenue by personal income taxes.

The UK has the highest share of taxes on corporate income among the countries in Table 2. Germany and France is the country with the highest share collected by social security contributions and payroll taxes. Almost 40 per cent of the tax revenue in these countries comes from this source.

Property taxes constitute high shares of total revenue on both the UK and the US. Denmark is the country with the highest share of general consumption taxes, almost 20 per cent. The highest share of revenue from specific consumption taxes can be found in the UK.

Compared to the EU averages, Sweden has higher shares of personal income taxes and social security contributions/payroll taxes and lower shares on consumption taxes in any case.

There exist several attempts to calculate the tax revenue of different types taxes in relation to the tax bases for these taxes. This way we get measures of the average effective tax burdens. European Commission (2003) reports recent calculations for the EU countries.<sup>7</sup> The implicit tax rates are based on macro data on

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<sup>6</sup> Lindh and Ohlsson (2000) estimate the elasticity of Swedish central government revenue with respect to GDP to 1.3 within the current year run and to 2.5 within a two-year period. This means that central government revenue as share of GDP is increasing in GDP.

<sup>7</sup> Any calculation of this kind rests on a number of assumptions. See, for example, de Haan *et al.* (2003) for a discussion of the choices to make when calculating implicit tax rates.

**Table 2**

**Tax Revenue of Major Taxes (2000)**  
(percent of total tax revenue)

	personal income	corporate income	social security, payroll	property	general consump- tion	other consump- tion	other
Sweden	35.6	7.5	32.4	3.4	13.4	7.3	0.1
Denmark	52.6	4.9	5.0	3.3	19.6	12.9	1.4
France	18.0	7.0	38.4	6.8	16.9	8.9	3.8
Germany	25.3	4.8	39.0	2.3	18.4	9.8	0.0
Italy	25.7	7.5	28.5	4.2	15.8	12.7	5.6
UK	29.2	9.8	16.4	11.8	18.4	13.9	0.0
USA	42.4	8.5	23.3	10.1	7.4	8.3	0.0
OECD, total	26.0	9.7	25.8	5.4	18.3	13.2	2.5
EU	25.6	9.2	28.4	5.0	18.2	11.8	1.2

Source: OECD Revenue Statistics.

actual tax revenues and estimates of tax bases. Table 3 presents the average effective tax burdens for our selection of countries.

The implicit tax rate on labor is 37 per cent on (unweighted) average in the EU. Tax revenue is computed as the sum of personal income taxes, payroll taxes, and social security contributions of employees and employers raised on labor income. This is divided by the tax base computed as the total amount of compensation of employees in the economy.

The implicit average tax rate on labor in Sweden – 49 per cent – is the highest in the EU. This is almost twice the rate in the UK. The other countries in the table have implicit rates around 40 per cent.

The average effective tax burden on capital and business income is 24 per cent in Sweden. This is slightly higher than the (unweighted) EU average. In this case, the tax revenue is income earned from savings and investments by households and corporations whereas the tax base is the potentially taxable capital

**Table 3**

**Implicit Tax Rates (2001)**  
(average effective tax burdens)

	labor	capital:		consumption
		capital and business income	total	
Sweden	49.1	24.5*	34.5*	28.0
Denmark	41.5	17.6	30.2	33.0
France	43.3	22.0	39.1	21.9
Germany	39.9	18.4	22.6	19.1
Italy	41.6	21.7	28.3	16.7
UK	25.8	24.4	35.1	21.0
EU	37.3	21.0	29.5	23.3

\* 2000.

Source: European Commission (2003).

and business income according to the national accounts. The implicit rate in the UK is as high as that in Sweden while Germany has the lowest rate among the countries reported in the table.

Adding revenue from capital taxes related to stocks of capital from savings and investments previous years and transactions related to these stocks yields the total implicit tax rate on capital. The (unweighted) average tax burden on capital now increases to 30 per cent. The implicit rate in France increases by 17 percentage points.

Denmark has the highest implicit tax rate on consumption: 33 per cent. In this case the implicit rate is measured as taxes on transactions between final consumers and producers and on final consumption goods in relation to the tax base final consumption expenditure of households. The implicit rate in Sweden is lower than in Denmark, 28 per cent, but well above the (unweighted) EU average of 23 per cent. Italy has the lowest rate among the countries reported in the table.

