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THE INCREASED REVENUE FROM FINNISH CORPORATE INCOME TAX IN THE 1990s

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Abstract: In 2000, revenues from corporate income tax (CIT) in Finland were seven times higher than in 1994. We decompose the aggregate development of CIT revenues in a number of ways in order to establish what aspects of corporate taxation changed. We present the average effective tax rate for corporations as calculated from micro data. We also describe the development of CIT revenues using distributional analysis and the decomposition of the aggregate growth rate.

Our analysis suggests that the substantial increase in CIT revenues was not related to any concurrent change in the Finnish corporate tax system. This phenomenon can be ascribed to a few large corporations, that have domicile in Finland. We also find that exceptional increase in the profits of large Finnish corporations explain much of the increase in CIT revenues. Finland can be seen as a case study since CIT revenues also increased in some other European countries in the 1990s.

Key words: Tax revenue, corporate taxation, tax competition

Tiivistelmä: Yhteisöverojen tuotto oli Suomessa vuonna 2000 seitsenkertainen vuoteen 1994 nähden. Tässä tutkimuksessa tarkastellaan aggregaattikehitystä eri tavoin, jotta saadaan selville mikä yhteisöverotuksen osa-alue on vaikuttanut kokonaiskehitykseen. Tutkimuksessa esitellään yritysten keskimääräinen efektiivinen veroaste laskettuna mikrodatasta. Yhteisöverotuoton kehittymistä kuvaillaan myös summajakauman ja yritysverojen kokonaiskasvuasteen dekomponoinnin avulla. Tutkimuksen pohjalta päätellään, että mikään samanaikainen muutos veroasteessa ei aiheuttanut merkittävää yhteisöverotulojen kasvua. Sen sijaan ilmiö johtuu suurimmista yrityksistä, noin viidestäkymmenestä yrityksestä, joiden kotipaikka on Suomessa. Suuri osa ylimääräisestä verotulojen kasvusta selittyy yhtä suurella yritysten voittojen kasvulla. Suomen voi nähdä tapaustutkimuksena, joka selvittää muissakin maissa havaittavan kohonneiden yhteisöverojen tuottojen taustaa.

Asiasanat: Verotuotto, yhteisövero, verokilpailu

Contents

1. Introduction

The overall statutory tax rate for companies has decreased steadily in most OECD countries over the last four decades. Average effective tax rates have also fallen. Although one would expect that revenues from corporate taxes would also decrease in such an environment, they have in fact remained fairly stable. In many European countries since 1990, corporation tax revenues as a share of total taxation have increased significantly (Devereux and Sørensen 2006). This pattern is even more evident in Finland. Revenues from Finnish corporate income taxes (CIT) were seven times higher in 2000 than in 1994.

The aim of this study is to understand what determines revenues from CIT. We concentrate mainly on Finland in the period 1994–2003. Although the phenomenon of increased CIT revenues is common to many OECD countries, there are not many studies on the factors that have contributed to this development. Devereux et al. (2004) try to explain the increased CIT revenues in the UK in terms of increased effective tax rates for corporations. It turns out that the base-broadening measures in the UK have not totally offset the reductions in statutory tax rates. Some sectors have increased their share of CIT more substantially than others, especially the financial sector. They claim that at least a partial explanation for the increased CIT revenues might be the increased profitability of firms. The analysis is aggregated at the national and sector level.

Devereux et al. (2002) focus on the international development of corporate taxes. They present a descriptive analysis of tax rates and a comparative measurement of taxes across countries, which they then try to fit to theories about international tax competition. They put forward two primary reasons for the falling tax rates across the OECD countries; income shifting and attracting multinational firms. The former explanation means that governments have lowered the corporate tax rates to attract mobile profits of corporations. The latter explains increased Foreign Direct Investment (FDIs) by decreased effective marginal tax rates. As becomes evident later in this study, neither explanation sits well with recent Finnish development.

The implied explanation offered in the studies into increased CIT revenues is that international tax competition has made it necessary to set capital and CIT rates at lower levels. To compensate this governments have at the same time broadened the tax base. The reasoning continues by claiming that the new tax system has stimulated growth and increased the profits of corporations. Thus tax revenues have expanded. Another strand of literature dealing with the tax competition is the profit-shifting argument. Countries with lower statutory capital tax rates encourage international corporations to report their profits in these countries. Multinational companies can do this through subsidiaries that operate in the destination country. Huizinga and Laeven (2006) present calculations that show

Finland as a potential receiver of profits of multinational corporations. This would of course increase Finland's CIT revenues.

Other explanations of what determines CIT revenues in the literature stress the behavioural effect of taxation. Tax competition is one kind of behavioural element, but profit-shifting in particular explains the accounting practices of corporations more than their actual investment and production decisions. Clausing (2007) conducted a systematic study of the effects of tax rates on tax revenues. She decomposes the effects of taxes into direct and indirect effects and then estimates the significance of various effects using aggregate data for OECD countries over the period from 1979 to 2002. She finds an inverse U-shaped curve relating tax rates and corporate tax revenues. This means that at an existing low level of tax rates it is possible to increase corporate tax revenues by increasing the tax rate, and vice versa for high tax rates. The level of tax rates is considered either high or low by comparison with other countries or regions.

One feature of the behavioural effects of a tax system is the elasticity of taxable income to the marginal tax rate. Gruber and Rauh (2005) investigate this area and use longitudinal data for publicly traded firms in the US. They argue that the corporate tax base is negatively elastic in respect of the marginal effective tax rate, their central estimated elasticity value being -0.2. While the question and analysis in that study is certainly interesting and relevant to the present study, it leaves room for future research in terms of data quality.
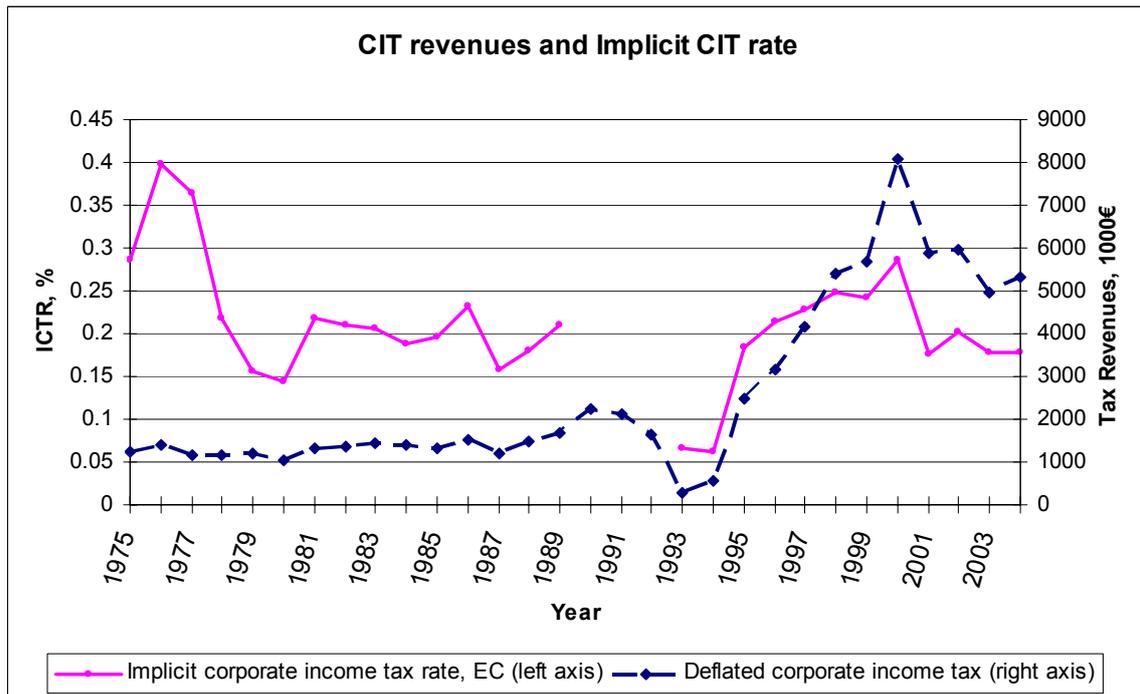
Figure 1[1]
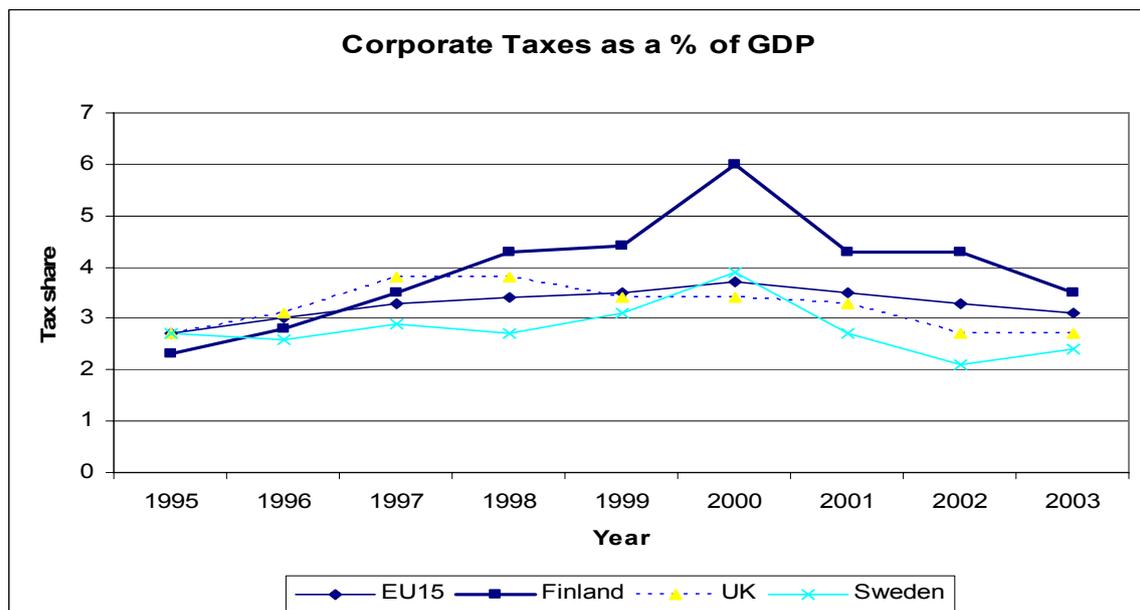
Figure 2

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[1] The Implicit Corporate Tax Rate is calculated according to formulas of European Commission (EC) 2005. The aggregate data from corporate income tax revenues as well as other variables needed in calculations came from Statistics Finland. There is brake in the Implicit tax rate curve because due to depreciation in Finland the data was not reliable for the beginning of 1990s. The data from year 1990 backwards may suffer from some shortfalls. CIT revenues are in prices of year 2003.

