



MINISTRY OF FINANCE

Preparation methods of on-budget revenue estimates in the Ministry of Finance

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Economic Prospects



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Abstract The publication describes procedures for the drafting of on-budget revenue estimates at the Ministry of Finance. Tax revenue estimates and other revenue estimates are drafted in cooperation among the Ministry's departments. The revenue working group serves as the coordinating body and, in addition to the Ministry's departments, it comprises representatives from the Tax Administration. The aim of the report is to provide a clear and concise picture of the principles governing the drafting of revenue estimates and the role of the revenue working group in the formulation of the on-budget revenue estimate. The drafting of revenue estimates is described by each type of revenue whereas the most significant uncertainties relating to forecasting are presented under a single heading. The report will be published in conjunction with the central government budget proposal.		

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1 Preparation of revenue estimates in the Ministry of Finance

1.1 Operating model

Tax revenue forecasts and other revenue forecasts are prepared in the Ministry of Finance as a cooperative effort of the Economics Department, the Budget Department and the Tax Department. The departments cooperate closely in the preparation of revenue forecasts. The Ministry of Finance's Revenue Working Group acts as the coordinating body, compiling the results of forecasting work at the key stages of Budget preparation and also when the Stability Programme and the General Government Fiscal Plan are prepared. The Revenue Working Group has members from each of the three departments and from the Tax Administration, and it is further divided into subworking groups, which meet as required.

The Revenue Working Group was established in 1997. Since then its main role has been to prepare a common outlook for the use of departments when they make estimates of central government revenue. Based on experiences received of the working group's activities and the development of its field of duties, the composition of the Revenue Working Group was partly modified and its mission statement slightly revised in 2002. In 2011 the working group's job description and operating principles were confirmed mainly on their prevailing lines. Support for the continuation and confirmation of the adopted operating principles has been obtained from a review of the accuracy of central government tax revenue estimates by the Parliamentary Audit Committee¹.

In accordance with its mandate, the Revenue Working Group coordinates the monitoring and analysis of central government and other general government revenue, and reconciles estimates of future revenue development with departmental needs. The working group compiles the central government and general government revenue forecasts and estimates required in economic outlook forecasts, the Budget and spending limits preparations, and medium-term and long-term scenario calculations.

Revenue estimates are reported in a manner that serves the reliability of analysis, transparency, and the development of assessment activity. Meeting reports are prepared systematically and background material attached to them as comprehensively as possible. Reports

¹ Parliamentary Audit Committee publication *The Accuracy of Budget Tax Revenue Estimates* (in Finnish) (Audit Committee publication 1/2009).

and studies relating to the realisation of revenue estimates, special issues, and procedures are prepared as required. Reporting procedures and communication principles are jointly agreed upon.

The working group agrees upon any subworking groups and other working arrangements it deems necessary. The working group also directs the monitoring and forecasting work of subworking groups and promotes through expert interaction the development of methods that serve forecasting work.

1.2 Activity in practice

The first tax revenue forecast of the upcoming Budget year is prepared in the summer in connection with the preparation of the Budget. After that, the forecast is revised regularly in connection with the Economics Department's forecast rounds and supplementary budget preparations as new information is obtained about the state of the economy and actual tax revenue receipts. In the spring, a medium-term revenue forecast is prepared in connection with the preparation of the General Government Fiscal Plan. This forecast is also used in Finland's Stability Programme. The main preparer with regard to revenue forecasts of individual tax categories in each forecast round is a Tax Department expert. He or she presents estimates of his or her own area of responsibility to a subworking group of the Revenue Working Group and to the actual Revenue Working Group. A Budget Department expert is responsible for non-tax revenue forecasts.

In the preparation of individual tax revenue forecasts, the starting point is the actual tax revenue receipts for the previous and current year. A forecast for the following year is obtained from the previous year's tax receipts by utilising 1) a forecast of the tax base change, and 2) information about tax criteria changes relating to the following year. The impact of behavioural responses on the revenue estimate caused by changes in tax criteria are taken into account only when this can be done reliably and based on solid research data. Tax estimates for each tax recipient are presented in tax categories in which there are several tax recipients.

The macroeconomic forecast prepared by the Economics Department is an important basis for the preparation of revenue forecasts, because the development of the tax base is forecasted using the development of macroeconomic parameters in most of the tax revenue forecasts. No tax revenue category or tax base is forecast solely on the basis of the macroeconomic forecast, however; its role varies according to the tax category in question and to some extent also the situation. In the forecasting process, alongside the macroeconomic forecast, emphasis is also placed on actual revenue receipts and the views of public servants, which are formed through expert interaction and the preparers' knowledge of the special characteristics relating to their area of responsibility. In the Revenue Working Group, tax revenue information obtained from different sources is compiled and combined into the macroeconomic forecast.

2 Revenue estimate preparation methods by revenue category

2.1 Taxes on earned and capital income

The forecast of earned and capital income tax is based on a forecast of the development of the tax base, i.e. of earned and capital income. In the forecast, current tax criteria are applied and known changes in tax criteria are taken into account.

2.1.1 Tax base forecasting

Tax base forecasting is based on the revenue base forecast which is prepared in the Economics Department of the Ministry of Finance. The revenue base forecast is based on the ministry's macroeconomic forecast, which describes general economic development. The revenue base is divided into earned income and capital income. Around 90% of the taxable income of households is earned income. The aim is to forecast the development of the revenue base by examining factors affecting individual income items such as wages and salaries, social benefits and capital income.

Earned income

The most significant items of earned income are wages and salaries, which account for around 66% of taxable earned income. The forecast of wages and salaries is based on an assumption on the general rise in earnings and an assessment of the development of labour.

