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Elements of income tax evasion and avoidance in Denmark

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Summary

■ Increasing internationalisation may challenge national tax systems in various ways, adding to the pressure on traditional tax bases. This paper examines mechanisms of evasion and avoidance that erode income tax bases. Special emphasis is placed on migration out of (and into) Denmark, but we also attempt to gauge in broad terms whether evasion is more important for income than consumption taxation.

As concerning migration, patterns of migration out of and into Denmark during the years 1993 to 1999 are analysed. During this period, around 14,000 Danish citizens aged 17 to 62 years have emigrated annually. About 75 per cent of these have returned to Denmark after six years. At the same time, about 9,000 people have immigrated into Denmark from the OECD area each year; because these people have a lower return propensity than emigrating Danes, the net annual migration deficit is only about 500 people. It is concluded that the current migration patterns do not seem to threaten the Danish income tax base.

As for income tax evasion, using an indirect method, we find that an amount of income in the order of 20 to 40 billion DKK (around 2-4 per cent of GDP) is missing during the years 1995-97. Though the figures should be interpreted very cautiously because of data problems, this amount suggests that income is especially vulnerable to tax evasion in Denmark, as compared to consumption.■

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In the coming years, it can be expected that there will be an increased pressure on the financing of the welfare state. One important reason for this is demographic change which, in the absence of reforms, will lead to a heavier tax burden. Another challenge is growing internationalisation, which may threaten some of the existing tax bases. However, the adjustment to pressures from abroad is not a new issue in Denmark. For example, there have been a number of adjustments during the last 15 years of company taxation and excise taxes on various goods which are sensitive to cross-border shopping, precisely in response to such pressures. Future developments may make further changes necessary, though.

This paper is a spin-off of the report "Danish Economy Spring 2001" from the Danish Economic Council, where the external and internal challenges to the Danish tax system were analysed. The analysis identified taxes which seem to be particularly distortionary today, or which can be expected to come under strong pressure in future. Conversely, other taxes were identified which should play a relatively stronger role in the tax system than today. In the present paper, we focus on elements of income tax avoidance and evasion in Denmark.

The paper is structured as follows. First, we briefly characterize the Danish tax system (Section 1) before introducing several types of tax avoidance mechanisms (Sections 2 and 3). Then we look more thoroughly into the question of whether tax evasion is especially serious for income taxation (as compared to consumption taxation) (Section 4), and whether migration constitutes a problem for income taxation (Sections 5 and 6). Finally, Section 7 concludes.

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1. The Danish tax system

Until 1987, the Danish income tax followed the global income tax principle, which aims at treating all kinds of income equally in the tax assessment. In particular, no distinction was made between personal labour income and personal capital income. Since 1987, however, the Danish income tax system can be characterized as a variant of the Nordic principle of dual income taxation. In its pure version, the dual income tax subjects labour income to a progressive tax, whereas personal capital income is taxed proportionally at a rate which is equal to the lowest rate of labour income taxation (and typically to the corporation tax rate as well). Sørensen (1994) summarizes various advantages of a dual income tax system and outlines the original transition of the Nordic countries to versions of this system. Nielsen and Sørensen (1997) present an efficiency argument in favour of the dual principle.

The Danish system differs from a pure dual system in various ways. Labour income is taxed progressively, but personal positive net capital income is taxed progressively as well, albeit at lower rates than labour income. Negative net capital income will be taxed proportionally at a rate of about 33 per cent from 2002, when the latest tax reform from 1998 has been fully implemented. This is lower than the lowest labour tax rate (which will effectively be 44.3 per cent in 2002) and slightly higher than the present corporate tax rate of 30 per cent.

One of the complications caused by a dual system is the treatment of income from unincorporated (personally owned) firms. This income must be divided into a component taxed as labour income and a component taxed as capital income, and there exist various schemes for doing this, which imply calculating an imputed capital income on the basis of the equity of the firm.

During the last 30 years, the corporation tax rate has shown large variations, first increasing and then decreasing. It reached its peak during the years 1985-89, when the rate was 50 per cent. Since then, Denmark has followed the general trend of successively lowering the statutory tax rate (down to 30 per cent as from 2001) and, at the same time, broadening the tax base, especially by reducing depreciation allowances.

Concerning indirect taxes, Denmark has a high comprehensive VAT rate of 25 per cent, and excise taxes are likewise relatively high in an international context.

The development of the overall tax burden in Denmark since 1970, as compared to other countries, can be seen in Table 1. During the whole period, Denmark has maintained a large tax burden, and with 50.6 per cent of GDP, it is only second to Sweden in the OECD area in 1999. During the observed period, the burden of taxation has increased by about 9 percentage points, mainly during the first half of the period. The same development has taken place in most other OECD countries, with the United States and the United Kingdom as the most spectacular exceptions. It should be noted that international comparisons of this kind must always be interpreted with caution because of differences in tax structures and in the way income transfers are treated in the tax system, among other things. For example, different traditions of giving social benefits as tax-free or taxable amounts, or indirectly as tax deductions, will affect the measured tax burdens considerably.