The measured implicit rates are affected by, among other things, the extent of tax evasion. This is an important issue, see Schneider and Enste (2000). SOU

2002:47 (2002) estimates the Swedish revenue loss because of tax evasion to 4 per cent of GDP or 8 per cent of total tax revenue. According to the committee these shares are not increasing over time. The committee, however, points out four areas where internationalization and new technologies create problems for raising tax revenue because across the border activities:

- financial assets held abroad by households,
- VAT evasion by false exports,
- tax havens used by corporations,
- illegal imports of alcohol, tobacco, fuel.

To summarize, there are large variations in tax design across countries. The fact that we do not find convergence suggests that there is room for national tax policies.

It is, however, important to stress that the implicit tax rates and other measures of tax design reported in this section do not take behavioral effects into account. This means that the incidence of the different taxes is not captured. Tax incidence is the starting point for the following section.

## 2. The academic and the government report

We will start this section by presenting a simple model to illustrate how taxes on labor, capital, and consumption might affect behavior. With the help of the model we can identify the crucial factors determining the incidence of the taxes and the efficiency effects of the taxes.

*Incidence.* Suppose that firms have production technologies with constant returns to scale. In addition, let us assume that the markets for inputs and outputs are competitive. If markets are organized this way, firms will be price takers. Assuming Cobb-Douglas technology, we can write the relationship between input prices and output price as:

$$d \ln p_p = (1-\alpha) d \ln r_p + \alpha d \ln w_p \quad (1)$$

where  $p_p$  = producer price of output,  $r_p$  = producer price of capital input,  $w_p$  = producer price of labor input, and  $\alpha$  = the elasticity of output to labor input, which also equals the wage income share of value added.

The producer price of capital input will be related to a value tax on capital according to:

$$d \ln r_p = \frac{\eta_{kr}}{\varepsilon_{kr_p} + \eta_{kr}} \frac{r}{1-t_r} dt_r \quad (2)$$

where  $\eta_{kr}$  is the supply elasticity of capital with respect to the price of capital,  $\varepsilon_{krp}$  is the demand elasticity of capital with respect to the producer price of capital, and  $t_p$  is the value tax on capital.

Analogously, the producer price of labor input will be related to a value tax on labor according to:

$$d \ln w_p = \frac{\eta_{lw}}{\varepsilon_{lwp} + \eta_{lw}} \frac{w}{1 - t_w} dt_w \quad (3)$$

where  $\eta_{lw}$  is the supply elasticity of labor with respect to the price of labor (wage),  $\varepsilon_{lwp}$  is the demand elasticity of labor with respect to the producer price of labor, and  $t_p$  is the value tax on labor.

Finally, the consumer price of output will be related to a value tax on output according to:

$$d \ln p = \frac{\eta_{qpp}}{\varepsilon_{qp} + \eta_{qpp}} \frac{p}{1 - t_p} dt_p$$

where  $\eta_{qpp}$  is the supply elasticity of goods with respect to the producer price of goods,  $\varepsilon_{qp}$  is the demand elasticity of goods with respect to the consumer price of goods, and  $t_q$  is the value tax on goods. However, the assumption of constant returns to scale technology assumption implies that the supply is infinitely elastic with respect to the producer price,  $\eta_{qpp} \rightarrow \infty$ . The incidence of a tax on goods will, therefore, exclusively be on consumers according to:

$$d \ln p = \frac{P}{1 - t_p} dt_p \quad (4)$$

But the consumer price will also depend on the extent at which taxes on capital and labor will affect producer prices on capital and labor. Changes in these prices will be shifted forward on consumers of goods. Combining (1) – (4) yields a relationship between the consumer price of goods and all three taxes.

$$d \ln p = (1 - \alpha) \frac{\eta_{kr}}{\varepsilon_{krp} + \eta_{kr}} \frac{r}{1 - t_r} dt_r + \alpha \frac{\eta_{lw}}{\varepsilon_{lwp} + \eta_{lw}} \frac{w}{1 - t_w} dt_w + \frac{P}{1 - t_p} dt_p \quad (5)$$

From (5) it is clear that the tax incidence on goods consumers depends on demand and supply elasticities, and on the output elasticity.