Pension income accounts for 24% of taxable earned income. The pension income growth estimate is based on assumptions about the number of pensioners and the development of the Earnings-Related Pension (TEL) Index as well as on an assessment of the maturity of the earnings-related pension system. By the maturity of the earnings-related pension system is meant that, with time, an ever larger proportion of all pension recipients receive a full earnings-related pension. As a consequence of this the average pension increases.

Estimates of unemployment benefits, in turn, are based on data on the level of unemployment benefits and the number of unemployed. In addition, there are separate projections of the development of a number of smaller income items, such as sickness allowance, home care allowance and study grant, for example.

Capital income

The most significant capital income items are capital gains (around 32%), dividend income (around 34%) and rental income (around 12%). In addition to these, the capital income base includes a number of smaller items, such as capital income from forestry as well as capital income from agriculture and business.

Capital gains are the most cyclically sensitive capital income item and the most difficult item to forecast. For example, in 2012 capital gains declined by around 34% from the previous year, while in 2013 they rose by around 48% from the previous year. Forecasting capital gains is made more difficult by the fact that reliable data on them are not obtained until the completion of the tax assessment, i.e. in October of the year following the tax year. In forecasting capital gains, actual information on the price development of securities is used as an indicative guide.

The development of dividend income is determined to a large extent on the basis of the development of companies' profits. When preparing the dividend income forecast, the preparer has to weigh up the assessment of companies' profit prospects included in the economic outlook forecast and market analysts' views on the development of dividend distribution.

Rental income is an income item whose development is relatively stable. The most important factor affecting it is the level of rents.

Final data on the development of the various capital income items are only obtained when the tax assessment is completed by the end of October of the year following the tax year.

2.1.2 Forecasting earned and capital income tax

The combined earned and capital income tax forecast is prepared by combining the forecast of the tax year's final taxes (i.e. of taxes payable in the tax year) and the forecast of taxes that have accrued during the calendar year.

Forecast of taxes for the tax year

The forecast of the tax year's final taxes is made on the basis of each year's income forecast and tax parameters. The forecast is made utilising the TUJA- and HVS-microsimulation models used by the Ministry of Finance. The TUJA-model is built upon Statistics Finland's income distribution data, while the HVS model, i.e. the personal taxation planning model, is built upon final taxation data.

The forecast of the tax year's final taxes includes all taxes contributing to total tax revenue from earned and capital income. These include central government progressive income tax, Finnish Broadcasting Company (YLE) tax, capital income tax, municipal income tax, church tax, and sickness insurance contribution. The forecast of the apportionment of central government and other tax recipients (i.e. their forecasted shares of total tax revenue from earned and capital taxes) is obtained directly from the forecasts of final taxes. The change percentages of withholding taxes and advance taxes, which are used in preparing the forecast of tax revenue receipts, are also derived from them.

2.1.3 Monitoring and forecasting monthly tax receipts

The tax for each tax year (i.e. the final tax) accrues over a number of calendar years, i.e. the tax revenue receipts of a calendar year consist of taxes received from a number of tax years. Most of the tax receipts of a calendar year consist of withholding taxes and advance taxes received during the same tax year. Tax receipts of a calendar year also include supplementary payments of advance tax and residual taxes relating to the previous tax year as well as a minor amount of taxes relating to earlier tax years. Refunds of advance tax relating to the tax year preceding the calendar year reduce the tax receipts of the calendar year.

When making a forecast of monthly tax receipts, the starting point is the previous year's tax receipt information about the various tax items. The forecast of withholding tax and advance tax receipts is based on the projected change in earned income tax. In addition, changes in the forecast of dividend income distributed from publicly listed companies and forecast of income from wood sales, among other things, are also taken into account. These two capital income items are subject to withholding taxes.

Separate forecasts of each year's advance tax refunds, residual taxes and supplementary payments of advance tax are made. A forecast of the development of capital gains and mortgage interest is used, among other things, in their preparation.

The forecast of monthly tax receipts is made at the level of total tax revenue from earned and capital income, because all earned and capital income taxes are handled as one entity in tax collection. The forecast is revised monthly on the basis of actual data. Data on monthly tax receipts for the current year are obtained from the Tax Administration's tax receipt statistics.

2.1.4 Forecast of central government on-budget earned and capital income tax receipts

Central government on-budget tax receipts (i.e. earned and capital income tax receipts) consist of taxes paid to the central government in a calendar year and withholding tax on non-residents' income.

The central government's share of the projected total tax receipts from earned and capital income is calculated with the aid of central government's apportionment ratio. The apportionment ratio of a tax year used in the forecast is always the apportionment ratio that is legislated for that tax year. An apportionment ratio estimate forecasted with the HVS-microsimulation model is used for tax years following the current calendar year, for which a valid apportionment has not yet been confirmed.

Withholding tax on non-residents' income also accrues to the same budgetary item of the central government as capital and earned income taxes. Most of it is generated on the basis of dividends paid abroad. Because of this, the forecast of withholding tax on non-residents' income is linked to the projected development of dividends from publicly listed companies.

In the final forecasting phase of the central government on-budget tax receipts, the necessary timing corrections are made into the forecast in order to achieve a revenue estimate that reflects revenue accruing to central government accounts.

