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Evaluation of Government Funding in RTDI from a Systems Perspective in Austria

by the working group consisting of

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Austrian Institute for SME Research

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Report 4:
Tax Incentive Schemes for R&D

WIFO

Tax Incentive Schemes for R&D

Worked out by:

Rahel Falk (WIFO)

with Julia Borrmann, Nadine Grieger, Elisabeth Neppl-Oswald and Ursula Weixlbaumer

Survey: Gerhard Schwarz (WIFO)

and Roald Steiner (Salzburg University of Applied Sciences)

Internal Referee: Gunther Tichy

External Expertise: Herwig W. Schneider (iwi, Vienna)

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SYSTEM EVALUIERUNG

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EXECUTIVE SUMMARY

1. Introduction

In Austria, special tax treatment of R&D expenditures was introduced as early as 1980. It has been continuously developed and refined ever since, the most fundamental changes arising from the introduction of Frascati-based tax incentive schemes in 2002. This change in tax funding legislation came as an immediate response to the Barcelona/Lisbon Challenge the Austrian government had committed to in the same year. Increasing emphasis on tax instruments to promote R&D is very much in line with recent trends in other EU member states, as well as with EC and OECD policy recommendations.[1]

The debate over the pros and cons of R&D tax funding becomes more lively and more controversial the higher its cost and the larger its stake in total public financing of research, technological development and innovation (RTDI). In 2006 direct public financing of R&D in the business sector amounted to € 428 million. A recent report by the Austrian Court of Audit estimates the total amount of tax funding to be as high as € 418 million in 2005 and quotes respective forecasts of the Ministry of Finance for the year 2008, to be about € 500 million.[2]

In response to these announcements, the Federation of Austrian Industries reiterated the need for public RTDI-funding and in fact came up with a wholly new additionality concept, "Standort Additionalität", claiming that generous R&D tax incentives play a key role in attracting large R&D players to Austria (and retaining them).

2. Challenges

Strangely enough, the heated debate proceeded with surprisingly little hard evidence on (i) the usage, (ii) the acceptance, and (iii) the effects of tax funding. Report 4 of the current System Evaluation is concerned with these questions, starting with a thorough presentation of the current structure of tax incentive measures. The main purpose of this report is to set the stage for subsequent discussions on the interplay between measures of direct RTDI funding on the one hand and tax funding on the other. For either scheme, effects of funding on economic and general innovation performance measures must take into account simultaneous usage of the other scheme. Otherwise, the analysis would suffer from an omitted variable bias. This long overdue, stand-alone assessment is, however, instrumental in assessing the extent to which tax funding addresses some structural deficits in current RTDI performance.

3. Main Results

3.1 Basis for Claims

The allowance for inventions generally applies to expenditures incurred for the development or improvement of economically valuable inventions; hence it focuses on the economic *results* of research activities. In this regard, it qualifies as an output-oriented measure. The Frascati-based

1 European Commission (2006, 2008)

2 Österreichischer Rechnungshof (2007)

instruments, on the other hand, address the input-side. They reward basic research and experimental development with little prospect for commercialisation in the near future, just as they are advantageous to output-oriented projects of applied research that would qualify for the allowance for inventions scheme.

Irrespective of the differing claims, considerable overlap remains in the coverage of expenditure items. That said, the basis for Frascati claims is generally more broadly defined. More specifically, the Frascati-based schemes are more advantageous with respect to software, investment in fixed assets, overhead costs, pilot facilities, and expenditures for the commercial exploitation of an invention. The allowance for inventions is more advantageous only in one, albeit important, respect: external R&D, also known as contract R&D.

3.2 *Generous tax funding*

Across time. Over time, rates of tax subsidies increased until 2004. After that, the fall of the corporate income tax rate made allowance-based schemes less advantageous (Table 1A).[3] More specifically, before 2005, each € of R&D expenditure was subsidised by 8.5 cents (volume based schemes). Since 2005, public funding has been only 6.25 cents.[4] The generosity of tax credits does not depend on income tax rates. Currently the tax office refunds 8 per cent of eligible R&D expenditure and thereby generates the highest possible volume-based benefits (as far as incorporated entities are concerned). Benefits accruing from incremental expenditures relating to economically useful inventions are still higher – with a subsidy rate of 8.75%) – but less relevant in practice.

Table 1A: Rates of Tax Subsidies per € 1R&D Expenditure

Firms liable for Corporate Tax[1)]

	Allowance for Inventions					
	Volume-based component	Increment-based component	Frascati Allowance	Allowance for Contract R&D	Frascati Tax Credit	Tax Credit for Contract R&D
2002	8.50%	11.90%	3.40%		3%	
2003	8.50%	11.90%	5.10%		5%	
2004	8.50%	11.90%	8.50%		8%	
Since 2005	6.25%	8.75%	6.25%	6.25%	8%	8%

Source: Statistik Austria (Corporate Tax Statistics) — WIFO calculations.

Note: [1)] For the allowance schemes the rates of R&D subsidisation are calculated by multiplying the allowance rate by the corporate income tax rate.

Across countries. Before 2005 the relative attractiveness of R&D activities vis-à-vis non-R&D activities carried out in Austria was clearly above European and OECD averages. As mentioned above, preferential treatment of R&D lost ground thereafter. While this supposedly has no effect on location decisions made by multinational R&D-performers, which instead assess the fiscal attractiveness of a location on the basis of total tax due,[5] it does affect the relative attractiveness of entrepreneurial activities within the country. The fiscal treatment of knowledge-intensive economic activities is less generous than before and hence undermines attempts to enforce

3 In general, if tax rates change by x per cent, then the rate of R&D-subsidisation under allowance-based schemes changes by x per cent as well.

4 The increment-based scheme subsidised 11.9 per cent of qualifying R&D-investment before 2005 and 8.75 per cent thereafter.

5 De Mooij and Ederveen (2008); Knoll (2004)

structural change towards knowledge-intensive industries. Little specialisation in dynamic, technology-intensive sectors dampen the prospect of long term economic growth.

Across corporate structures. For allowance-based schemes, the rate of tax subsidisation depends on income tax rates. While corporate entities currently face a flat rate of 25%, companies liable for income taxes face progressive taxation. If their taxable income falls short of € 10,000 per year, their tax debt is zero. In this case fiscal incentives for R&D come only through the tax credit. If a company makes more than the critical benchmark of €10,000, its tax benefit accruing from any of the allowance schemes is higher than would be the case if it were run as a corporate entity.

Table 2A: Rates of Tax Subsidies per € 1 R&D Expenditure
Companies liable for Income Tax[1), 2)]

Taxable income in €	Allowance for Inventions		Frascati Allowance and Allowance for Contract R&D	Frascati Tax Credit and Tax Credit for Contract R&D
	Volume-based component	Increment-based component		
10,000 and less	0%	0%	0%	8%
Above 10,000	9.58%	13.42%	9.58%	8%
Above 25,000	10.9%	15.26%	10.90%	8%
Above 51,000	12.5%	17.50%	12.50%	8%

Source: Statistik Austria (Income Tax Statistics) - WIFO calculations.

Note: [1)] For the allowance schemes the rates of R&D subsidisation are calculated by multiplying the allowance rate by the *marginal* income tax rate. [2)] The table displays the situation prevailing since 2005. The situation prior to 2005 is displayed in Table A1-1 of Appendix 1.

3.3 Aspects of Administration

Administering fiscal support for R&D is a delicate but crucial issue which is inherently related to the effective basis for claims. The allowance for economically useful inventions focuses on innovation output ("inventions") and on economic output ("economic usefulness"). The Frascati-based instruments, on the other hand, address the input side and examinations of such claims occur ex post. Auditing of eligible input items seems to be very difficult in practice, at least for non-specialised tax auditors.

Claims on the basis of the allowance for economically useful inventions are closely examined ex ante (the invention issue is dealt with ex post). The Ministry of Economics is in charge of certifying these claims. Roughly three out of four companies asking for a certificate filed a patent application in the past and base their current claims on further developments thereof. As for such "further developments", we note that these are extremely hard to trace. In principle the company has to disentangle sunk research cost from research expenditure that contributed to economic success, since only the latter qualify for fiscal support. In practice, it seems that claims are rather decided in the affirmative if applicants are economically successful plus innovative in some unspecified way and that there is greater emphasis on "economic usefulness" than on the invention issue.

3.4 Scope and Quality of Data

The statistical basis for a thorough evaluation of Austrian tax funding turned out to be insufficient in many respects. There are severe deficiencies in the coverage of relevant information on the one hand, and abundant amounts of very detailed but useless information on the other. In parts, the statistics misrepresent evidence on the use of tax incentives. Access to a unique and potentially very valuable firm-level database on the usage of allowances for inventions was denied since data privacy laws apply. The Ministries of Finance and Economics eventually provided aggregate data. Empirical evidence based on micro-data would have been much more reliable and explicit.

Above all, the search for data tied up far too many resources and could hardly have been accomplished by non Austria-based evaluators. To the extent that Austrian policy makers value quantitative assessments of tax funding measures, possibly commissioned to international experts, such data should in future be made readily available.

3.5 Beneficiaries of Fiscal Measures for R&D

Sectoral User Profile. The "natural beneficiaries" of tax incentive schemes for R&D will be affiliated to business sectors that have high R&D expenditures. In 2004 and 2006, the high-tech and medium-high-tech industries together accumulated around 59 per cent of total R&D expenditure in the business sector. The service sector accounted for 29 per cent of R&D, the rest falling on low-tech industries (less than 4 per cent) and medium-low-tech industries (around 9 per cent)[6].

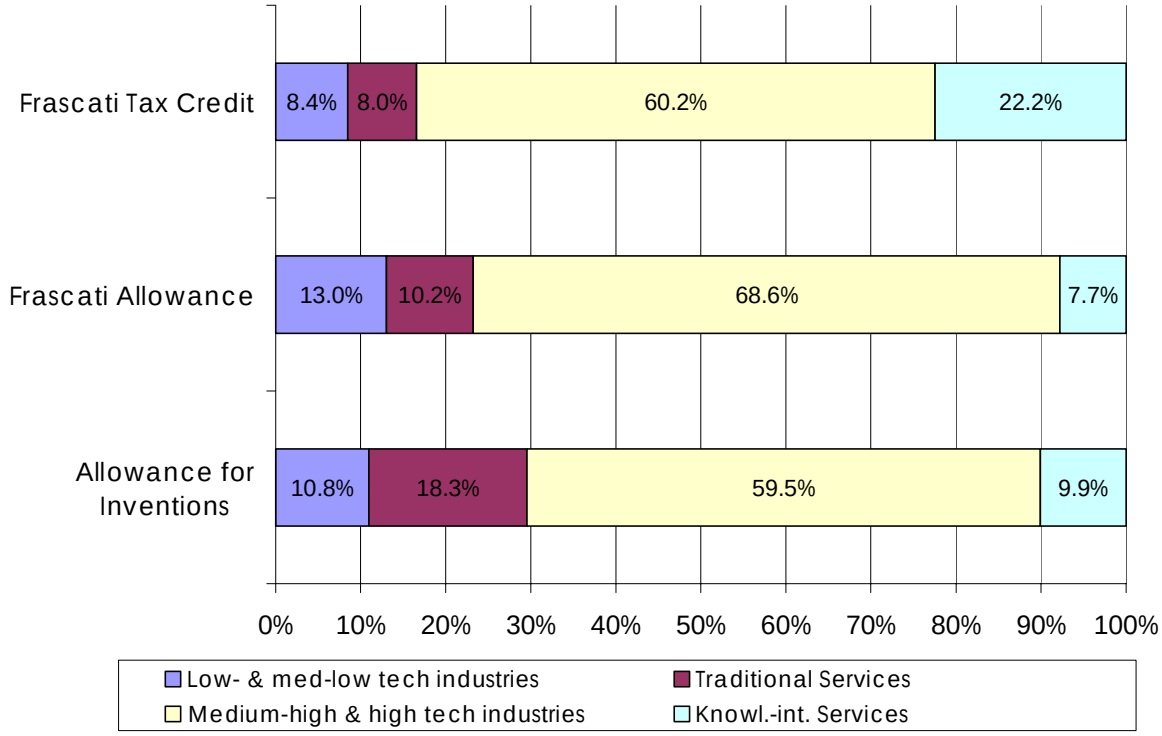
Overall, the sectoral distribution of R&D expenditure matches the sectoral distribution of tax funding very well (Figure 1A). A between-scheme comparison of sectoral user profiles reveals some interesting findings.

In 2005 22 per cent of tax credit funding is absorbed by knowledge-intensive services, and 60 per cent falls on medium-high and high-tech industries. This sector profile qualifies the tax premium as the tax funding instrument that is most suitable to enforce structural change in the direction of knowledge-intensive sectors. While the allowance for inventions covers the service industries to a similar extent, it addresses more traditional services. This supports the notion that the allowance does not only target inventions, but, more generally, also rewards activities "valuable to the domestic economy."

Moreover, the usage of the allowance for inventions proves to be highly concentrated in a dual sense. First, only three (medium-) high-tech industries take in the bulk of allowance throughout the entire period: chemicals; manufacturing of radio, TV, and communications equipment and machinery. Second, the first two industries include relatively few companies that benefit from the allowance scheme. Note also, that for the latter two the allowance for inventions remains attractive even after 2004, as these industries contract out considerable shares of their R&D.

6 See Figure A1.1 in Appendix 1.

Figure 1A: Sectoral Distribution of Tax Funding in 2005 — by Funding Scheme



Source: see Tables A2-3 and A2-4 in Appendix 2 — WIFO calculations. Note: Data includes individual persons and partnerships subject to income tax.

User Profile by Size Classes. The distribution of R&D expenditure across size classes is highly concentrated, with 85 per cent of total R&D activity in the business sector occurring in companies with more than 100 employees. It is therefore not surprising that companies with more than 100 employees make up nearly 90 per cent of both, Frascati allowances and the allowance for inventions. These top size classes also dominate the tax credits, though to a somewhat lesser degree.

Leaving aside the allowance for inventions for a moment, we note that neither the design nor the administration of Frascati-based tax incentive schemes for R&D discriminate, in principle, against small and medium-sized enterprises (SME). The crucial point is that innovation activities of small companies are mostly less technical in nature and hence they mostly do not meet the Frascati-based funding criteria. If large companies do not meet these criteria in a strict sense, they may still claim the allowance for inventions and the chance of getting through is not too bad if a given company is large enough to argue substantial contributions to the domestic economy (in terms of employment, export performance, or GDP growth). Small companies have little bargaining power in this sense.

Furthermore, small companies seem to have little awareness of the structure of tax incentives for R&D and many of them complain about insufficient information. Representatives of the business community should meet these concerns and provide easy-to-read information.

3.6 Funding Effects

In 1998, half of the R&D-active companies made use of the allowance for inventions. Four years later, when the Frascati-based schemes had been introduced, this share (the so-called support quota) fell to 40 per cent, and the total support quota pertaining to all fiscal funding schemes for

R&D ranged between 50 per cent and approximately 65 per cent depending on the number of companies using more than one tax funding instrument in parallel. Survey evidence strongly suggests that companies mostly tend not to do so, though multiple usages of fiscal instruments are explicitly permitted. Meanwhile the vast majority draws on one instrument only, the Frascati tax credit.

At least 85 per cent of the total number of R&D-performing companies made use of one (or more) tax funding instruments in 2004. In 2005 the fiscal support quota exceeds 100 per cent. In other words, the latest figures strongly suggest that any R&D-performing company does in fact benefit from fiscal incentives for R&D. In absolute terms, the number of tax-funding beneficiaries has more than tripled since the introduction of the Frascati-based schemes, from 835 users in 2001 to about 3,000 in 2005.