*Efficiency.* Economists prefer taxes on fixed tax bases on efficiency grounds. The efficiency comes from the fact that the tax is unavoidable. The reason why economists like them is exactly why people hate them.

There is a tension between the proponents of uniform taxation and the proponents of optimal taxation. It is claimed that uniform taxes counteract special interests and reduces tax avoidance.

Suppose that we study a household with the budget constraint:

$$wl = pq + s \quad (6)$$

where  $w$  = wage rate,  $l$  = hours worked,  $p$  = price vector,  $q$  = consumption vector, and  $s$  = savings. We also assume that the household has no capital income.

Now suppose that savings are unaffected by taxes on labor and consumption. In addition suppose that goods supply and labor demand are perfectly elastic ( $\eta_{qp} \rightarrow \infty$  and  $\epsilon_{lw_p} \rightarrow \infty$ ). A proportional labor income tax ( $t_w$ ) is then equivalent to a uniform consumption tax ( $t_p$ ).

Can uniform taxation be optimal? Suppose, in addition, that there are no effects of taxes on the time allocation of the household. This means that the supply of labor and the demand for leisure are not affected by taxes, ( $\eta_{lw} = 0$ ). The budget constraint can be rewritten to:

$$wT = pq + s + wl \quad (7)$$

where  $T$  = total time and  $l$  = leisure. A proportional labor income tax remains equivalent to a uniform consumption tax. But in addition a uniform consumption tax is optimal in this case. If the tax bases total time, leisure, and savings are unaffected by taxes, any taxes on these bases will, therefore, be of lump-sum character. But uniform consumption taxes will also be of lump-sum character and, therefore, optimal.

## 2.1 Personal income taxes

Starting with personal income taxes we will now use this framework to discuss the actual Swedish tax system and present the suggestions in SOU 2002:47 (2002). For each type of tax we will discuss incidence (burden), efficiency (excess burden), and automatic stabilization.

### 2.1.1 Labor income

The labor supply in a country is affected by the number of inhabitants (and, therefore, migration), labor force participation, and the number of hours supplied by each worker. It is the wage bill, not the number of hours, which is the base for labor income taxation.

The conventional wisdom is that the incidence is on labor supply in the short and the long run. Labor demand is assumed to be perfectly elastic. The sensitivity of the tax base will, therefore, depend on the (uncompensated) labor supply elasticity.

Note that even if the supply effects are small, excess burden may be large as it depends on the compensated labor supply elasticity.

Fuchs *et al.* (1998) reports survey evidence of economists' beliefs about different key parameters and values. The uncompensated (*i.e.* Marshallian) elasticity of labor supply for men aged 25-54 is on average 0.10 according to this study. They report the uncompensated (*i.e.* Marshallian) elasticity of labor supply for women aged 25-54 to be 0.45. This is considerably higher than for men. Fuchs *et al.* (1998) also reports compensated (*i.e.* Hicksian) labor supply elasticities. For men aged 25-54 the number reported is 0.22. They report the compensated (*i.e.* Hicksian) elasticity of labor supply for women aged 25-54 to be 0.59.

The labor income tax system in Sweden has two brackets; 31 per cent and 55 per cent for incomes above a bracket limit. This tax is collected at source. It is problematic to split the income of self-employed between labor income and capital income.

SOU 2002:47 (2002) discusses migration and participation but says very little about the supply of hours. The committee suggests that the ceilings in the social security system should be increased. This will increase the actuarial element of the social security system. The incentives to participate in the labor force will be strengthened this way. It is an application of the benefit principle of taxation. The committee, however, writes that the tax rate in the upper bracket of the labor income tax system should be decreased if possible.

### 2.1.2 Capital income

The conventional wisdom is that the incidence is on capital supply (savings). The internationally determined interest rate will result in a perfectly elastic capital demand. The sensitivity of the tax base will, therefore, depend on the capital supply (savings) elasticity. Note that even if the supply effects are small, excess burden may be large.

Suppose that all capital income taxes were replaced by a wage tax yielding as much tax revenue. Which would the effects be?<sup>8</sup> Fuchs *et al.* (1998) reports an estimated of 0.35 percentage point increase in the average GDP growth rate over the next ten years.