Table 1. Total taxes as percentage of gross domestic product in selected OECD countries

	1970	1975	1980	1985	1990	1995	1999
Denmark	40.4	41.3	45.4	48.9	47.1	49.4	50.6
Austria	34.9	37.7	40.3	42.4	41.0	42.4	44.3
Finland	32.5	37.7	36.9	40.8	44.9	45.2	46.5
France	35.1	36.9	41.7	44.5	43.0	44.0	46.0
Germany	32.9	36.0	38.2	38.1	36.7	38.5	37.7
Netherlands	37.1	43.2	45.2	44.1	44.6	42.0	40.3
Norway	34.9	39.9	42.7	43.3	41.8	41.5	41.8
Sweden	39.8	43.4	48.8	50.0	55.6	47.9	52.1
UK	37.0	35.4	35.1	37.5	36.3	35.2	36.6
US[a]	28.1	27.5	27.6	26.9	27.6	28.8	28.9
Japan	19.7	20.9	25.4	27.6	30.9	28.4	27.7
EU	31.2	34.0	36.9	39.8	39.6	40.5	41.6
OECD	29.6	31.7	33.4	35.3	35.9	37.0	37.9

Note: [a] Latest figure is from 1998.
Source: OECD (2000).

Table 2 describes the composition of tax revenue in Denmark and elsewhere. From the table, it can be seen that personal income taxes account for a considerably larger share of GDP than in all other countries. On the other hand, the Danish tax system is characterized by mandatory labour market contributions and subscriptions making

up only a very small part of the total tax revenue. If the two columns are added to get a broader measure of the tax burden on personal income, Denmark is still high on the list, but now on a level comparable with countries like Germany and Finland, whereas Sweden has a higher income taxation. Concerning indirect taxes, Denmark has the heaviest tax burden of all countries with 17.3 per cent of GDP. Taxes on wealth and real property, however, are a little lower than in most other OECD countries. Measured as a share of total tax revenue, this difference would be even more pronounced.

Table 2. Tax type revenues as a percentage of the gross domestic product 1998

	Personal income taxes	Other income and profits taxes, etc.	Labour market contributions and subscriptions	Taxes on wealth, real property, etc.	Indirect taxes
Denmark	25.7	3.7	1.6	1.7	17.3
Austria	10.0	3.0	15.1	0.9	15.3
Belgium	14.1	3.9	14.5	1.4	12.0
Finland	14.9	4.2	11.6	1.0	14.3
France	7.8	2.7	16.4	3.1	15.2
Germany	9.0	1.6	14.6	1.1	12.2
Italy	10.7	3.3	12.5	1.7	14.5
Netherlands	6.6	4.6	17.3	2.4	12.5
Norway	11.9	4.2	10.2	1.5	15.8
Sweden	18.2	2.9	14.9	2.1	13.9
UK	10.2	4.1	6.5	4.1	12.2
US	11.7	2.6	6.9	3.4	4.3
Japan	5.3	3.8	10.9	3.1	5.3
EU	11.3	3.7	11.5	1.9	13.5
OEC.-D	10.6	3.6	10.3	2.0	12.1

Source: OECD (2000).

An alternative way of measuring the tax burden of different factors uses the method developed by Mendoza et al. (1994). This method divides total tax revenues into taxes on consumption, labour, and capital. The three corresponding tax bases are defined in a parallel way, i.e. total consumption, labour income and capital income (pre-tax). By dividing each amount of revenue with the corresponding tax base, the average effective tax burden is found. The European Com-

mission did this for the year 1999 for the EU countries, the United States and Japan, cf. Table 3. From the table, it can be seen again that Denmark has a very high tax burden on consumption—the highest of all countries, with about 30 per cent. Denmark also has a high effective tax rate with respect to capital income as defined by the Commission (with 28 per cent only surpassed by Luxembourg and the UK). Concerning labour income, Sweden has the highest tax burden; Denmark is in second place together with Germany and Belgium. Again, the figures in the table should be treated with caution, not least because the split between labour and capital income is a difficult one, and there is no obviously correct way of doing it.

Table 3. Effective tax rates 1999 (per cent)

	Effective tax rate on labour	Effective tax rate on capital	Effective tax rate on consumption
Denmark	44.5	28.0	30.5
Austria	40.6	18.8	23.4
Belgium	44.8	23.7	20.5
Finland	43.3	24.1	24.5
France	42.4	22.6	24.5
Germany	44.0	15.9	17.9
Greece	29.3	19.5	20.0
Ireland	24.2	20.8	24.8
Italy	35.8	26.2	22.9
Luxembourg	31.0	34.0	25.7
Netherlands	36.9	25.1	19.5
Portugal	27.8	24.6	22.7
Spain	29.9	18.5	17.7
Sweden	51.3	27.9	28.0
UK	25.2	35.1	18.2
EU	37.6	23.6	20.8
US	23.9	22.7	9.3
Japan	20.3	18.7	13.6

Source: European Commission (2000).

2. Tax avoidance mechanisms

Tax avoidance (and evasion) mechanisms can be international or domestic. International tax avoidance and evasion exploit the economy's links with foreign countries and affect both consumption taxation, labour income taxation, and the taxation of capital income.

One tax avoidance mechanism in Denmark is cross-border shopping. Denmark reduced the excise taxes on a number of goods before 1993 in order to avoid an unacceptable level of cross-border shopping, particularly at the German border. In general, these adjustments seem to have been adequate, as there was only a moderate net tax revenue loss of around DKK two billion in 2001, equivalent to 0.3 per cent of the total Danish tax revenue. This is the net result of a deficit towards Germany and a surplus towards Sweden and Norway (see Ministry of Taxation, 2002). However, the Danish exemption from the removal of quantity restrictions on personal importation of spirits and cigarettes (the so-called 24-hour rule) expires by the end of 2003. According to the Ministry of Taxation it will, at that time, be beneficial for Denmark to reduce the duties on these goods as both the revenue loss and the overall distortions will then likely decrease.[1]

Migration could reduce the labour income tax base. However, the tax loss for a given net outflow of persons will depend crucially on the type of migration. If the migration is temporary, the loss of tax revenue is likely to be small and could even be converted into a gain, as the migrants can be expected to return with useful skills. An examination of the potential net loss of tax revenue due to migration out of and into Denmark is carried out in more detail in Sections 5 and 6.