While corporate taxation may certainly have behavioural effects on corporations, it is possible that their behaviour changes for other reasons as well. Increased competition means that capital must be more effective, for instance. Kyyrä and Maliranta (2006) study the change in factor income shares in Finland. Their results show that factor income shares changed to the benefit of capital in Finland in the 1990s. This is another possible reason why CIT revenues have increased. Furthermore, if increased CIT revenues have been caused by a change in factor income, the phenomenon may be more persistent than when caused by a fluctuating business cycle.

The present study considers Finnish CIT revenues. The trend in CIT revenues over the longer term along with the implicit CIT tax rate can be seen in Figure 1. Revenues have indeed increased quite dramatically in the 1990s. Note that the implicit CIT rate has a similar shape to the actual CIT revenue curve, especially in the 1990s. This indicates that increased implicit tax rates may partly reflect increased revenues, not the other way round (Devereux et al. 2002).

To put CIT revenues in a European context, we present Finnish and some European CIT revenues as a share of GDP (Figure 2). CIT as a share of total taxation gives a similar picture (EC, 2005). Finland increased its share of CIT more than the EU on average or neighbouring Sweden, which experienced similar economic trends to Finland in the 1990s. This makes Finland an interesting subject for a case study.

In Chapter 2 we present empirical facts concerning Finnish legislation and economic developments affecting the CIT. We present descriptive results from micro-level data in Chapter 3. They indicate that the substantial increase in CIT revenues was not due to concurrent changes in the tax system; Finland's average effective corporate tax rate as calculated from our micro-level data did not change in any significant way over our period. Thus based on our analysis the direct effect of taxation can probably be ruled out as being the cause of increased CIT revenues.

We present distributional analysis of CIT revenues and positive operating margin in Chapter 4. These statistics show that the aggregate development for the top 0.5 per cent of corporations explains most of the extraordinary increase in CIT revenues. This is our main result, since it shows us what kind of corporations have influenced the above average increase of Finnish CIT revenues.

Chapter 5 captures other aspects relating to what type of corporations have contributed to the increased aggregate growth rate in CIT revenues. Here we apply a decomposition of the aggregate change rate of tax revenues. This method can show whether the aggregate development is due to structural change or growth common to all corporations. Chapter 6 gives a brief summary and concludes the analysis.

2. Important Events in Finland Prior to 1994

There were fundamental economic and institutional changes in Finland at the end of the 1980s and in the beginning of the 1990s. In some studies these developments are offered as an explanation for the subsequent economic growth, although usually one institutional change is offered as an explanation, neglecting other institutional changes taking place at the same time. Here we detail the important events in the tax system, institutions and in the economy, because all of these can be seen as affecting later developments.

2.1 Corporate Taxation

There were significant changes in corporate and capital taxation between 1989 and 1993. The last significant tax reform was in 1993, when a dual income tax (DIT) system was introduced in Finland. The aim of all these reforms was to lower the statutory tax rate and broaden the tax base. Prior to the reform the tax system distorted the behaviour of companies and was not neutral between sectors. Companies retained earnings and used debt to finance their operations. The new system was seen as being more neutral and companies were encouraged to show profits from which they then paid more tax than before (Myhrman et al. 1995).

The statutory income tax rate for corporations at the end of the 1980s was 60 per cent. However, the effective average tax rate in the same period was less than 20 per cent (Myhrman et al. 1995). The large difference was due to the narrow tax base, since significant reserves could be deducted from profits before taxes were paid. The system introduced in 1993 meant that the CIT rate was 25 per cent and the effective tax rate was much closer to this level than before reforms. The importance of reserves was thus diminished.

The corporate tax rate has remained fairly stable since 1993. The rate was 25 per cent in 1993-95, 28 per cent in 1996-99 and was raised further to 29 per cent in 2000. From 1993 to 2004 there have not been any substantial base-broadening measures either (Hietala and Kari 2006).

2.2 Economic Conditions

The most noticeable event in the Finnish economy during the period under scrutiny was the recession of 1990-93. There are many theories and studies that attempt to explain what caused the recession (Kiander 2004). The international economic downturn, the collapse of the Soviet Union and with it bilateral trade, high interest rates and perhaps less than ideal political decisions. These were all

elements that turned what would have been a normal economic downturn, into a severe recession.

There was an international economic boom at the end of the 1980s. Economic growth was also strong in Finland, but it was debt-financed. The end of the 1980s could be described as a bubble. The problems began in 1990 when international interest rates started to rise. The Finnish markka was fixed to other European currencies in the EMU. With high inflation, a collapse in exports to the Soviet Union and high demand for imports, the current account deficit widened. The Bank of Finland tried to fend off the growing pressure to devalue the currency by raising short term interest rates to a very high level. High interest rates were a serious negative shock to the overly indebted private sector. Total output started to fall, interest rates remain high and asset prices gradually collapsed (Kiander and Vartia 1996).

In 1991 the Bank of Finland was forced to devalue the currency by more than 10 percentage points and later allowed it to float, causing the currency to devalue by an additional 30 percentage points. Because there was no longer any need to keep short-term interest rates at a high level, the central bank lowered them significantly. The export sector naturally benefited from a lower exchange rate once the currency was floating. Thus exports soon started to increase rapidly. Economic growth was very much export-driven, whereas the domestic sector was more subdued due to low demand. Exports increased until 2000. Part of the success was due to the rapidly growing ICT sector. The domestic part of the Finnish economy regained its 1990 level in real terms by 1999 (Kiander 2004). Maybe because the domestic sector was subdued for so long, it continued to grow after 2000 when the international ICT boom experienced a downturn.

2.3 Institutional Changes

There were also other institutional changes in the beginning of the 1990s in addition to the corporate tax reforms. One was the liberalisation of the financial markets that started in the 1980s and was completed in the first half of the 1990s. The other was the gradual abolition of the laws forbidding foreign ownership in Finland in 1991 and 1992. These laws prevented foreigners from owning capital and real estate in Finland.

After the worst of the recession in the mid-1990s, Finnish firms grew rapidly, but were still undervalued by foreign standards, hence, there was rapid growth in portfolio investment by foreigners. Direct investments in Finland were also increasing, but at a much lower rate (Ylä-Anttila, Ali-Yrkkö and Nyberg 2004). Finnish companies were internationalising at a quick pace, but most of this took place through mergers and acquisitions, so that ownership partly remained in Finnish hands. Towards the end of the decade many Finnish companies had

foreign owners but their domicile remained in Finland (Ali-Yrkkö and Ylä-Anttila 2002). This meant that they continued to pay corporate taxes in Finland. It is also thought that with foreign owners Finnish firms gained better access to international funding and consumer markets, and this has helped exporting firms grow still faster.

There was a structural change in Finnish industrial production and a shift from resource-based to skills-based exports. One visible aspect of this change was that Finnish firms entered the ICT sector in the beginning of the 1990s. Towards the end of the decade the ICT sector had become one of the largest sectors in Finland (Kiander 2004).

3.   Descriptive Micro-level Analysis

In this section we present aggregate statistics along with the effective average tax rate. The purpose is to describe how variables relating to CIT revenues have developed over time. We will also be able to show that concurrent changes in the effective tax rate do not explain the increase in CIT revenues.

The data set used in this study contains financial statements for all Finnish corporations from 1994 to 2003. It has been collected from the registers of the Finnish Tax Administration. There are from about 100,000 to 200,000 yearly observations, but only 60,000 to 80,000 yearly observations have non-missing values in relevant variables.

In Figure 3 five variables aggregated to the national level are presented: 1) CIT revenues, 2) Operating margin, 3) Extraordinary income, 4) Financial income minus expenses and 5) Depreciations[2]. These series are presented in the prices for 2003. The values for year 1999 are missing from the data for Extraordinary income, Depreciations and Net financial income. Taxable income is not presented in the Figure because the tax treatment of corporations has remained fairly stable over the period. Tax revenues are just a share of taxable income. The development of these same variables aggregated to the level of certain selected sectors is presented in Appendix 1. The general rules of the tax system are presented in Appendix 1.

The Operating margin curve reflects how the profitability and turnover of corporations have changed over the period considered. In particular it is interesting to see whether Operating margin has changed in line with tax revenues. It is worth noting that Operating margin can have both positive and negative values, whereas corporations generally do not pay taxes when they have negative revenues.

Extraordinary income is thought to capture one-off profits that corporations may have, for example from selling a subsidiary company. They are not closely related to the long-term trend of the behaviour of corporations. In Figure 3 we see that in 2001, when Corporate tax revenues started to decline, Extraordinary income declined also, whereas Operating margin did not.

Depreciations follow invariant rules, so they should not fluctuate greatly over time. From Figure 4 it is evident that aggregated Depreciations indeed develop quite steadily over time.

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[2] Some variables do not develop smoothly over time, which is explained by some single transactions by large multinational corporations (Statistics Finland 2001).

Finally Financial net income is added to Operating margin when determining Taxable income. It should be noted though, that under the Finnish tax system foreign dividends were exempted from tax (OECD, 1991). The total level of Financial net income was negative in the beginning of our period, as can be seen from Figure 4. This indicates that corporations paid more interest on debt than they had profits from financial items.