2.1.5 Apportionments and changes to them

The total tax revenue from earned and capital income taxes is distributed between the central government, the municipalities, the parishes and the Social Insurance Institution of Finland according to their respective legislated apportionment ratios. However, the final tax revenue share of each tax recipient in a given tax year is settled only after the completion of the tax assessment. During the tax year when the final tax revenue and the relative proportions of earned and capital income tax items are still unknown, tax revenue is distributed to tax recipients using estimated apportionments ratios. These ratios are confirmed at the beginning of every tax year by the Ministry of Finance. The estimated apportionment ratios are forecasted by the Ministry of Finance using the HVS-model. The starting point of the estimation is the tax data from the most recently completed tax assessment year (for example data on tax year 2014 is available at the beginning of 2016). The revenue base and deductions are then increased to correspond with their level in the tax year. In addition, tax criteria of the tax year are used in the estimation. The estimated apportionments can be revised before the completion of the tax assessment if, for example, there is reason to assume, on the basis of the development of a given income item, that the proportions of tax items belonging to the earned and capital income tax collection set are changing significantly.

When the tax assessment of a tax year is completed, the apportionments of each tax recipient are adjusted to correspond with the relative revenue proportions of earned and capital income tax items and legislated apportionment ratios of tax recipients. In this context, a so-called tax payment settlement is made in which the taxes already paid to tax recipients are adjusted to reflect the final tax revenue shares of the tax year. The adjustments made in connection with the tax payment settlement may be tens or even hundreds of millions of euro in magnitude.

After the completion of the previous year's tax assessment, the estimated apportionments of current tax year that affect the accrued tax revenue of that calendar year are reviewed and changed as necessary. This adjustment takes place in December. The capital income forecast is highly influential in estimating tax recipients' apportionment, because tax on capital income is only paid to the central government. Final data on capital income are only obtained when the tax assessment is completed. This means that it is usually not possible to take the apportionment adjustment for the current year into account in the supplementary budget proposal.

2.1.6 Medium-term forecast

The medium-term forecast is built on top of the more detailed short-term forecast. Medium-term estimates of earned and capital income tax revenues are forecasted with the help of medium term earned and capital income growth estimates. The revenue base is divided into earned and capital income in the medium-term calculations.

The medium-term forecast includes the assumption that taxation of earned income will be eased such that progression does not tighten taxation as a result of rising incomes. Con-

cerning other changes in tax criteria, only those on which a clear decision has been made are taken into account. Without the effect of progression, tax revenue would grow in line with the taxable revenue base. If the tax scale and deductions were to remain unchanged, taxation would tighten due to the progression of the tax system as earnings rose.

Wherever possible, an effort is made to base assumptions relating to tax criteria changes on statements made in the Government Programme and on decisions made by the Government. However, often for the medium-term, no detailed view exists on the exact scale of tax cuts or their timing. Accordingly, the assumptions about tax criteria changes included in calculations are of a technical nature.

2.2 Corporate income tax

The forecasting of corporate income tax revenue is based on an estimate of companies' taxable income and the tax payable, i.e. the final tax, for the tax year. The starting point in the forecast is corporate income tax according to the most recently completed tax assessment, which is changed in accordance with profit development. The change in profit development is estimated mainly with the aid of the change in the national accounts net operating surplus. With regard to the current year, monitoring data obtained on tax receipts and payments of advance tax are also taken into account. The medium-term forecast of corporate income tax is made by changing the amount of taxes payable by the change in the national accounts net operating surplus. The Economics Department forecasts the change in the net operating surplus as part of the macroeconomic forecast.

The corporate income tax base consists of companies' taxable income, which in turn is determined by a combination of several different factors. Companies' income formation is based on the quantity of goods and services produced and the price received for them. To estimate the development of companies' income, the costs of production, such as wages and salaries, social security contributions, the value of other production inputs used and other extraordinary items, must be deducted from the value of total production.

The macroeconomic forecast prepared by the Economics Department is based on the national accounts framework and the identities contained within it. There are many key items in the accounts that can be utilised in estimating companies' profit development in a consistent way in relation to the other assumptions included in the forecast.

The national accounts provide data on the development of total production value, wages and salaries, social security contributions and the value of intermediate products. In the accounts framework, the net operating surplus describes, in principle, how companies' profits are developing. The net operating surplus is obtained in the national accounts so that employee compensation and taxes on production and imports net of subsidies as well as consumption of fixed capital are deducted from value added. It is the surplus or deficit of production activities before interest, rents or other payments and corresponds to the income that units receive from their own use of their production equipment.

The profit estimate based on the net operating surplus does not take into account many extraordinary factors or items that can strongly affect the profit of some single company. The

change in net operating surplus has been significantly more stable than other information about companies' profit development. In preparing the forecast, the net operating surplus is, despite its shortcomings, a natural starting point for examining the development of corporate income tax revenue. In addition, an effort is made to improve the picture of companies' profit development by collecting and analysing information obtained from interim reports.

The tax revenue forecast based on the net operating surplus is revised further on the basis of the following data, among others:

- Tax year-specific payment data on advance tax payments of corporate income tax. These data are obtained monthly on an up-to-date basis;
- Revenue data, obtained from tax settlement statistics, on advance tax payments, supplementary payments of advance tax and other items;
- Possible tax criteria changes, e.g. changes in tax rates or tax recipients' allotment shares.

Companies file a tax return no later than the end of April of the year following the tax year. As soon as the tax return data has been recorded in early June, the Large Taxpayers' Office produces, for the taxes of its client companies, statistics that contain the tax data of the previous year and the tax year. The tax revenue forecast is updated on the basis of these data, if this is deemed appropriate on the basis of the new data.

As with earned and capital income taxes, the corporate income tax payable for each tax year is received over a number of calendar years. Around 80% of the tax is received as advance tax payments during the tax year. In the year following the tax year, before the completion of the tax assessment, companies can pay supplementary payments of advance tax or apply for a reduction of advance tax (and a monetary refund). The size of these two items varies considerably from year to year. After the completion of the tax assessment, the corporate income tax receipts are diminished by advance tax refunds and increased by residual taxes.