Another channel of tax avoidance is tax-driven international capital movements. Capital is normally supposed to be a very mobile factor of production and consequently, rather sensitive to tax changes. When discussing the impact of company taxation upon the behaviour of firms, statutory company tax rates are only part of the story. It is important to clarify the nature of tax competition and distinguish three types of effects: the influence of taxes upon the localization of firms, their influence upon the investment expenditures of existing firms, and their influence upon the geographical placement of the in-

[1] The Ministry of Taxation in Denmark, 2002, finds that lowering the excise taxes on spirits and cigarettes (by 45 and 20 percent, respectively) will reduce the additional loss of revenue upon the expiration of the Danish exemptions from DKK 1.4 to 1.1 billion. According to the Ministry, lowering the excise duties in this situation will also decrease the overall level of distortions as the reduction in resources spent on cross-border shopping and the lower distortion in consumption from lower prices outweigh (by approximately DKK 1.5 billion) the increased costs related to medical treatment, loss of working effort, traffic accidents etc.

come of multinational companies. These decisions are influenced by different aspects of the tax system.

The localization of firms is influenced by the average effective tax rate, defined as that part of a company's income, including pure profits, that will be paid in the form of corporate taxes (see Devereux and Griffith, 1998; and Chennels and Griffith, 1997). The average effective tax is a complex function of the statutory tax rate, depreciation allowances, inflation compensation rules, etc., as well as the ability of the firm in question to generate a supranormal profit. For existing companies deciding upon the size of new investments, the marginal effective tax—which is another complex function of tax rules—is decisive, whereas the statutory tax rate alone is decisive for the allocation of company profits between different subsidiaries of a multinational firm.

Turning from business income to personal capital income, the tighter integration of international capital markets offers further tax avoidance mechanisms. It is not difficult to avoid domestic taxation of interest income by moving funds abroad rather than placing them in domestic financial institutions, as banks in many countries have no obligation to report the earned interest income to the domestic tax authorities, let alone foreign authorities. The end result therefore is that cross-border interest flows may escape taxation altogether.

3. Income shifting

One important channel of tax avoidance is income shifting: the transformation of income from one category to another in order to achieve lower taxation (or no taxation at all) of the amount in question. Income shifting is often found to be a serious problem, and the tax system of any country should take account of the risk of losing tax revenue through this mechanism.

Income shifting can be national as well as international. An example of national income shifting is the re-declaration of labour income to capital income. For instance, a person who is the main shareholder in a company where he, at the same time, works as the general manager, could pay himself only a modest salary and leave the remaining income in the company, from where it could later be paid out as dividends or capital gains when the associated equity is sold. Conversely, if the corporate tax rates increase relative to the personal tax rates, income shifting may lead to an increase in reported personal income

and a drop in reported corporate income. Gordon and Slemrod (1998) provide evidence of such income shifting. Anyhow, a tax system in which labour income is taxed differently from income from other sources provides incentives for income shifting of this kind.

A typical channel of international income shifting is the manipulation of transfer prices between entities of multinational companies. One entity may sell goods and services cheap to foreign entities, in this way transforming income which is generated in one country into official income in another. Transfer pricing is a very important aspect of internationalisation; it is estimated that between 30 and 50 per cent of all international transactions take place between dependent companies and parties (cf. Gam et al., 2000). A number of empirical studies document the use of transfer prices for income shifting purposes. See, for example, Grubert (1997) and Bartelsman and Beetsma (2000).

A supplementary channel is debt shifting: A multinational company can reallocate its debt from a low-tax country to a high-tax country to benefit from the more valuable interest deduction in the latter country, and internal debt arrangements within the multinational company can attempt to employ non-market interest rates to exploit the tax-induced advantages further. Jog and Tang (2001) document an increase in debt-to-asset ratios of foreign-controlled companies in Canada from 1984 to 1994, following tax reforms in Canada and the United States, indicating that the observed debt shifting may be tax-driven. To prevent such arrangements, some countries have rules to prevent tax avoidance through "thin capitalization" (a very high debt-asset ratio).[2]

The channels of income shifting are generally very difficult to follow. Consequently, it is hard to obtain a good direct measure of the amounts of income that are being shifted in various ways. In Denmark, there has recently been some discussion of the likely extent of abuse of transfer prices to shift multinational income out of the country. On the one hand, it has been observed that the Danish affiliates of many multinational companies (such as oil companies) declare rather low taxable incomes year after year. Further, a special unit in the Danish Central Customs and Tax Administration, created in 1998 to subject transfer pricing to greater scrutiny, has reportedly enabled an upward adjustment of the sum of taxes paid by companies in-

[2] Companies may also engage in debt shifting within federations, such as between states or provinces with different corporate income tax rates. Mintz and Smart (2001) provide evidence of debt shifting between Canadian provinces.

spected of more than a billion DKK. On the other hand, the Ministry of Taxation estimates that the net effect on taxable company incomes from transfer pricing does not exceed 5 billion DKK a year (see Ministry of Taxation, 2001).