The development in selected sectors is presented in Figures 12 and 13 and in the Appendix 1. Overall it seems that CIT revenues develop proportionally to Operating margin. The peak in the international boom around 2000 is seen in the Operating margin of Manufacturing of electronics, Pulp and paper, Transport and communication and Financial intermediation.
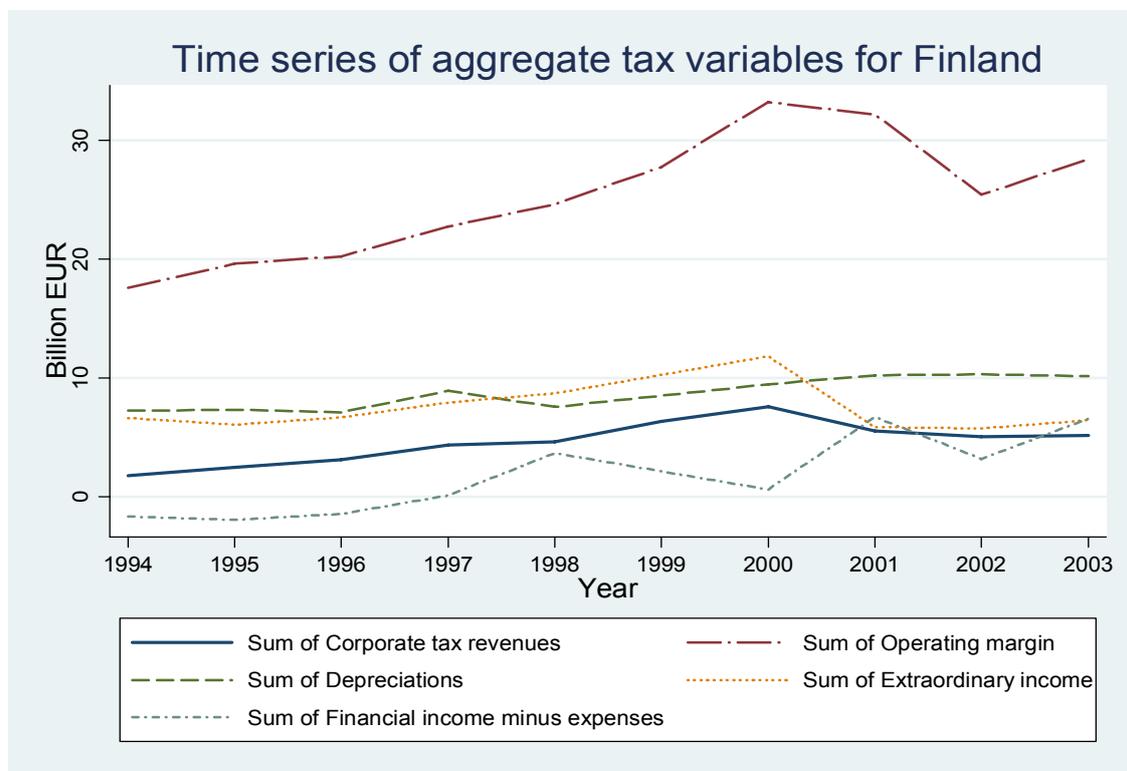
Figure 3[3]

We now proceed to calculate the (average) Effective corporate tax rates (ECTR) from our corporate-level data using the variables shown in Figure 4. The ECTRs are calculated using as the economic profit Operating margin minus Depreciations according to plan plus Net financial income (missing for 1999)[4].

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[3] The data is missing for Depreciations, Extraordinary income and net Financial Income in 1999.

[4] Our ECTR is intended to measure effective domestic tax rate, which in principle is different from effective international tax rate.

Only observations over 100 EUR were included in the tax base thus calculated. Then the ECTR is calculated simply by dividing the CIT by the profit, and then further restricted to lie on the unit interval. One main problem with our ECTR measure is that we could not obtain data for dividends received by corporations from foreign subsidiaries that are exempt from taxation. This creates a downward bias. Still the ECTR should be much more accurate than a typical backward-looking measure calculated using aggregate statistics (Sørensen 2004, about backward- and forward-looking measures). Forward-looking measures could also be used, as in Devereux et al (2002).

The analysis for the ECTRs can be seen in Figures 4 and 5. Figure 4 shows the median, arithmetic mean and weighted mean using as weights the tax base and CIT, respectively. The median and unweighted mean develop quite evenly over the period. The weighted series do not develop so smoothly, which is partly explained by the untaxed dividends of larger corporations that are still included in the tax base. In particular, the median curve, which better represents the middle point of the distribution of ECTR, shows the increases in the statutory tax rate in 1995 and 1999.
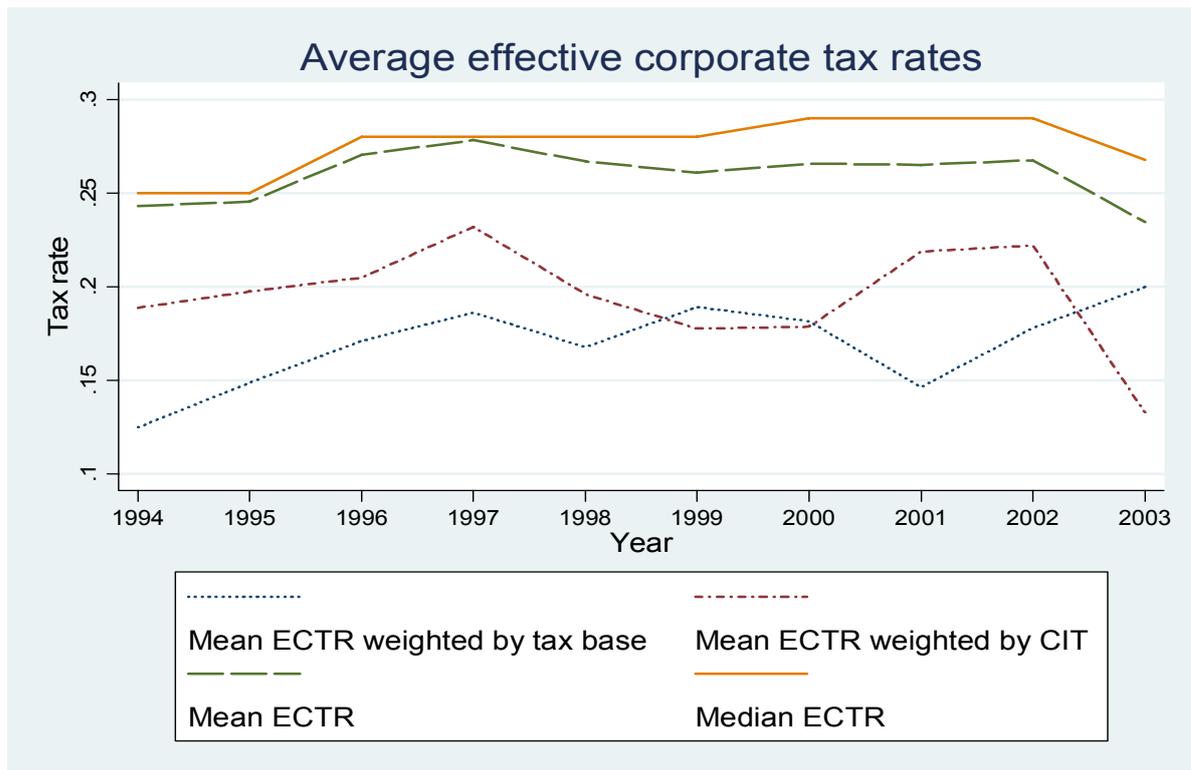

Figure 4

Figure 5 depicts the densities of the ECTR for selected years[5]. The variable is restricted to lie on the unit interval. It is evident that the distributions are quite dense and not too skewed. After removing the outliers from the statistics, there is still substantial variation around the median ECTR. This variation captures the problems that arise when aggregate statistics are used, because then large corporations that pay CIT affect the resulting sum with greater weight.

The differences between aggregate measures and our ECTR are also partly explained by negative observations in Operating margin that are summed in the tax base when calculating aggregate statistics. Thus the median ECTR calculated from our data is quite different from the Implicit tax rate presented in Figure 1, that being calculated by dividing an aggregate statistic (tax revenues) by another aggregate statistic (the tax base).
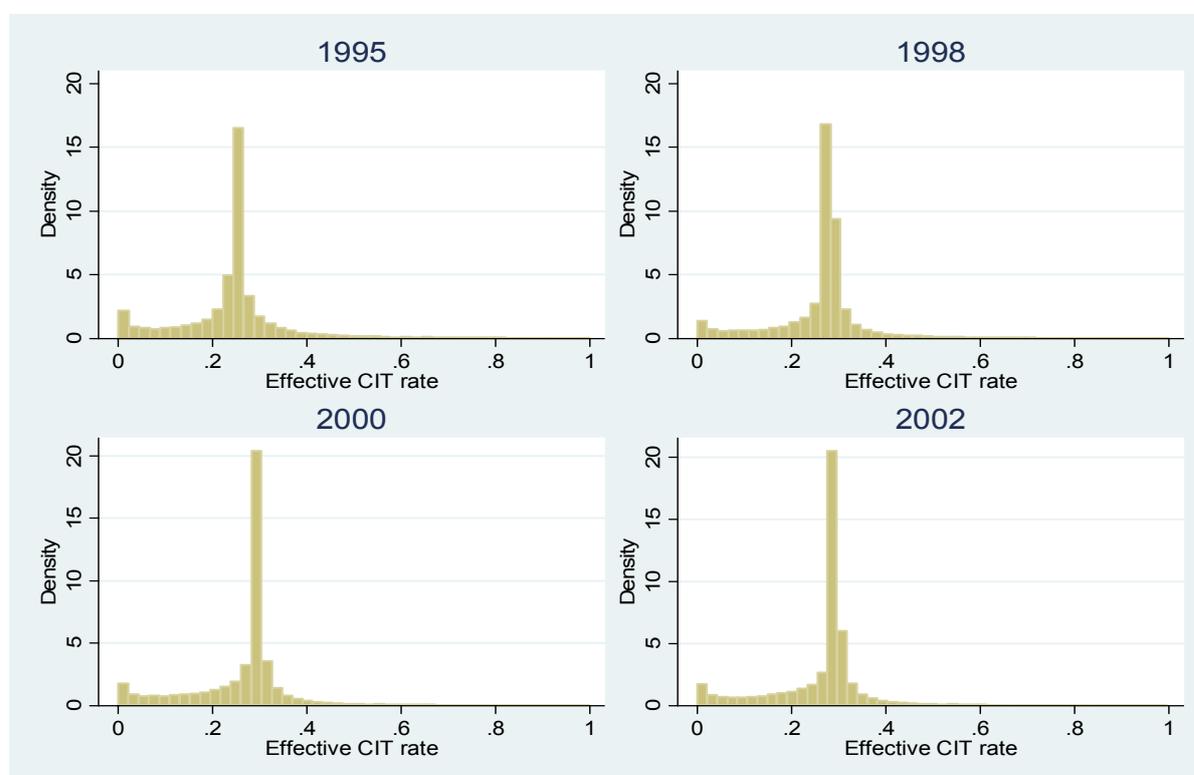
Figure 5

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[5] These years are selected simply because they are evenly spread over our period and they also present turning points in aggregate time.series.

4. Distributional Analysis

In this chapter we describe the distribution of CIT revenues at the national level and in some sectors. We present the amount of observations per size class, the distribution of the largest observations and the aggregate distribution function for selected years. It is meaningful to study distributional statistics because the data contains every Finnish CIT observation of relevant size.

