A Disaggregated Approach to Analyzing Public Finances in Austria

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The budget elasticities derived in this study indicate that a 1% deviation of GDP from the long-term growth potential causes a purely cyclical change of 0.38% of GDP in Austria's budget balance.

The predominance of progressive income taxation in Austria is reflected in the estimated elasticity of direct taxes on households to average income of 1.3. We expected the elasticity of direct taxes on enterprises to gross operating surplus to come to 1, since the corporate income tax is a proportional tax; the computation result of 0.9 confirms our assumption. The elasticity of indirect taxes to private consumption of 0.97 documents both the high share of proportional taxes and the impact of specific taxes, while the elasticity values of social security contributions and pension insurance contributions to average income (0.99 and 1) reveal the close correlation of these budget categories with the macroeconomic base variable. The elasticity of unemployment benefits to the number of unemployed persons of 0.9 results from the rising average duration of unemployment.

Between 2000 and 2004, the general government's structural budget balance (i.e. the budget balance adjusted for cyclical effects and one-off measures) improved from −2.1% to −0.9% of trend GDP. The development of the structural budget balance in Austria is above all shaped by discretionary measures based on legislative changes. The deviation of budget categories' development from the underlying tax base, which is especially pronounced for progressive taxes, and the deviation of the tax base from GDP are only of minor importance in the development of public finances in Austria.

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1 Introduction

The primary government balance (fiscal balance less interest payments) is to a large extent determined by policy and decision-making processes. However, the budgetary outcome is also (substantially) shaped by factors outside the decision makers' (direct) sphere of influence. Cyclical fluctuations in macroeconomic activity, for instance, impact strongly on government balances via automatic stabilizers taking effect (passive stabilization policy). In a difficult economic climate, corporate profits deteriorate, unemployment rates rise and wage and employment developments are merely modest, causing revenues from taxes and social security contributions to drop while transfer payments increase. By contrast, economic upturns are characterized by disproportionately higher revenues and generally lower transfer payments (most notably unemployment and welfare benefits).

Assessments of the soundness and sustainability of public finances are usually based on cyclically adjusted budget balances; these focus purely on the development of the structural budget balance, which largely represents the result of discretionary fiscal policy.

Accordingly, section 2 of this study is dedicated to measuring cyclically adjusted budget balances for Austria using an approach developed by Bouthevillain et al. (2001) for the European System of Central Banks (ESCB). In section 3, we investigate the determinants of structural budget balances,[2] which allows us to single out the impact of both noncyclical macroeconomic developments and discretionary measures of fiscal policy. The fact that residuals remain after this disaggregation underlines the need to improve data quality.

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2 Estimates of Cyclically Adjusted Budget Balances

A uniform, two-stage procedure used by the ESCB forms the basis for our estimation of cyclically adjusted budget balances in Austria.[3] In the first step, an error correction model is used to estimate the elasticities of various revenue and expenditure categories to their macroeconomic base variables. These elasticities specify the percentage changes in budget categories when the underlying base variables change by 1%. In the second step, the cyclical position of the economy is determined by calculating the cyclical gap, i.e. the extent to which each macroeconomic base variable deviates from its trend value, using the Hodrick-Prescott filter.[4] The cyclical component of the budget balance is calculated by multiplying the cyclical gap by the elasticities of the individual revenue and expenditure categories. The cyclically adjusted budget balance represents the budget balance under a "normal" growth path. Adjusting budget balances for cyclical effects makes it possible to analyze the development of structural budget balances and to assess the effects of discretionary fiscal policy.

The disaggregated approach we used has several advantages over methods that base estimates of the cyclical component exclusively on total GDP[5]. First, it takes into account the effects of changes in the composition of aggregate demand on public revenues and second, it allows for the fact that the various macroeconomic base variables do not necessarily follow synchronous cycles. If we consider only the cyclical fluctuations of total GDP, the asynchronous cyclical effects of various base variables on the different budget items would not be taken into account.

2.1 Budget Categories and Their Macroeconomic Base Variables

This analysis focuses on those budget categories that are directly (or automatically) influenced by the business cycle and cyclical fluctuations. These cyclically sensitive categories trace the development of selected macroeconomic base variables that in essence correspond to the respective tax base or have a direct causal link with the related budget items. While business cycle developments strongly affect government revenues in the form of indirect taxes, direct taxes on households and enterprises as well as social security contributions – around 90% of total revenues are sensitive to cyclical changes – their direct impact on government expenditures is limited to transfer payments to the unemployed. All other expenditure items (e.g. for education, research, public employment, health etc.) are not cyclically sensitive. However, pension payments in Austria used to be influenced by the business cycle: Until the turn of the year 2003 / 2004, pension payments had been coupled to the development of average net wages pursuant to §108 of the Austrian General Social Security Act. Thus, pension payments in Austria had been subjected to the same cyclical changes as wages.

We examined the relationships between the following macroeconomic base variables and budget categories:

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[3] See Bouthevillain et al. (2001).

[4] See, for instance, Bouthevillain (2001) for a description of the Hodrick-Prescott filter, its methodological shortcomings and alternative approaches.

[5] See, for instance, Girouard and Andre (2005).