4. Is income taxation especially vulnerable to evasion?

In simple theoretical models of taxation, there is an exact relation between the tax bases for a (labour) income tax and a consumption tax. There is still a relation between the two bases, even when both income and consumption taxes are subject to avoidance and evasion. Since the two types of tax are, to some degree, equivalent (broadly, labour income can be taxed either when earned or when consumed), an interesting question concerns the appropriate weighting of income and consumption taxes in the tax system.

This theme has been dealt with in Gordon and Nielsen (1997). They compute the optimal weights of income and consumption taxes in a simple model of tax evasion in an open economy. They also suggest a method for computing whether tax authorities are able to register the income that seems to be generated in a country and ought to be taxed there, using the relation between income and consumption tax bases. Stated a bit differently, the method sheds light on whether income taxation is more sensitive to evasion than is consumption taxation.

Using their method, they calculated that about 15 billion DKK of income (net) were missing in Denmark in 1992, corresponding to about 1.75 per cent of GDP. The same method (slightly modified) has been used by the Danish Economic Council (2001a) to obtain figures for the years 1995-97.

To understand the idea of the method, it is instructive to observe the following national accounts identity:

$$Y_w + Y_r = C + G + I + \Delta F \qquad (1)$$

where Y_w is wage income, Y_r capital income, C private consumption, G government consumption, I investments, and ΔF is the change in the net foreign debt. After subtracting investment on both sides in the

equation, the left-hand side becomes an income tax base,[3] and the right-hand side becomes a consumption tax base (the sum of private and public consumption) plus a correction term for the change in the net foreign debt:

$$Y_w + Y_r - I = C + G + \Delta F \qquad (2)$$

calculate both sides of (2) independently of each other. Assuming that there are no errors and omissions in the underlying data material, the two numbers will be identical when no tax evasion is taking place. Further, the two numbers would also tend to be identical if the only source of tax evasion were activities in the underground economy, since such transactions typically imply evasion of both labour income and consumption taxes.[4] Consequently, the observed actual difference between the two figures points towards a difference between tax evasion of income on the one hand and tax evasion of consumption on the other. Such a difference could be due to simple labour income tax evasion (erroneous or non-reporting of income earned). It could also stem from individuals storing assets in, e.g., foreign banks and not informing the domestic authorities about income from such sources. As the Ministry of Taxation (2001) has pointed out, it is less clear whether international income shifting would show up in the difference.

Calculations for 1995-97 are presented in more detail in Table 4[5], and the numbers in brackets in this section refer to the corresponding line of Table 4. To arrive at a figure for the left-hand side of equation 2, we use data for wage incomes from the Ministry of Taxation [1]. Because the financial sector does not pay VAT, however, we want to exempt this sector from our calculations altogether. Hence, the wages of the financial sector (from the National Accounts) are deducted [2]. The cash flow tax base plus investments from private companies are added to this number. These figures come from two sources: For most companies, the tax authorities provide data [3]. For some sectors, however (mainly primary sector and utilities), these data do not

[3] In a closed economy, the left-hand side in this case would equal the sum of labour income of individuals plus the cash-flow tax base of firms in the economy.
[4] For further discussion see Gordon and Nielsen (1997).
[5] A thorough account of the calculations and the various data sources used is presented in Danish Economic Council (2001b).

exist. In these cases, national accounts figures have been used instead [4]. Services from the financial to other sectors (from input-output tables) [5] must be added and production taxes (net of subsidies) must be subtracted [6]. Finally, fixed gross investments (from the National Accounts: Total gross fixed investments minus investments in the residential, government and financial sectors) are subtracted [7] to arrive at the figures in line 8.

From tax authorities, the actual Danish VAT tax base is known [9], from which should be subtracted all excise taxes that are part of this base [10]. An estimated tax base of sectors which are currently VAT exempt (except for the financial sector) is added [11]. Likewise, the part of government consumption which is not already in the official VAT tax base is added [12], and the consumption of foreigners in Denmark is subtracted from the national accounts [13]. (To find foreign consumption in Denmark net of taxes, figures from the European Commission for the average effective Danish consumption tax rate for the corresponding year are used.) This results in the figure for the total consumption tax base in line 14.

Finally, some corrections for transactions between Denmark and the rest of the world must be made. To the consumption tax base we add figures from the Danish central bank (Danmarks Nationalbank) for the net income of foreign assets (which is a negative number, 15) and the net acquisition of foreign assets [16]. We also add to this tax base an estimated amount of the consumption taxes paid abroad by Danes purchasing goods there, minus the corresponding amount of taxes paid by foreigners in Denmark [17], and subtract from the tax base the total expenditure on goods abroad by Danes (before taxes) [18].

Subtracting the income tax base from the consumption tax base corrected in this way, we arrive at the figure in line 20 which amounts to a deficit in all three years. This deficit lies between DKK 20 and 40 billion (between 1.8 and 3.6 per cent of GDP). In the end, it is the result of two different kinds of phenomena: 1) A *difference* between the errors and omissions in data on each side in the general equation (income tax base = consumption tax base plus correction terms for foreign activities); and 2) A *difference* in tax evasion for each tax base.