Table 1 lists the number of observations for certain arbitrary size classes. The values are based on 2003 prices. Most corporations that do not pay CIT in a particular year have a missing value in the CIT variable and have thus not been taken into account. Missing values do not appear in the table. There are from 50,000 to 140,000 missing values per year in the CIT variable, which, together with the data in Table 1, represents the total data. It is apparent that the number of small CIT observations far outnumbers the large ones and that the distribution of CIT is thus quite skewed. The largest observations in some years amount to over one billion euros.

Not missing CIT observations by year and size				
Year	0€ to 1000€	1000€ to 5000€	5000€ to 20000€	20000€ to highest	Total (not missing) obs. by year
1994	23028	18057	12208	7999	61292
1995	23542	19168	15104	10586	68400
1996	23443	20498	17702	12174	73817
1997	23532	22251	19485	13409	78677
1998	24376	23316	20022	13848	81562
1999	23108	23473	20133	15096	81810
2000	21536	22791	20741	16448	81516
2001	20579	21805	20819	16927	80130
2002	19985	21176	21446	16955	79562
2003	19668	20870	21319	17037	78894

Table 1

Few large corporations can have a large impact on the sum of CIT revenues and on the Operating margin. Figure 6 shows the yearly sum of CIT revenues and Operating margin. The highest line shows the yearly total of all observations in the data. The line below is the yearly sum excluding the highest 0.5 % of observations. The other lines depict the sums up to 99 % and 90 % of observations, respectively. Thus, Figure 6 illustrates how the highest decile of total revenues are distributed in each year. Putting all years to the same figure shows how this distribution changes over time. Only positive values are included

in the Operating margin, since only those corporations with a positive Operating margin pay taxes. The number of excluded observations is based on the total number of tax-paying corporations for each year (see Table 1). To be precise, 0.5 % of yearly observations represents from 300 to slightly over 400 observations.

Below the highest 0.5 % of observations the distribution of CIT revenues becomes so dense that sum up to lower deciles are not presented, because they would not be easy to distinguish from the Figure 6. This reflects the fact that there are a lot of small observations in the data. It seems that when the development of CIT revenues is described using aggregate statistics, effectively only the CIT of a small number of the largest corporations is taken into consideration. So our analysis using the sum up to certain percentage points reveals that surprisingly few corporations paid most of the extra revenues. It is also evident that the statistic of Operating margin behaves in the same way in Figure 6. Moreover, especially in CIT revenues the gap between the 0.5 % of the largest observations and the others has widened up to the year 2000. Despite the drop in aggregate revenues, the gap remained much wider after that year compared to beginning of our observation period.

Because both positive Operating margin and CIT revenues show a similar statistic in Figure 6, it seems that profits did not leak from Finland to another country. It also indicates that the larger tax revenues were indeed explained by larger profits, and not any concurrent change in the tax system. To be more confident that Finnish corporations were not paying large amounts of tax to any other country would require data on foreign activities which we do not have.

As for profit-shifting to Finland, of 25 largest corporations that paid together in 2000 3.6 Billion EUR CIT revenues, that is almost half of total revenues, only two do not have domicile in Finland. So, although the largest corporations are multinational in their operations, they are still mostly Finnish corporations (domicile in Finland). The large increases in Finnish CIT revenues are not thus explained by contributions of multinational corporations that have a subsidiary in Finland.
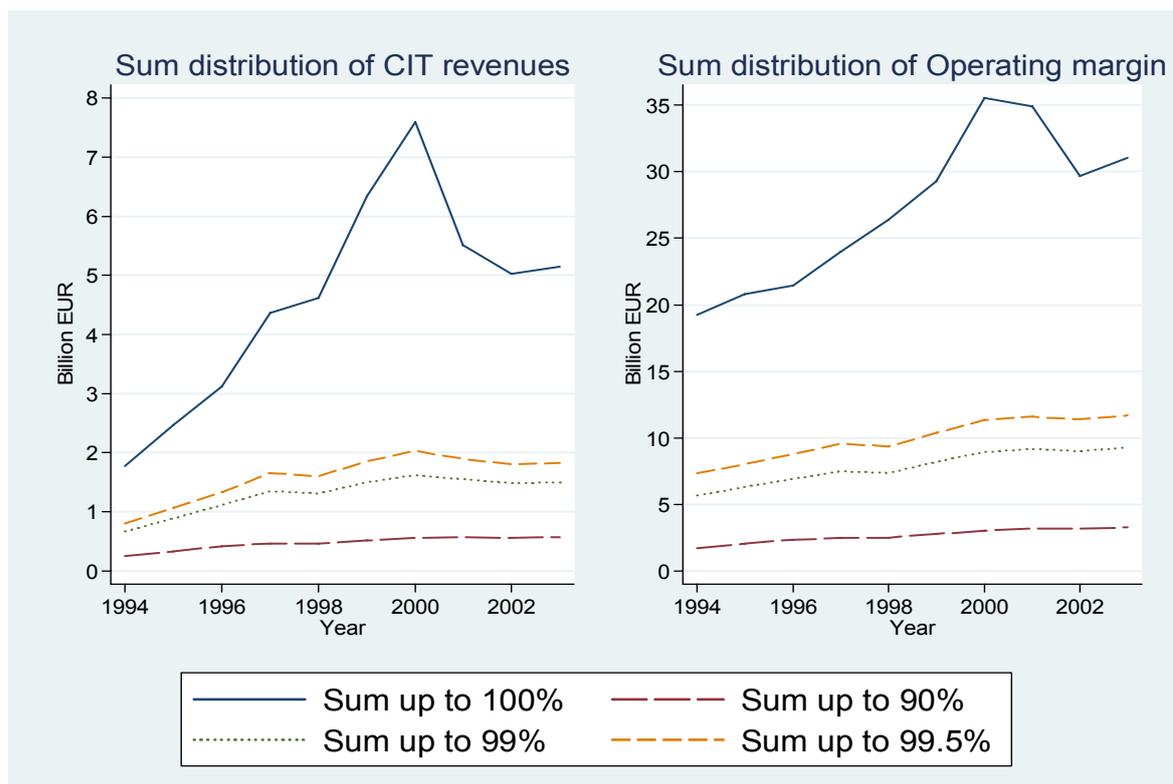
Figure 6

We hypothesise that certain large multinational corporations that increased their Operating margin and CIT explain most of the increase in CIT revenues. Their domiciles are in Finland and some of their owners are Finnish, but they are multinational in their operations. This hypothesis is based on the internationalisation of the Finnish economy described in Chapter 2, and the statistics in Figure 6.

The hypothesis receives further support from Figures 7 and 8. These show the sum of CIT revenues in selected sectors up to certain percentage points. In certain Manufacturing industries, Transport and communication and Financial intermediation sectors there are large multinational corporations (Statistics Finland 2002). There are big differences between the largest 0.5 % of observations and the remainder in these sectors. There is also a definite peak in 2000, when the international economy experienced the end of the ICT boom. On the other hand, in the Wholesale and retail trade and Services sectors greater proportion of corporations are domestic (Statistics Finland 2002). Their sum statistics are not so dense and they do not show a clear peak in 2000. This corresponds to overall economic development in Finland, where multinational corporations suffered from international downturn, but domestic firms continued their growth after the year 2000.
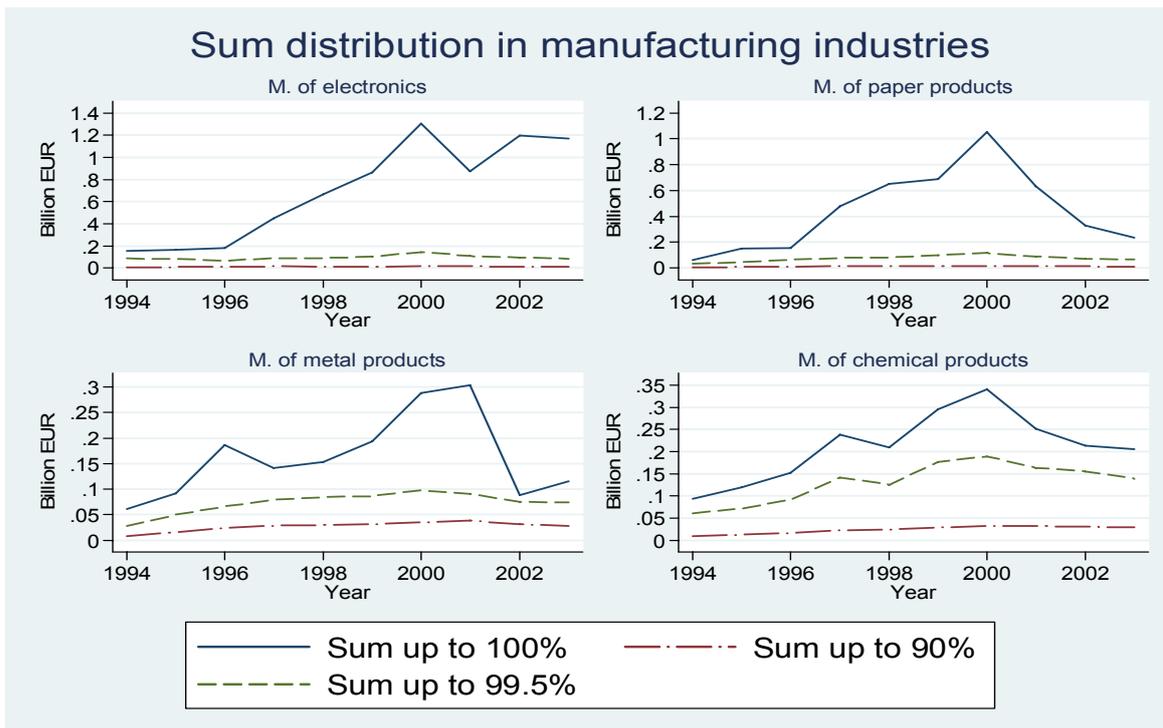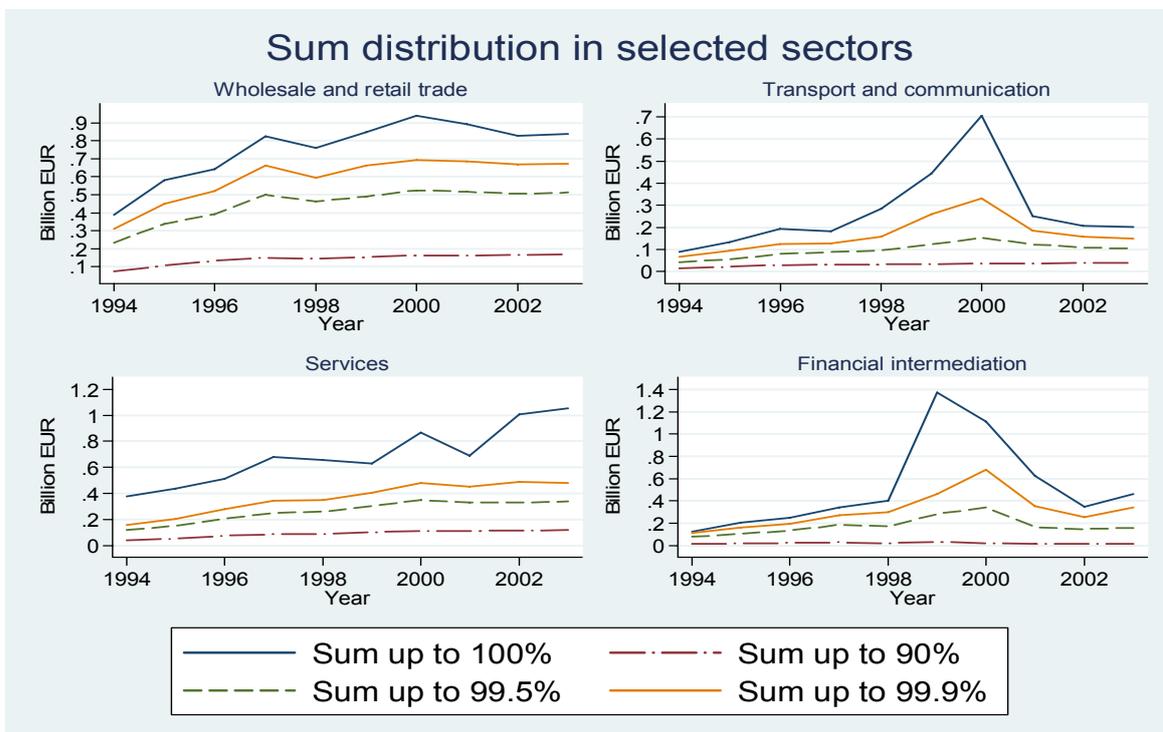
Figure 7[6]