Sweden has uniform capital income taxation except for unrealized capital gains and tax deferred pension savings. This tax is collected at source except for realized capital gains. The rate is 30 per cent.

SOU 2002:47 (2002) suggests that the system with tax deferred pensions savings shall be removed.

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<sup>8</sup> Bernheim (2002) is a recent survey discussing the effects of capital income taxation on total savings. The effects of capital income taxation are surveyed by Poterba (2002).

## 2.2 Corporate income taxes

The conventional wisdom is that the incidence is on capital demand (investment). In a small open economy the rate of return requirement is internationally determined. This is equivalent to a perfectly elastic capital supply. The sensitivity of the tax base will, therefore, depend on the capital demand (investment) elasticity. Note that even if the demand effects are small, excess burden may be large.

Suppose that firms were allowed to write off capital investment immediately and that this was compensated by an increase in the corporate income tax rate yielding the same tax revenue as before. According to Fuchs *et al.* (1998), economists believe that this would give an 11.7 percentage increase in investment in plant and equipment over the next five years. According to the same source the percentage of the current corporate income tax in the United States that is ultimately borne by capital is 41.3 per cent.

The corporation income tax rate in Sweden is 28 per cent. It is collected ex post.

SOU 2002:47 (2002) suggests that Sweden prepares to decrease the rate to 25 per cent. The reduction shall only be put in effect if key European countries reduce their rates. The committee also proposes that the possibilities for firms to put profits in periodization funds shall be removed.

## 2.3 Social security and payroll taxes

The conventional wisdom is that the incidence is shared in the short run but on labor supply in the long run. This is equivalent to a perfectly elastic labor demand in the long run. The sensitivity of the tax base will, therefore, depend on the (uncompensated) labor supply elasticity in the long run. Note that even if the supply effects are small, excess burden may be large.

Fuchs *et al.* (1998) reports a number of 25.6 per cent as the percentage of payroll taxes that is borne by employers in the long run. They also report a total wage elasticity of labor demand of  $-0.63$ , and an output-constant wage elasticity of labor demand of  $-0.42$ .

The social security and payroll tax rate (mark-up) in Sweden is ca. 34 per cent.<sup>9</sup> It is collected at source.

Payroll taxes are reduced for small firms up to a wage bill corresponding to about EUR 100,000. SOU 2002:47 (2002) suggests that this reduction shall be removed.

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<sup>9</sup> In addition, there are contribution to pension systems, etc., based on the wage bill decided by collective agreements between employers and employees.

## 2.4 Property taxes

Sweden taxes net wealth, property, inheritances, and *inter vivos* gifts. The Swedish net wealth tax is inconsistent and regressive. Not all assets are included, the most rich are exempt.

SOU 2002:47 (2002) suggests that the tax base should be broadened and the rates reduced. If this is not possible, the net wealth tax should be removed. The committee also suggests that the inheritance and gift taxes should be removed for within-family transfers.

## 2.5 Consumption taxes

### 2.5.1 General consumption taxes

The Swedish value added tax rate (mark-up) is 25 per cent. The VAT is collected at source. The VAT rate can be changed during the fiscal year. Lower VAT rates are applied for food, books, etc. The reductions make the Swedish system one of the least effective VAT systems; see van den Noord and Heady (2001).

SOU 2002:47 (2002) suggests that the VAT base should be broadened, the lower rates removed, and the normal rate reduced.

### 2.5.2 Specific commodity taxes

Some of the specific commodity taxes are the taxes on:

- emissions,
- energy,
- fuels,
- alcohol,
- tobacco.

Most taxes have whole or parts of value added as their bases. Some commodity taxes differ from this as also input use in production (intermediate goods) are affected. Are fiscal taxes on production (input use) more distortive than taxes on consumption? Productive efficiency is desirable even in second best situations, see Diamond and Mirrlees (1971a,b).

Fuchs *et al.* (1998) report the compensated (*i.e.*, Hicksian) price elasticity of demand for gasoline in the United States over a horizon of two to five years to be  $-0.53$ .