The corporate income tax recipients are, up to the end of 2015, the central government, the municipalities and the parishes. As of the beginning of 2016, the tax recipients will be the central government and the municipalities, because the parishes' corporate income tax allotment will be transferred to the central government and replaced by an appropriation paid from the Budget. Corporate income tax revenue is paid to the tax recipients monthly.

2.3 Value-added tax

The concept of value-added tax revenue in the forecast is the same as the net value-added tax revenue seen in the central government's budget account. It includes all value-added tax paid to the central government during the year, less refunds of value-added tax. The net revenue does not, however, include value-added tax paid by the municipalities, because this is refunded to the municipalities monthly.

Value-added tax revenue is forecasted using a model based on as complete a survey as possible of the value-added tax base. Value-added tax is paid for consumption in respect of which the value-added tax paid cannot be deducted elsewhere. The tax base therefore

consists mainly of household consumption, public sector intermediate consumption and investments, and the intermediate consumption and investments of businesses and organisations that are not subject to value-added tax. Household consumption generates nearly 70% of value-added tax revenue. Value-added tax-exempt sectors are financial and insurance activities, home ownership, and health care and social services.

The value-added tax base forecast is made with the aid of national accounts statistics produced by Statistics Finland. They can be used to form a comprehensive picture of the tax base, because the detailed data enables different tax rates under the value-added tax rules to be applied to the data. In the forecasting process, the tax base of future years is estimated on the basis of the macroeconomic forecasts produced by the Economic Department of the Ministry of Finance. In addition, the forecast for the current year is revised with the aid of actual revenue data obtained from the Tax Administration and Customs.

In estimating the tax base, ten calculation entities are itemised:

1. Household consumption
2. Social transfers in kind
3. Construction companies' own use of intermediate consumption
4. Intermediate consumption of non-profit institutions
5. Investments of non-profit institutions
6. Intermediate consumption of public sector (excl. municipalities)
7. Investments of public sector (excl. municipalities)
8. Intermediate consumption of other tax-exempt sectors
9. Investments of other tax-exempt sectors
10. Restrictions on deductibility of company cars and YLE tax

Value-added tax forecasts are made on the same principle also in the medium term.

[Factors affecting the value-added tax forecast](#)

The forecast is affected by five factors:

1. The starting level, i.e. changes to the previous year's projected VAT revenue
2. The Economics Department's macroeconomic forecast
3. Monthly revenue data of the forecast year
4. Changes in value-added tax criteria
5. Changes in consumption structure

The forecast for the current year is affected by changes made to the previous year's forecast. The forecast of 2016 tax revenue, for example, is based on the 2015 forecast. For this reason, changes made in the 2015 forecast change the starting level for 2016 and therefore also affect the 2016 forecast, even if no changes were to happen in other factors affecting the forecast (for example in the Ministry of Finance's macroeconomic forecast).

The most important factor affecting the forecast is the macroeconomic forecast. It enables a statistical base for the forecast year to be estimated for the forecasting of tax bases and revenue. Thus any changes in the macroeconomic forecast are also immediately reflected in the forecast of value-added tax revenue.

The key variable of the macroeconomic forecast is household consumption expenditure in Finland, which is taken into account in the tax base forecast in accordance with the durability classification. Consumption accounts for around 70% Finland's value-added tax base. Important tax base items are also public intermediate consumption and investments, for which forecast figures are used with regard to the central government and the social security funds. With regard to private intermediate consumption and investments, data is obtained in respect of financial institutions, home ownership and non-profit organisations.

The Tax Administration and Customs report the VAT revenue they collect monthly. The forecast for the current year is revised by weighting actual monthly revenue receipts and estimating the year-end VAT revenue in accordance with the Economics Department's forecast.

The significance of reduced value-added tax rates in value-added tax revenue is determined mainly on the basis of Statistics Finland's private consumption statistics. Consumption structure is updated particularly when a new household consumption survey is done. This may affect projected value-added tax revenue slightly.

Around EUR 10.9 billion in value-added tax refunds were paid to taxpayers in 2014 and around EUR 10.8 billion in 2013. Of value-added tax refunds, those received by municipalities accounted for around EUR 2.3 billion in 2014. Value-added tax included in input purchases are refunded mainly to those companies of whose sales a significant proportion goes for export or which have made large investments, in which case the amount of value-added tax included in investment inputs exceeds the amount of payable value-added tax included in the company's sales. Monthly, the amount of refunds paid varies between EUR 800 million and EUR 1,100 million. The strong fluctuations in the amount of refunds both on a monthly and annual level make the precise estimation of total value-added tax revenue more difficult and therefore give rise to differences resulting from timing factors between forecast and actual tax receipts.

2.4 Excise duties

Excise duties include the duty on tobacco products, the duty on alcoholic beverages, excise duties on sweets, ice cream and soft drinks, the duty on certain beverage packages, and the duty on certain energy products.

Excluding the value-based element of the duty on tobacco products, excise duties are unit taxes. So, in addition to tax criteria, the forecasting of revenue from excise duties is largely a matter of forecasting the tax bases, i.e. the level of consumption of products subject to excise duties.

In forecasting the development of tax bases of excise duties, it is often not possible to use any economic indicator. This is because in forecasting the development of the consumption of a single product group, macroeconomic indicators have been shown in studies to be

too imprecise. This is due to the fact that the link between macroeconomic indicators and development of the consumption of a single product group is often weak and the development of the consumption of a single product group subject to an excise duty is dominated by factors characteristic to each excise duty category. Tax base projections are often based on identifying trends in the past development of each product group and on the estimation of the often repeated and differently directed effects of tax criteria changes. The effects on the tax base of tax criteria changes are generally estimated with the aid of price elasticities of demand, which are based on available research.