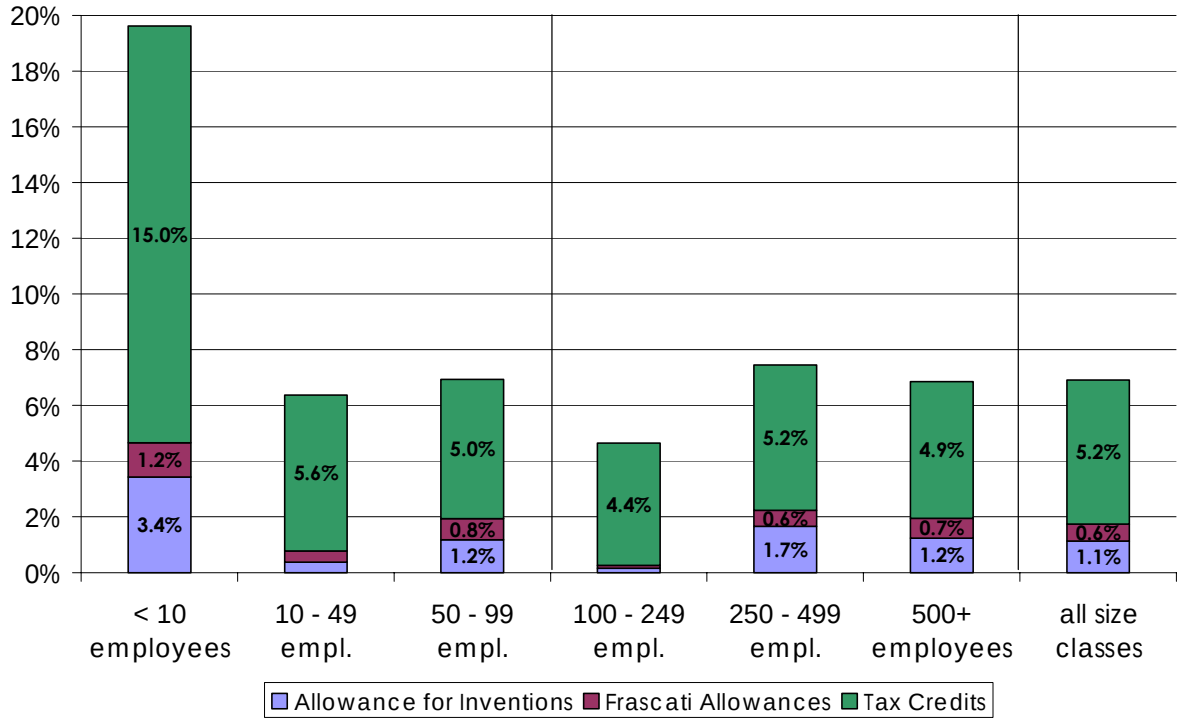
Neutrality with respect to access to fiscal funding can be broadly confirmed with regard to the manufacturing industries. In particular, the tax credit reaches about the same share of R&D-performing manufacturing firms, regardless of their technological intensity.

The intensity of fiscal support for R&D is calculated as the ratio between the cash value of tax funding and total R&D expenditure as reported in the R&D statistics of the Federal Statistical Office. R&D intensities rose until 2004, when the aggregate figure reached 7.7 per cent. Thereafter it fell to 6.9 per cent.

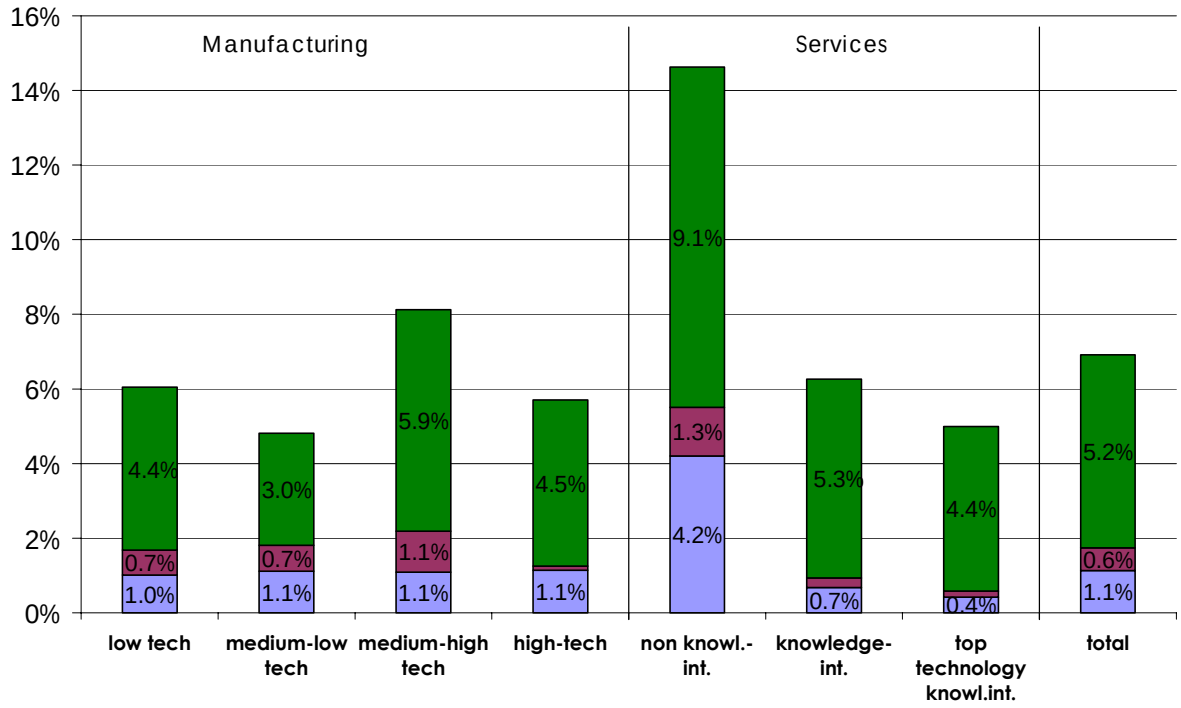
Fiscal funding intensities turn out to be remarkably neutral across company sizes but not so across industries (Figure 2A). Worrisome or unreasonably high fiscal support intensities result in most cases from incomplete collection of data. This is certainly the case for non-knowledge-intensive services and even more with respect to companies operating on a tiny scale, i.e., with less than 10 employees. There still remains some concern as regards the extent of tax support for high-tech companies and top technology using knowledge-intensive services, since their fiscal funding levels fall short of the aggregate figure.

Figure 2A: Intensity of Fiscal Support for R&D, 2005

a) Analysis by size classes



b) Analysis by industrial sectors

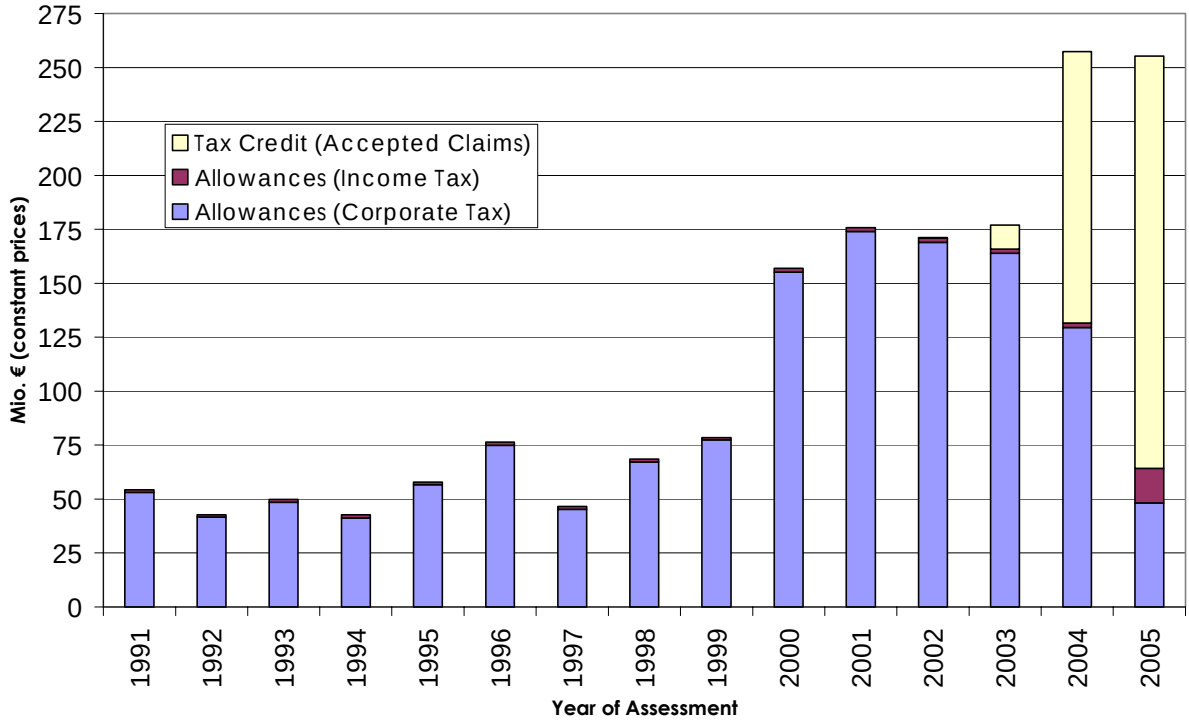


Source: panel a) Tables A2-5 and A2-6 in Appendix 2, panel b) Tables A2-3 and A2-4 in Appendix 2; Static Austria (R&D Surveys 2004 and 2006) — WIFO calculations; Note: [1)] R&D expenditure in 2005 is calculated as the 2004/2006-average; [2)] The "totals" include the Primary Sector which is not displayed.

3.7 *Fiscal Cost of Tax Funding Measures for R&D*

Fiscal support for R&D for assessment year 2005 cost slightly more than € 250 million when measured at constant prices of the year 2000 (Figure 3A). Measured in current prices, total cost of R&D funding for the year 2005 amounted to € 276.7 million. This falls far behind the forecast figures of the Austrian Court of Audit (€ 418 million).

Figure 3A: Cost of Fiscal Support for R&D — Evidence by Assessment Years
At constant prices (2000 = 100)



Source: See TableA2-1 and A2-2 in Appendix 2 — WIFO calculations; Note: [1)] Business partnerships subject to income tax are included only in 2005.

1. Introduction

In Austria, special tax treatment of R&D expenditures was introduced as early as 1980. It has been continuously developed and refined ever since, the most fundamental changes arising from the introduction of Frascati-based tax incentive schemes in 2002. This change in tax funding legislation came as an immediate response to the Barcelona/Lisbon Challenge the Austrian government had committed to in the same year. Increasing emphasis on tax instruments to promote R&D is well in line with recent trends in other EU member states, as well as with respective EC and OECD policy recommendations.[7]

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In response to these announcements, the Federation of Austrian Industries emphasised the need for public RTDI funding and in fact came up with a wholly new additionality concept, "Standort Additionalität", claiming that generous R&D tax incentives play a key role in attracting large R&D players to Austria (and retaining them).

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The report is divided into seven sections. Chapter 2 outlines the structure of fiscal incentives for R&D in Austria. Chapter 3 discusses aspects of administration. Chapter 4 presents evidence on the usage of fiscal instruments for R&D. Chapter 5 deals with its effects with respect to indicators of funding: reach of fiscal instruments, support intensities, and fiscal cost. Chapter 6 gives policy recommendations. Chapter 7 contains an extensive Data Appendix.

7 European Commission (2006, 2008)

8 Österreichischer Rechnungshof (2007)

2. The Structure of R&D Tax Incentives

2.1 Available Schemes

The Austrian Tax Code has granted tax incentives for expenditures related to inventions "valuable to the economy" since 1958. Since 1980 an allowance of up to 5 per cent could be claimed on such expenditures or on expenditures relating to inventions protected under patent law. In 1985 the allowance rate rose to up to 12 per cent. An increased allowance of up to 18 per cent was granted, if the intervention was utilised primarily internally and not by others. In practice the lower rate of 12 per cent played only a minor role (Hutschenreiter, 2002, p. 78). The last changes in the fiscal treatment of inventions "valuable to the economy" were due to the Tax Reform Act in 2000.[9] At that time, the general volume rate was lifted to 25 per cent of qualifying R&D expenditure. In addition "incremental" R&D expenditures exceeding the (moving) average levels of the last three years are deductible at a rate of 35 per cent. Furthermore, the differentiation of support according to whether the invention's use is internal or external has been abolished.

More fundamental changes in the structure of R&D tax incentives occurred in 2002 when the so-called Frascati allowance and a tax credit were introduced. Both of these schemes focus on R&D according to the definition of the OECD Frascati Manual: basic research, applied research and experimental development. Furthermore, the 2005 Growth and Employment Act introduced preferential tax treatment of contract R&D to Frascati-based schemes.[10] This provision mainly addresses small companies that do not have the technological capacity to conduct R&D internally. The most recent change in legislation took place in 2007. At that time tax incentives were restricted to respective expenditures that accrue to plants and establishments located within the EU or the EEA (European Economic Area).[11]

At present, the Austrian tax code offers three different types of allowances and two types of tax credit for R&D-performing firms. Table 1 traces the development of tax incentives schemes for R&D back to the 1980s.

Table 1: Tax incentives for R&D

Type of Instrument Supports	Allowances			Tax Credits	
	inventions „valuable to the economy"	Frascati – R&D	Contract R&D	Frascati – R&D	Contract R&D
Since 1980	5%				
Since 1985	12%/18%				
Since 2000	25%/35%				
Since 2002	25%/35%	10%		3%	
Since 2003	25%/35%	15%		5%	
Since 2004	25%/35%	25%		8%	
Since 2005	25%/35%	25%	25%	8%	8%

Source: WIFO-illustration based on Schneider (2008)

Firms may simultaneously claim some of the above R&D tax benefits (see Figure 1 for an illustration).[12] If a company holds R&D expenditures that are eligible for each of the three

9 Hutschenreiter and Aiginger (2001), Hutschenreiter (2002a, 2002b)

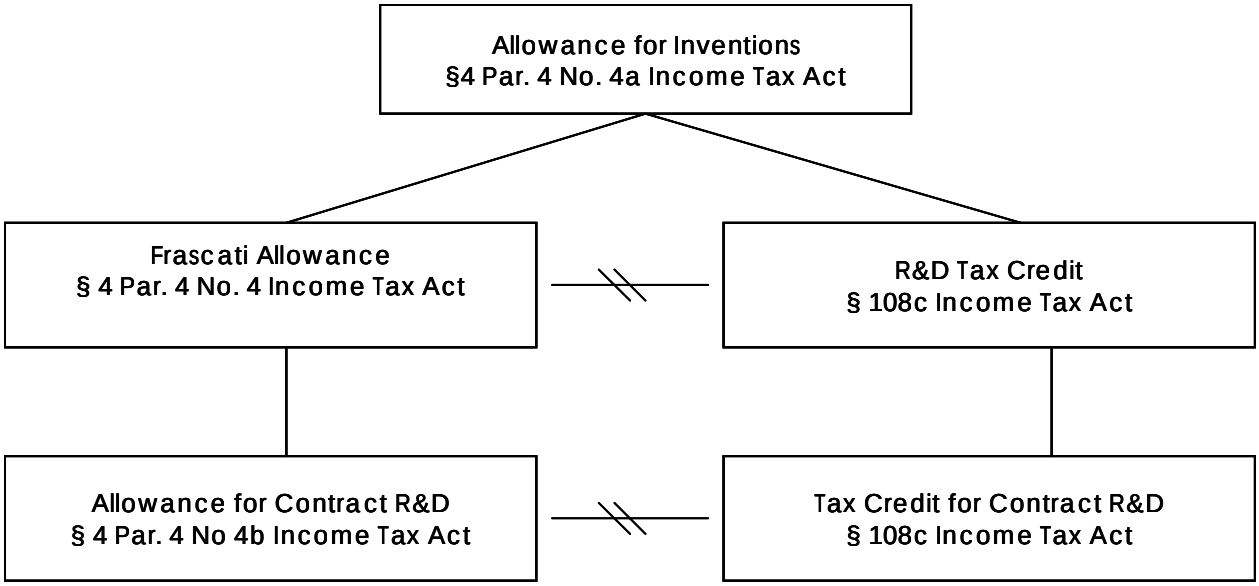
10 The allowance for inventions allows for contract R&D as well, and, in fact, to a wider degree, see section 2.3.