Table 1

Macroeconomic Base Variables and Budget Categories

Budget category	Macroeconomic base variable
Direct taxes on households	Employment rate and average income
Direct taxes on enterprises	Enterprises' gross operating surplus
Indirect taxes	Private consumption
Social security contributions	Employment rate and average income
Unemployment benefits	Number of unemployed
Pension payments	Average income

2.2 Data Set Harmonization

The underlying European System of Integrated Economic Accounts (ESA) data were adjusted to capture only the developments of the cyclical component and to make the data set as consistent as possible.[6]

— The data was adjusted for the impact of the government sector itself on the revenue and expenditure variables to make sure that the observed changes were actually caused by cyclical changes alone and not also by government reactions to economic developments. As public sector employment is directly and exclusively determined by the government, we excluded the share in total revenues of taxes and social security contributions that the public sector itself pays, i.e. the share of public employees' payroll tax and social security contributions. Furthermore, we excluded all public revenues that also appear on the expenditure side (e.g. EU contributions, indirect taxes paid by the public sector), with the exception of cyclical expenditure items determined above (unemployment benefits, pension payments).

— Direct taxes on interest income (capital income tax) are excluded a priori in accordance with the ESCB's approach. This is justified by the weak correlation between interest income and the business cycle, and it is legitimate for consistency reasons – as a rule, public interest payments are not cyclically adjusted either.

— In addition, the budget category must directly correlate with the macroeconomic variable (assessment base). In the absence of a direct correlation, the budget category in question must be reclassified. This means that the respective tax revenues are removed from the original tax aggregate and included in a tax aggregate with a suitable base variable. Unlike most indirect taxes, revenues from municipal tax payments, for instance, are based on the total wage bill and not on private consumption. These revenues are factored out of indirect taxes and included in direct taxes on households, with average income as the macroeconomic base variable.

This data harmonization ensures that the resulting elasticities are not biased by possible discretionary policy measures in response to the economic situation – they represent only the impact of the business cycle on tax revenues and the expenditure categories analyzed.

2.3 Budget Elasticity Estimates

Estimates of budget elasticity can be based on econometric methods or directly on correlations derived from

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[6] *This harmonization broadly follows the suggestions of Bouthevillain et al. (2001).*

tax law. The second option uses tax rate design and taxable income data to derive theoretical elasticities of tax revenues. In this study, we chose the second approach to estimate the elasticity of social security contributions to employment (base variable), which was set to 1 in accordance with economic theory. The cyclical elasticities of the other budget categories were estimated using econometric methods (see box below).

Cyclical Elasticity Estimates

We used a two-step error correction model (using the Engle-Granger approach) to make econometric estimates of the other categories' cyclical elasticities for the period from 1976 to 2004[1]. In the first step, the coefficient that indicates the long-term relationship between two variables is restricted to 1, since taxes cannot exceed their macroeconomic base variable (tax base) in the long run.[2] In order to determine the short-run relationship in the second step, the residuals of the long-term relationship are included as an explanatory variable, the coefficient of which can be interpreted as the speed of adjustment[3] (error correction). The estimation equation of the short-run relationship can be expressed in the following general form:

$$\Delta Y_t = \phi_1 \Delta X_t - \gamma(Y_{t-1} - \alpha - \beta X_{t-1}) + \varepsilon_t,$$ *where ΔY_t denotes the change in the logarithmed budget category at time t, $(Y_{t-1} - \alpha - \beta X_{t-1})$ represents the error correction term, i.e. the residual term, γ is the speed of adjustment, ΔX_t denotes the change in the logarithmed macroeconomic base variable, ϕ_1 is the coefficient of this explanatory variable (the elasticity value to be identified) and ε_t represents the error term.*

Coefficients of Dynamic Estimation Equations (Elasticities)[1]

	Budget Categories					
	Direct taxes on house-holds	Direct taxes on enter-prises	Indirect taxes	Social security contributions	Unemploy-ment benefits	Pension payments
Macroeconomic base variables[2]						
Average income	0.76**			0.99***		0.98***
Average income (lagged by 1 period)	0.54*					
Gross operating surplus of enter-prises (lagged by 1 and 2 periods)		0.90**				
Private consumption			0.97***			
Number of unemployed persons					0.88***	
Number of employed persons	1			1		
Share of average income in the maximum contribution base				1.00***		
Lagged cointegration term	−0.51***	−0.61*	−0.66***	−0.23***	−0.80***	−0.70***
Step dummy variables[3]						
1984 Tax rate increase				0.06***		
1989 Tax rate decrease	−0.15***					
1993 Pension insurance contributions					0.31***	
1995 Effects of EU accession			−0.08***			
2001 Interest charge on outstanding tax liabilities		0.42***				
2002 Tax relief/flood		−0.39**				

Source: OeNB.
*** Significance level 1% ** Significance level 5% * Significance level 10%; 1 = restricted to 1.*
[1] All equations were estimated in logarithms.
[2] The coefficients of the macroeconomic base variables are not statistically significantly different from 1 with the exception of the coefficients of direct taxes on households relative to average income and of unemployment benefits relative to the number of unemployed persons.
[3] Step dummy variables are used to adjust for one-off (outstanding) changes in growth rates.

This table shows the elasticities (cyclical sensitivities) that were determined in the short-run estimation equations. Elasticities are basically measured as the ratio of the percentage change in the variable to be identified (the budget category) and the percentage change in the explanatory variable (the macroeconomic base variable). Thus, elasticities denote the percent change in a budget category in reaction to a 1% change in the respective macroeconomic variable. Including dummy variables allows for specific features in the budget categories' development (e.g. tax reforms and other discretionary measures), thus improving estimation results.[4] For instance, in 1984, indirect tax revenues in Austria were considerably influenced by the increase in value added tax rates as well as the increase in the motor vehicle tax, the road transport duty levied on heavy goods traffic and the sparkling wine tax, among others. In 1995, the country's indirect tax revenues were dampened by several fiscal measures in connection with Austria's EU accession, e.g. the abolition of the import turnover tax and the introduction of the EU's common external tariff.