Figure 8

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[6] The sum up to 99.9% is omitted from Figure 7, because there were not enough observations in these industries.

We have thus far described the composition of sum of the largest CIT revenues in Finland. We continue the analysis by excluding the largest observations, that are treated as outliers from the point of view of distribution, and focus on the 99.99 % of smaller corporations, which means that only less than ten observations have been excluded yearly. To be able to depict smaller observations more clearly, we present an empirical "Aggregate Distribution Function" (ADF), as shown in Figure 9. This shows how a large proportion of total CIT revenues (y-axis) are paid by a corporation that pay certain amount of corporate taxes (x-axis). Figure 9 shows the ADF for selected years, so that the shape of the ADF can be compared for different years. Thus we are able to compare how large a proportion of CIT revenues came from an observation of certain size between different years.

Several things can be learned from Figure 9. Since the curve of the ADF increases steeply from zero, the small CIT payers contribute significantly to the total. The slope of the ADF curve would increase again in the end if the top 0.01 % of observations were included in the calculations. Thus, regardless of how small they may be, there are so many of them that they form a steady "basis" of the CIT revenues. Another interesting point is that the ADF seems to move to the right year by year, until 2000. Then for 2003 the ADF has shifted to the left again. The curve for 2003 is much closer to that of 1998 than that of 2000. This indicates that CIT revenues from all corporations have increased towards the end of 1990s and then the development reversed again from 2000. When the ADF curve shifts to the right, smaller observations contribute larger proportion to the aggregate than before. Thus the smaller corporations once again contributed more to the aggregate statistics in year 2003 than in 2000.
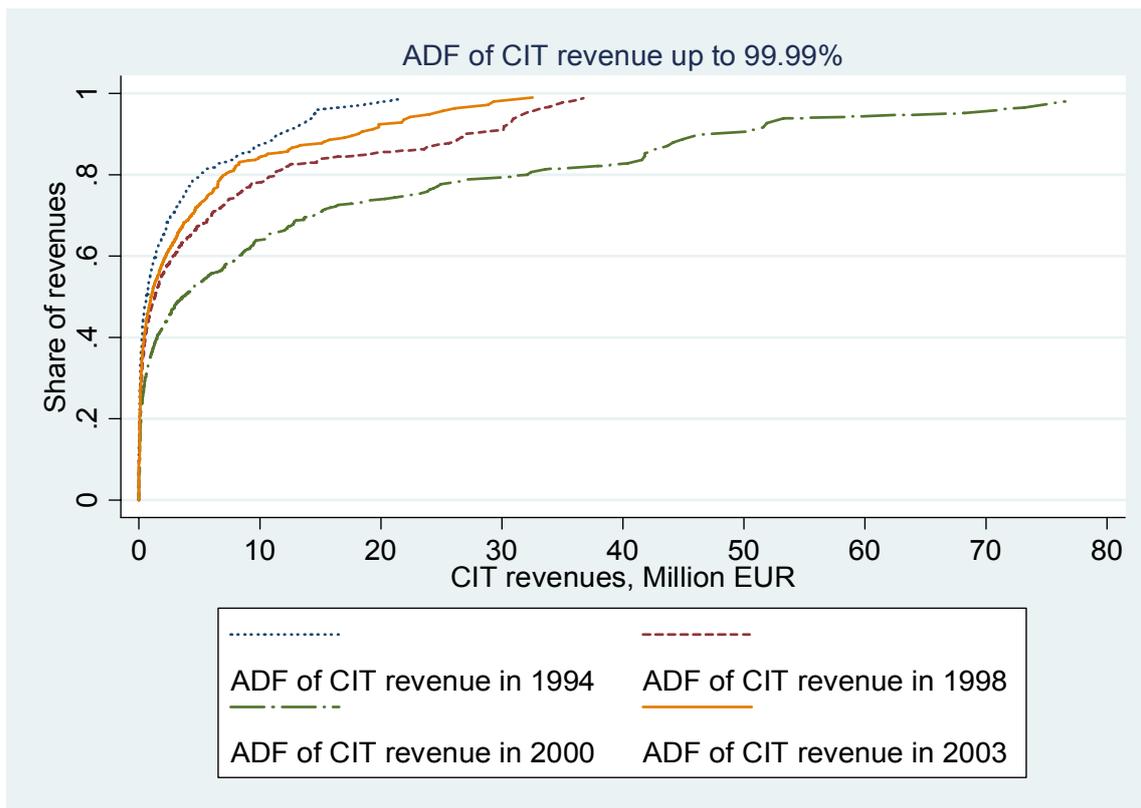
Figure 9

5.   Decomposition of Aggregate CIT Revenues

Now we take a different approach to help to understand the factors behind the recent development of CIT revenues. In this chapter we present a decomposition of the aggregate growth rate of CIT revenues. Our aim here is to present the growth rate and show its components. The components show us whether the development of corporate taxes were due to growth by all corporations, changes in the structure of the economy or whether new corporations had more profitable revenues than old ones. First we describe the methodology applied and then discuss the empirical results of the decomposition of Finnish CIT revenues.

5.1 The Methodology of the Decomposition of the Mean

Decomposition methods are generally developed to describe the behaviour of productivity growth. Here we adapt these methods, with only slight changesfor decomposing the growth rate of tax revenues. There are several different methods available.We utilise the one first described by Bernard and Jones (1996) and then developed further by Maliranta (2001). The modification to this decomposition method that we make is simply to measure the change in the aggregate growth rate of tax revenues instead of productivity. Maliranta (2001) uses input weights, we use instead tax shares as weights to calculate the weighted sum of CIT revenues. Kyyrä and Maliranta (2006) applied a similar kind of methodology to decompose the change in factor income shares in Finland.

The variable of interest is CIT revenue v_{it} for corporation i and year t. To give an overall picture of the development, this variable is aggregated to a relevant population level (such as country). The aggregation is performed by adding up the observations according to the following formula:

$$(5.1) \qquad V_t = \sum_{i \in T} \left(\frac{v_{it}}{\sum_{i \in T} v_{it}} \right) v_{it} = \sum_{i \in T} w_{it} v_{it} \,,$$

where T refers to the population of corporations in year t and w_{it} is the weight for corporation i in year t. The weight is calculated by dividing the CIT by total CIT revenues. We are interested in the growth rate of corporation tax revenues. The growth rate can be the log difference of corporation tax revenues. Here we take another measure, which we are able to decompose later, so that the growth rate is measured as:

$$(5.2) \qquad \frac{\Delta V_t}{\overline{V_t}} = \sum_{i \in T} w_{it} \frac{v_{it}}{\overline{V_t}} - \sum_{i \in T} w_{it-1} \frac{v_{it-1}}{\overline{V_t}} \,,$$

where $\overline{V_t} = \frac{1}{2}(V_t + V_{t-1})$. The growth rate of corporate tax revenues describes the increase in corporate tax revenues from year *t-1* to year *t* relative to the average of those years. The growth rate is then decomposed into elements according to the following formula:

$$(5.3) \qquad \frac{\Delta V_t}{\overline{V_t}} \cong \sum_{i \in C} \overline{w_{it}} \frac{\Delta v_{it}}{\overline{v_{it}}} + \sum_{i \in C} \Delta w_{it} \frac{\overline{v_{it}}}{V_t^C} + \sum_{i \in C} \overline{w_{it}} \frac{\Delta v_{it}}{\overline{v_{it}}} \left(\frac{\overline{v_{it}}}{V_t^C} - 1 \right) + \ln\left(\frac{V_t}{V_t^C} \right) + \ln \frac{V_{t-1}^C}{V_{t-1}}$$

Where *C* refers to those corporations that were in the population for both years *t* and *t-1*. Then V_t^C is aggregate taxes calculated for those corporations that are included in population *C*. A bar over the variable always indicates the average of years *t* and *t-1*. It is shown in Appendix 2 that this decomposed term on the right side of (5.3) equals the aggregate growth rate in (5.2).