In the preparation of the alcohol consumption forecast, the views of alcohol industry actors and research institutes on the development of the taxable consumption of different beverage groups are utilised. The distribution of consumption among the different distribution channels and the development of imports by travellers are also significant factors. When the tax is changed, estimates of the changes in the tax base caused by it are founded on beverage group calculations made using the most recent domestic research data available at the time in question.

With regard to the consumption of tobacco products, estimates of future development like those mentioned above cannot be formed; instead, development estimates are based on trends. On the other hand, due to the level of detail of the data, the market can be monitored very precisely, particularly in the case of cigarettes, which account for round 90% of revenue from the duty on tobacco products. The duty on tobacco products is also affected by the prices of tobacco products, which except in cases when the duty is changed have moved in line with changes in the Consumer Price Index. When the duty is changed, estimates of the change in the tax base caused by it are founded on calculations made using the most recent domestic research data available at the time in question.

In energy taxation, the tax levels are mainly determined according to a product's energy content and carbon dioxide emissions. Tax levels of energy products differ from each other significantly. Because, in addition to this, there are certain other steering elements in the tax structure influencing the amount of the tax, it is important in terms of the accuracy of the forecast that it is done on a sufficiently detailed level for each energy product and according to its use. In forecasting energy taxes, a key factor is forecasting the consumption of transport fuels, because they account for nearly 60% of energy tax revenue. In addition to the development of petrol and diesel, the development of the consumption of biofuels that replace them is significant from the energy tax forecast's point of view, because biofuels are characteristically related with lower emissions and their tax level is also lower. The electricity tax accounts for slightly less than 25% of energy tax revenue and the remainder consists of excise duties on other energy products.

In the forecast of energy taxes, the energy balance sheet prepared in the Energy Department of the Ministry of Employment and the Economy is extensively utilised. Economic outlook forecasts of the Ministry of Finance and various research institutes are used, both at the level of the whole economy and at the sector level. The energy balance sheet is prepared from the perspective of total energy production and consumption, which means that the balance does not correspond fully to the forecasting needs of taxable consumption, because taxable consumption is only a part of total energy consumption.

Forecasts of excise duty revenue are made on the same principle also in the medium term.

2.5 Car and vehicle tax

2.5.1 Car tax

The car tax is a one-off tax levied in connection with the acquisition stage of a vehicle or when a vehicle is first registered. The car tax is levied on passenger cars and vans and also on motorcycles. The car tax may also be levied if the structure of a vehicle is altered beyond certain limits or if changes take place in the terms of possible tax exemption. In car taxation, the taxable value is the vehicle's general retail sale value. With regard to new vehicles, this is usually based on vehicle trade price lists and advertisements. The general retail sale value of used cars is ascertained mainly using market data.

The level of the tax on passenger cars and vans is determined according to the vehicles' CO₂ emissions, if this data has been determined in a vehicle's type approval. Most of the tax revenue (around 90%) consists of taxes on new and used cars. In the tax revenue forecast, car tax revenue is projected on the basis of three components, namely number of vehicles sold, taxation value and average CO₂ emissions. Of these, the level of average CO₂ emissions is expected very probably to fall in the future due to technological developments and the steering effect of taxation, which encourages reductions in CO₂ emissions. A downward trend is therefore expected to be associated with the car tax revenue forecast. Growth of taxable values is based on long-term trends and is close to inflation. With regard to the fluctuation of tax revenue, the most important component, the level of demand for passenger cars, is forecasted with the aid of actual tax receipts, anticipated other factors, and demand components of the macroeconomic forecast.

2.5.2 Vehicle tax

The vehicle tax is a time-linked tax levied in 12-month periods for passenger cars and vans and also for lorries. It is possible to pay the tax in a number of instalments. Vehicle tax is divided into a base tax, which is levied for all passenger cars and vans, and into a tax on motive force, which is levied for those vehicles that use some other force or a fuel taxed more lightly than petrol. Most of the tax on motive force is collected from vehicles that use diesel as a fuel.

The base part of the vehicle tax is determined on the basis of the vehicle's CO₂ emissions. For those vehicles that have no CO₂ data in the vehicle register, taxation is based on the vehicle's total mass. The tax on motive force is also based on the vehicle's total mass. In addition, in the taxation of lorries, there is an additional element for the use of a draw bar and a trailer. The tax revenue forecast for the base tax and the tax on motive force is produced by calculating for an up-to-date vehicle stock a precise vehicle-specific amount of tax based on revenue receipts according to the current situation.

2.6 Other taxes

Of other taxes and other tax-like payments, the most significant are tax at source on interest income, inheritance and gift taxes, insurance premium tax, asset transfer tax and lottery tax.

2.6.1 Tax at source on interest income

Tax at source on interest income consists mainly of the interest income of household deposits. Development of total household deposits and the average interest rate are monitored using the Bank of Finland's monthly statistics. The assessment of the Economics Department and Financial Markets Department of the development of total deposits and the level of interest rates is used when estimating tax at source revenue.

2.6.2 Inheritance and gift taxes

The tax base of inheritance and gift taxes consists of inheritances and gifts. Inheritance tax is paid on inheritances of EUR 20,000 or greater. Inheritance tax is determined on the basis of the value of the assets inherited and the family relationship, according to an inheritance tax scale and tax classes. Gift tax is paid on gifts valued at EUR 4,000 or greater. The central government is the recipient of inheritance and gift taxes.

In the preparation of the inheritance and gift tax revenue estimate, tax receipt data for the current year and provisional data on taxes payable are utilised. In addition, the estimate takes into account tax revenue impact estimates for changes made to tax criteria. Inheritance and gift tax revenue for later years is projected by systematically increasing the previous year's revenue estimate, because the tax base of inheritance and gift tax fluctuates strongly from year to year and does not follow very well the development of any macro-economic indicator.