11 Schneider (2008) and Federal Ministry of Economics and Labour and Federal Ministry of Finance (2008)

12 Simultaneous claiming of preferential tax treatment and direct R&D funding schemes is allowed for as well (see Box 3 for an illustrating example)

allowances, it can claim some of it via the allowance for inventions, other parts via the allowance for contract R&D, and the remaining eligible expenditures via the Frascati allowance. Alternatively, this company could also claim some of its eligible R&D expenditures under the allowance for inventions, others under the tax credit for Contract R&D, and the remaining eligible expenditures under the R&D tax credit. Note, however, that the same R&D expenditure cannot be claimed twice.[13] Furthermore, companies cannot claim both the Frascati allowance and the (Frascati) R&D tax credit; neither can they claim both the allowance for contract R&D and the tax credit for contract R&D.

Figure 1: Present Structure of Tax Incentive Schemes for R&D



Source: Federal Ministry of Economics and Labour and Federal Ministry of Finance (2008); ≠ means that the two instruments may not be claimed in parallel.

In addition to the five core fiscal measures discussed above, several other tax incentives are directed towards the promotion of R&D (see Box 1). Some of these aim at the attraction and advancement of human capital, others reward inventors with reduced income tax rates.

***Box 1**: Other tax incentives to promote R&D*

Licensing or selling patents[14]

Inventors who sell or license their own patents benefit from a reduced income tax rate on the earnings achieved from granting licenses and selling patents. Their earnings are taxed at only half of the applicable average income tax rate. Only the inventor herself can make use of this tax benefit. The patent must, however, be valid throughout the time period in which the license is granted, or when the patent is sold, respectively.

Workplace inventions by an employee[15]

13 This statement applies to the R&D tax allowances and tax credits presented above, but does not apply to other tax incentives such as the Apprenticeship Premium or the Training Allowance (see Box 1).

14 § 38 Income Tax Act

A workplace invention is defined as an invention that occurs at the inventor's employing firm. Furthermore, one of the following three conditions needs to be true: the work that led to the invention is part of the employee's defined job spectrum; the employee has received his inspiration for the invention from his work; or the invention has been facilitated by the experience or resources of the workplace. The invention should also be patented or be worthy of a patent.

If an employee makes an invention at the workplace and receives a salary bonus for the invention, a reduced income tax rate applies to the bonus (or to part of the bonus). The reduced income tax rate can be claimed for part of the salary bonus that does not exceed a sixth of the employee's remuneration of the current year plus 15 per cent. The reduced income tax rate specified in § 67 (1) and (2) of the Income Tax Act applies, which is generally equal to 6 per cent.

Mobility premium[16]

Researchers and scientists who establish a residence in Austria can benefit from income tax reductions if their relocation is beneficial to science or research in Austria. These researchers or scientists will be exempt from additional income tax burdens that arise due to their move to Austria, for the time period in which they are active in science and research in Austria.

Subsidies for R&D[17]

Certain types of income are exempt from income tax, such as subsidies for science and research, inclusive of funding from EU institutions.

Donations for R&D[18]

Donations for R&D can entirely be deducted from income tax.

Intangible assets[19]

The purchase price for intangible assets is immediately deductible from income tax. Intangible assets are not allowed to be capitalized.

Public research institutions[20]

Research institutions that are run by public corporations are exempt from corporate income tax. The exemption from corporate income tax also applies to charitable foundations.

Training expenditures[21]

A training allowance is granted for expenditures incurred for the education and training of employees at external training institutions. It is equal to 20 per cent of the qualifying expenditures. The expenditures need to be directly related to the training; travelling expenditures do not qualify for the tax break. Alternatively to the training allowance, a Training Premium equal to 6 per cent of the qualifying expenditures can be claimed. An internal training allowance amounting to 20 per cent of the qualifying expenditures can be claimed for education and training within a company. The qualifying expenditures may not exceed a daily amount of € 2,000 per training.

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15 This is the same tax rate that applies to special payments, i.e. the 13th and 14th monthly salary.

16 See § 103 Income Tax Act.

17 See § 3 Par. 1 (3) c, d, e and § 3 Par. 1 (6) Income Tax Act.

18 See § 4 Par. 4 (5) Income Tax Act.

19 See § 4 Par. 1 Income Tax Act.

20 See § 2 Par. 5 and § 5 Par. 6 of the Corporation Tax Law.

21 The Training Allowance is regulated under § 4 Par. 4 (8) and § 4 Par. 4 (10) of the Income Tax Act; The Training Premium is regulated under § 108c of the Income Tax Act.

Training expenditures for apprentices[22]

The apprenticeship premium is equal to € 1,000 and can be claimed for each year of apprenticeship training per apprentice. Alternatively to the apprenticeship premium, the apprenticeship allowance can be claimed under specific conditions. The apprenticeship allowance consists of a tax-free allowance of € 1,460 which can be claimed at three different stages of the apprenticeship. It is granted for an apprentice's first year of training (if it was begun before the year 2003), for the completion of an apprenticeship, and for passing the final apprenticeship exam.

Investment Allowance[23]

The investment allowance was introduced in 2007. It is restricted to companies using cash based accounting and investing in R&D facilities. The investment allowance can be deducted from the income tax. It is limited to € 100,000 per business year or to 10 per cent of the profits in the business year. The investment allowance cannot be claimed for investments for which the Frascati allowance, the allowance for contract R&D, or the respective tax credits were claimed.

Source: based on Schneider (2008)

22 The Apprenticeship Premium is regulated under § 108f of the Income Tax Act. The Apprenticeship Allowance is regulated under § 124b of the Income Tax Act.

23 The Investment Allowance is regulated under § 10 Income Tax Act.

2.2 Accounting of R&D Tax Incentives

R&D expenditures qualify as operating expenditures and thereby reduce the amount of taxable profits. Allowances provide an additional tax relief in that a certain percentage of specific expenditures can again be deducted from the tax base. At present all of the three R&D allowances are equal to 25 per cent of the qualifying expenditures (see Table 1). In other words, fictitious operating expenses of R&D add up to 125 per cent; this is the so-called volume-based component of the allowance schemes. The allowance for inventions additionally offers an increased rate of 35 per cent of the qualifying expenditures to companies that are extending their R&D activity to a significant degree. This incremental-rate based allowance applies to the R&D expenditures of the current year that are in excess of the average R&D expenditures incurred in the past three years. Note that the incremental rate applies regardless of the firm's actual operating status in the relevant reference period.

To illustrate, assume that a company invests in R&D for the first time in 2004. It may either be a start-up or a formerly established company that is merely an R&D newcomer. The first line in Table 2 below gives the annual amount of eligible R&D expenditure and the second line gives 3-year moving averages thereof. In 2004 the company may entirely draw on the increased allowance rate. In 2005 some of the eligible R&D expenditures are subject to the lower allowance rate. From 2006 onwards moving average R&D expenditures do not exceed R&D spending of the current year and hence the company applies only the volume-based scheme.

Table 2: Volume-based vs. Incremental-based Allowances - Sample Calculation

Year	2001	2002	2003	2004	2005	2006	2007
Eligible R&D expenditure in € millions	0	0	0	3	1.5	1.5	1.8
Average R&D expenditures of the past three years in € millions				0	1	1.5	2
35% allowance applies to € millions				3	0.5	0	0
25% allowance applies to € millions				0	1	1.5	1.8

Source: WIFO illustration

The cash equivalent of the allowance is calculated by multiplying the given allowance rate by the going corporate tax rate, or the marginal income tax rate, respectively. Box 2 gives an illustrating example.

***Box 2**: Calculation of the tax advantage generated by a 25 per cent R&D allowance*

Assume that a company realises profits before tax equal to € 1 million and that its R&D investment comes up to € 100,000. R&D expenditures are eligible for a 25 per cent allowance (e.g., the Frascati allowance or the volume-based component of the allowance for inventions).

The tax benefit generated by the R&D allowance is calculated as follows: The tax allowance reduces the tax base by 25 per cent of the eligible € 100 000 R&D expenditures, i.e., by € 25 000. The new corporate income tax base is thus € 1 million minus € 25 000 = € 975 000.

Without the R&D allowance, the company pays currently 25 per cent corporate income tax on its profits, i.e., the company would pay € 250,000 in corporate income tax. By claiming the R&D allowance, the company only pays 25 per cent corporate income tax on the reduced tax base of € 975,000, i.e., the company only pays € 243,750. The R&D tax allowance thus creates a tax benefit equal to € 6,250 or 6.25 per cent of the qualifying R&D expenditures.

Loss-making companies or companies that are liable for income tax and realize taxable income of less than € 10,000 pay no taxes. In this case R&D allowances provide no particular incentives to invest in R&D. For these companies it is clearly more profitable to draw on the tax credit scheme instead which reduces the tax liability in a direct way: taxes owed are reduced by 8 per cent of the qualifying R&D expenditure. If the company is exempted from corporate (income) tax, 8 per cent of the R&D spending is refunded in cash.

Finally, Box 3 provides an example of the fiscal treatment of an R&D performing company which receives a non-refundable grant for R&D.

***Box 3**: Parallel use of fiscal support for R&D and direct government funding*

Assume that a company realizes profits before tax (pbt) equal to € 1 million and spends € 100,000 on R&D. Assume further that the company receives a non-refundable grant equal to € 30,000 for conducting specific R&D activities in this business year. The grant constitutes a tax-free subsidy. Only R&D expenditures which are not covered by the non-refundable grant are eligible for tax incentive schemes.

The company may opt for the tax credit, in which case taxes are reduced by 8 per cent of the € 70,000, that is by € 5,600. In total this company receives a benefit of € 35,600 for conducting R&D (€ 30,000 subsidy and a € 5,600 tax relief). The government thus pays for 35.6 per cent of the firm's R&D expenditures.

Alternatively, the company may draw on the allowance. To keep things simple, it is assumed that only the volume-based rate of 25 per cent applies. Taxable income is calculated as

Taxable income = pbt- (R&D-grant)· allowance rate,

hence taxable income amounts to € 982,500 (instead of € 1 million) and the company pays € 245,625 in corporate income taxes (instead of € 250,000). The government thus finances 34.4 per cent of the firm's R&D expenditures, viz. tax relief (€ 4,375) plus the non-refundable grant (€ 30,000).

2.2.1 *Fiscal Subsidisation of R&D — the temporal perspective*

Table 3 displays the temporal evolution of cash equivalents of tax incentive schemes for companies liable for corporate tax. Throughout all schemes, the rates of tax subsidisation rose until 2004. In 2005 the corporate income tax rate dropped from 34 per cent to 25 per cent. Since tax credits reduce the amount of tax owed directly, whereas tax allowances only reduce the tax base, companies that are subject to corporate income tax now receive a higher tax benefit from claiming an 8 per cent tax credit than from claiming a 25 per cent tax allowance. At the current corporate income tax rate of 25 per cent, the Frascati allowance generates a corporate income tax reduction equal to 6.25 per cent of the eligible expenditures. If a company subject to corporate income tax is eligible for the increased rate of 35 per cent for the allowance for inventions, then this generates the highest possible tax benefit, 8.75 per cent of the qualifying expenditures.

Table 3: Rates of Tax Subsidies per € 1R&D Expenditure[1)]
Firms liable for Corporate Tax (1989 – 2008)

	Corporate Income Tax Rates	Allowance for Inventions	Frascati Allowance	Allowance for Contract R&D	Frascati Tax Credit	Tax Credit for Contract R&D
Since 1989	30%	3.60% / 5.40%				
Since 1994	34%	4.08% / 6.12%				
Since 2000	34%	8.50% / 11.90%				
2001	34%	8.50% / 11.90%				
2002	34%	8.50% / 11.90%	3.40%		3%	
2003	34%	8.50% / 11.90%	5.10%		5%	
2004	34%	8.50% / 11.90%	8.50%		8%	
Since 2005	25%	6.25% / 8.75%	6.25%	6.25%	8%	8%

Source: Statistics Austria (Corporate Tax Statistics) — WIFO calculations; Note: [1)] For the allowance schemes the rates of R&D subsidisation are calculated by multiplying the allowance rate by the corporate income tax rate.

Table 3 provides a preliminary explanation of recently observed changes in the usage of the various tax incentive schemes. Apart from the given rates of allowances and tax credits, a firm's choice of the optimal scheme depends on tax rates, and, of course, on the type of qualifying expenditure. To stick to the example above, 6.25 per cent of a broader assessment base may still be more profitable than an 8 per cent cash refund on a more narrowly defined assessment base. Beneficiaries of the invention allowance switch to the tax credit scheme only to the degree that the Frascati notion of R&D allows them to claim expenditure items that are not covered otherwise.

The situation is different for companies that are liable for income tax. Income taxes are not calculated on a flat-rate basis, hence the tax benefit generated by the allowance equals the allowance-rate times the *marginal* income tax rate (see Table 4). The high tax rates generally make the allowances the more favourable schemes as compared to the tax credits — unless the assessment falls below € 10,000 once the allowance has been claimed. To see this, consider a start-up with income before allowance of € 20,000 and eligible R&D expenditure of € 60,000. Taxes due amount to € 3,833 and the cash refund from the tax credit comes up to € 4,800, hence the company "pays" taxes of (3,833 - 4,800) = € - 967. (It actually gets a refund.) If the company claims a 25 per cent R&D allowance instead, its taxable income falls to € 5,000. Though the company pays no taxes, it gives away the cash refund and would have been better off had it opted for the tax credit scheme.

More generally, it is important to note that companies liable for income tax face higher tax incentives for R&D as compared to companies liable for corporate tax — an effect that results from higher tax rates of the former group.

Table 4: Rates of Tax Subsidies per € 1 R&D Expenditure[1)]
Firms liable for Income Tax (2000 – 2008)[2)]

Taxable Income in €	Marginal Income Tax Rate	Allowance for Inventions	Frascati Allowance and Allowance for Contract R&D	Tax Credits
		since 2000		
3,634 and less	0%	0%		
More than 3,634	21%	5.25% / 7.35%		
7,267	31%	7.75% / 10.85%		
21,802	41%	10.25% / 14.35%		
50,871	50%	12.50% / 17.50%		
		since 2002		
3,634 and less	0%	0%	0%	3%
More than 3,634	21%	5.25% / 7.35%	2.10%	3%
7,267	31%	7.75% / 10.85%	3.10%	3%
21,802	41%	10.25% / 14.35%	4.10%	3%
50,871	50%	12.50% / 17.50%	5.00%	3%
		since 2003		
3,634 and less	0%	0.00% / 0.00%	0.00%	5%
More than 3,634	21%	5.25% / 7.35%	3.15%	5%
7,267	31%	7.75% / 10.85%	4.65%	5%
21,802	41%	10.25% / 14.35%	6.15%	5%
50,871	50%	12.50% / 17.50%	7.50%	5%
		since 2004		
3,634 and less	0%	0%	0%	8%
More than 3,634	21%	5.25% / 7.35%	5.25%	8%
7,267	31%	7.75% / 10.85%	7.75%	8%
21,802	41%	10.25% / 14.35%	10.25%	8%
50,871	50%	12.50% / 17.50%	12.50%	8%
		since 2005		
10,000 and less	0%	0%	0%	8%
More than 10,000	38.33%	9.58% / 13.42%	9.58%	8%
25,000	43.60%	10.9% / 15.26%	10.90%	8%
51,000	50%	12.5% / 17.50%	12.50%	8%

Source: Statistics Austria (Income Tax Statistics) - WIFO calculations; Note: 1) For the allowance schemes the rates of R&D subsidisation are calculated by multiplying the allowance rate by the marginal income tax rate; 2) Table A1-1 in Appendix 1 displays rates of tax subsidies prior to the year 2000.