The table shows that e.g. the elasticity of indirect taxes to private consumption comes to 0.97%; this means that indirect tax revenues increase (drop) by 0.97% when consumption expenditures rise (fall) by 1%.

[1] *For direct taxes on households, the period under review was extended to 1970.*
[2] *Leibrecht and Schneider (2006).*
[3] *This term denotes the extent of adjustment (return to the long-term growth path after a shock) within one year.*
[4] *While taking into account all reforms that have impacted on tax revenues in our estimations, we have included only the corresponding, statistically significant dummies in our estimation equations.*

The resulting sensitivity of the budget balance to GDP is 0.38 according to these estimations. This means that the budget balance will change by 0.38% of GDP for purely cyclical reasons when GDP deviates from the long-term growth potential by 1%.[7]

The results can also be used to decompose the general government budget into a structural and a cyclical component (see chart 1). Compared with other countries, the cyclical component plays only a minor role in Austria's general government budget, which is mainly attributable to the low progressivity of the tax system as a whole and to the low business cycle volatility (Url, 2000).

Chart 1

Structural and Cyclical Componant of the General Government Budget

in Austria

% of GDP

- Cyclical component
- Budget balance
- Cyclically adjusted budget balance
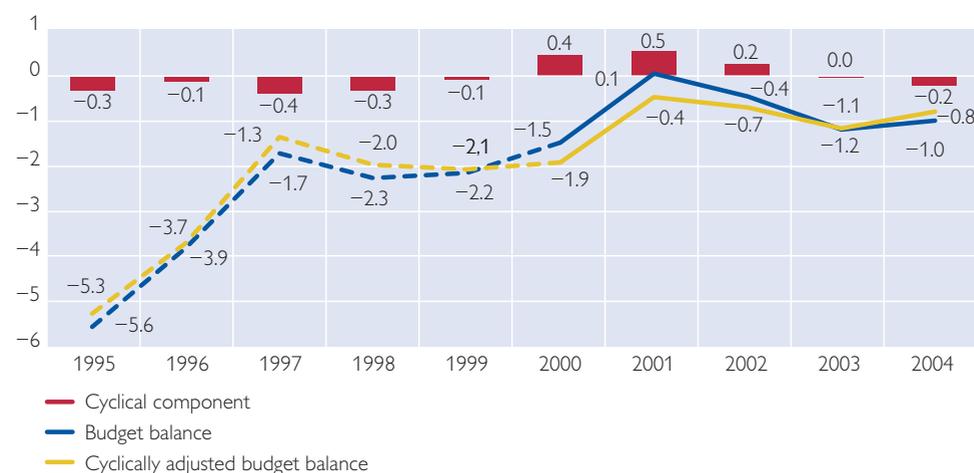
Source: OeNB, Statistics Austria.

[7] *For a description of the approach used to derive sensitivity, see Bouthevillain et al. (2001).*

2.4 Interpreting the Estimation Results

Revenue elasticities close to 1 may be expected for proportional taxes, as the level of the average tax rate is independent of the respective macroeconomic base (tax assessment base) – the average and marginal tax rates are identical. The revenue elasticity of progressive taxes is higher than 1, since rises in the tax assessment base cause the average and marginal tax rates to increase. The more progressive a tax system is (i.e. the higher the ratio of marginal tax rate and average tax rate is), the higher its elasticity is (Lehner, 2002).

The elasticity of *direct taxes on households* to average income (sum of the two coefficients of the table in the box) is greater than 1, which reflects the predominance of progressive income taxation (payroll tax and assessed personal income tax) in this revenue category in Austria. When we add self-employed income to the household sector's results, the average income level lagged by one period provides a statistically significant explanation for tax revenue developments, since assessed personal income tax is usually levied on self-employed income. Given the March 31 deadline of the following year for filing tax returns with the tax authorities (or May 15, if part of the income is subject to payroll tax), the income situation of the previous year also impacts on the tax revenues of the current year. The estimation results for elasticities of direct taxes on households released by the various national and international institutions differ considerably in some respects (e.g. Url, 2000; Girouard and Andre, 2005). This is mostly attributable to large differences between the underlying data sets, e.g. regarding sector delimitations, adjustment methods or the period under review.

It is almost impossible to narrow down the elasticity of *direct taxes on enterprises* a priori, since the relationship between tax revenues and gross operating surplus is nonlinear (given the option of carrying forward or back losses; enterprises in Austria, however, are only permitted to carry forward losses). In Austria, the required adjustments limit this budget category essentially to corporate income tax revenues. Since it is a proportional tax (proportional rate of 34%, of 25% as of 2005), we may assume elasticity to be close to 1. The determined value of 0.9 is in line with this assumption.[8]

Owing to the large share of proportional taxes, the elasticity of *indirect taxes* to private consumption may be expected to be close to 1, too. However, the fact that indirect taxes include specific taxes with a lower proportionality to private consumption suggests that elasticity will remain below 1. The estimation result for indirect taxes of 0.97 confirms this assumption. If, for instance, an increase in private consumption is only attributable to higher prices (with demand quantity remaining unchanged), tax revenue developments will remain below nominal private consumption growth.