The components of the decomposition on the right side of (5.3) are, from the left: within effect, between effect, residual effect, entry effect and exit effect. The last two terms describe the net entry effect of corporations, and are decomposed originally to: $NetEntry = \frac{V_t - V_{t-1}}{\overline{V_t}} - \frac{V_t^C - V_{t-1}^C}{\overline{V_t^C}}$ but are approximated in (5.3) with a more convenient formula:

$$\frac{\Delta V_t}{\overline{V_t}} - \frac{\Delta V_t^C}{\overline{V_t^C}} \cong \ln\left(\frac{V_t}{V_{t-1}} \right) - \ln\left(\frac{V_t^C}{V_{t-1}^C} \right) = \ln\left(\frac{V_t}{V_t^C} \right) + \ln\left(\frac{V_{t-1}^C}{V_{t-1}} \right).$$

The first three terms on the right side of (5.3) describe the behaviour of continuing corporations. The within effect describes what share of the total aggregate change rate is due to changes in each continuing corporation. This can also be called the firm effect and is positive when on average all continuing corporations increase their tax revenues. The between effect describes how much the change in the structure of population affects the total growth rate. It is positive when corporations with a large weight increase their share of average taxes more than smaller corporations. The residual component is the terms that were left over from the within and between effects, although Maliranta (2003) calls it a catching up term in the context of productivity growth.

The entry and exit effects describe the effect of corporations that appear in the population in year *t* and those that leave it in year *t-1*. The entry effect is positive if the entering corporations contribute positively to the change rate and the exit effect is positive if continuing corporations contribute more positively to the change rate than exiting corporations.

5.2 Bootstrap estimation of standard errors

Before going into the empirical results of the decomposition, we present a method for calculating standard errors of point estimates. These are important in order to test whether the point estimates deviate significantly from zero. We might also want to have some idea as to how significantly certain effects differ from each other. Because the point estimates are based on rather non-normal formulas, straightforward standard errors would not be an appropriate statistic. Instead we bootstrap the standard errors. The discussion here is based on Hall and Horowitz (1996) and Horowitz (2001).

The idea behind bootstrapping is that the original data is treated as a population (which it is in this case) and then pseudo data is generated for a Monte Carlo experiment by randomly sampling the estimation data with replacements. Moreover when the estimated data is such that the analytical standard error is difficult if not impossible to derive, the bootstrapping provides a way to estimate the standard errors in a meaningful way.

The bootstrap algorithm (Efron and Tibshirani 1993, 47) uses an estimated statistic $\hat{\theta} = s(x)$, in this case, for example, the within effect in formula (5.3). We then deduce the B independent bootstrap samples, from which we calculate the bootstrap estimate $\hat{\theta}^*(b) = s(x^{*b})$. From these we calculate then the estimated standard error using the sampled standard deviation:

$$\hat{se}_B = \left(\sum_{b=1}^{B} \left(\hat{\theta}^*(b) - \sum_{b=1}^{B} \hat{\theta}^*(b)/B \right)^2 1/B \right)^{1/2}$$

This statistic has better small sample properties than normal standard error (Horowitz 2001).

5.3 Decomposition of Finnish Corporate Tax Revenues

In this section the decomposition of the aggregate growth rate of corporate tax revenues is presented for Finland from 1995 to 2003. In the main text we present graphs only; tables of the calculated coefficients and estimated standard errors can be found in Appendix 3.

The total change rate and the entry and exit effects are calculated from aggregate statistics, thus disabling us to estimate the bootstrapped standard errors for these statistics. We do provide standard errors for the total change rate of continuing corporations and the within, between and residual effects. This distinction follows from the fact that a single corporation can only either be in the sample or not, thus the ratio of present and lagged values is always one (or missing).

Figure 10 shows the aggregate change rate decomposition variables for Finland for all the corporations in the data. Figure 11 shows the same variables but with the outliers removed (the largest 0.1 % of corporations for each year).

There are interesting differences in Figures 10 and 11. Overall the change rate was much larger when all the corporations were included in the analysis. Also, when the largest corporations are excluded, the within effect is greater than the between effect, but this changes to the opposite when the largest corporations are included in the analysis. Moreover, much of the large entry and exit effects seem to be due to the exclusion of outliers in Figure 11, because these effects are close to zero for many years in Figure 10. The large negative peak in 2002 in exit effect is due to transactions of single large corporations. All these facts are consistent with the hypothesis that the largest corporations grew much more than the rest and contributed to a change in the structure of the Finnish economy. This group of the largest corporations is quite small, and the large bulk of smaller corporations grew more steadily.

It is also interesting to note the bootstrapped standard errors in Appendix 3, Tables 3 and 4. Although the estimated coefficients for total change are larger when no outliers are removed from the data, the standard errors are so large that almost all of the coefficients are rendered statistically insignificant (not significantly different from zero). On the other hand when we remove the outliers from the analysis, the change rate for continuing corporations and the within effect are statistically significantly different from zero almost for every year. This indicates that the largest corporations have different change rates from the rest of the population, so that when they are included in the analysis, the population becomes very heterogenous and it is difficult to conclude anything about average behaviour. Unfortunately even when the outliers are removed, we cannot say anything statistically significant about the difference of the within and between effects.

Finally, making some descriptive observations from the analysis, we note that the aggregate growth rate shows in all cases that the overall development over our observation periodshows positive growth rate. Measured in this way, 2001 was not a particularly good year for Finnish CIT revenues. The largest 0.1 % of corporations contributes somewhat to structural change and to the large positive change rate, whereas the remainder of the corporations still contributed steadily to the positive change rate.
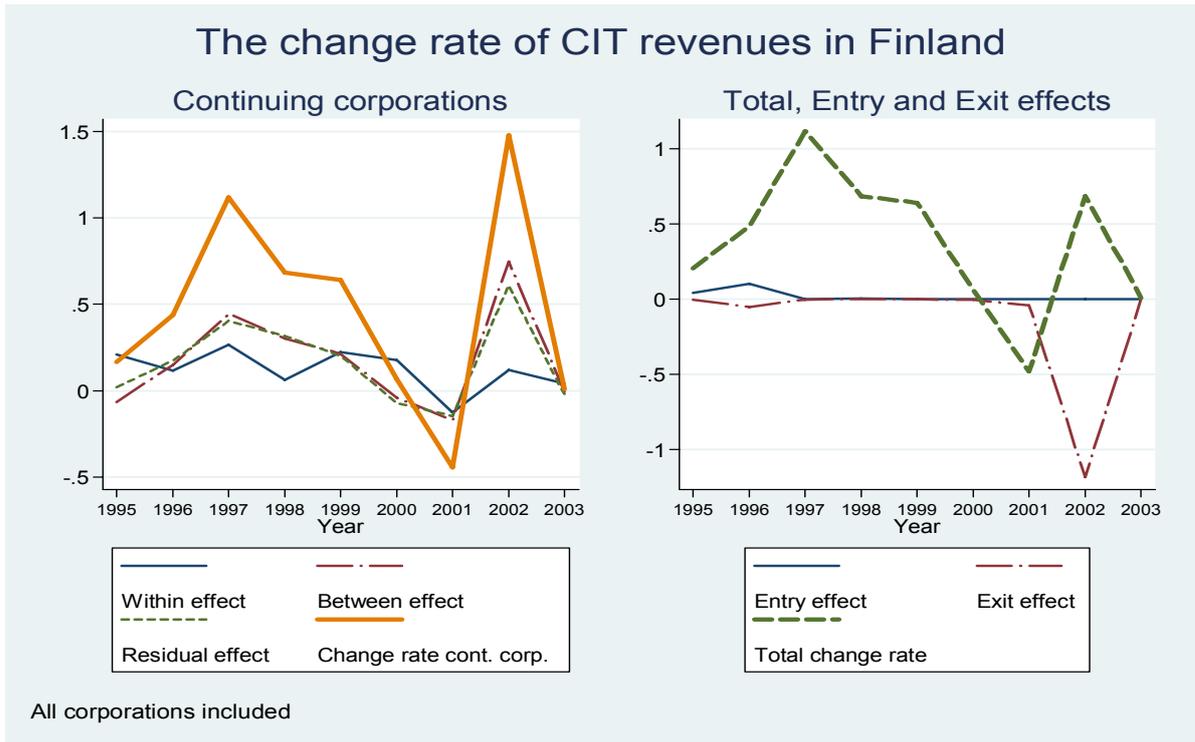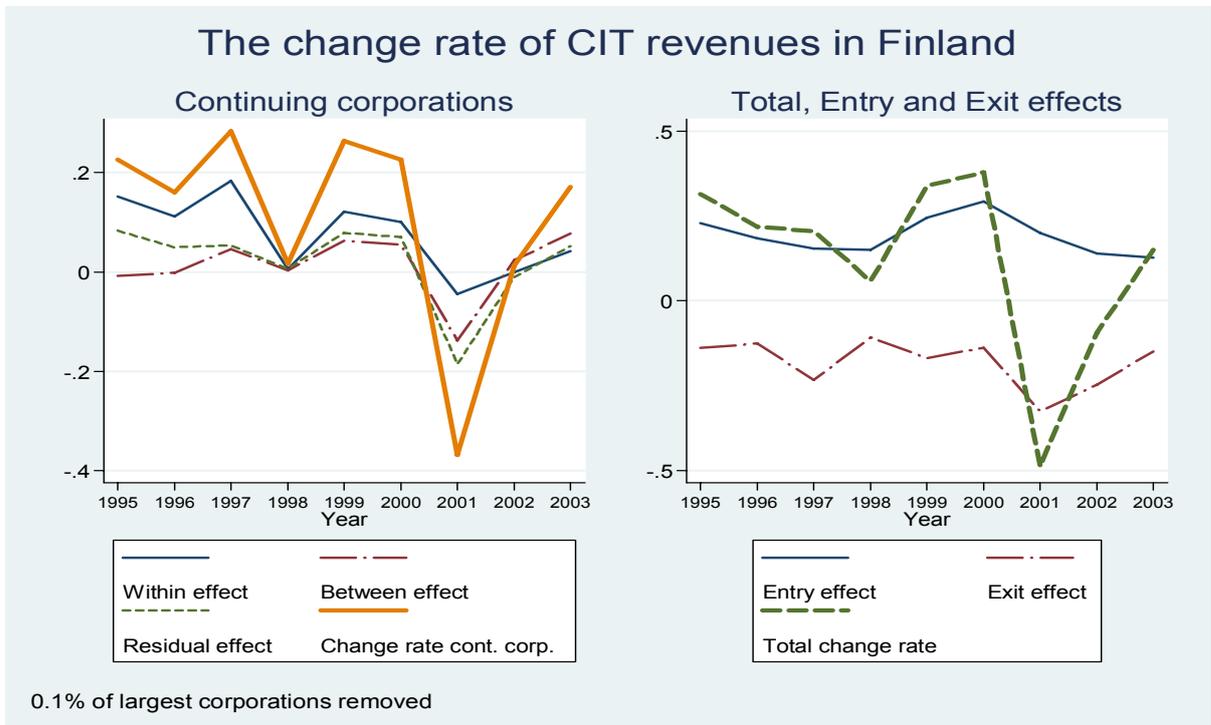
Figure 10

Figure 11

6. Conclusions

Many European countries have experienced a phenomenon of increasing Corporate income tax (CIT) revenues and declining statutory CIT rates. CIT revenues increased sevenfold over the 1990s in Finland. This study has tried to shed some light on what factors have contributed to the large increase in CIT revenues. We have described the behaviour of different items relating to CIT revenues, presented the distribution of CIT and decomposed the aggregate growth rate of CIT revenues.