2.2.2 Fiscal Subsidisation of R&D – the cross-country perspective

To make the relative generosity of R&D tax treatment comparable across countries, Warda developed the so-called "B-Index".[24] The B-index is defined as the present value of before-tax income necessary to cover the initial cost of 1 € R&D-investment and to pay corporate income tax, so that it becomes profitable to perform research activities. Algebraically, the definition of the B-Index is:

B-Index = $(1 - A) / (1 - t)$, where t gives the corporate income tax rate and A gives the net present discounted value of depreciation allowances, tax credits, and special allowances on R&D assets in a given country. The enumerator in the above expression thus gives the net cost of 1 € investment in

24 Warda (1996) and Warda (2002)

R&D. The more favourable the tax treatment of R&D, the *lower* a country's B-index is: the company breaks even with less income.

Tax subsidies are calculated as 1 minus the B-index. Hence, the "1 minus B-Index" rises with the generosity of the tax treatment and turns negative if there are no tax incentive schemes in place. For in this case, a company with R&D-expenditures of 1€ will only break even if its before-tax income ("B-Index") *exceeds* 1€ and hence the rate of tax subsidisation ("1 minus B-Index") turns negative.

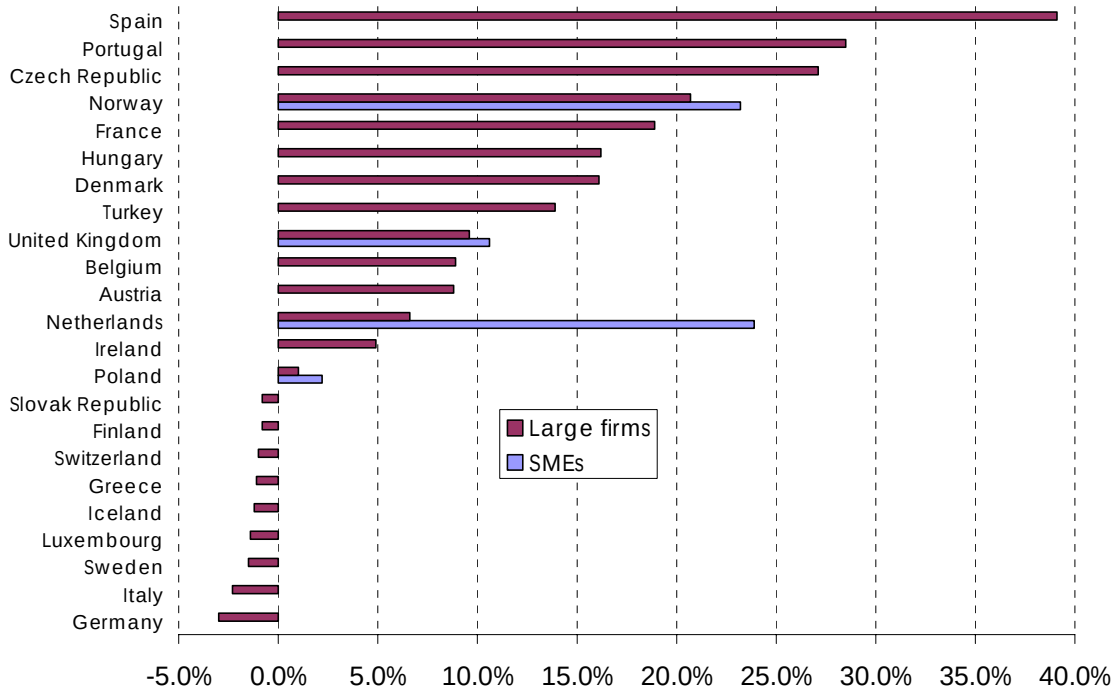
According to Figure 2 below, expenditures of € 1 on R&D of a "representative" company in Austria are rewarded by 8.8 cents of tax relief in total. This figure is slightly higher than the maximum rate of tax subsidies presented in Table 3, since Warda's gross rate of R&D tax subsidisation includes depreciation allowances. The average of the 23 European countries listed in Figure 2 is nine cents for large firms. Some countries such as Norway, the UK, Poland, and most of all the Netherlands provide special tax incentives for small companies undertaking R&D.[25]

Though in Austria, none of the schemes are restricted to SMEs, in practice some of them do not really appeal to large firms. First, the increased allowance rate for inventions sure enough mainly benefits start-up (and therefore small) companies. Second, and more specifically, the allowance for contract R&D puts an upper limit of € 100,000 per year on the amount of external R&D eligible for the allowance. Alternatively, € 8,000 may be claimed under the tax credit for Contract R&D. Regular R&D-performers or large firms will find it hard to draw great advantage from such cap restrictions. Third, Austria introduced a so-called investment allowance in 2007.[26] It is confined to companies using cash-based accounting — a form of accounting that is only chosen by smaller firms. Firms investing in R&D facilities and using cash-based accounting may subtract a maximum of € 100,000 per business year (or up to 10 per cent of their profits) from their income tax base. Expenditures that are already covered by either type of the classical R&D tax incentive schemes, however, may not be claimed twice.

25 For a comprehensive and up-to date overview of tax incentive schemes in European countries and the US, refer to Spengel (2009), chapter 4 and Appendix 1. The particular situation in Norway and the Netherlands is covered in De Jong et al. (2007), Lokshin et al. (2007), Haegeland et al. (2007a) and Haegeland et al. (2007b).

26 See Box 1 in this report

Figure 2: Gross Rate of Tax Subsidies per € 1 of R&D, 2007[1), 2)]

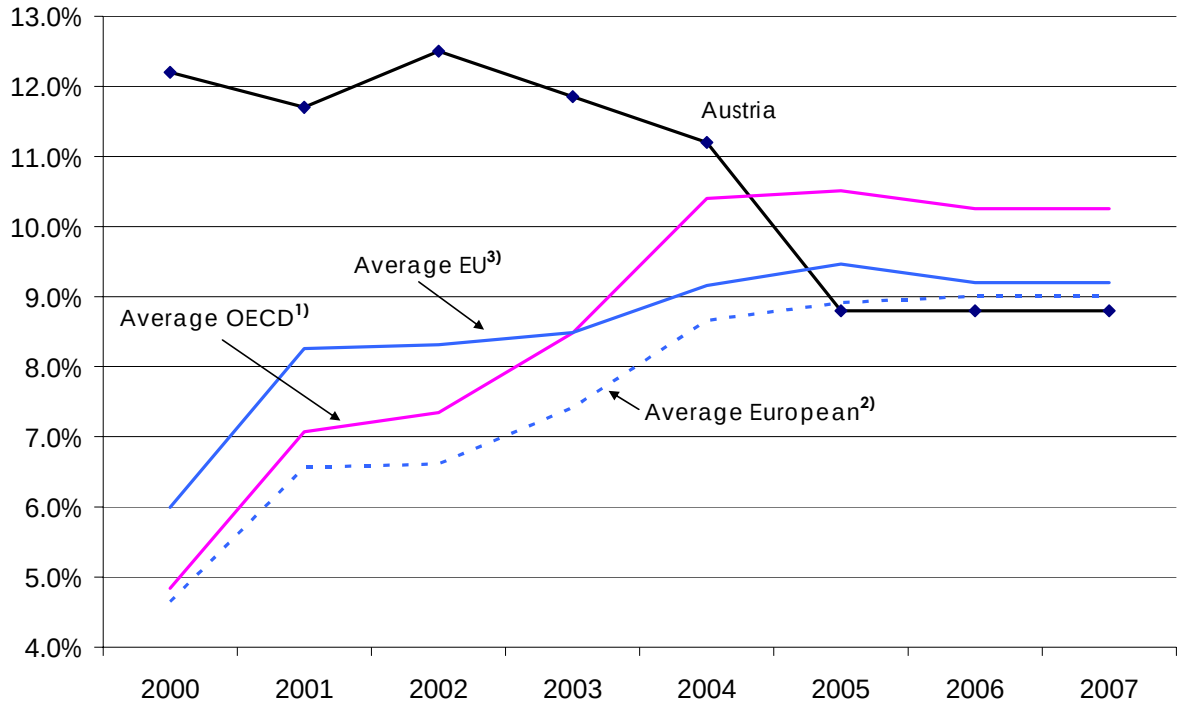


Source: OECD Science, Technology and Industry Scoreboard 2007, p. 73. — WIFO illustration; Note: Data is based on national estimates (OECD xNESTI R&D tax incentives questionnaire); [1]) Tax subsidies are calculated as "1 minus B-index" [2]) SMEs and large companies are treated alike except in Norway, the U.K, the Netherlands, and Poland.

Before 2005 the attractiveness of R&D activities relative to non-R&D activities carried out in Austria was clearly above European and OECD-averages (Figure 3). As shown in section 2.2.1, preferential treatment of R&D lost ground when corporate income tax rates fell to 25 per cent. While this has supposedly no effect on the location decisions of multinational R&D-performers, which instead assess potential locations' fiscal attractiveness on the basis of total tax due,[27] it does affect the relative attractiveness of entrepreneurial activities within the country. The fiscal treatment of knowledge-intensive economic activities is less generous than before, which undermines attempts to enforce structural change in the direction of knowledge-intensive industries.

27 De Mooij and Ederveen (2008); Knoll (2004)

Figure 3: Gross Rate of Tax Subsidies per € 1 of R&D, 2000-2007[1)]



Source: OECD Science, Technology and Industry Outlook and Science, Technology and Industry Scoreboard, various issues - WIFO calculations.

Note: [1)] Unweighted average of all 30 OECD member states. Data for Hungary only available since 2004. Data for the Czech Republic, Luxembourg, Poland, Slovakia, and Turkey only available since 2006. [2)] Unweighted average of European OECD countries (including Turkey); same data limitations as noted in footnote 1). [3)] Unweighted average of EU member states in a given year; same data limitations as noted in footnote 1). No data available for Cyprus, Estonia, Latvia, Lithuania, Malta, and Slovenia.

2.3 Eligible expenditure

The allowance for inventions generally applies to expenditures incurred for the development or improvement of economically valuable inventions, hence it focuses on the *results* of research-activities (output-based measure). In order for research results to qualify as an invention, they must solve a technical problem using technical means and they must constitute a technological advancement in comparison to the current technical state of the art. Scientific theories, mathematical methods, aesthetic designs, plans, rules and processes for developing thoughts, and programs for data processing facilities or for reproducing information do *not* qualify as inventions.

The Frascati-based concepts, on the other hand, generally apply to research and experimental development being carried out systematically and by using scientific methods. This notion of research and development is not, however, confined to technological R&D in a narrow sense. Instead activities must merely aim at increasing the store of knowledge and at creating applications for this knowledge. Furthermore, the basis for a claim under Frascati-based instruments does not depend on eventual innovation success; in this sense it is an input-based measure.

Table 5 compares eligible expenditure items in both schemes. Irrespective of the differing theoretical concepts underlying the allowance for inventions (output-based measure) and the Frascati-based schemes (input-based measures), considerable overlap remains in the coverage of respective expenditure items. In particular, the main expenditure item of research, viz. wages and salary, is treated alike. This said, the basis for Frascati claims is broader as compared to the items

eligible for the allowance for inventions. This comes as an immediate consequence of Frascati's input-orientation. It rewards basic research and experimental development with little prospect for commercialisation in the near future, just as it is advantageous to output-oriented projects of applied research.

More specifically, the Frascati-based schemes are more generous with respect to software, investment in fixed assets, overhead costs, pilot facilities, and expenditures for the commercial exploitation of an invention.[28] The allowance for inventions is more advantageous only in one, albeit important, respect: external R&D (contract R&D). If no more than 50 per cent of a R&D project's budget is contracted out and if the principal spends at least half of the project's total budget on internal R&D to improve the results of external R&D, then these expenditures may be claimed under the invention allowance. It is important to note that there is no upper limit on the amount of eligible expenditure. While the Frascati schemes allow for contract R&D as well, such expenditure is capped at an annual limit per company of 100,000 €.

Table 5: Eligible Expenditures: Allowance for Inventions Useful to the Economy vs. Frascati-based Schemes

	Allowance for Inventions	Frascati (Allowance and Tax Credit)
Software: Frascati Allowance more generous scheme	Not eligible - Expenditures for the development of software, if this is the main purpose of the R&D activity	Not eligible - Adaptations of existing software without changes in the structure or processes; conversions or translations of programming languages; debugging program errors, user handbooks, and documentation
	Eligible - The development of program logic that constitutes the foundation of computer equipment is eligible if it is an economically valuable invention	Eligible - Software development contributing to scientific or technological advances, addressed systematically and scientifically[1)]
Fixed Assets: Frascati Allowance more generous scheme	Not eligible - Purchasing costs and the depreciation of fixed assets that are relevant for R&D - Finance lease expenditures for fixed assets used for R&D	
	Eligible - Maintenance expenditures and rent for fixed assets that are used for R&D purposes	Eligible - Investments for land, buildings, and other depreciable assets that have an economic life of more than 10 years and are used for R&D for at least 10 years - Investments into limited-life assets with an economic life of up to 10 years, if they are used for R&D activities for more than half of their economic life

28 Fachverband der Elektro- und Elektronikindustrie et al. (2008)

Table 5: … continued

	Allowance for Inventions	Frascati (Allowance and Tax Credit)
Human Capital: same provisions in both schemes	Eligible: - Salaries for researchers and R&D personnel (incl. taxes and social security contributions). For employees who do not engage solely in R&D, the R&D relevant-salary component is to be taken.	
Contract R&D: Invention Allowance more generous scheme	Not eligible: - Expenditures incurred by the principal for outsourced R&D producing economically valuable inventions Eligible: - Expenditures incurred by the principal for internal R&D that improves outsourced R&D results. Note: at least 50 % of the costs must be incurred internally; R&D must lead to an economically valuable invention.	Not eligible: - External R&D that constitutes an independent R&D project. But up to a maximum of € 100,000 the principle may claim such expenditure under the Allowance/Tax Credit for Contract R&D Eligible: - External R&D that is a dependent component of an internal R&D project[2)]
Pilot Facilities and Prototypes	Eligible: - Expenditures for constructing, installing, and testing prototypes until they are mature for production	Eligible: - Expenditures for constructing and operating pilot facilities until they are used commercially - Expenditures for constructing, installing, and testing prototypes until they are mature for production
R&D Expenditures Incurred Abroad: same provisions in both schemes	Not eligible: - R&D expenditures in a company or in company premises outside the EU or EEA Eligible: - R&D expenditures in a company or in company premises within the EU or the EEA	
Patenting: Frascati Allowance more generous scheme	Not eligible: - Expenditures for the commercial exploitation of an invention (e.g., yearly patent fees)	Eligible: - Administrative and legal activities that are directly related to patenting R&D
Overhead Costs and Financing Expenditures: Frascati Allowance more generous scheme	Not eligible: - Overhead costs such as expenditures for accounting or marketing Eligible: - Interest payment for debt that can be allocated to R&D activities	Eligible: - Overhead costs and financing expenditures that can be allocated to R&D.
Parallel Subsidies: same provisions in both schemes	- R&D expenditures covered by income-tax-free subsidies are *not eligible*.	
Parallel Tax Incentives Related to Human Capital	- R&D training expenditures that have already been claimed under the training allowance or premium or apprenticeship premium can be claimed again under the allowance for inventions or alternatively under the Frascati –based schemes.	