The development of *social security contributions* is basically determined by the development of wages and salaries, the number of employed persons (i.e. those paying compulsory contributions) and the maximum contribution base. Since social security contributions in Austria are computed as a proportional share of income up until the maximum contribution base (appli-

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[8] *The result of the Wald test (which tests the statistical significance of the coefficient) also confirms that the coefficient is not statistically significantly different from 1.*

cable to about 8% of employees), the
estimated coefficient of 0.99 of average
income is in line with economic theory.

The elasticity of *unemployment ben-
efits* to the number of unemployed per-
sons was estimated at 0.9, which is,
among other things, attributable to
the longer average duration of unem-
ployment: The long-term unemployed
receive lower transfer payments (social
assistance), so that elasticity may be ex-
pected to remain below 1.

In the past, *pension payments* in Aus-
tria had been coupled to the develop-
ment of average net wages (less social
security contributions) pursuant to
§ 108 of the General Social Security
Act.[9] Our estimation result confirms
the expected elasticity of 1.

The estimated elasticities are sum-
med up in table 2 and compared with
the ECB's results for Austria (Bouthe-
villain et al., 2001; Url, 2000).[10]

Table 2

Comparing the OeNB's Elasticity Estimations with the ECB's Results for Austria

Budget category	Macroeconomic base variable	OeNB results	Bouthevillain et al. (2001) and Url (2000)
Direct taxes on households	Employment	1.00	1.00
	Average income	1.30	1.34
Direct taxes on enterprises	Gross operating surplus of enterprises	0.90	1.11
Indirect taxes	Private consumption	0.97	0.93
Social security contributions	Employment	1.00	1.00
	Average income	0.99	0.90
Unemployment benefits	Number of unemployed	0.88	0.91
Pension payments	Average income	0.98	1.00

Source: Bouthevillain et al. (2001), Url (2000), OeNB.

3 Analysis of Structural Budget Balances

3.1 Analytical Framework

We opted for a disaggregated approach
to analyzing both the budget balance
(the primary balance) and the individ-
ual revenue and expenditure catego-
ries to identify the key determinants
of budgetary developments in Austria.
In consistency with the method of
measuring cyclically adjusted budget
balances in section 2, individual budget
items were first adjusted for cyclical in-
fluences and temporary measures. The

resulting structural revenues and ex-
penditures are indicated as percentage
ratios of revenue and expenditure to
nominal trend GDP (table 3).[11] Then
we analyzed the driving forces behind
the annual changes in the structural
revenue ratio by determining the con-
tributions of factors that are believed
to account for the bulk of total changes
(table 4):

— *Fiscal drag (deviation in a budget cat-
egory's development from the underly-
ing macroeconomic base variable)*: If
the elasticity of a revenue category

[9] From 2004, the inflation rate has been the adjustment basis for pension payments.

[10] We refrained from comparing our data with the OECD's estimation results, given the different methodological ap-
proaches (among other things, differences in the data set definitions, macroeconomic variables and observation pe-
riods).

[11] Fiscal indicators are usually expressed in relation to GDP at market prices for the sake of better international com-
parability. Given the cyclical adjustment of the budget categories, the representation of revenue and expenditure
categories (i.e. the budget balance) is based on normal economic conditions. To ensure data set consistency, it is
therefore justified to use nominal trend GDP.

to its base variable does not equal 1, the development of revenues from a tax deviates from that of the underlying tax base. The following two examples illustrate why and how fiscal drag occurs. The payroll tax is usually a progressive tax with a revenue elasticity of above 1 and thus exemplifies positive fiscal drag. Since tax brackets (different tax rates as a percentage of income) are usually also defined by fixed nominal benchmark values, both wage gains that only compensate for inflation and real wage gains steadily raise the proportion of incomes in higher tax brackets. Thus, an increase in average nominal income leads to a disproportionate increase in tax revenue to the tax base.

However, an increase in the macroeconomic base variable (tax base) that is only attributable to inflation may be accompanied by dropping tax revenues (negative fiscal drag). This is especially true of specific excise duties (e.g. the mineral oil tax or the alcohol tax).

The following simplified method can be used to calculate the contribution of fiscal drag to the change in a revenue category's structural revenue ratio:[12]
$\frac{(\varepsilon-1)g_t R_{t-1}}{Y_t}$ where ε denotes the elasticity of revenue category R to its macroeconomic base variable, g represents the nominal trend growth rate of the tax base, Y is nominal trend GDP and t denotes the period of time. If the estimated elasticity does not equal 1, fiscal drag exists and is represented by $(\varepsilon - 1)$. In order to determine the contribution of fiscal drag to total change, it is multiplied by the change in the structural revenue ratio $\left(\frac{(g_t R_{t-1})}{Y_t}\right)$.

— *Decoupling of the tax base from GDP:* This factor identifies the degree by which the trend growth rate of the tax base (macroeconomic variable) deviates from nominal trend GDP. If trend GDP grows more strongly than the tax base, the resulting drop in tax revenues in percent of GDP is indicated as the decoupling effect. Sometimes, this effect is also attributable to attempts to improve price competitiveness: In Germany, for instance, the path of wage moderation in recent years has clearly caused the growth of the payroll tax base to deviate from GDP development in general. The contribution of the decoupling effect to changes in the structural revenue ratio (of individual revenue categories) is calculated as follows:
$\frac{(g_t - \gamma_t)R_{t-1}}{Y_t}$ with γ denoting the growth rate of nominal trend GDP (in addition to the notation indicated above). This effect exists when the two growth rates deviate $(g_t - \gamma_t \neq 0)$; it explains that part of the change in the structural revenue ratio that is consistent with the degree of decoupling.