In the relevant literature there is a possible explanation for increased CIT revenues and declining statutory tax rates (Devereux et al. 2004), namely that many governments have engaged in a base-broadening and rate-cutting tax reform. Although earlier reforms may have had a delayed effect, in Finland there were not big tax reforms between 1994 and 2003. In Chapter 3 we presented financial items and the average effective tax rate for corporations which indicated that the tax system developed quite steadily between 1994 and 2003. These statistics suggest that a plausible explanation for increased revenues is simply increased profits.

In Chapter 4 we discussed the distributions of CIT revenues and Operating margin to give a more detailed picture. In particular, the composition of sum showed that the largest corporations have strongly increased their share of CIT revenues and Operating margin. The sum statistics showed that the 0.5 % of the largest corporations paid most of the CIT and that this share increased up to 2000. The same held true for Operating margin, meaning that the income distribution of corporations widened until 2000. When the economic growth of larger corporations slowed down after 2000, the CIT revenues fell simultaneously. This happened at the same time as a slowdown in the global economy, indicating that the bulk of CIT revenues came from multinational corporations. We may conclude that an influencing factor in CIT revenues was the internationalisation of large corporations. That might explain how they were able to increase their profits so rapidly, and the increase in CIT revenues was merely a consequence of this phenomenon.

Developments at the sectoral level fit with the conclusion about Finnish multinational corporations becoming stronger, since the sectors containing mostly domestic firms did not experience such strong growth. There was indeed some growth, but the growth did not peak in 2000, and continued quite steadily. Also, in domestic sectors the income distribution of corporations did not widen as strongly as in sectors containing multinational corporations.

From further distributional analysis we may conclude that the smaller corporations increased their share of CIT, but their growth rate was slower and

closer to normal rates. In particular the aggregate distribution function showed that when the CIT of larger corporations declined from 2000 to 2003, the distribution again shifted towards medium-sized companies.

Devereux et al. (2002) reported that one effect of tax reforms, that various countries had made, was to attract multinational corporations. Based on our analysis it seems, that the tax reforms in the beginning of the 1990s did not decrease the average effective tax rates more on profitable projects than on other projects. Although the Finnish economy has strongly internationalised after 1993, the internationalisation has not happened mainly through FDIs. So it does not seem plausible that the changes in tax system explain the increased profits of multinational corporations in Finland. It should be kept in mind that evaluating a tax reform on a basis how it affects CIT revenues is not entirely satisfactory. Most of revenues come from small number of corporations (0.5 per cent in this case), but changing the entire tax system affects all of the corporations.

We do not have data on activities of corporations outside Finland, so our point about profit-shifting is somewhat moot. However, since Finnish corporations increased their profits and thus taxes so strongly in Finland, it does not seem logical that they would have shown significant amount of profits in other countries as well. As regards profit-shifting towards Finland, we presented the top 25 tax-paying corporations in 2000 and noted that only two of them have their domicile in a country other than Finland. These corporations paid almost half of all Finnish CIT revenues that year, so foreign corporations did not contribute significantly to the increase in CIT revenues, as Huizinga and Laeven (2006) would have argued.

The decomposition of the aggregate growth rate presented in Chapter 5 described what effects contribute most to total CIT revenues. We are interested in two effects in particular: simultaneous growth by all corporations and structural change in the economy, which can both affect the aggregate development in the same direction. We contributed to the methodology by calculating the bootstrapped standard errors, and were thus able to present a test statistic for the significance of the point estimates. The main differences in the analysis came between the total data and the data from which the outliers had been removed. The largest corporations contributed to the total change rate more positively than smaller ones for most of the years, but they rendered the point estimates statistically insignificant.

The decomposition indicates that there was a structural change in the Finnish economy such that the largest corporations (0.1 % of all observations) increased their weight. When these observations are removed from the calculations, the within effect signifying the common growth of all corporations becomes bigger than the between effect, signifying structural change. This result is in accordance with the conclusions from distributional statistics. What may have happened in

Finland is a structural change where the largest corporations have increased their multinational operations.

Overall the aim of this study has been to investigate the development of corporate tax revenues in Finland in the period 1994–2003. The results indicate that changes in the tax system are not an important factor explaining increased CIT revenues. Rather it is the increase in the profits of corporations that explains better this phenomenon.

References

Ali-Yrkkö, J. – Ylä-Anttila, P. (2002): Pääkonttorien sijainti, kansainvälistyminen ja verotus. ETLA-Discussion Papers No. 831, Helsinki.

Bernard, A. B. – Jones, C. I. (1996): Productivity across industries and countries: Time series theory and evidence. The Review of Economics and Statistics, Vol. LXXVII, Number 1, 135–145.

Clausing, K. (2007): Corporate tax revenues in OECD countries. International Tax and Public Finance, Volume 14, No. 2, April, 2007.

Devereux, M. – Griffith, R. – Klemm, A. (2002): Corporate income tax reforms and international tax competition. Economic Policy.

Devereux, M. – Griffith, R. – Klemm, A. (2004): Why Has the UK Corporation Tax Raised So Much Revenue. IFS, WP04/04.

Devereux, M. – Sorensen, P. (2006): The Corporate Income Tax: International Trends and Options for Fundamental Reform. European Economy, Economic Papers No. 264. European Commission, Brussels.

Efron, B. – Tibshirani, R. J. (1993): An Introduction to the Bootstrap. Chapman & Hall, London.

European Commission (2005): Structures of the Taxation Systems in the European Union.

Hall, P. – Horowitz, J. L. (1996): Bootstrap Critical Values for Tests Based on Generalized-Method-of-Moments Estimators. Econometrica, 64 (4), 891–916.

Hietala, H. – Kari, S. (2006): Investment Incentives in Closely Held Corporations and Finland's 2005 Tax Reform. Finnish Economic Papers, Vol.19, No.2.

Horowitz, J. L. (2001): The Bootstrap. In Heckman – Leamer (eds.): The Handbook of Econometrics, Vol. 5, Amsterdam: North-Holland.

Huizinga, H. – Laeven, L. (2006): International profit shifting within multinationals: a multi-country perspective. European Economy. Economic Papers No. 260. European Commission, Brussels.

Gruber, J. – Rauh, J. (2005): How Elastic Is the Corporate Income Tax Base? Seminar paper presented in "Taxing Corporate Income in 21st Century", May 5–6, 2005.

Kiander, J. (2004): The Evolution of the Finnish Model in the 1990s: from Depression to High-Tech Boom. VATT Discussion Papers 344, Government Institute for Economic Research (VATT), Helsinki.

Kiander, J. – Vartia, P. (1996): The Great Depression of the 1990s in Finland. Finnish Economic Papers, Vol. 9 No. 1.

Kyyrä, T. – Maliranta, M. (2006): The Micro-Level Dynamics of Declining Labour Share: Lessons from the Finnish Great Leap. VATT Discussion Papers 406, Government Institute for Economic Research (VATT), Helsinki.

Maliranta, M. (2001): Productivity growth and micro-level restructuring, Finnish experiences during the turbulent decades. Discussion Papers 757, The Research Institute of the Finnish Economy (ETLA).

Maliranta, M. (2003): Micro level dynamics of productivity growth, An empirical analysis of the great leap in Finnish manufacturing productivity in 1975–2000. The A 38 Series, The Research Institute of the Finnish Economy (ETLA), Taloustieto Oy, Helsinki.

Myhrman, R. – Kröger, O. – Rauhanen, T. – Junka, T. – Kari, S. – Koskenkylä, H. (1995): Finnish Corporate Tax Reforms. VATT Publications 20, Government Institute for Economic Research (VATT), Helsinki.

OECD (1991): Taxing Profits in a Global Economy. Domestic and international issues. OECD, Paris.

Sørensen, P. (2004): Measuring Taxes on Capital and Labor: An Overview of Methods and Issues. In Sørensen, P. (ed.): Measuring the Tax Burden on Capital and Labor. CESifo seminar series, The MIT Press, London.

Talouselämä 26.5.2006. Nro 20/2006.

Tilastokeskus (Statistics Finland) (2001): Financial statements statistics 1999. Yritykset 2001:3, Tilastokeskus.

Tilastokeskus (Statistics Finland) (2002): Suomen Yritykset 2000, Yritykset 2002:1, Tilastokeskus.

Tilastokeskus (Statistics Finland) (2004): Business Enterprises – Net Results and Balance Sheets 2002. Yritykset 2004:2, Tilastokeskus.

Ylä-Anttila, P. – Ali-Yrkkö, J. – Nyberg, M. (2004): Foreign Ownership in Finland – Boosting Firm Performance and Changing Corporate Governance. ETLA-Discussion Papers No.904, Helsinki.

Appendix

Appendix 1

In Table 2 the main features of the Finnish corporate tax system in the period 1994–2003 are presented. The calculation starts from Operating margin, because that is the variable we have in the data. Moving downwards in the table, the various items are either added or subtracted according to their sign. The CIT is calculated using the flat CIT rate (25–29 % during our period).