Table 4. Danish income shifting internationally 1995-97 (Billion DKK)

		1995	1996	1997
1	Total wage incomes	517.9	542.1	575.3
2	Minus wages in the financial sector	24.5	25.0	25.3
3	Plus cash-flow and investments, covered sectors	145.2	140.1	155.5
4	Plus cash-flow and investments, remaining sectors	64.5	73.6	73.8
5	Plus services from financial sector	15.6	16.8	18.8
6	Minus production taxes net of subsidies	-0.4	0.6	-1.7
7	minus fixed gross investments	137.9	134.5	152.6
8	= total income tax base	**581.2**	**612.5**	**645.3**
9	Actual Danish VAT base	381.5	404.6	425.4
10	Minus excise taxes	37.6	41.8	44.2
11	Plus estimated VAT base in VAT-exempt sectors	23.9	25.4	2.7
12	Plus VAT base of public expenditures	191.9	219.7	236.9
13	Minus consumption of foreigners in Denmark. net of taxes	12.5	11.8	12.3
14	= total consumption tax base	**547.2**	**596.1**	**632.8**
15	Net income from foreign assets	-9.7	-32.9	-32.6
16	Plus net acquisition of foreign assets	-11.8	-6.6	9.7
17	Plus consumption tax paid by Danes abroad (net of consumption taxes paid by foreigners in Denmark)	3.4	3.5	3.4
18	Minus Danish consumption expenditure abroad, net of taxes	19.7	19.7	22.6
19	= Total correction term	**-57.8**	**-55.7**	**-42.1**
20	Missing Danish income (= 14 + 19 - 8)	**23.8**	**39.3**	**29.6**

The exact size of the individual figures in Table 4 should be taken with considerable caution because of the uncertain data on which they are based. Clearly, the reliability of the statistical information used can be questioned; one major problem is that data come from several different sources which are not necessarily mutually consistent. The main principle has been to exclusively use primary data from tax authorities as far as this is possible. However, in a number of cases, it has been necessary to supplement with figures taken mainly from Na-

tional Accounting data from Statistics Denmark and data on cross-border capital flows from the Danish central bank[6].

Nevertheless, the table indicates that perhaps Danish individuals and/or companies earn a rather large income which escapes taxation in Denmark each year. Note again that activities in the shadow economy will generally not affect the calculations in Table 4, because activities of this kind normally equally diminish the declared income tax base and the consumption tax base.[7]

As already mentioned, one of the sources of this untaxed income could be simple under- or non-reporting of labour income of Danish citizens. Another source could be the returns from unregistered placements of capital abroad. Individuals can place financial capital in foreign financial institutions, so that it is impossible (or very difficult) for the national tax authorities to acquire information about the interest payments on this capital. Several countries (among them Austria, Luxembourg and Switzerland) allow their financial institutions to refuse to give information on the interest income of their customers. Unless the investors themselves inform their local tax authorities, these have no possibility of taxing capital income of this kind. However, it is very difficult to assess the amount of interest income from passive investments which escapes taxation in Denmark in this way.

To the extent that the income tax system really has such leakages, one may contemplate changes in its structure, including the weighting of income and consumption taxes in the system. But another conclusion from the exercise above is that it is important to study the magnitudes in the computation in Table 4 in more detail to derive a more certain assessment of the amounts of income that evade taxation.

5. Patterns of migration out of and into Denmark

We next move the focus to income tax avoidance by means of migration. The question we ask is: Has migration out of and into Denmark

[6] For comparison, the discrepancy between the current payments and capital transfers to and from abroad reported by Statistics Denmark and the external financial transactions reported by Danmarks Nationalbank amounted to absolute values between DKK 6 and 20 billion during the same three years.

[7] Gordon and Nielsen (1997) show that the desirable weights of (labour) income and consumption taxes in the tax system are not influenced by the extent of activities in the underground economy, provided that underground transactions imply an evasion of both labour income and consumption taxes. We do not know of any empirical examinations of this question.

in the 1990s been a severe problem for Danish tax collection? In answering this question, we are looking at the personal income tax base only. That is, we are not explicitly dealing with side effects on e.g. corporate income, which could be expected to be affected by an outflow of skilled labour. Also it is clear that emigration reduces public expenditures to education, health services, etc. From the viewpoint of financing the welfare state, the relevant figure for migration is hence the loss of tax revenue net of public expenditures saved.[8]

There is a sharp distinction between temporary and permanent migration as they affect the personal income tax base very differently. Permanent migration, especially by young people, can potentially be very damaging to the home country, whereas temporary migration could even increase tax revenue in a longer time perspective by offsetting the initial loss in the period of migration through a possibly higher personal income after the return to the home country, due to the acquisition of additional qualifications.

The flows of emigration of Danish citizens have been volatile in the last twenty-five years, whereas the proportions of return migration have changed only slightly over time (Table 5). Emigration is known to be negatively affected by the growth rate of GDP which reflects the prospect of employment and income (Pedersen, 1996). This also appears from the table as Denmark was severely hit by the first oil crisis and also experienced low activity in the late 1980s after a stint with contractionary fiscal policy. In the mid and late 1990s, there has been a small increase in the emigration of Danish citizens in a period when the Danish economy has experienced relatively high growth rates. This could be an indication of a growing emigration problem. However, the analysis in the following will indicate that the emigration of *adults* out of Denmark has been stable in the 1990s.[9]

Interestingly, the vast majority of migration is temporary. For example, three out of four return to Denmark within a period of six years. It is also clear from Table 5 that the share of temporary migration has, in general, been increasing in the period, although there may have been a small decrease since the mid 1990s.