2.6.3 Insurance premium tax

The insurance premium tax is directed at certain insurance services. The insurance premium tax is levied on the insurance premium paid according to the insurance agreement when the insured property or other insured interest is situated in Finland or the insured interest is related to activity conducted in Finland. The insurance premium tax is viewed as a special consumption tax that supplements value-added taxation.

The insurance premium tax base is considered to develop in line with the projection of growth of private consumption. With regard to the revenue estimate for the current year, Tax Administration data on insurance premium tax receipts are also utilised. Changes in the revenue estimate for the current year affect the revenue estimates for later years via the projection of growth of private consumption.

2.6.4 Asset transfer tax

The biggest part of the asset transfer tax base consists of housing share and real estate sales. Of housing share sales, sales of first homes are exempt from asset transfer tax. With regard to housing-share and other owner-occupied apartments, data on sale prices and the number of sales are obtained from the Tax Administration. For real-estate sales, actual data is obtained from real estate sale price statistics produced by the National Land Survey of Finland. In addition, asset transfer tax is received from other kinds of share trading, but securities trading on the stock market does not fall within the scope of the tax. In the asset transfer tax forecast, the Economics Department's assessment of the development of the housing and real estate market is used.

2.6.5 Lottery tax

The lottery tax is received almost entirely from lotteries implemented by exclusive right, from which the tax is collected from the difference of stakes and winnings paid. Lottery tax revenue is forecast on the basis of tax revenue data and by increasing the revenue estimate systematically for future years.

2.7 Other central government revenue

Other central government revenue consists of miscellaneous revenue of the different administrative branches, net income from sales of shares, interest income and profit entered as income. With regard to miscellaneous revenue of the administrative branches, the ministries make proposals in the budget formulation stage, which are then handled in the Budget process in the same way as appropriation proposals.

The estimate of net income obtained from share sales is based on a share sales provision in the Government Programme, if the Government Programme contains such a provision. The Government's share sales decisions deviating from this main provision are taken into account in the revenue estimate, if information on them is available. No clear monetary target for share sales was set in Prime Minister Sipilä's Government Programme. The assumption used in budgeting is in fact based on an estimate of share sales potential made by the Ownership Steering Department of the Prime Minister's Office.

The dividend income estimate is also based on provisional data of the Ownership Steering Department of the Prime Minister's Office and on estimates of companies' profit development as well as the development of potential dividend income. Since the 2009 Budget, dividend income and income from share sales have been in the same revenue item. Alko's (National alcoholic beverage retailing monopoly in Finland) dividend income is based on a forecast of the Ministry of Social Affairs and Health.

The profits entered as income of state-owned enterprises (Senate Properties, Metsähalitus) are estimated on the basis of proposals of the ministries steering the enterprises. The Bank of Finland's forecast of profit entered as income takes into account the levels of

previous years and the Bank of Finland's assessment of the future development of profit entered as income. Under the Act on the Bank of Finland, half of profits are paid to the central government. The Parliamentary Supervisory Council may, however, decide to use the profits otherwise.

Interest income projections are made on the basis of State Treasury estimates. The central government's interest income derives from long-term loans granted by the central government and from interest accrued from the investment activity of cash reserves exceeding everyday needs. The estimated amount of interest income is affected by assumptions about average cash reserves and the interest rates paid on deposits. The future development of interest rates is derived from Ministry of Finance's macroeconomic forecast.

Estimates of the administrative branches' miscellaneous revenue are formed in the Budget and spending limits process on the basis of ministries' proposals.

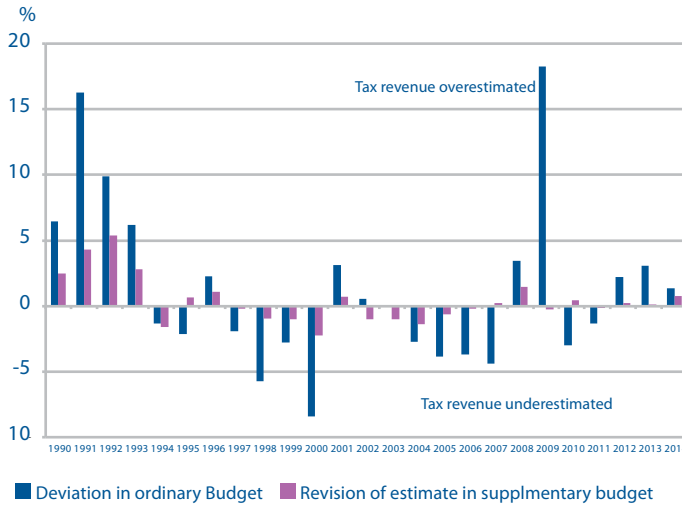
3 Sensitivity and risk assessment of revenue estimates

3.1 Risk assessment of revenue estimates

Tax revenue forecasts are based to a large extent on an assessment of economic growth and its underlying factors. According to the current macroeconomic forecast (autumn 2015), the Finnish economy would experience a cyclical upturn during 2016 and GDP would grow by around 1.3% from the previous year. There is significant uncertainty, however, associated with timing of the upturn specifically in 2016, because cyclical upturns and downturns are very difficult to forecast. This uncertainty is also reflected in tax revenue forecasts, in the vast majority of which the development of the tax bases is projected using the forecast development of macroeconomic parameters.