How corporate income taxes are determined in Finland	
Operating margin	
Depreciation and reduction in value	(−)
Other operating expenses	(−)
Operating profit (loss)	
Financial income minus expenses	(+)
Profit (loss) before extraordinary items	
Extraordinary income	(+)
Extraordinary expenses	(−)
Profit (loss) before tax reserve and taxes	
Tax reserves	(−)
Losses from previous years	(−)
Taxable income	

Table 2

Below is presented the development of financial items is presented for selected industries and sectors. It should be noted that the panels have different scales on the y-axis. The largest single industry is Manufacturing of Electronics and Electronical equipment. This is the industry where the CIT revenues of Nokia appear (Statistics Finland 2002). Financial net income and Extraordinary income have large peaks in some years, especially in Manufacturing industries (Figure 12). This indicates that there are large multinational corporations that suddenly book large sums of Financial or Extraordinary income. In 1998, for example, the large positive peak in Financial net income in Manufacturing of electronics is explained by dividends from a foreign subsidiary company (Statistics Finland 2001). Note that these items usually are exempted from taxation.
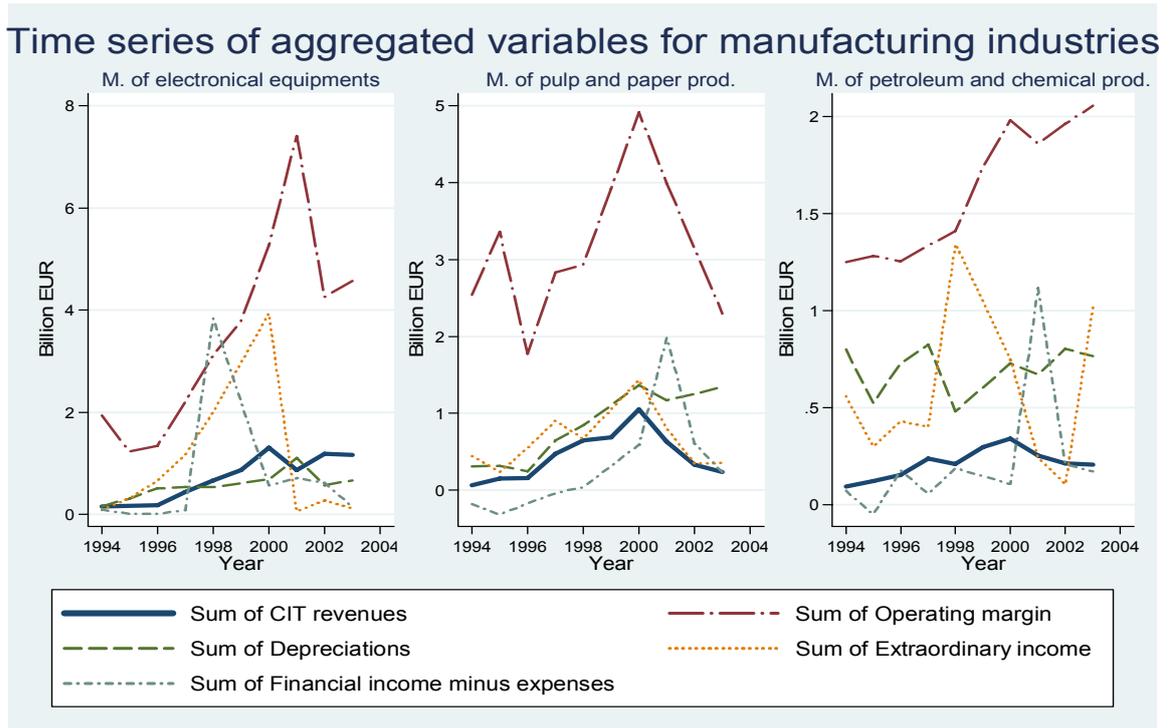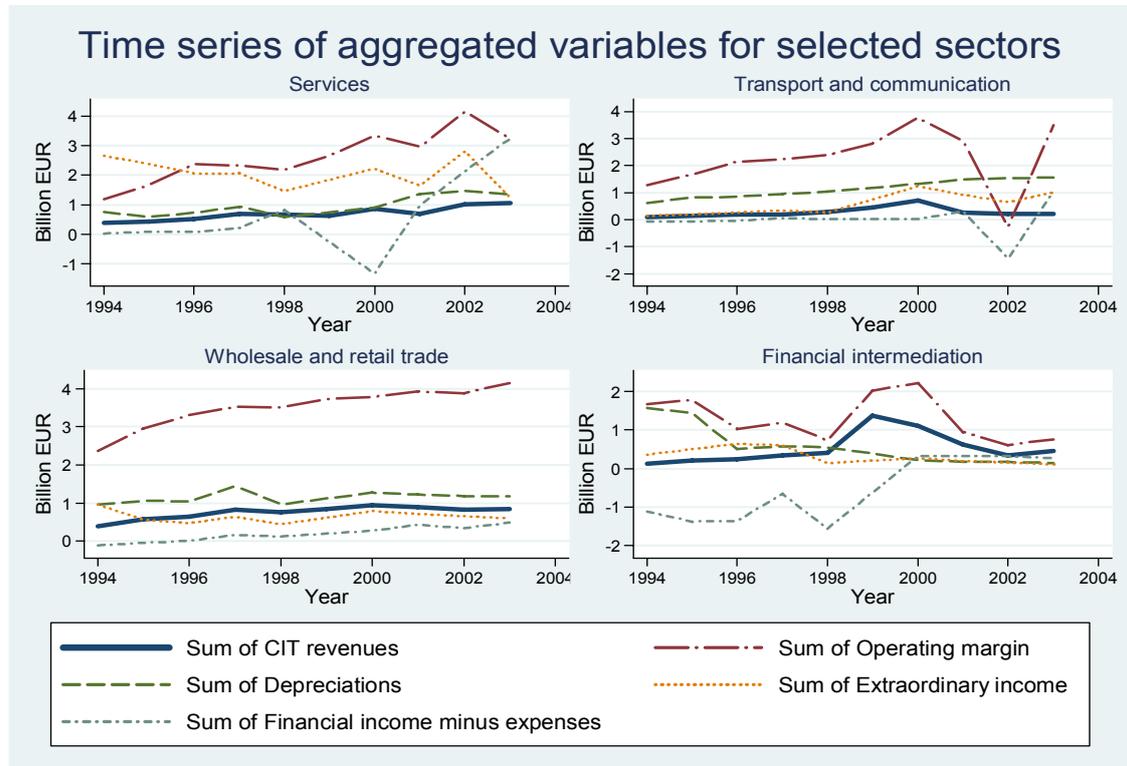
Figure 12

Figure 13

The sizeable negative peak in Operating Margin and Financial net income in the Transport, Storage and Communication sector in 2002 is largely explained by a reduction in value made after previous unsuccessful investments (Statistics Finland, 2004). It is public knowledge that this loss was related to telecommunications licence auctions, for example in Germany.

In Services and especially in the Trade sector the number of companies is larger, and no single corporation dominates. The variables also develop more smoothly over time, as can be seen from Figure 13. For Services the Extraordinary income seems to explain much of the changes in Operating margin. For the Trade sector, Operating margin and Other financial items do not seem to explain the behaviour of CIT revenues.

Appendix 2

In this appendix we demonstrate that the decomposition formula equals aggregate growth rate formula. From the calculus it is easy to see, that the decomposition is calculated on micro level only for continuing corporations.

$$\sum_{i \in C} \overline{w_{it}} \frac{\Delta v_{it}}{\overline{v_{it}}} + \sum_{i \in C} \Delta w_{it} \frac{\overline{v_{it}}}{V_t^C} + \sum_{i \in C} \overline{w_{it}} \frac{\Delta v_{it}}{\overline{v_{it}}} \left(\frac{\overline{v_{it}}}{V_t^C} - 1 \right) + NetEntry =$$

$$\sum_{i \in C} \Delta w_{it} \frac{\overline{v_{it}}}{V_t^C} + \sum_{i \in C} \overline{w_{it}} \frac{\Delta v_{it}}{V_t^C} + NetEntry =$$

$$\frac{1}{2V_t^C} \sum_{i \in C} \left(w_{it} v_{it} + w_{it} v_{it-1} - w_{it-1} v_{it} - w_{it-1} v_{it-1} + w_{it} v_{it} - w_{it} v_{it-1} + w_{it-1} v_{it} - w_{it-1} v_{it-1} \right) + NetEntry =$$

$$\sum_{i \in C} \left(\frac{w_{it} v_{it} - w_{it-1} v_{it-1}}{V_t^C} \right) + NetEntry =$$

$$\frac{V_t^C - V_{t-1}^C}{V_t^C} + \left(\frac{V_t - V_{t-1}}{V_t} - \frac{V_t^C - V_{t-1}^C}{V_t^C} \right) = \frac{V_t - V_{t-1}}{V_t}$$

Appendix 3

In this appendix the tables for the aggregate change rate of CIT revenues are presented. In the tables the standard errors are also included for those statistics that were calculated at the micro level. The standard errors are bootstrapped with 1000 replications.

Decomposition of the change rate of Finnish corporate tax revenues including all observations

Variables	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total (continuing)	0.17	0.44	1.12	0.68	0.64	0.07	-0.44	1.48	0.01
s.e.	0.36	0.32	0.74	0.59	0.65	0.60	0.96	1.58	0.05
Within	0.21	0.12	0.27	0.06	0.23	0.18	-0.13	0.12	0.04
s.e.	0.04	0.06	0.09	0.08	0.13	0.14	0.17	0.21	0.04
Between	-0.06	0.15	0.45	0.30	0.21	-0.04	-0.17	0.75	-0.01
s.e.	0.21	0.14	0.32	0.27	0.33	0.28	0.48	0.79	0.03
Residual	0.02	0.17	0.40	0.32	0.20	-0.07	-0.15	0.61	-0.02
s.e.	0.12	0.13	0.34	0.26	0.22	0.21	0.32	0.59	0.02
Entry	0.04	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Exit	0.00	-0.05	0.00	0.00	0.00	-0.01	-0.04	-1.18	0.00
Total change rate	0.20	0.49	1.12	0.69	0.64	0.06	-0.48	0.69	0.01

Table 3

Standard errors are based on bootstrapping with 1000 replications for each year.

Decomposition of the change rate of Finnish corporate tax revenues with outliers (0.1 % of largest corporations) removed

Variables	1995	1996	1997	1998	1999	2000	2001	2002	2003
Total (continuing)	0.23	0.16	0.28	0.02	0.26	0.23	-0.37	0.01	0.17
s.e.	0.08	0.07	0.07	0.07	0.07	0.08	0.09	0.06	0.06
Within	0.15	0.11	0.18	0.01	0.12	0.10	-0.04	0.00	0.04
s.e.	0.02	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01
Between	-0.01	0.00	0.05	0.00	0.06	0.06	-0.14	0.02	0.08
s.e.	0.04	0.04	0.03	0.03	0.03	0.04	0.05	0.03	0.03
Residual	0.08	0.05	0.05	0.01	0.08	0.07	-0.19	-0.01	0.05
s.e.	0.03	0.03	0.02	0.02	0.02	0.03	0.04	0.02	0.02
Entry	0.23	0.19	0.15	0.15	0.25	0.29	0.20	0.14	0.13
Exit	-0.14	-0.13	-0.23	-0.11	-0.17	-0.14	-0.33	-0.25	-0.15
Total change rate	0.31	0.22	0.21	0.06	0.34	0.38	-0.49	-0.09	0.15

Table 4

Standard errors are based on bootstrapping with 1000 replications for each year.

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