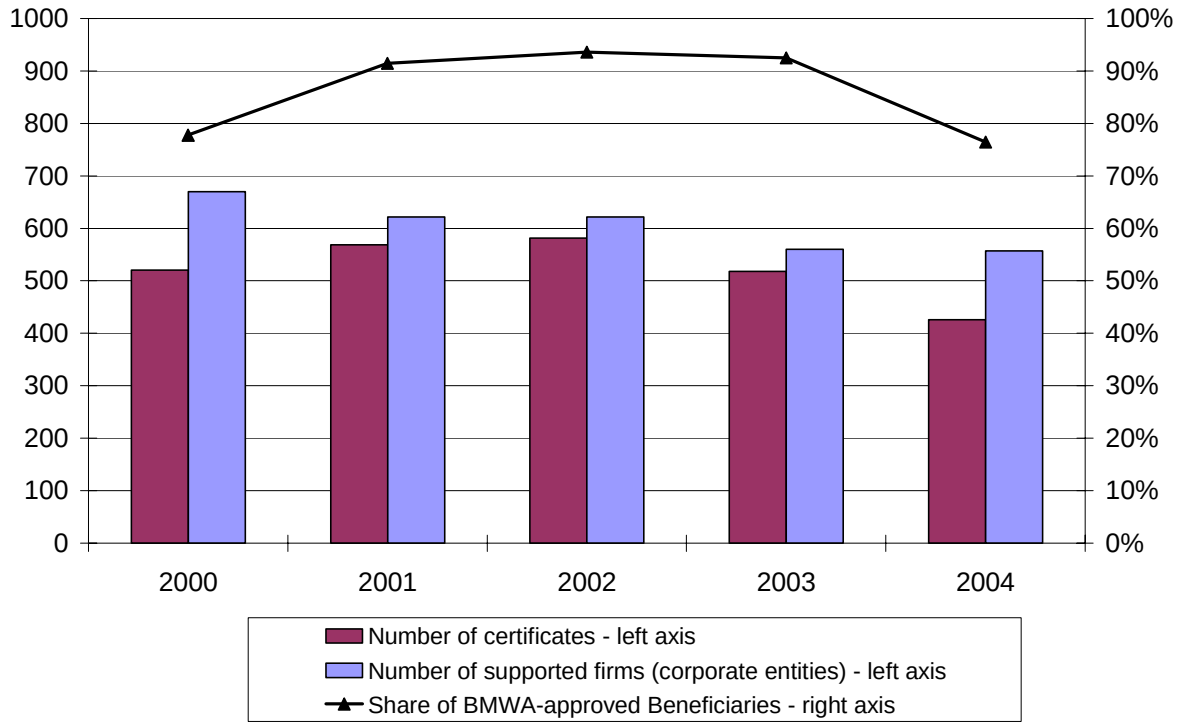
Source: based on Schneider (2008), – WIFO illustration; Notes: [1)] This includes the development of operating systems; programming languages; data base systems; communication software; access techniques and tools for software development; development of internet technologies; research on methods for the development, application, protection and storage of software; software development that enables general advances in collecting, transmitting, storing, retrieving, processing, integrating, protecting and presenting data; experimental developments that aim to fill technological gaps of software programs and systems; R&D on software tools or software technologies in special applications (e.g. integration of telemetric and sensor data, simulation); [2)] It is however necessary that the internal R&D project that the outsourced R&D belongs to is eligible for the Frascati Allowance. Similarly, the external R&D by itself is not allowed to be eligible for the Frascati Allowance. See Income Tax Directive 2000 / Rz. 1329d.

3. The Administration of Fiscal Benefits for R&D

3.1 Ex ante Administration

Inventions automatically qualify as being valuable to the Austrian economy when the inventions are patented in Austria or in a foreign country that has patent allocation criteria that are equal to or are harmonized with the Austrian criteria. All other applicants need a certificate from the Federal Ministry of Economics and Labour specifying that their invention is valuable to the economy. The latter route is the dominant one: between 75 and 90 per cent of the total number of incorporated entities that claimed the allowance for invention between 2000 and 2004 proved their entitlements via a certificate (Figure 4). In fact, a recent survey reveals that a non-negligible fraction of companies that apply for a certificate would do so even though their invention has been patented (Table 6).

Figure 4: Access to Allowance for Inventions via Certification



Source: Number of certificates as communicated by the Federal Ministry of Economics (BMWA) on May 21, 2008. For the total number of supported companies see Table A2-1 in Appendix 2 — WIFO Calculations. Note: Applicants for the certificate are almost always incorporated entities. Because of this, the "total" number of companies making use of the allowance for inventions comprises corporate entities only.

In order to receive the certificate, the applicant must provide written justifications to the Federal Ministry for Economics and Labour explaining why the R&D results should qualify as an invention that is valuable to the domestic economy. This application must include the following four elements:

1. A technical report about the completed or expected invention.
2. An explanation of the extent to which the invention constitutes technological progress in comparison to the current state of the art.
3. A description of the commercial value of the invention. This should be done by making projections about the planned production, sales, and/or export figures.

4. The value to the domestic economy should be described and estimated, e.g., by the expected contributions to GDP, (projected) sales figures, qualitative improvements of products, productivity increases, increases in the number of jobs, energy savings, or environmental benefits.

In order to evaluate the extent of the technological advancement, the Ministry can, in principle, draw upon the expertise of the Patent Office. However, according to BMWA staff such expertise is hardly ever requested. In practice, the main criteria for awarding the certificate relate to the presumable value for the domestic economy.

Table 6 displays "routes of access" to the allowance of inventions by company size. Small companies base their claims far more often on patents as compared to larger firms.

Table 6: Access to Allowance for Inventions via Patent and/or Certification
By Firm Size

	Patent	Certification	both
Less than 10 employees	50%	38%	12%
10 - 49 employees	35%	56%	8%
50 - 99 employees	23%	50%	27%
100 - 249 employees	25%	63%	12%
250-499 employees	27%	65%	8%
500+ employees	11%	70%	19%
Total	27%	59%	14%

Source: WIFO/KMFA (2008): Public support of firms' RTDI-activities. Survey for the System Evaluation — WIFO calculations. Notes: N = 245.

The larger the firm, the easier it will be for it to argue economic value since the list of applicable criteria leaves such wide scope. The certificate can be awarded as soon as one of the criteria is met and, above all, large companies with dynamic employment prospects and output growth are economically valuable per se. It is viewed as being positive when the invention-activity in question is already being sold as a commercial product, and sales figures can be provided. The lack of hard figures is no sufficient grounds for rejection nor are figures verified ex post. The Ministry answers the vast majority of applications in the affirmative (Eder, 2005, p. 11). The rather low official rejection rates are supplemented by early informal (or semi-formal) contacts in instances in which the BMWA staff sees no reasonable chance for a formal application to be successful. The Ministry is reluctant to officially object to an application for it fears potential suits that would tax its limited resources.

Finally, the question must be raised if the Ministry allocates a sufficient amount of qualified manpower to evaluating the technical and commercial reports. On inquiry European Patent Office staff (EPO) stated, it takes on average 3.5 days to prove a patent application. Merely reading and understanding the claim takes about one day, i.e., after one day a decision can be made as to whether the application is, in principle, worth further investigation, or whether it should be rejected right away. Without exception, EPO staff members in charge of scrutinising the claims hold university degrees in engineering or natural sciences, and the level of specialisation is quite high. In Austria, three generalists are in charge of issuing about 450 certificates per year. To summarise, it seems that the Ministry of Economics administers the allowance rather with regard to general economic concerns and that the specific research focus is less important.

The allowance for contract R&D and the tax credit for contract R&D can only be claimed by the one who bears the research risk, i.e., by the company that is "contracting out" (independent) R&D projects. As for the allowance, an upper limit of € 100.000 per business year applies. The tax credit for contract R&D is limited to € 8.000 per year. The contractor—a research institution or business—

must be domiciled in an EU or EEA member state. It is not sufficient to merely establish a head office in one of these countries. If the client (principal) is a grouped company, the contractor may not belong to the same group of companies.[29] In order for the principal to claim the allowance (or the tax credit) for contract R&D, he must inform the contractor about the level of expenditures that he will claim in the current business year. Such ex-ante information is mandatory even if the contractor herself does not plan to draw on any kind of tax incentive schemes for R&D (e.g., because the contractor is a tax exempt public research institution or a company located outside the EU or EEA).

With respect to the Frascati-based schemes for intramural R&D, there are no special ex-ante provisions — except for quite demanding general claims on accounting.

3.2 Ex-post Administration

General tax office staff is in charge of scrutinising the claims. While SMEs only sporadically face close examination, things are different for large firms. They face all over ex-post examinations. The risk of experiencing disapproval of a claim, or part of a claim, generally increases with company size. According to the survey for the System Evaluation, every third very large company (those with more than 500 employees) reported that its claims had been disallowed at least once. Small companies (those with less than 10 employees) can count on nearly full acceptance of their R&D statements (Figure 5). Note also that large but not very large companies seem to enjoy some kind of comparative size advantage: they appear to be too large for routine checks of their tax returns by general Tax Office staff, but too small for closer all over-examinations by auditors on the spot.

The Tax Office does not, however, re-examine claims that have already been certified by the Federal Ministry of Economics and Labour, and companies naturally appreciate this feature very much. There is some anecdotal evidence that, for this very reason, the allowance for inventions is becoming increasingly popular again—despite currently lower rates of subsidisation as compared to the Tax Credit.

In discussions with Members of the Austrian Federal Economic Chamber and of the Federation of Austrian Industries complaints emerged about improper Frascati audits. They reported that assessments have recently become far more restrictive and arbitrary. Above all, they questioned the qualifications of general tax auditors when it comes to the very specific provisions of fiscal incentives for R&D. They also said that they suspected the Federal Ministry of Finance of giving instructions to deny tax funding in case of slightest doubts and tax auditors would be notorious sceptics as a matter of principle.

Though the tax auditors themselves deny the existence of any such directives, they concede that a clear interpretation of the Frascati concept is very difficult in practice. It turns out that tax auditors deal with this problem in quite different ways. One deliberately introduced himself as a personification of the watering-can principle ("Good morning, I am the watering-can!"). He reported that there was some, but probably too little, training with respect to the pitfalls of Frascati. Each auditor would enter the firm, equipped with an English edition of the manual, and would then struggle his way through the accounts. He would randomly check the crucial R&D data, but he would accomplish this task only to the degree to which the figures corresponded, or did not, to the rules of bookkeeping arithmetics.

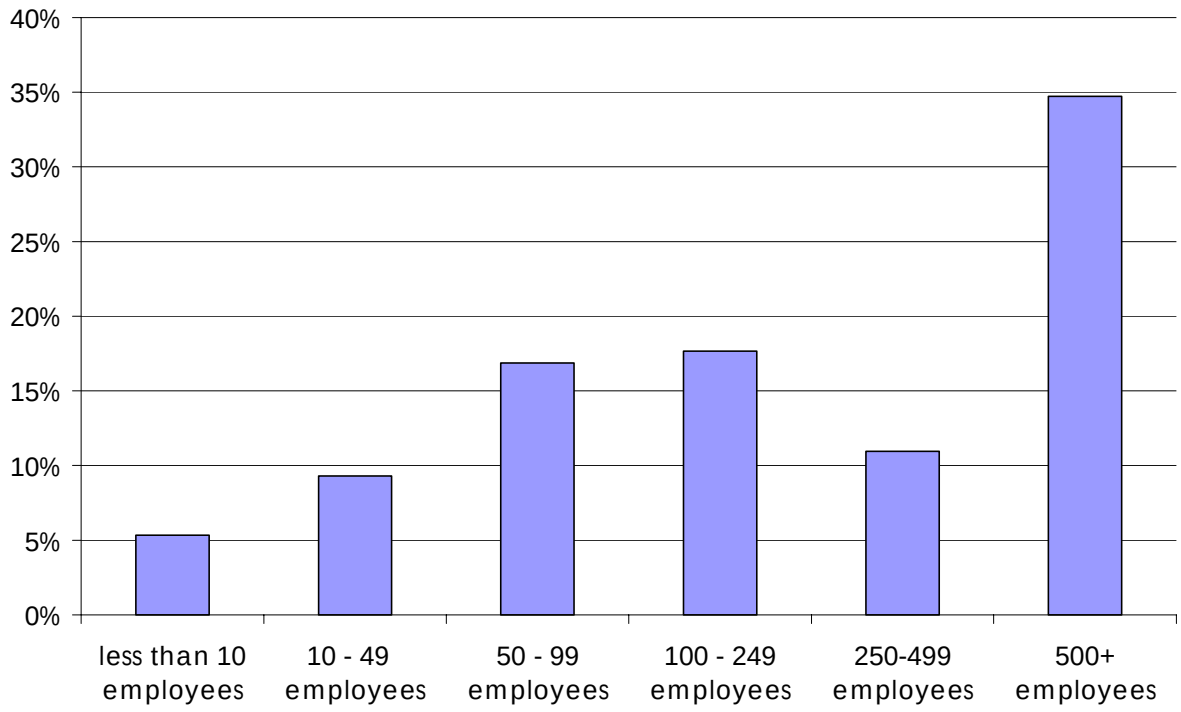
Another tax auditor rated the quality of training more highly. However, ex-post administration of fiscal support for R&D would still be an extremely tedious task. The companies would deliberately

29 See Group Taxation Regime AÖF No. 99/2005

allude to their legal claims and announce litigation. They would appeal in case of a negative notice of assessment. The very least they would do is to threaten to go to court. Judges in Austria would generally decide legal disputes in favour of companies, hence such announced intentions are taken quite seriously.

In summary, a negative notice of assessment imposes considerable additional work on the tax auditor. Such effort would not be rewarded in any way. Quite to the contrary, there would be a large risk of being declared as incompetent if the company prevails in the litigation. This tax auditor noted that talking to the researchers themselves was the most useless undertaking. They would become extremely upset if a tax auditor presumed to cast doubt on the research content of their work, no matter how small the fiscal advantage in question. In light of given time constraints on the auditor's side and subject matter superiority on the researcher's side, there was little incentive to further fight for the cause.

Figure 5: Share of Tax-Funded Firms that Have Experienced Disapproval of Claims[1]
by Firm Size



Source: WIFO/KMFA (2008): Public support of firms' RTDI-activities. Survey for the System Evaluation— WIFO calculations.
Notes: N = 663

4. Usage of R&D Tax Incentives

This chapter provides some stylized facts. To what extent have tax incentive schemes for R&D being utilised in the past? How do allowances and tax credits develop over time? Are the changes in tax legislation mapped by structural breaks? What schemes are utilised? By how many firms? Which type of company makes use of what type of instrument? These are the questions Chapter 4 seeks to address. The introductory section discusses availability, types, and quality of the data to assess its robustness and to qualify the empirical findings in terms of reliability.

Table 7: Statistical Coverage of Fiscal Instruments to Support R&D

	Corporate Tax Statistics	Income Tax Statistics	Biannual R&D-Survey done by Statistics Austria
Data for assessment year X is published in year	X+4 (summer)	X+3 (spring)	
Data for disbursement year X is published in year			X+2 (early autumn)
1) Allowance for Economically Useful Inventions			
Cases and values covered since assessment year	1981	1991	
breakdown by			
- amount of taxable income	Yes	Yes	
- legal form of companies	Yes	No	
- states	Yes	No	
Separate statistics on cases and values for tax-paying units and non-tax paying units	Yes	Yes	
Breakdown by			
a) sectors (1-digit level)	Since 1981	No	
b) BS-68 classification of industries[1)]	1980 – 1997	No	
c) ÖNACE (2 digits) classification of industries	Since 1995	No	
d) ÖNACE (3 digits) classification of industries	Since 2000	No	
2) Frascati Allowance			
Covered since	2004	2002: joint entry, together with allowance for inventions that are useful to the economy	
Statistical processing same as in 1)			
3) Tax Credits (for Frascati R&D and Contract R&D)			
Data by assessment year	Completely missing	Completely missing	
Amount of tax credit paid out covered since (disbursement) year; breakdown by			2006
a) ÖNACE (2 digits) classification of industries			Yes
b) size classes			Yes
4) Allowance for Contract R&D			
Covered since	Corporate Tax Statistics for assessment year 2005 not published yet	2005: separate entry; statistical processing same as in 1)	

[1)] Since 1995 the Austrian NACE classification has been applied ("ÖNACE-1995") which is compatible with international classification standards, e.g., the sectoral classification system of the OECD. Before 1995, sectors were classified according to a unique Austrian system (Betriebssystematik 1968, "BS 68" for short) that followed a different logic than the NACE-system does. For that reason, translating the old sector codes to the NACE-systems can only be accomplished on the basis of individual company data (which is not available for the sake of evaluation).