— *Impact of legislative changes on revenues:* The impact of legislative changes on the general government's revenues from taxes and social security contributions is also indicated separately. This analysis thus includes the expected or estimated effect of tax rate changes on revenues (in percent of trend GDP).

— *Residual*: When the total changes in individual revenue categories are

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[12] See Kremer et al. (2005) for a detailed formal description of changes in structural revenue ratios.

not fully attributable to the sum of the three factors listed above, the resulting residual should be used to identify possible special factors that can (or should) be considered to explain the total change.

An individual revenue category contributes to budget consolidation when its structural component increases, whereas public finances deteriorate when this component decreases.

Expenditure categories were not analyzed in detail. All expenditure items with the exception of (cyclically adjusted) unemployment benefits were directly included in table 4. An expenditure category contributes to budget consolidation when the percentage ratio of its structural component to trend GDP decreases. The use of nominal trend GDP instead of nominal GDP also adjusts the denominator of the expenditure ratio for cyclical developments.

3.2 Decomposition of Fiscal Developments – Results for 2000 to 2004

The following analysis examines the determinants of change in Austria's structural budget balance as defined above from 1999 onward. The data presented in table 3 serves as a basis for decomposing the revenue and expenditure ratios into the above-mentioned components. Total government revenue and expenditure were adjusted for cyclical influences and temporary measures (e.g. investment subsidy, expenditures in the wake of the flood in 2002) and expressed in percent of nominal trend GDP.

Between 2000 and 2004, the structural budget balance (i.e. the general government budget balance adjusted for cyclical effects and temporary measures) improved from –2.1% to –0.9% of trend GDP. This improvement is attributable to reduced interest expenditure on the one hand, and to the strong increase in the primary surplus in 2001 and 2002 on the other. Even though the structural primary surplus gradually declined over the following years, its value in 2004 was still noticeably above that recorded in 2000.

Budget consolidation was achieved despite the marked decrease in the structural revenue ratio from 50.9% to 49.2% of trend GDP.[13] In 2001, this decrease was primarily caused by a drop in public sales, whereas in the following years, it was ascribable also to lower tax revenues especially from corporate taxes and direct taxes on households. The structural revenue ratio from social security contributions and indirect taxes also declined.

Table 4 shows the changes in individual budget categories (revenue and expenditure ratios), broken down by the four explanatory factors. An analysis of the structural revenue ratio shows that payroll and income taxes, owing to their progressive nature, contribute positively to the structural primary balance (*fiscal drag*), whereas corporate taxes (in this case, corporate income taxes) cause it to deteriorate slightly given the elasticity of below 1. Specific taxes, which are responsible for the negative fiscal drag of indirect taxes, do not play a significant role. All in all, the positive fiscal drag of direct taxes on households offsets the negative fiscal drag of all other tax categories under review.

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[13] The unadjusted revenue ratio increased considerably in 2001, which is mainly attributable to temporary measures that pushed up revenues.

Table 3

Total Revenue and Expenditure of the General Government in Austria, Adjusted for Cyclical Influences and Temporary Measures