[8] To pursue the issue of financing the welfare state, we use gross income accruing from labour and capital, but do not include public transfers.

[9] The analysis does not include the years 2000 and 2001, where an increase in the emigration of Danish adults has probably occurred, in line with the information in Table 5.

Table 5. Emigration and return migration of Danish citizens

Emigration		Accumulated return migration, within			
Year	Flow (no. persons)	1 yr. (%)	2 yrs. (%)	6 yrs. (%)	10+ yrs.[a] (%)
1973	16963	30.0	43.1	66.8	77.4
1974	25330	27.8	43.1	66.4	77.4
1975	25783	31.8	41.9	68.2	78.4
1976	17370	29.4	45.7	68.4	79.6
1977	15335	28.7	44.5	67.8	79.7
1978	15729	27.9	44.4	67.7	80.5
1979	16211	29.1	43.1	67.6	79.8
1980	17792	29.2	43.5	67.7	79.2
1981	18404	29.6	44.6	69.2	79.3
1982	17771	31.4	45.0	70.3	80.7
1983	16629	31.9	47.5	70.5	80.9
1984	16655	31.6	48.4	70.6	80.8
1985	17369	32.6	48.2	70.3	80.3
1986	19319	32.1	48.1	70.7	80.0
1987	19623	31.1	48.1	69.8	78.9
1988	23538	32.7	47.1	72.1	79.8
1989	25171	33.0	49.1	72.9	79.0
1990	23294	35.2	50.4	74.4	80.1
1991	21995	35.2	52.1	74.9	•
1992	22479	36.3	52.9	75.7	•
1993	22279	36.9	54.5	75.9	•
1994	23729	38.0	55.4	75.8	•
1995	23429	37.0	53.5	•	•
1996	24249	34.2	50.2	•	•
1997	24229	33.7	49.9	•	•
1998	24586	33.4	49.6	•	•
1999	25014	33.3	•	•	•
2000	26772	•	•	•	•
2001	26688	•			

Notes: Emigration is defined by the number of reports to the national register. This includes migration with a few months duration; hence, the same person can, in principle, appear more than once per year. [a] Within 10+ years means having returned in year 2000.
Source: Statistics Denmark (2001, 2002).

In the following, we narrow down the definition of emigrants to persons of 17-62 years of age at the time of emigration who do not return in a given calendar year. Therefore, the same person can only appear once in the same year. For these reasons, the number of emigrants is smaller than the figures reported in Table 5. We have used

panel data for 1992-99 based on a 10 per cent sample of the Danish population.

In the 1990s, there has been a relatively constant annual emigration of around 14,000 adult Danes, which is equivalent to 0.45 per cent of the population in the relevant age category. The pattern of emigration did not change much in this period. Around 75 per cent of the Danish emigrants were in their twenties or thirties and more than half had no qualifying education; but only lower or upper secondary school as their highest education or the status as students.

Table 6. The level of education of Danish emigrants (per cent)

Level of education	1993	1994	1995	1996	1997	1998	1999
Lower secondary school	12.6	12.9	16.3	16.5	11.8	12.9	11.1
Upper secondary school	18.7	20.7	18.4	17.0	19.3	17.8	18.0
Students, non-long educ.	15.0	12.9	12.2	10.9	12.3	11.9	12.0
Students, long education	8.2	8.7	10.3	9.8	11.1	9.1	9.8
Skilled worker	23.3	22.3	21.1	22.7	19.7	22.5	24.6
Short further education	4.2	4.2	3.9	4.0	4.2	4.2	3.6
Medium further education	8.9	9.5	9.2	10.3	10.0	10.8	9.3
Long further education	9.3	8.9	8.6	8.9	11.6	10.8	11.7
Total	100	100	100	100	100	100	100
Total no of pers.	13450	14200	14000	13900	14050	14550	13800

Note: The level of education is defined as the highest level of education passed or on-going education. Only Danish citizens from 17 to 62 years are included. The status of education is as reported during the year before emigration. Therefore, students could have finished their education by the time of emigration. Short, Medium, and Long further education are defined as less than 3 years (Short), 3 years to less than 5 years (Medium), and at least 5 years (Long) of further education.
Source: Statistics Denmark; own calculations.

There are large differences in the propensity to emigrate among different educational groups. Persons who have a long further education are nearly three times as likely to emigrate as the average of other people. Their propensity to emigrate has been rather stable in the period. This reflects the fact that the rising fraction of persons with a long education among emigrants in Table 6 is simply due to an increasing level of education in the period for the population as a whole.

Interestingly, the return migration pattern is almost independent of the level of education. Around 70 per cent of the persons with a qualifying education (or only a lower secondary school background) have returned to Denmark within six years after emigration. Persons

with an upper secondary education and students (non-long education) were significantly different, as more than 85 per cent returned within six years. However, this group consists of young people who in general are more likely to return and also spend less time abroad, typically just a single year.

What is the relevant size of the annual net loss of Danish citizens? As we do not know the return pattern in the 1990s for a longer perspective than six years for those emigrating in the early 1990s, we have to make a few assumptions. We make a very rough estimate by postulating that people who have not returned to Denmark within six years constitute a permanent loss, whereas those who did return within six years do not. So roughly speaking, there is an annual loss of 3,500 Danish citizens (25 per cent of the 14,000 emigrants).