4.1 Data Sources

This report entails an extensive data Appendix. The corporate tax statistics and the income tax statistics report data on tax allowances for R&D by year of assessment. Corporate entities account for the bulk of claimed allowances. The respective reporting in the corporate tax statistics goes quite deeply into the details (Table 7) but is published over three years after tax declarations for a

given year are due.[30] Tax statistics follow some well defined logic which may be perfectly appropriate in general. With regard to an economic evaluation of tax incentives, they report lots of dispensable information in a considerable degree of detail (e.g., amount of allowances claimed in Upper Austria as opposed to Lower Austria). On the other hand, some crucial information is missing. For instance the extent to which business partnerships make use of tax credits shows up in no publication. Similarly there is no officially published data on the size distribution of fiscal tax incentives' beneficiaries.

A third serious drawback arises from the way observations enter the statistics. Each observation refers to a "case" (with separate statistics on "tax-paying cases" and "non-tax paying cases"). As long as only one scheme for R&D tax incentives was in place, a "case" was equal to a company. Things changed with the introduction of the Frascati allowance, since both research allowance schemes may be used in parallel. If a company makes use of two (or three) tax incentive schemes, it shows up two (or three) times in the statistics. As a consequence, it is impossible to determine the total number of companies benefiting from tax incentives. Fourth, only since assessment year 2005 have fiscal grants for R&D been linked to respective declarations in the tax form. Hence the number of tax funding beneficiaries is only known since 2005. Fifth, though introduced in 2002, detailed data on the Frascati allowance is covered for the first time in the corporate tax statistics for assessment year 2004. The 2002 and 2003 publications are quite confusing and, in fact, misleading about the covered type of allowance. Either the type remained unspecified ("Forschungsfreibetrag"), the label ("Forschungsfreibetrag 2") did not match any of the relevant terms explained in the glossary, or the wrong paragraph was attached in parentheses, suggesting that the data referred to Frascati allowances when actually they covered the allowance for inventions. Upon request, the Federal Statistical Office clarified matters and sent the missing data.

The statistical reporting on Tax Credits constitutes the most severe case of data insufficiency. Information by assessment year is completely absent, i.e., unpublished. Before 2006, information by disbursement year is limited to two aggregate numbers per year. The Austrian Research and Technology Reports list expected total tax credit disbursements for the current year in a footnote of the first table in the Appendix. Actual cash outflow in a given calendar year (t) show up two years later (t+2) in a publication of the Federal Ministry of Finance ("Förderungsbericht"). The 2006 survey on R&D in the business enterprise sector ("R&D Survey") covers tax credit payments for the first time—but keeps silent with respect to the number of beneficiaries. In former years (2002 and 2004) the survey did not explicitly ask about public R&D support via tax credits. The general item "R&D transfers provided by the public sector" should—in principle—comprise tax credits.[31] However, it remains unclear to what extent the survey respondents acknowledged that tax credits are classified as direct public funding. Between 2004 and 2006 (when tax credits were for the fist time explicitly listed as a source of public finance) "business enterprise R&D (BERD) financed by the government" rose by € 200 million. The 2006 tax credit came up to € 156 million. The share of government funded BERD grew by more than 3 percentage points from initially 6.4 per cent to 9.6 per cent, a 50 per cent increase. These observations cast some doubt on the assumption that prior to 2006 survey respondents took notice of all "direct" public funding sources.

Finally, the delicate issue of confidentiality and anonymity deserves comment. The ministry in charge of the allowance for economically useful Inventions possesses a unique, firm-level database

30 Tax declarations for a given assessment year (t) are due on April 1st of the next year (t+1).

31 Formally, tax credits qualify as direct transfers, while tax allowances qualify as indirect transfers. Report 8 of the System Evaluation elaborates this issue, including its effects on funding statistics.

extending back to the early 1990s that would be very well suited to assessing additionality issues of tax funding and related questions: How much R&D is induced? How much would have been spent anyway? What type of company is the most/least responsive, etc.? Contrary to what had been promised in the first meeting with the steering committee of the System Evaluation, however, the ministry later denied access to this database, citing data confidentiality. Eventually the ministry provided data for assessment years 1993–2007 on approved R&D expenditures (at 2-digit industry level) and the number of beneficiaries (at the aggregate level). Though receipt of this data is acknowledged, the practice of holding back very useful existing data for general non disclosure principles should be reconsidered. Different funding actors assess the notorious conflict between public interest (free access to relevant information) and private interest (secrecy) quite differently. At the other extreme, the daily newspapers recently revealed identities and amounts of EU agricultural funding.

Insisting on data confidentiality produces some unpleasant side effects. Policy making becomes less evidence based and more subject to the interest and judgments of selected opinion leaders. At best, these interests are transparent ("Standort-Additionalität"); at worst, they enter the policy discussion in a very subtle way and become hard to grasp.

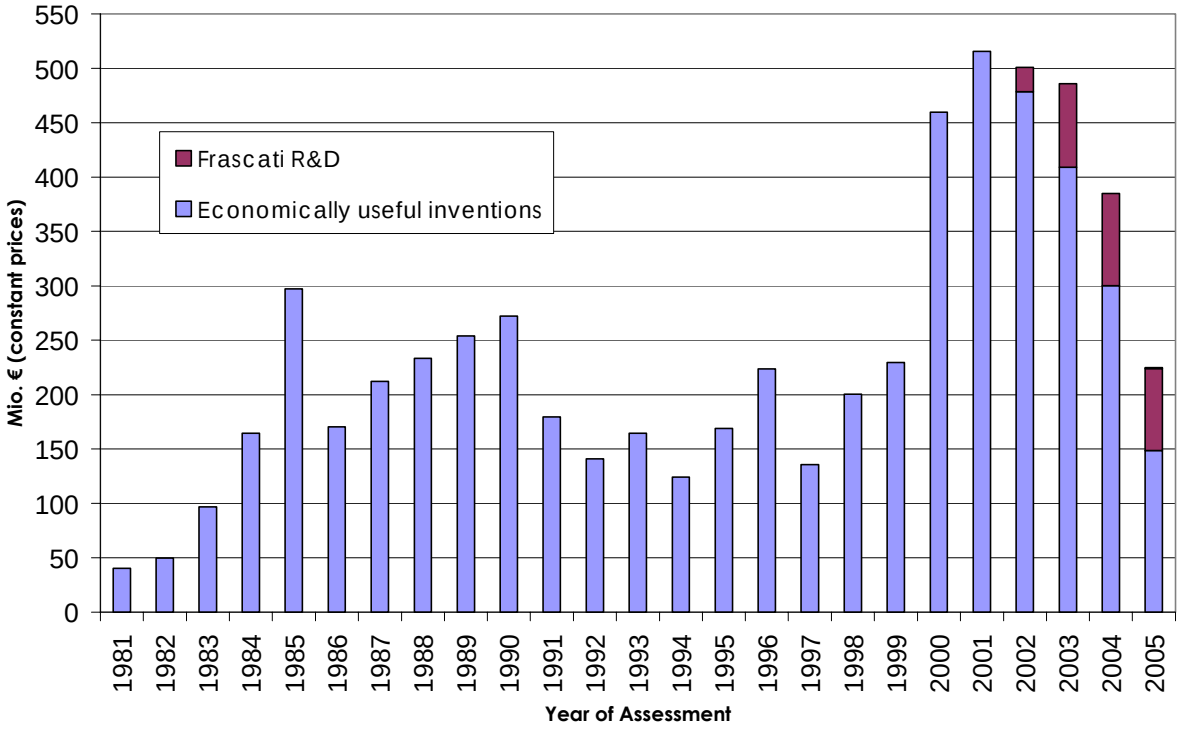
In any case, distinguished international academic scholars (from KU Leuven, from Merit in Maastricht) refrained from participating in the evaluation of R&D tax incentives when they were invited to do so in late 2007. In their opinion, this task could not be accomplished with the poor database at hand.

The Ministry of Finance in collaboration with the Federal Data Centre and the Federal Statistical Office were very helpful in improving the data basis and in clarifying issues of interpretation. This is gratefully acknowledged. The author is particularly indebted to Phillip Panzenböck and Rainer Pilz.

4.2 Empirical Evidence at the Aggregate Level[32]

4.2.1 Evolution of Allowances and Tax Credits since 1981

Figure 6: Usage of Tax Allowances for R&D
At constant prices (2000 = 100)



Source: see Table A2-1 in Appendix 1 - WIFO calculations; Note: Individual persons subject to income tax are included since 1991; business partnerships subject to income tax are included only in 2005.

Figure 6 shows the usage of tax allowances for R&D since 1981 in constant prices of the year 2000. Initially companies claimed allowances (for economic useful inventions) totalling € 41 million. By 2005, aggregate allowances came up to € 197 million—nearly five times as much as in 1981. The average annual growth rate of allowances in the 25-year period between 1981 and 2005 is given by 6.8 per cent. The growth in allowances did not follow a smooth path, however. Instead, we observe structural breaks arising from changes in the tax incentive schemes. The sharpest increase in allowances took place between 1999 and 2000, when allowance rates were lifted from 12 per cent and 18 per cent, respectively, to 25 per cent (volume-based rate) and 35 per cent (incremental rate).

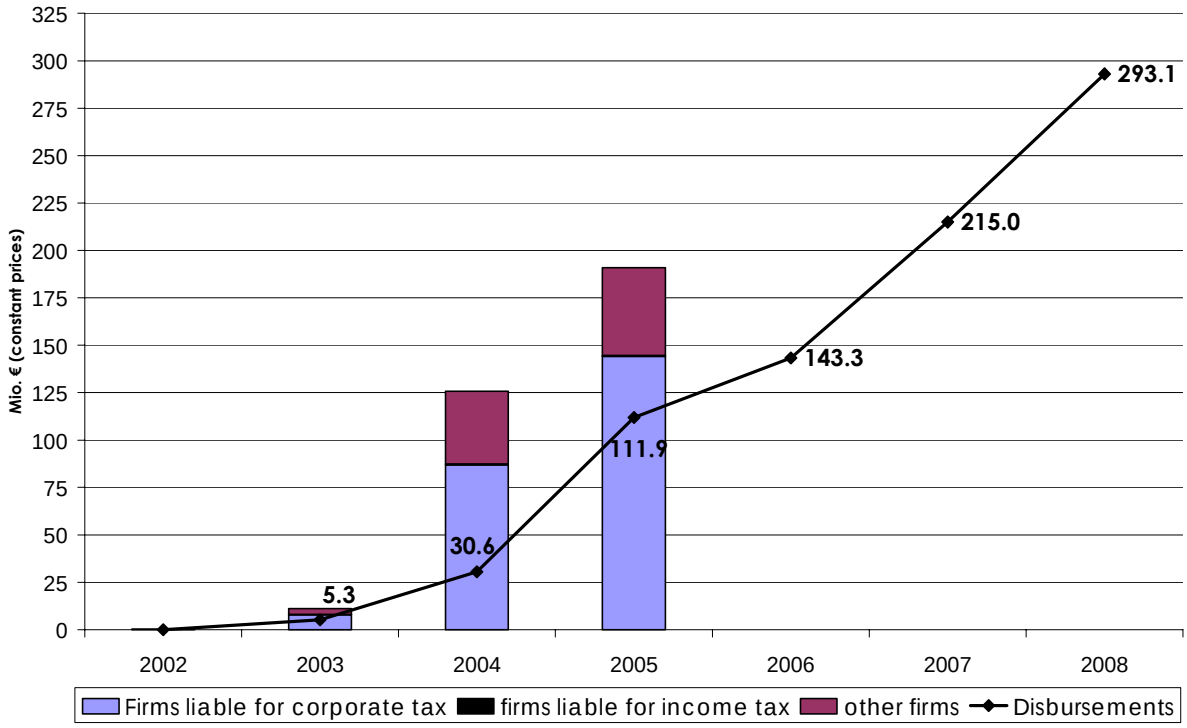
In 2002, the Frascati allowance was introduced. The initial rate of 10 per cent climbed to 15 per cent in 2003. Since 2004, it has been on par with the rate pertaining to the volume-based component of the allowance for invention. Therefore, parts of the observed increase in claimed Frascati allowances are due merely to higher rates and do not correspond to higher R&D investment.

In 2004 the rate for the Frascati tax credit was set to 8 per cent. Though, at that time, the effective support rates of the allowances were still slightly greater (8.5 per cent and 11.9 per cent), former

32 Appendix A2 provides the figures: Table A2-1 displays aggregate data on tax allowances; data on tax credits are listed in Table A2-2.

beneficiaries of the allowance schemes might still opt for the tax credit if they ranked the advantage of a more speedy treatment highly. In any case, quite noticeable declines in the amount of allowances on the one hand side go along with drastic increases in the amount of Tax Credits (see Figure 7). This observation proves all the more true in assessment year 2005 when the decline in corporate tax rates made the tax credit scheme the most generous one.

Figure 7: R&D Tax Credit—Accepted Claims and Disbursements[1), 2)]
At constant prices (2000 = 100)



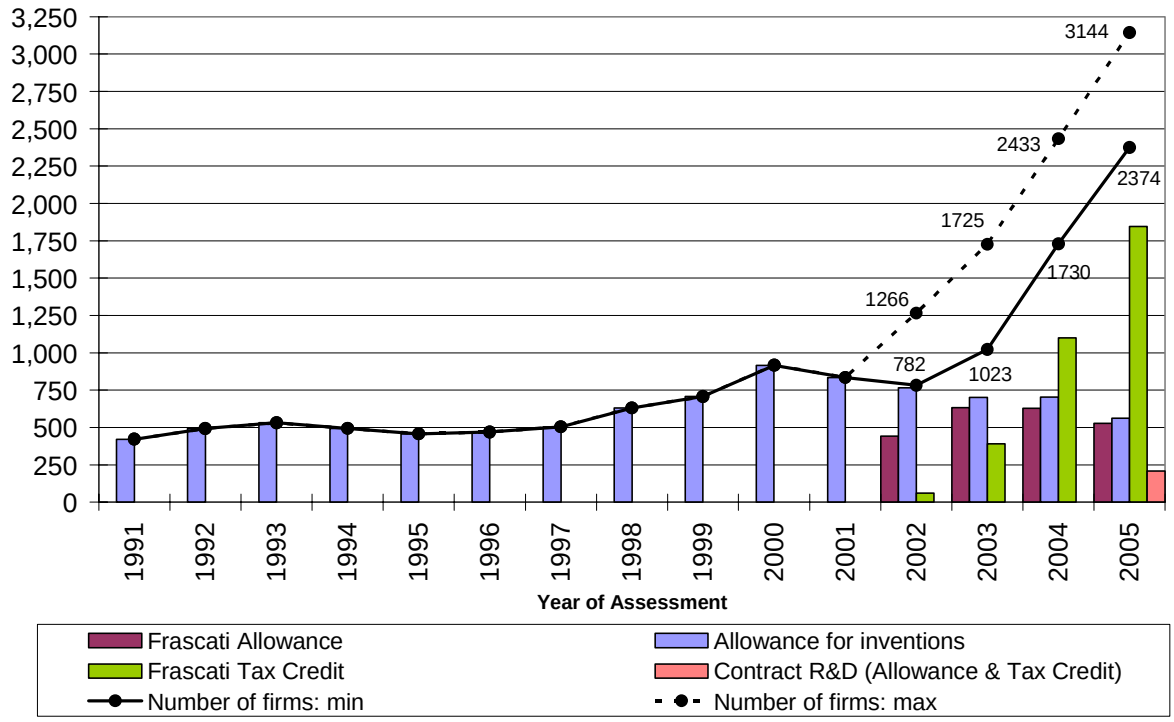
Source: Accepted Claims: see Table A2-2 in Appendix 2; Disbursements (2002 – 2007): Communication from the Ministry of Finance as of February 29, 2008. Disbursements in 2008: Communication from the Ministry of Finance as of February 2009 — WIFO calculations.