% of trend GDP

	1999	2000	2001	2002	2003	2004
Deficit (−) or surplus (+)	**−2.3**	**−2.1**	**−0.9**	**−0.6**	**−0.9**	**−0.9**
Total revenue	*52.0*	*50.9*	*50.7*	*50.1*	*49.4*	*49.2*
Total current revenue	51.7	50.7	50.5	49.9	49.2	49.1
Total capital revenue	0.3	0.2	0.2	0.2	0.2	0.2
Total expenditure	*54.3*	*53.0*	*51.6*	*50.7*	*50.2*	*50.2*
Total current expenditure	50.1	49.5	47.9	47.3	47.2	46.6
Total capital expenditure	4.2	3.5	3.7	3.4	3.0	3.5
Primary deficit (−) or surplus (+)	**1.3**	**1.6**	**2.7**	**2.8**	**2.2**	**2.0**
Deficit (−) or surplus (+)	−2.3	−2.1	−0.9	−0.6	−0.9	−0.9
Interest payable	3.6	3.7	3.6	3.4	3.1	3.0
Total current revenue	**51.7**	**50.7**	**50.5**	**49.9**	**49.2**	**49.1**
Direct taxes	*13.3*	*13.2*	*14.1*	*13.5*	*13.5*	*13.4*
of which by corporations (S.11+S.12)	2.1	2.3	2.9	2.4	2.4	2.4
of which by households (S.14+S.15)	11.2	10.8	11.3	11.1	11.1	11.0
Indirect taxes	*15.8*	*15.2*	*15.1*	*15.3*	*14.8*	*14.8*
of which VAT	8.5	8.1	8.0	8.1	7.8	7.9
of which taxes on energy	1.6	1.6	1.7	1.7	1.8	1.8
Social contributions	*17.1*	*16.7*	*16.3*	*16.2*	*16.2*	*16.3*
of which employers' contributions	7.2	7.0	6.8	6.8	6.8	6.8
of which employees' contributions	6.2	6.1	6.1	6.0	6.0	6.0
Other current transfers receivable	*2.5*	*2.6*	*2.9*	*2.9*	*2.7*	*2.6*
of which interest receivable	0.6	0.8	0.8	0.8	0.7	0.7
Sales	*3.0*	*2.9*	*2.0*	*2.0*	*2.0*	*2.0*
Total current expenditure	**50.1**	**49.5**	**47.9**	**47.3**	**47.2**	**46.6**
Current transfers	*30.0*	*29.8*	*30.3*	*30.1*	*30.2*	*29.9*
Social payments	23.7	23.7	23.4	23.7	23.9	23.8
of which old age pensions − COFOG 10.2.0	3.6	3.5	3.4	3.5	3.7	3.8
of which unemployment benefits − COFOG 10.5.0	0.0	0.1	0.1	−0.0	−0.0	−0.1
Subsidies	3.5	3.4	3.5	3.7	3.7	3.3
Other current transfers payable	2.8	2.7	3.4	2.7	2.6	2.7
Interest	*3.6*	*3.7*	*3.6*	*3.4*	*3.1*	*3.0*
Compensation of employees	*11.3*	*11.1*	*9.8*	*9.5*	*9.5*	*9.4*
of which employers' contributions	0.8	0.8	0.7	0.8	0.8	0.8
Intermediate consumption	*5.2*	*4.9*	*4.2*	*4.3*	*4.4*	*4.4*
Gross savings	**1.6**	**1.2**	**2.5**	**2.6**	**2.0**	**2.4**
Total capital revenue	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
of which capital taxes	0.1	0.1	0.1	0.1	0.1	0.1
Total capital expenditure	**4.2**	**3.5**	**3.7**	**3.4**	**3.0**	**3.5**
Gvernment investment	1.7	1.5	1.2	1.3	1.2	1.3
Other net acquisitions of nonfinancial assets	−0.0	−0.4	−0.0	−0.0	−0.1	0.0
Capital transfers	2.5	2.5	2.6	2.1	1.9	2.3

Source: Kremer et al. (2005),OeNB.

It is primarily in the development of revenues from social security contributions, most notably in 2001, that the *decoupling of tax bases from GDP growth* becomes evident. The strong decoup-

ling of the payroll tax base (average income multiplied by employment) in 2001 is chiefly attributable to public sector developments. The new calculation method for imputed social secur-

Table 4

Change in Total Revenue and Expenditure of the General Government in Austria,

Adjusted for Cyclical Influences and Temporary Measures

% of trend GDP

	2000	2001	2002	2003	2004	2000 to 2004	Average 2000 to 2004
Unadjusted balance (improvement +, worsening −)[1]	**0.7**	**1.8**	**−0.5**	**−0.9**	**0.0**	**1.1**	**0.2**
Cyclical component	0.5	0.1	−0.3	−0.3	−0.2	−0.1	0.0
Temporary measures	0.0	0.5	−0.5	−0.3	0.1	−0.2	0.0
Balance (improvement +, worsening −)	**0.2**	**1.2**	**0.4**	**−0.3**	**−0.1**	**1.3**	**0.3**
Interest payments	0.2	−0.1	−0.2	−0.3	−0.1	−0.6	−0.1
due to changes in average interest rate	*0.1*	*−0.1*	*−0.2*	*−0.2*	*0.0*	*−0.5*	*−0.1*
due to changes in debt level	*0.1*	*0.0*	*0.0*	*−0.1*	*−0.1*	*−0.1*	*0.0*
Primary balance (improvement +, worsening −)	**0.3**	**1.1**	**0.1**	**−0.6**	**−0.2**	**0.8**	**0.2**
Total revenue	**−1.1**	**−0.2**	**−0.6**	**−0.8**	**−0.1**	**−2.7**	**−0.5**
Direct taxes paid by corporations	**0.2**	**0.5**	**−0.4**	**0.0**	**0.0**	**0.3**	**0.1**
Fiscal drag	0.0	0.0	0.0	0.0	0.0	−0.1	0.0
Decoupling of base from GDP	0.0	0.1	0.1	0.1	0.1	0.4	0.1
Legislation changes	0.0	0.5	0.3	0.0	0.1	0.9	0.2
Residual	0.2	0.0	−0.9	−0.1	−0.2	−0.9	−0.2
Direct taxes paid by households	**−0.4**	**0.4**	**−0.2**	**0.0**	**−0.1**	**−0.2**	**0.0**
Fiscal drag	0.1	0.1	0.1	0.1	0.1	0.4	0.1
Decoupling of base from GDP	0.0	−0.1	0.0	0.0	0.0	−0.1	0.0
Legislation changes	−0.5	0.4	0.0	0.0	−0.1	−0.3	−0.1
Residual	0.0	0.0	−0.2	−0.1	0.0	−0.2	0.0
Social contributions	**−0.4**	**−0.4**	**−0.1**	**0.0**	**0.1**	**−0.8**	**−0.2**
Fiscal drag	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Decoupling of base from GDP	0.0	−0.6	−0.2	−0.1	0.0	−0.9	−0.2
Legislation changes	0.0	0.0	0.0	0.0	0.1	0.1	0.0
Residual	−0.3	0.2	0.1	0.1	0.0	0.0	0.0
Indirect taxes	**−0.5**	**−0.1**	**0.1**	**−0.4**	**0.0**	**−0.9**	**−0.2**
Fiscal drag	0.0	0.0	0.0	0.0	0.0	−0.1	0.0
Decoupling of base from GDP	0.0	0.0	−0.1	0.0	0.0	−0.2	0.0
Legislation changes	0.0	0.0	0.0	−0.1	0.1	−0.1	0.0
Residual	−0.5	0.0	0.2	−0.3	−0.1	−0.7	−0.1
Taxes and social contributions overall	**−1.1**	**0.4**	**−0.6**	**−0.5**	**0.0**	**−1.7**	**−0.3**
Fiscal drag	0.1	0.1	0.0	0.0	0.1	0.3	0.1
Decoupling of base from GDP	0.0	−0.6	−0.1	0.0	−0.1	−0.8	−0.2
Legislation changes	−0.6	0.9	0.3	−0.2	0.2	0.6	0.1
Residual	−0.5	0.1	−0.8	−0.3	−0.2	−1.8	−0.4
Non-tax-related revenue[2]	**0.0**	**−0.6**	**0.0**	**−0.3**	**−0.1**	**−1.0**	**−0.2**
Total primary expenditure	**−1.4**	**−1.3**	**−0.7**	**−0.2**	**0.1**	**−3.5**	**−0.7**
Social payments	0.0	−0.3	0.3	0.2	−0.1	0.1	0.0
of which old-age pensions	*−0.1*	*0.0*	*0.1*	*0.2*	*0.1*	*0.2*	*0.0*
of which unemployment benefits	*0.1*	*0.0*	*−0.1*	*0.0*	*0.0*	*−0.1*	*0.0*
of which social transfers in kind	*0.0*	*−0.1*	*0.0*	*0.0*	*0.0*	*−0.1*	*0.0*
Subsidies	−0.1	0.2	0.1	0.0	−0.3	−0.2	0.0
of which EU[3]	*0.1*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
Compensation of employees	−0.3	−1.3	−0.2	−0.1	−0.1	−2.0	−0.4
Intermediate consumption	−0.3	−0.7	0.1	0.1	0.0	−0.8	−0.2
Government investment	−0.2	−0.4	0.1	−0.1	0.1	−0.5	−0.1
Other[4]	−0.6	1.2	−1.1	−0.3	0.5	−0.3	−0.1
of which EU[5]	*−0.1*	*0.0*	*−0.1*	*0.0*	*−0.1*	*−0.3*	*−0.1*
Memorandum items							
Health care[6]	0.0	−0.2	0.1	0.0	0.0	−0.2	0.0
Trend growth of real GDP	2.2	2.1	2.0	1.9	2.0	×	2.0
Change in GDP deflator	1.8	1.8	1.3	1.4	1.9	×	1.6
Change in number of public employees	−0.5	−11.1	−0.6	−0.5	−0.4	×	−2.6