In the same period, there has been a slight increase in the number of people coming to Denmark from other OECD countries (excluding immigrants from Turkey, Mexico and South Korea), reaching 9,000 people in the late 1990s. These people tend to stay in Denmark "permanently" to a larger extent than Danes stay abroad. The return migration pattern at the beginning of the 1990s among OECD immigrants indicates that more than 3,000 are expected to stay "permanently" in Denmark. The overall net outflow of Danes and people from OECD is thus seen to be less than 500 people per year, due to the relatively high return rates among Danes in particular. However, immigrants from OECD countries typically have an income in Denmark that is smaller than that of Danes who emigrated, but the differences in income are not large.[10] We have not looked at the educational status of immigrants from other OECD countries. This type of data has very recently become more reliable and hence ought to be used in this area of research in the future.

Johansson (2001) finds that the emigration out of Sweden in 1998 is associated with a revenue loss (net of public expenses) of 0.64 pct. of GDP. This might be considered a substantial loss; however, the calculation does not take into account the benefits for Sweden from OECD immigrants. The overall revenue loss in Sweden from the net flows of migration could therefore be considerably lower, as our analysis suggests to be the case in Denmark.

[10] We decided to focus on immigrants from OECD countries, as their motives for emigration could be expected to be similar to the motives of emigrating Danes. Immigrants coming from outside OECD earn a much lower income even two years after their immigration.

6. Analysis of factors behind migration

We use a logit estimation in order to uncover the factors that are important in explaining who decides to emigrate. The most decisive socio-economic factors for emigration in 1999 were the levels of education, income, age and family status.

A higher level of education clearly has a positive effect on the probability to emigrate (Table 7). Hence, persons with a long education have the highest propensity to emigrate.[11] Persons with an upper secondary education are also relatively likely to emigrate, and so are students going for a long education.

Generally, a higher level of income is positively correlated with the probability of emigration. Especially those with an income above DKK 400,000 (EUR 54,000) have a much higher probability of emigration than those with an intermediate income of DKK 150,000-250,000. Interestingly, however, also people with a low income are more prone to emigrate. These are typically unemployed persons (income is measured excluding public transfers). This pattern seems to be confirmed by the negative correlation between working experience and the propensity to emigrate.

Persons above 40 years of age and especially those above 50 have a much lower propensity to go abroad than their younger fellow citizens. Those most prone to emigrate are persons aged 25 to 39. Not surprisingly, singles without children are much more mobile than couples and singles with children.

When comparing emigration propensities in 1999 with those of 1993, it is interesting to note that the importance of long education and high income seems to have declined slightly through the 1990s. Moreover, emigrants in 1999 were older than those in 1993, where the very young persons aged less than 25 had the highest probability of emigration.

[11] We have looked for differences with respect to emigration among different types of long educations; in particular, we were interested in the group of scientists and engineers, but did not find any significant heterogeneity.

Table 7. Logit regression on the probability of emigration among Danish citizens

Characteristics	Emigration in 1993	Emigration in 1999
Lower secondary school	-0.30**	-0.36**
Upper secondary school	0.72**	0.64**
Students, long education	0.67**	0.55**
Short further education	0.65**	0.32**
Medium further education	1.14**	0.73**
Long further education	1.60**	1.19**
No partner and with children	-0.93**	-0.87**
Partner	-1.05**	-0.97**
Woman	0.30**	0.00
17-19 years	0	-0.79**
20-24 years	0	-0.39**
30-39 years	-0.24**	-0.17**
40-49 years	-1.05**	-0.73**
50-62 years	-1.44**	-1.20**
Income < DKK 50,000	0.63**	0.56**
Income > DKK 50,000 and < DKK 150,000	0.45**	0.39**
Income > DKK 250,000 and < DKK 400,000	0.61**	0.43**
Income > DKK 400,000	1.31**	1.08**
Self-employed	-0.43**	-0.43**
0-5 years of working experience	0.35**	0.59**
10-15 years of working experience	-0.25**	-0.35**
At least 15 years of working experience	-0.38**	-0.65**
Intercept	-5.39**	-5.09**

Notes: A positive coefficient means that the variable increases the probability of emigration. The benchmark person in the regression is 25-29 years old, a skilled worker, with no partner and without children, man, employee, having an income of DKK 150-250,000 and 5-10 years of working experience. The coefficients to these characteristics are zero by default. ** (*) means that the variable is significant at a 5 per cent (10 per cent) level of significance. A "0" reflects the fact that the variable is insignificant at a 10 per cent level of significance. Income is given as the sum of gross labour and capital income, excluding public transfers.
Sources: Statistics Denmark; own calculations.

In searching for the factors that can explain temporary versus permanent migration, we use a logit estimation of the probability of returning within six years among those persons who emigrated in 1993. The return pattern is very homogeneous compared to the emi-

gration pattern.[12] The level of education has no significant effect on the propensity to return to Denmark; there is no difference between persons with further educations, lower secondary education or skilled workers. However, persons with an upper secondary education and students (non-long education) have a higher return propensity (Table 8). Not surprisingly, what really makes a difference is that very young people are extremely prone to return. Those who had a high income before they emigrated are more likely to stay abroad permanently, as are persons with a very low income. Finally, persons who had a partner at the time of emigration return more frequently than those who were single.