Risks relating to the accuracy of tax revenue forecasts, in fact, also grow in connection with cyclical upturns and downturns, just as the following historical examination of tax revenue forecast deviations illustrates. Figure 1 shows how estimates of central government tax revenue in ordinary Budgets and in supplementary budgets have deviated from actual revenue. Figure 1 shows that tax revenue in the 2008 and particularly the 2009 Budget was significantly overestimated, as was also the case in connection with the 1990s recession, in 1990–1993. Tax revenue was overestimated by around 18% in the 2009 ordinary Budget, since the level of total output fell unusually sharply in 2009, around 8% from the previous year. In 2010, on the other hand, economic growth picked up significantly and more quickly than forecast in connection with the 2010 Budget. Due to this, tax revenue was underestimated by around 3%.

The 2011 ordinary Budget's estimate of central government tax revenue was, as in 2010, lower than actual revenue. The deviation in the tax revenue forecast was, however, smaller than in 2010. From 2012, the situation was reversed. Tax revenue was overestimated by just over 2% in the 2012 Budget and by just over 3% in the 2013 Budget. In 2014 the tax revenue estimate exceeded actual revenue by just over 1%. The main reason for the overestimation in these years was that national output declined, in contrast with the forecasts made in connection with the budget proposals of the years in question.

Figur 1. Budget forecasts of central government revenue relative to actual revenue, 1990–2014.

The impact of economic development that deviates from the economic scenario underlying a revenue forecast depends on which economic demand items and factors deviate from earlier estimates. For example, changes in domestic demand affect tax revenue receipts more strongly than changes arising via external demand. For this reason, forecasting errors relating to domestic demand factors generally weaken the accuracy of tax revenue projections more than forecasting errors relating to external demand factors. Based on historical data, a slowdown in economic growth by one percentage point would weaken the central government budgetary position by 0.2–0.3 percentage points of GDP. Most of this is based on a reduction in tax revenue.

The impact on the revenue of individual taxes of economic development deviating from economic scenarios is mediated via the forecast deviations of those macroeconomic parameters with which the tax base is forecast. With individual tax revenue forecasts, however, are also associated individual risks that are not connected with the macroeconomic forecast, but rather stem from the characteristics of the tax being forecast, such as factors relating tax settlement. For example, with regard to corporate income tax, risks to the revenue estimate arise from tax credits payable in later years in Finland's taxation to companies for taxes paid abroad.

There follows an examination of the key risk factors relating to tax revenue and their significance for the tax receipts of each tax category.

3.1.1 Earned and capital income taxes

Capital income, particularly capital gains, reacts more strongly to fluctuations in economic conditions than earned income. For example, in 2011 capital income grew 14%, whereas in 2012 it declined by around 6%. In 2015, capital income is again projected to

grow by around 8%. Capital income tax revenue is particularly susceptible to financial market instability. In particular, forecasting the intensity of changes in capital gains and losses has proved to be difficult. Forecasting capital income is also adversely affected by the fact that relatively little actual data are obtained about it before the tax assessment is completed.

Any change in capital income is seen with a delay in tax revenue receipts. Tax on capital gains, which is the most cyclically sensitive item of capital income, is not paid, more often than not, until the year following the tax year, either as a supplementary payment of advance tax or as residual tax. Besides directly via tax receipts, the accuracy of the capital income forecast is also affected by the apportionments applied in the settlement of earned and capital income taxes. The amount of capital gains for 2014 affects earned and capital income tax receipts in 2015, because tax from capital gains is mainly not received until the year following the end of the tax year. In addition, any deviation of capital income development from the forecast impacts the assessment of tax recipient groups' apportionments more than forecasts of earned income. The central government is the sole recipient of capital income tax, whereas all tax recipients receive earned income tax. The final amounts of tax for the tax year and the apportionments for each tax recipient are known only after the tax assessment is completed in October the following year. Before the completion of the tax assessment, estimated apportionments based on tax revenue forecasts are applied in the settlement of taxes, and these apportionments are adjusted, if necessary, when forecasts change during the tax year.

3.1.2 Corporate income tax

It is typical for the forecasting of corporate income tax revenue that the tax changes of a single large company can change the revenue forecast by several hundreds of millions euro. Forecasting these changes is impossible, because even the companies themselves do not always know about them earlier in the year; rather, they apply for a lowering or increasing of advance taxes of corporate income tax for the latter part of the year.

Furthermore, tax credits payable in later years in Finland's taxation to companies for taxes paid abroad are also impossible to take into account in the forecast. These credits, made to eliminate double taxation, are one-off and typically large items about which the authorities are informed only when companies apply for the credits.

The uncertainty associated with estimating the net operating surplus constitutes a risk to forecast accuracy both in the current year and in the years following it. On the other hand, the more actual information is obtained about a tax year's taxation, the smaller is the significance of the net operating surplus as a forecast criterion in respect of the current year. Based on ex-post analyses, it can also be stated that the net operating surplus is a good starting point for the preparation of forecasts.

3.1.3 Value-added tax

The accuracy of the value-added tax forecast crucially depends on how well the development and allocation of the aggregate value of consumption can be forecasted. With regard to private consumption, the most significant risk relates to the development of household income and thereby consumption propensity. Household consumption accounts for around two-thirds of the value-added tax base. In addition to current consumption, changes in household consumption affect projected future consumption and thereby the projected value-added tax base. Household consumption propensity can also be affected by, in addition to the economic outlook, the development of asset values, such as the price of securities. For example, during the 2008–2009 recession, household saving increased substantially.

3.1.4 Other taxes

A general weakening of confidence is typically reflected in respect of consumer goods most strongly in consumer durables, such as passenger cars, the purchase of which is often possible to postpone. Changes in the economic outlook and consumer confidence, therefore, constitute a significant risk to the car tax forecast. In terms of car tax revenue, the sales development of new passenger cars has the greatest significance. For example, during the 2008–2009 recession, first registrations of new cars fell exceptionally sharply from around 140,000 to 90,000 units. Tax criteria changes can also affect demand for cars.