Source: Kremer et al. (2005), OeNB.

[1] Change in unadjusted balance, cyclical component and temporary measures as percentage of nominal GDP. Due to the different denominator the change in the ratio of the adjusted balance to trend nominal GDP might deviate slightly from the change in the ratio to nominal GDP of the unadjusted balance less cyclical component less temporary measures.

[2] Other current transfers receivable, sales and total capital revenue.

[3] Expenditure paid from EU funds that is spend under category „Subsidies".

[4] Other current transfers payable, other net acquisitions of non-financial assets and capital transfers.

[5] If country is a net payer to EU budget: net payments to EU budget less expenditure paid from EU funds that is not spent under category „Other". If country is a net receiver from EU budget: expenditure paid from EU funds that is spent under category „Other."

[6] Social benefits, social transfers in kind and other current transfers that can be allocated to the function of the provision of public health care services.

ity contributions, which has been in use since 2001, is a key factor.[14] Furthermore, the Austrian federal government's measures to downsize the public sector (as specified in the 2000 to 2003 and 2003 to 2006 government programs) took effect in 2001. They included measures such as not filling vacancies caused by retirement and substantial outsourcing. These changes alongside very modest wage increases in the public sector caused the wage bill to decrease by 5% while trend GDP grew by 4%. Even though the private sector displays an – albeit small – positive decoupling[15] (i.e. the wage bill is growing faster than GDP), this effect will not be sufficient to offset the developments in the public sector. Decoupling in the private sector had generally been characterized by a positive sign until 2003; this trend seems to have come to an end: Now the wage bill in the private sector, too, is growing at a slower pace than GDP, primarily because GDP growth in recent years has been chiefly fueled by net exports. However, the contribution of net exports to wage bill growth is not necessarily as high as that to GDP growth.

Even though the underlying macroeconomic base is the same, the rise in direct taxes on households does not deviate as strongly from GDP growth as that in social security contributions. One possible explanation for this phenomenon (with the exception of 2001 for methodological reasons) is that whereas pension payments are subject to payroll tax (so that revenues from payroll tax remain basically unchanged, as pension payments to retired civil servants, for instance, are calculated as a proportion of their last active income), they are not subject to social security contributions or accident insurance premiums.

The impact of *legislative changes* accounts for the bulk of changes within the individual revenue categories. The impact of this explanatory component on annual total revenues comes to between 0.2% and 0.9% of trend GDP. In every year of the observation period, this impact is stronger than the significance of the other explanatory components. In 2001, for instance, the introduction of interest charges on outstanding tax liabilities of 5.75% p. a. had a positive structural effect – the tax authorities received about EUR 1 billion from enterprises seeking to avoid paying these interest charges. This improvement in tax morale may be regarded as a permanent change, as it was observed throughout the period under review. Still, the effect of this legislative change decreased over time. In 2002, other legislative changes (e.g. the abolition of the investment allowance, the limitation on the use of loss carryovers) further drove up revenues.