Table 8. Logit regression on the probability of returning among emigrants in 1993

Characteristics	Return migration
Upper secondary school	0.51**
Students, non-long education	0.66**
Partner	0.35**
17-19 years	2.28**
20-24 years	1.07**
Income < DKK 50,000	-1.14**
Income > DKK 50,000 and < DKK 150,000	-0.70**
Income > DKK 400,000	-1.15**
Intercept	0.94**

Notes: A positive coefficient means that the variable increases the probability of returning (temporary migration). The benchmark person in the regression is 25-29 years old, a skilled worker, with no partner and without children, man, employee, having an income of DKK 150-250,000 and 5-10 years of working experience. The coefficients to these characteristics are zero by default.
Sources: Statistics Denmark; own calculations.

One economic explanation of temporary migration is that return migration is associated with a positive income premium. The rationale for this lies in qualifications obtained abroad which are of relevance to the labour market in the home country. We find such a positive income premium, as emigrants in 1993 who returned in 1998 at the latest earned a higher income in 1999 (compared to their 1992 in-

[12] The regression on return migration has less power than the logit estimation of the probability of emigration, as we can only include observations for migrants (1345 persons in 1993 in the 10 per cent sample). Therefore, more variables will tend to be insignificant.

come) than they would have if they had stayed in Denmark in the first place. In an OLS wage regression, migration was seen to increase income by 0.5 per cent per year abroad as compared to 0.15 per cent from another year of working experience in Denmark. Hence, the net income premium per year associated with return migration is approximately 0.35 per cent. This result is similar for men and women. However, it differs across educational groups. Well-educated people (medium or long further education) were found to have a lower income premium compared to those with no further education or a lower level of education.[13]

We have not dealt explicitly with the problem of selection bias. This will clearly be a problem if there are common factors determining the level of income and whether to emigrate (and whether to return). Naturally, unobserved personal characteristics like entrepreneurship, talent for innovation etc. are important in determining the income level. It could be that the same factors are also affecting the decision to emigrate, in which case the estimates of the income premium will be too large. The result that well-educated people have a lower income premium from return migration could partly be explained by the fact that this group is probably more homogeneous with respect to unobserved personal characteristics than is the group of people with no or lower further education.

All in all, the analysis shows that the net outflow from Denmark is very moderate (less than 500 people when disregarding immigration from non-OECD countries), and it does not seem to pose any threat to the Danish tax revenue, even though immigrants from other OECD countries have a lower income in Denmark than Danish emigrants. This is partly due to the positive income premium from temporary migration which, to some extent, offsets the initial loss from emigration.

The ongoing process of internationalisation can be expected to reduce the barriers to emigration stemming from differences in language and culture and thereby increase the mobility of labour. If this increases net migration out of Denmark, it will be important to know what causes migration. Naturally, we cannot answer this question on the basis of correlations between migration propensities and socio-

[13] Johansson (2001) points out that a general increase in the level of productivity by ten per cent after the point of return (independently of the time stayed abroad) would lower the net revenue loss from Swedish emigration from 0.64 per cent to 0.27 per cent.

economic characteristics. Many personal and economic factors affect such a profound and complicated decision as whether to emigrate. Among the economic factors, the average effective tax rate on labour income should be of some importance along with the level of the gross wage, the cost of living, services of the welfare state etc., as compared to the possible country of destination. Our estimates show that income (above a certain level) affects the degree of emigration (both temporary and permanent) positively. However, one must be cautious in interpreting this as saying that there is a negative relation between income taxes and emigration. Estimating migration elasticity with respect to the taxation of labour income is a very complex matter. If data were harmonized internationally, one could obtain information about what people are doing while they are abroad. Ideally, such harmonized data would provide information on wage differentials, tax differentials etc. on an individual level and so form the basis for an econometric investigation of the economic factors behind migration.

7. Conclusions

The external pressure on the Danish tax system manifests itself in several different ways. Many of the potential mechanisms were touched upon in this paper, and one received particular attention, namely income tax avoidance through migration. In addition, we looked at the question whether income taxation may be especially vulnerable to tax evasion (as compared to consumption taxation).

The number of emigrated Danish citizens aged 17 to 62 years has been quite stable around 14,000 persons during the observed period. Likewise, the emigration pattern with respect to educational background and income brackets has barely changed in the period. The tendency to emigrate is highest for highly educated persons and persons with a high income. However, only about 30 per cent of the people from these groups who emigrate are still abroad after six years (the corresponding number for all Danish emigrants is 25 per cent). Moreover, Danes who do return home earn a higher income than similar groups who remain in Denmark during the same period, probably due to the fact that they have relatively improved their qualifications while staying abroad.

During the same period, there has been a small rise in the immigration of foreigners from OECD countries. At the end of the 1990s,

about 9,000 persons aged 17 to 62 years emigrated from these countries each year. This yields an immediate migration deficit of 5.000 people each year between Danish citizens and non-Danish OECD citizens, but after six years, this deficit has been reduced to less than 500 persons, the reason being that Danes are more likely to return to their original home country than are persons moving to Denmark from the rest of OECD. However, non-Danish OECD citizens in Denmark typically have a lower income than the emigrated Danes had before their emigration, although the differences are not large. Altogether, it can be concluded that the current migration patterns do not seem to threaten the Danish income tax base.

An indirect measure of income tax evasion was found by comparing the size of the reported income tax base of the economy with a corresponding reported consumption tax base, correcting for, chiefly, reported changes in net foreign debt. With no errors and omissions in the underlying data and no evasion of income taxation, the two tax bases should be equal. During the years 1995-97, however, they differed by an amount between 20 and 40 billion DKK. Making reservations for data inaccuracies, this amount may indicate underreporting of labour income and returns to unreported portfolio investments abroad by Danish residents, etc.

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