The vehicle tax base is the total stock of cars, vans and lorries in transport use, as a result of which the tax base is relatively stable and no great changes take place annually or over the short term.

Excise duty forecasting is facilitated by the fact that the tax bases have developed steadily in recent years, when changes in excise duty have not been made and no changes in the availability of products have taken place. On the other hand, taxable consumption of products subject to excise duty can change rapidly when changes in the availability of products take place, for example in the case of imports by travellers. Demand and supply of products are subject to diverse administrative and financial steering, the effects of which are generally difficult to predict. In addition, forecasting is made more difficult by various external factors, which in practice are very difficult or even impossible to forecast. For example, with regard to energy taxes, exceptional weather conditions significantly affect energy tax revenue. Weather conditions may also have a significant impact on the consumption of other goods subject to excise duties, such as alcohol, ice cream or soft drinks. In addition, various unforeseen production interruptions such as strikes heavily influence energy tax receipts. Often, tax planning that takes place in connection with tax increases is a factor whose effects on the consumption of products may be very small, but significant for tax revenue. The effects on the tax base of unexpected changes that are difficult to forecast and verify, adversely affect the reliability of extrapolation later.

Cyclical developments pose risks to asset transfer tax revenue, which depends on the development of housing and real estate prices and the number of transactions. Asset transfer

tax revenue changes considerably each year due to, among other things, fluctuations in the number of mergers and acquisitions that fall within the scope of the tax, as well as cyclical fluctuations in the housing and real estate market. Asset transfer tax must be paid within 2–6 months, and in the case of new housing shares even later than this, as a result of which changes in the housing and real estate market are evident in asset transfer tax receipts with a delay of up to a year. The tax collected from individual large-scale mergers and acquisitions might be tens of millions of euro and they cannot be foreseen.

3.2 Sensitivity of tax revenue estimates to various factors

Revenue forecasts are based on an assessment of economic growth and its underlying factors as well as on an estimate of the effects on tax revenue of expected changes in tax criteria. Table 1 presents estimates of the impacts that changes in the development of macroeconomic parameters have on tax revenue through tax base changes. The impact estimates are presented at the 2016 level and they are based on macroeconomic and revenue estimates made in August 2015.

Table 1. Impact on tax revenue of changes in certain tax base items, estimated at the 2016 level

Tax category	Tax base / demand item	Change	Change in tax revenue, EUR million
Taxes on earned income	Wages and salaries	1 %-point	373, of which central government 126 and municipalities 167
	Pension income	1 %-point	117, of which central government 30 and municipalities 76
Capital income tax	Capital income	1 %-point	32
Corporate income tax	Net operating surplus	1 %-point	40, of which central government 28 and municipalities 12
VAT	Value of private consumption	1 %-point	118
Car tax	Sales of new passenger cars, units	1,000 units	6.5
Energy tax	Electricity I consumption *	1%	10
	Petrol consumption	1%	13
	Diesel consumption	1%	14
Duty on alcoholic beverages	Alcohol consumption	1%	14
Duty of tobacco tax products	Consumption of cigarettes	1%	7

Table 2 presents estimates of the effects of tax criteria changes on the revenue of various taxes, estimated at the 2016 level. The estimates are also based on revenue forecasts made in August 2015. The perspective in Table 2 is how changing the tax criterion by a percentage point or by some other suitable unit amount affects tax revenues when the size and structure of the tax base remain unchanged. Such estimates are called unit revenue impact estimates.

Unit revenue impact estimates are static estimates that do not take into account the possible effects of tax criteria changes on agents' behaviour and thereby on the tax base and taxes. The reliability of a unit revenue estimate can be considered the weaker, the larger the

tax criterion change in question, because behavioural effects are in monetary terms generally the greater, the greater the tax criterion change in question. According to the table, for example, increasing all three tax rates of value-added tax by one percentage point would increase central government tax revenue by around EUR 820 million. Taking behavioural effects into account, the impact on tax revenue would probably be smaller than this. Unit revenue impacts, moreover, do not take into account the fact that tax criteria changes may also affect other revenue and expenditure items and that it may not be possible to implement them as a single measure.

Table 2. The impact of tax criteria changes on tax receipts, estimated at the 2016 level

	Central government tax revenue (most recent actual figure), EUR million	Criterion change	Change in tax revenue on an annual basis in 2016, EUR million
Central government earned income tax scale ¹⁾			
1st band (16,300-24,300)		1 %-point	172
2nd band (24,300 -39,700)		1 %-point	180
3rd band (39,700 -71,400)		1 %-point	101
4th band (71,400 - 90,000)		1 %-point	17
5th band (90,000 -)		1 %-point	27
All tax recipients, total	5,696	1 %-point	497
Local government taxation	18,335	0.5 %-point	494
Average tax rate (19.74% in 2014)		1 %-point	987
Capital income tax	2,417		
1 %-point		1 %-point	79
Corporate income tax			
Tax rates 24.5% in 2013	4,640	1 %-point	211
Consumption taxation			
VAT ²⁾			
- reduced 10% rate	749	1 %-point	74
- reduced 14% rate	2,321	1 %-point	173
- normal rate, 24%	13,483	1 %-point	571
Fuel taxes			
petrol	1,298	1 cnt/litre	20
diesel	1,246	1 cnt/litre	28
Electricity tax ³⁾	720	0.1 cnt/kWh	40

¹⁾ Scale boundaries are based on 2014 legislation

²⁾ Value-added tax receipt figures are based on 2014 actual receipts.

³⁾ Other than industry, data centres and greenhouses

Universally applicable information on the tax revenue sensitivity of the various tax categories to discretionary measures that change the size and structure of the tax base cannot be presented, because the effects of such tax changes are specific to each case in question.



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