While tax revenues from households (and subsequently also the primary surplus) were dampened by the reform of payroll taxation and assessed income taxation in 2000, revenues were driven up in 2001 by the reduction of tax credits in payroll and income taxation as well as the increase in the prepayment of income tax.

Given that the *residuals* – correlations not accounted for in these estimations – are generally small, the explanatory power of the three factors listed

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[14] *Decoupling effects are caused by changes in the calculation method of imputed social security contributions, as wage bills are calculated on the basis of the compensation of employees.*

[15] *It seems that the positive decoupling resulting from the outsourcing measures was not more pronounced in the private sector as many people decided to retire before the pension reform of 2000 became fully effective.*

above may be regarded as high in most cases. However, individual residual items (e.g. in corporate taxes in 2002) came to as much as 0.9 percentage points of GDP. The surge in corporate tax revenues in 2001 was attributed to the above-mentioned introduction of interest charges on outstanding tax liabilities. Still, as the assumptions on the long-term effects of this measure were clearly too high for 2002, the contribution to growth of legislative changes in 2002 does not provide an explanation for the actual developments, which caused the residual to increase.

As a matter of fact, the macroeconomic base variable for enterprises' gross operating surplus is merely a rough approximation of the tax base for the corporate income tax. Hence, the largest residual may be expected for direct taxes on enterprises.

The comparatively large negative residuals for social security contributions might be ascribable to the elimination of social security contributions that were levied pursuant to the Continued Payment of Wages and Salaries Act, whereas the positive residual in 2001 may be attributable to the increase in civil servants' pension insurance contributions in 2000, which caused revenues to go up especially from 2001 onward, and to the abolition of premium-free coverage of childless nonworking spouses by the national health plan. These factors should have been included in the explanatory component "legislative changes"; owing to a lack of reliable estimates of budgetary effects, however, it was impossible to single out the relevant data. Thus, the measures' effects contribute to the residual.

Unfortunately, a similarly detailed analysis of the spending structure is not feasible, given that public spending is shaped by discretionary decisions to a much larger extent than revenues. Generally speaking, budget consolidation when the revenue ratio is sinking is only possible if expenditure is cut, too. The structural expenditure ratio declined from 53.0% to 50.2% of trend GDP in the period under review, with structural cost savings focusing on expenditures for civil servants and intermediate consumption.

4 Conclusions

The budget elasticities derived in this study indicate that a 1% deviation of GDP from the long-term growth potential causes a purely cyclical change of 0.38% of GDP in Austria's budget balance.

The estimated elasticity of direct taxes on households to average income comes to 1.3, reflecting the predominance of progressive income taxation in Austria. The elasticity of direct taxes on enterprises to gross operating surplus may be expected to come to 1, since the corporate income tax is a proportional tax; the calculated elasticity of 0.9 corroborates this assumption. The elasticity of indirect taxes to private consumption of 0.97 documents both the high share of proportional taxes and the impact of specific taxes. The elasticity of social security contributions and pension insurance contributions to average income comes to 0.99 and 1, respectively, which documents the close correlation of these budget categories with the macroeconomic base variable. The elasticity of unemployment benefits to the number of unemployed persons of 0.9 is determined by the longer average duration of unemployment. The econometric estimations of short-run and long-run relationships between the individual budget categories and the respective macroeconomic base variables pro-

duced statistically significant results. What is more, they are in line with expectations based on tax theory.

Both the cyclical fluctuations of the Austrian economy and the changes in the budget balance in reaction to these fluctuations are smaller in Austria than, for instance, in the Scandinavian countries (see e.g. Bouthevillain, 2001). This means that the structural component of revenue and expenditure accounts for a bigger share of the unadjusted budget balance in Austria than in the Scandinavian countries.

Between 2000 and 2004, the general government's structural budget balance (i.e. adjusted for cyclical effects and temporary measures) improved from –2.1% to –0.9% of trend GDP. This is attributable to lower interest expenditures on the one hand and to the strong increase in the primary surplus in 2001 and 2002 on the other. Even though the structural revenue ratio (adjusted for cyclical effects and temporary measures) declined notably from 50.9% to 49.2% of trend GDP, the budget was consolidated, as the structural expenditure ratio (adjusted for temporary measures) dropped from 53.0% to 50.2% of trend GDP. Structural cost savings were achieved primarily by reducing expenditures for civil servants and intermediate consumption.

Fiscal drag (i.e. the deviation in a budget category's development from the underlying macroeconomic base variable) makes a positive, albeit small, contribution to the development of Austria's primary balance. This results from the structure of the Austrian tax system: The proportion of progressive taxes is comparatively small, as is their degree of progressivity. Still, the progressive nature of payroll and income taxation contributes positively to the development of the structural primary balance. These effects more than offset the negative contribution of the corporate income tax and of specific taxes (as a subaggregate of indirect taxes) to fiscal drag.

With a few exceptions, the decoupling of macroeconomic base variables from GDP is only of minor importance for the development of public finances in Austria.

The development of the structural primary balance in Austria is primarily attributable to discretionary measures (based on legislative changes). In the period under review (2000 to 2004) numerous discretionary measures caused both increases and shortfalls in revenues.

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