Peat, firewood, and garbage are exempt from fuel taxation. SOU 2002:47 (2002) suggests that taxation of fuels should be made uniform. The committee also suggest that tax rates on alcohol should be reduced as it will become possible for

households to bring much larger quantities alcohol to Sweden from abroad. New technologies may make road charges more feasible.

Recently the Official Government Committee on Energy Taxation in the Business Sector published the report SOU 2003:38 (2003). The objective of the suggested tax changes is to conform to the rules within the EU.

### **3. The practitioner**

#### *3.1 Efficiency vs. distribution, political economy*

In a country with ambitious welfare policies, it is necessary to find a reasonable tradeoff between efficiency and distribution. But this presupposes knowledge about the effects of different taxes on the income distribution. Initial focus should primarily be on the static distribution of tax payments. The issue is the different taxes contribution to the existing income distribution.

But it can also be of interest to look at the distribution of excess burdens that arises because of marginal increases of different taxes. Also the efficiency properties of the tax system need to be further illuminated. The principle of uniform taxation was a cornerstone of the Swedish tax reform 1990/91. The objective was to minimize the efficiency losses of the tax system. A uniform tax system will, however, maximize efficiency only under certain conditions. It is an important task to find out if these conditions apply.

The political system is continuously exposed to different interest groups' demands for special treatment and exemptions. To promote a tax system with so few distorting effects as possible, it is necessary to have more empirical knowledge about the effects of different types of special treatments. It may, for example, concerns cost-benefit analyses of tax expenditures of different types.

#### *3.2 Behavioural effects – demand and supply elasticities*

There is a great need of empirical estimations of demand and supply elasticities. This concerns consumption demand and labor supply as well as firms' investments. The estimates can provide a crucial basis for analyses of the effects of different types of taxes and changes in taxes. It would be important to build a model for repeated estimations of consumption demand elasticities.

Regarding labor supply we lack knowledge about the differences in wage elasticities, and, therefore, effects of tax increases, for different groups – age groups, income groups, ethnic groups, etc.

A special issue in this context is how the labor supply is affected by changes in consumption taxes. According to theory it does not matter if labor taxes are levied on income, on consumption, or the employer's wage bill provided that savings are unaffected. Empirical results also show that these taxes in the long run are shifted

onto wages in similar ways. But how are the incentives affected? Do increased consumption taxes only imply that the average tax rate increases? Or does the marginal tax rate also increase? This is probably very much an empirical question. The answer varies between different groups and different types of consumption taxes.

On the production side we need to know more about the price elasticities of factor demand – both own and cross elasticities. This concerns, in particular, the demand for energy and the relationship between this demand and labor demand.

### 3.3 *Tax avoidance and tax evasion*

In the discussion it is assumed that the problem with tax evasion, in the form of working off the books, could be limited by tax decreases that reduce the tax wedge between the labor costs for employers and the take-home pay of employees. This argument is also supported by theory. Empirical evidence on the importance of the tax wedge for the extent of working off the books is, however, lacking.

Suppose that there existed estimations of the extent of working off the books in different industries. It would then be possible to study the relationship between the size of the tax wedge and the extent of working off the books. With such estimations it would also be possible to study the importance of other factors. How important are, for example, the ceilings in the social security system? This could be analyzed by studying if annual incomes corresponding to the benefit ceilings are more frequent in occupations where working off the books is common.

Another crucial question is the tax evasion problems associated with different VAT rates. How important are these problems empirically?

## 4. **The synthesis: concluding remarks**

There are large variations in tax design across countries. The lack of convergence suggests that there is room for national tax policies.

When designing a tax system the objectives of equity, efficiency, and stabilization have to be balanced against each other. In Sweden, there are three important areas where there are permanent needs to learn more all the time. These are the effects of taxes on household and firm behavior, the effects of taxes on income distribution, and the effects of taxes on tax evasion and tax avoidance.

First, there is a need for continuously updated empirical estimations, using micro data, of households' and firms' behavior.

For households this concerns consumption demand, factor supply, savings, and time use. The empirical studies may focus on, for example:

- estimation of expenditure systems, own and cross price elasticities,

- cross effects of factor prices on consumer demand,
- cross effects of consumption prices on factor supply,
- estimation of time use system.

For firms it is important to learn more about technology, returns to scale, dynamic factor demand, and investment.

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