Notes: [1]) Tax credits for contract R&D (in 2005) amount to € 0.5 million and are included in the data; [2]) in case of accepted claims (disbursements), the year refers to the assessment year (year of payout); [3]) accepted claims (disbursements) in 2002: € 0.2 million (€ 0)

4.2.2 Number of Firms Benefiting from Fiscal Support for R&D

Figure 7 depicts the number of companies making use of R&D tax incentive schemes in each of the years 1991-2005. In 2001 (2000) 835 (917) companies claimed the allowance for inventions. In 2002 the new Frascati-based schemes were introduced. These could be combined with the old scheme to some extent.[33] Since the available data refers to "cases" making use of some scheme, and not to companies, uncertainty remains with respect to the degree companies did in fact combine instruments. Figure 8 therefore depicts a maximum and a minimum level of users for each year. The upper (dotted) line refers to the former. The assumption is that companies made use of only one scheme, e.g., companies either opted for the Frascati allowance, the Tax Credit or for the allowance for inventions. If so, each "case" represents a firm.

Figure 8: Number of Firms Making Use of R&D Tax Incentive Schemes



Source: see Table A2-1 and A2-2 in Appendix 2 — WIFO calculations. Note: [1)] "Min" abbreviates "minimum number of companies making use of tax incentives for R&D. The assumption is that companies combine available tax incentive schemes to the full extent, e.g., if the company holds R&D expenditures that are eligible for each of the three allowances, then the company claims all three of them in parallel; [2)] "max" abbreviates "maximum number of companies making use of tax incentives for R&D. The assumption here is that companies make use of only one scheme, e.g., companies either opt for the Frascati allowance or for the allowance for inventions; [3)] business partnerships subject to income tax are included only in 2005.

The lower line refers to the minimum number of users. Here the assumption is that companies combine available tax incentive schemes to the full extent, e.g., if the company holds R&D expenditures that are eligible for each of the three allowances, then the company claims all three of them.[34]

33 See Chapter 2.

34 Note, however, that there are restrictions on possible combinations. In particular, the Frascati Allowance may not be combined with the Frascati Tax Credit (see Chapter 2).

To determine the exact number of companies making use of R&D tax incentives, it is necessary to get an idea of the importance of multiple-instrument use, i.e., how many companies would make use of only one tax support measure and how many companies combine instruments. Evidence from the System Evaluation's survey suggests that, first, actually very few and, second, a decreasing number of companies relies on more than one tax incentive measure for R&D. The share of companies using one instrument only rose steadily from 87 per cent in 2002 to 93 per cent in 2006.[35] Furthermore, in none of the years would the share of companies combining three instruments exceed 1 per cent.[36] Hence in 2005 the number of companies making use of any kind of tax incentive measure for research comes close to 3000. Strangely enough, the Statistical Office only counts 2407 R&D-performing companies in 2006 (and 2123 in 2004). The introduction of the Frascati-based schemes has more than tripled the number of tax incentive beneficiaries.

4.3 Distribution by Industry and Size Classes

4.3.1 Industries[37]

Which industries make use of tax incentive schemes for R&D to what degree? Apparently the "natural beneficiaries" should be connected with sectors that have high R&D expenditures. In 2004 and 2006, the high-tech and medium-high-tech industries together accounted for around 59 per cent of total R&D expenditure of the Business Sector.[38] The Service Sector accounted for 29 per cent of R&D, the rest falling on low-tech industries (less than 4 per cent) and medium-low-tech industries (around 9 per cent).

Overall, the sectoral distribution of R&D expenditure matches the sectoral distribution of tax funding very well (Figure 9)

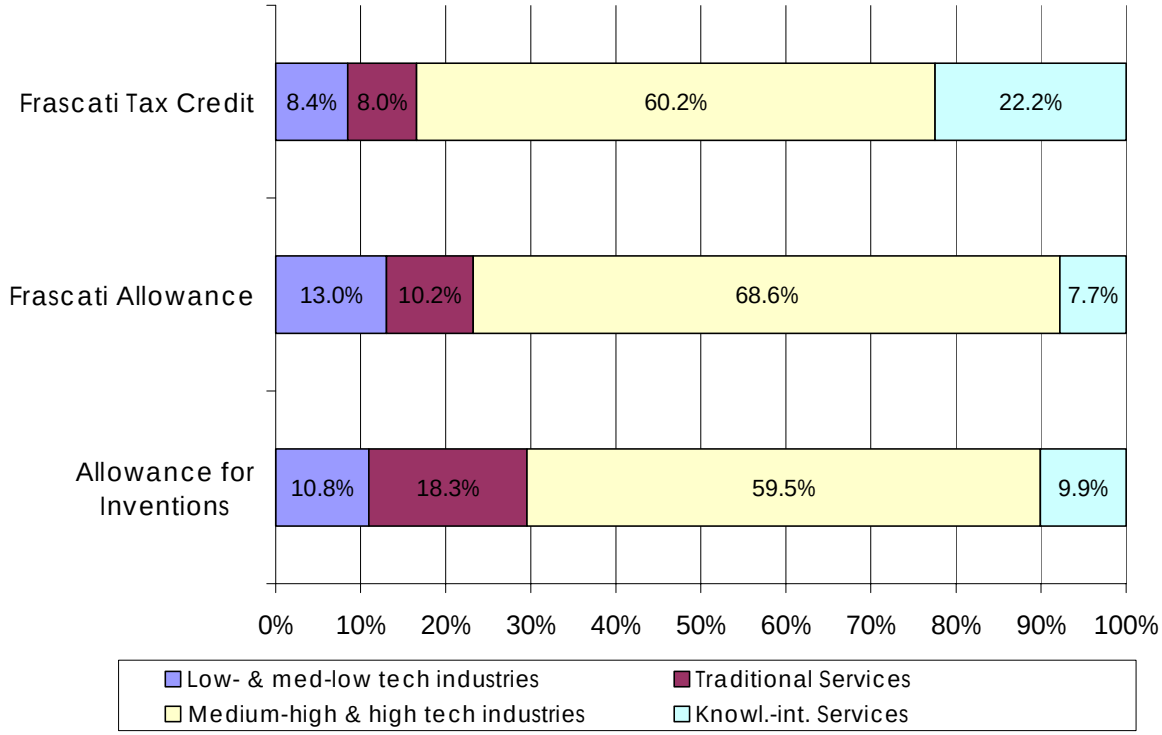
35 2003: 88%, 2004: 90%, 2005: 92%

36 Section 4.4 presents detailed evidence.

37 Table A2-3 in Appendix 2 displays absolute figures on Tax Allowances at 2-digit ÖNACE-levels. Table A2-4 covers the Frascati tax credit in quite some detail.

38 See FigureA1-1 in Appendix 1.

Figure 9: Sectoral Distribution of Tax Funding in 2005 — by Funding Scheme



Source: see Tables A2-3 and A2-4 in Appendix 2 — WIFO calculations. Note: Data includes individual persons and partnerships subject to income tax.

Tables A1-2 to A1-4 in Appendix 1 provide more detailed evidence on the distributions of the different schemes across 2-digit industries and years, starting in 1995 with the allowance for inventions. In each table, the last column gives an industry's average share (across time) in

(i) the *amounts* of allowances and tax credits, respectively (upper panel) and

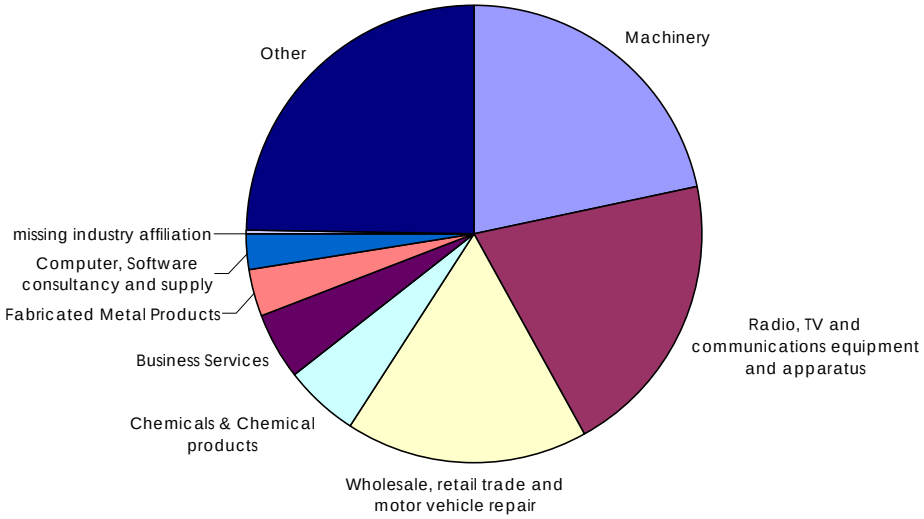
(ii) the *number* of companies making use of the particular scheme (lower panel).

Industries are sorted in descending order of (i).

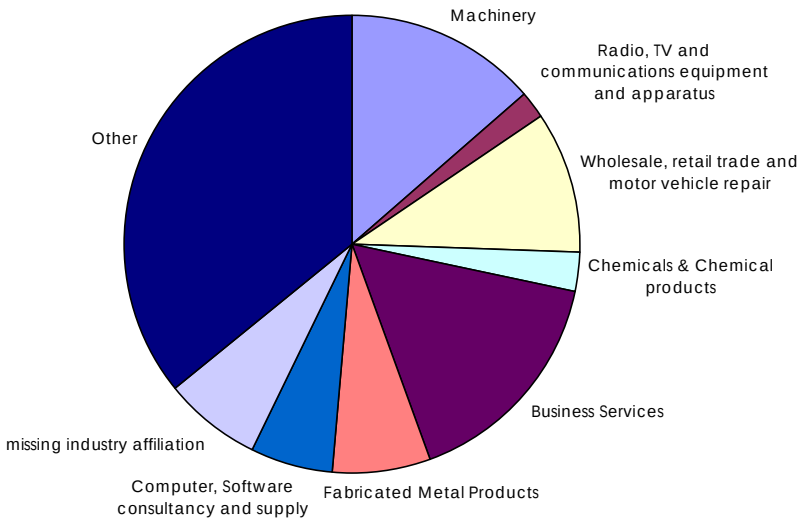
The usage of the allowance for inventions proves to be highly concentrated in a dual sense. First, only three industry sectors account for the bulk of allowance throughout the entire period: manufacturing of radio, TV, and communications equipment (ÖNACE 32); chemicals (ÖNACE 24); and machinery (ÖNACE 29). Second, the two top-performing industries (ÖNACE 32 and 24) assemble not particularly many companies that benefit from the allowance scheme. Many and, supposedly, quite some large companies affiliated with these two industries draw on the allowance for inventions. Things are different for the machinery sector. Its share of the total number of beneficiaries is well above the average across industries throughout the 1995-2005 period. In other words, the machinery sector has a large share of the total allowances for inventions due to the sheer number of claiming firms.

Figure 10: Distribution of Allowances for Inventions, 2005

a) Amounts



b) Cases (firms)



Source: see Table A2-3 in Appendix 2 — own calculation; Note: 1) joint distribution for all types of ownership; 2) if an industry's share in allowances and its share in the total number of supported companies is less than 5 per cent, it is subsumed in the residual category "other"

In 2005, falling corporate income tax rates worked against the relative attractiveness of the allowance for inventions and since then companies in general fare better when claiming the tax credit — provided, of course, the same activities would be eligible for Frascati-based tax funding. The quite high share taken by "wholesale, retail trade and motor vehicle repair" in 2005 supports the notion that the old allowance scheme does not necessarily target only inventions, but, more generally, also rewards activities "valuable to the domestic economy" (Figure 10). Second, since the old allowance scheme is far more generous when it comes to extramural research activities, it remains attractive to business sectors contracting out considerable shares of their R&D, i.e., Radio, TV, and Communication Equipment and Apparatus and the Machinery sector.

The distribution across industries of the Frascati allowance is relatively even in the first three years (see Table A1-3 in Appendix 1). In 2005 two top R&D performers in the motor vehicle industry moved from the old allowance scheme to the Frascati allowance scheme. Strangely enough, they did *not* claim the more advantageous Tax Premium (see Table A2-3 in Appendix 2). These two companies make up 52 per cent of total Frascati allowances in 2005.[39]

The Frascati tax credit is characterised by the least sectoral concentration throughout the years 2002-2004. Moreover, tax credits are the only scheme with one of its biggest shares falling on knowledge-intensive services, i.e., Business Services. While the allowance for inventions covers the service industries to a similar extent, it addresses more traditional services. In 2005 22 per cent of tax credit funding was absorbed by knowledge-intensive services, and 60 per cent went to medium-high and high-tech industries (Figure 9). This sector profile qualifies the Tax Premium as the tax funding instrument most suitable to enforce structural change in the direction of knowledge-intensive sectors.

Overall the empirical evidence of this section supports the notion that tax funding mainly benefits manufacturing companies in high- and medium-high tech industries. As long as tax funding schemes rely on the rather technical notion of Frascati R&D, they will not be a useful instrument for encouraging typically non-technical innovation activities in the service sector.[40]

4.3.2 Size Classes

A comparative analysis of the size distribution of the different tax incentive schemes for R&D reveals that these schemes are used mostly by large firms. Firms with more than 100 employees make up about 40 per cent (30 per cent) of the beneficiaries of the allowance for inventions (Frascati allowance) (Figure 11). Their share in the amount of allowances came close to 90 per cent in 2005 (Figure 12). This size class also dominates the tax credits, though admittedly to a somewhat lesser degree. This finding is not particularly surprising given that the distribution of R&D expenditure across size classes is concentrated to a similar extent: 85 per cent of total R&D activity in the Business Sector occurs at companies with more than 100 employees (see Figure A1-2 in Appendix 1).

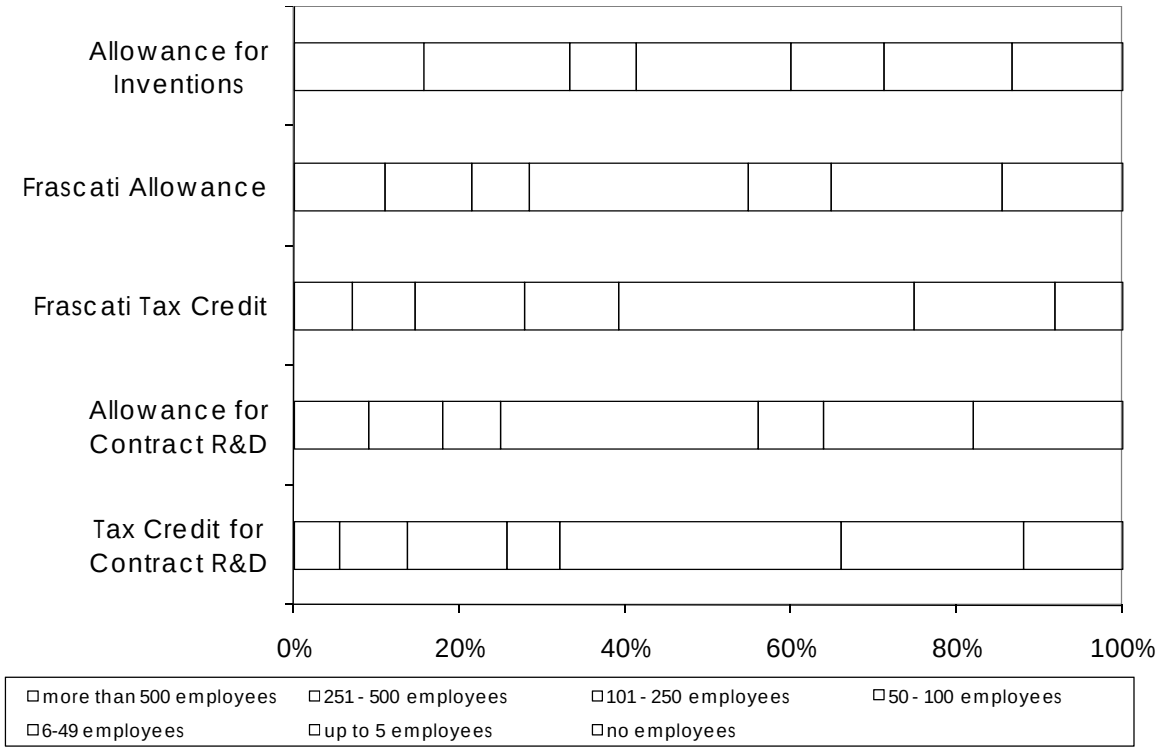
On the other hand, small companies with less than 50 employees account for 70 per cent of the beneficiaries of the Frascati tax credit for contract R&D. The observation that the distribution of beneficiaries across size classes closely follows the distribution of claimed amounts comes as a natural consequence of the overall cap on extramural R&D eligible for tax funding under Frascati Schemes (€ 100,000 per company and year).

39 The respective share decreases to 43 per cent, if the analysis includes individual persons and partnerships subject to income tax.

40 On Innovation Activities in Service Industries, see Salter and Tether (2006) and Schibany et al. (2007).

Leaving aside the allowance for inventions for a moment, we note that neither the design nor the administration of Frascati-based tax incentive schemes for R&D discriminate against SMEs. In fact, the recent company survey reveals that the larger the firm, the more fiscal authorities object to their claims. The crucial point is that innovation activities of small companies are mostly less technical in nature, and hence they mostly do not meet the Frascati-based funding criteria.[41] The survey strongly supports this notion. It asked RTI-active companies why they would not claim tax support. They responded that they do not apply for tax funding since the nature of their RTI activities simply does not entitle them to do so. If large companies do not meet these criteria in a strict sense, they may still claim the allowance for inventions and the chances of obtaining it are not too bad if the company is large enough to argue substantial contributions to the domestic economy (in terms of employment, export performance of GDP growth). Small companies have little bargaining power in this sense.

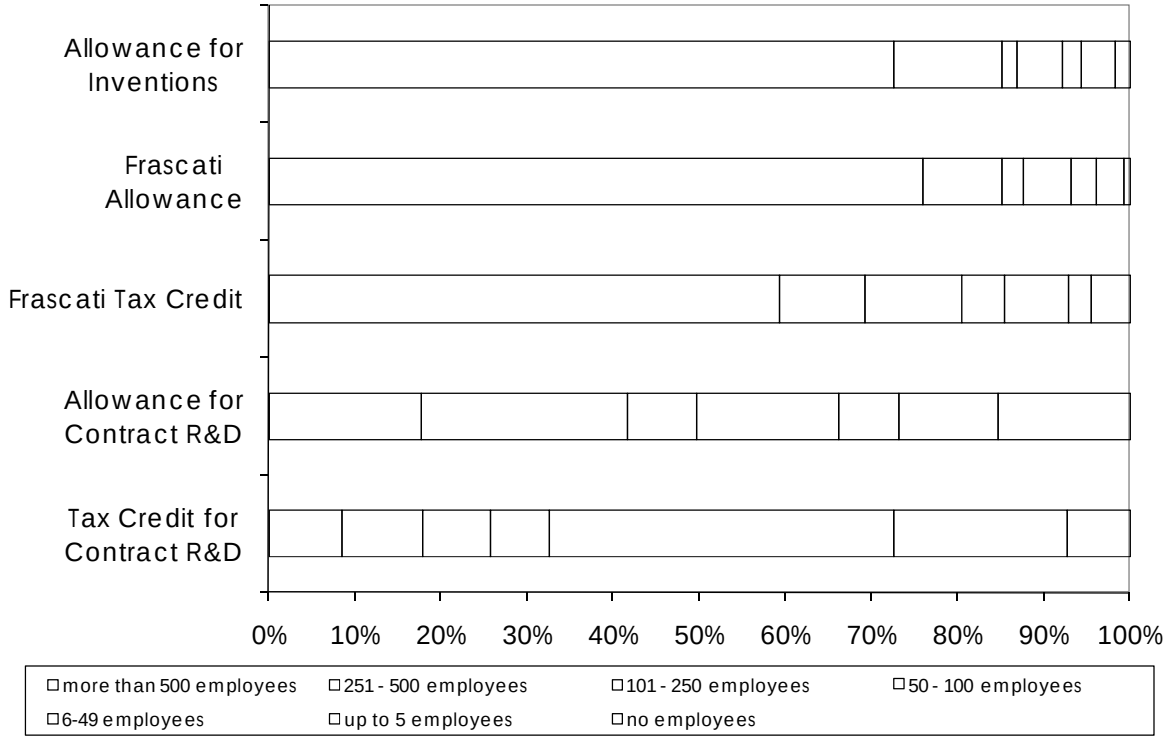
Figure 11: Size Distribution of Supported Firms
Assessment year 2005



Source: see Tables A2-5 and A2-6 in Appendix 2 — WIFO calculations.

41 On Innovation Activities of small-scale companies see, e.g. Mayerhofer, Palme, Sauer (2007)

Figure 12: Size Distribution of Fiscal Support for R&D
Assessment year 2005



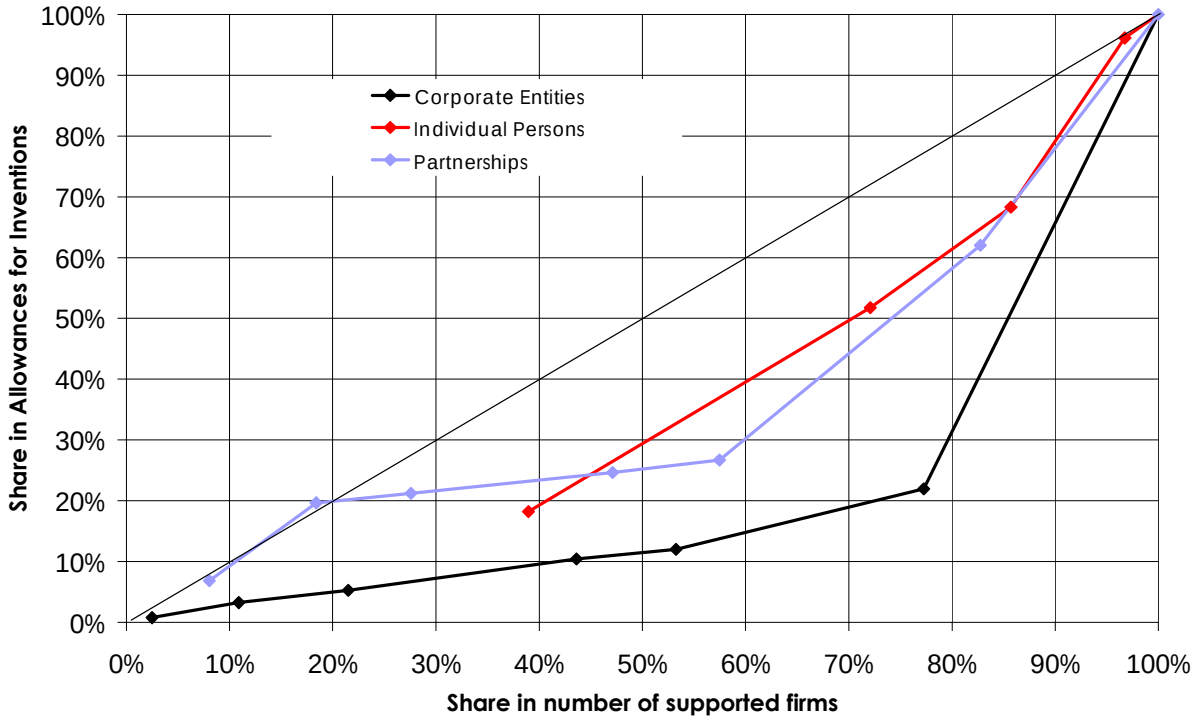
Source: see Tables A2-4.5 and A2-6 in Appendix 2 — WIFO calculations.

Figure 13 depicts measures of concentration for each of the three allowance schemes. The analyses distinguish between three corporate structures: corporate entities liable for corporate tax (black line), individual persons subject to income tax (red line), and partnerships, also liable for income tax (blue line). In keeping with evidence from Figures 11 and 12 we observe that allowances aiming (mainly) at intramural R&D activities — the allowance for inventions in panel a) and the Frascati allowance in panel b) — are in general quite skewed towards large firms. The degree of concentration proves to be less for partnerships as compared to corporate entities. Within the sample of companies that are organised as partnerships, companies with up to five employees and drawing on the allowance for inventions make up 20 per cent of the beneficiaries and attract 20 per cent of funding. Nevertheless, measured in absolute figures, funding under the allowance for inventions in this size class is of negligible importance. Things are a bit different for companies that are run as individual persons. Their total share in allowances schemes aiming at intramural research activities is undoubtedly small. Very small firms, however, make up a considerable share of this group.

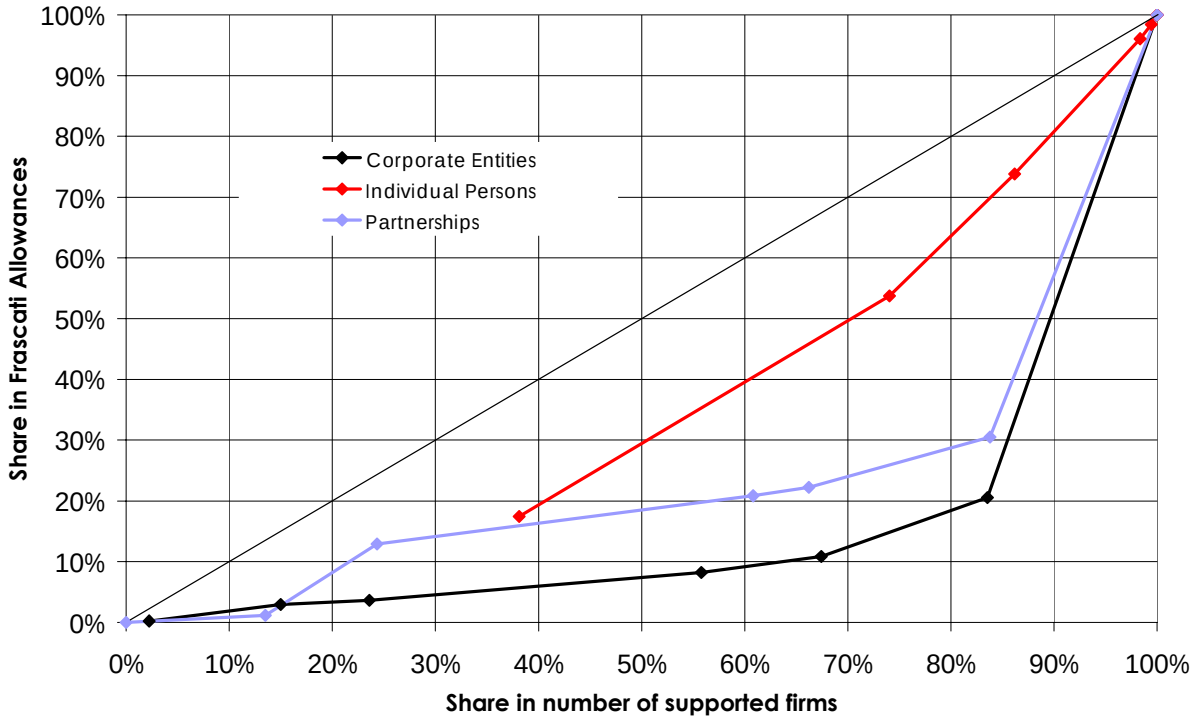
With respect to the allowance for contract R&D we note, first, that each type of ownership gets about the same (small) amount of funding. Second, the share of (very) small companies organized as individual persons is disproportionately high.

Figure 13: Measures of Concentration, 2005

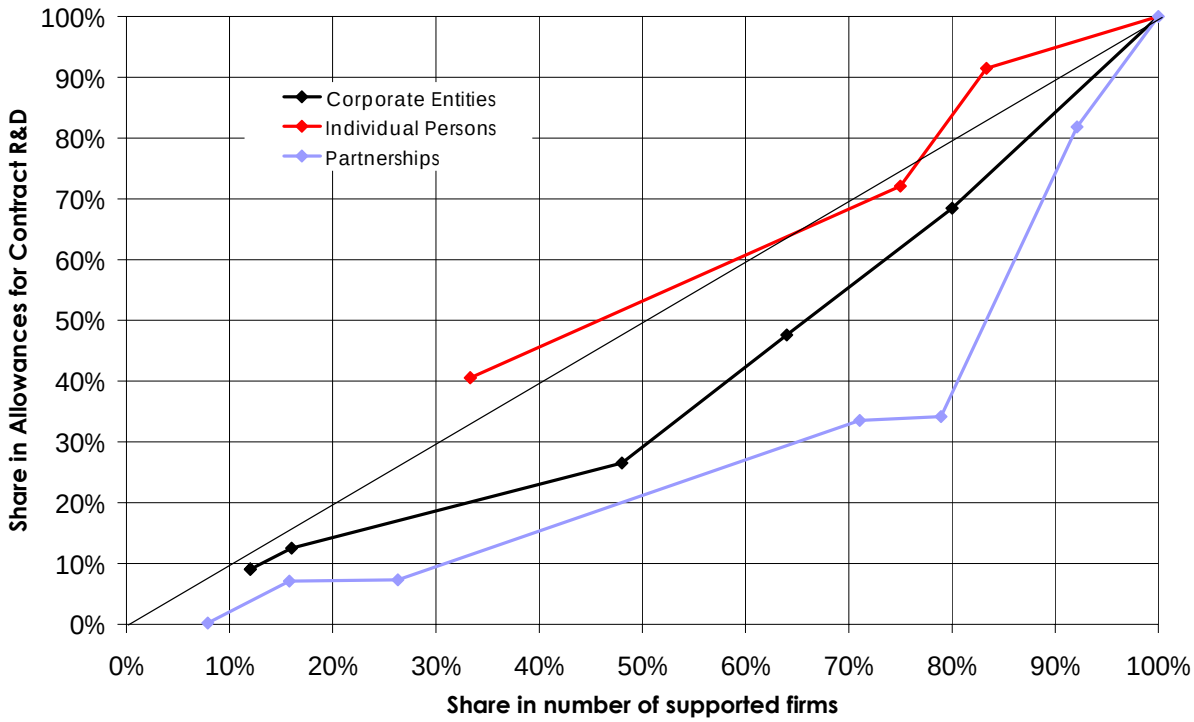
a) Allowance for Inventions



b) Frascati Allowance



c) Allowance for Contract R&D



Source: see Table A2-5 in Appendix 2 — WIFO calculations; Note: for each type of ownership (i.e., in each line) the first mark refers to companies with no employees, the second mark refers to companies with up to five employees, the third mark refers to companies with 6 to 49 employees, the fourth mark refers to companies with 50 to 100 employees, the fifth mark refers to companies with 101 to 250 employees, the sixth mark refers to companies with 251 to 500 employees, and the last mark refers to companies with more than 500.

4.4 Combination of Schemes

Table 8 gives some evidence on the simultaneous use of fiscal measures directed at the promotion of R&D. The analysis is based on data from the 2008 company survey which was conducted in the course of the current System Evaluation). The survey covers close to 25 per cent of all RTDI-active companies that make use of fiscal funding instruments. Detailed information on patterns of tax funding is available for 604 firms. Though multiple usage of fiscal instruments is explicitly permitted by tax legislation, only a few companies actually do so and the number of "multiple-instrument users" is decreasing. In assessment year 2006 only 7 per cent of the users would draw on more than one tax incentive instrument. The vast majority draws on one instrument only, i.e., the Frascati Tax Credit.

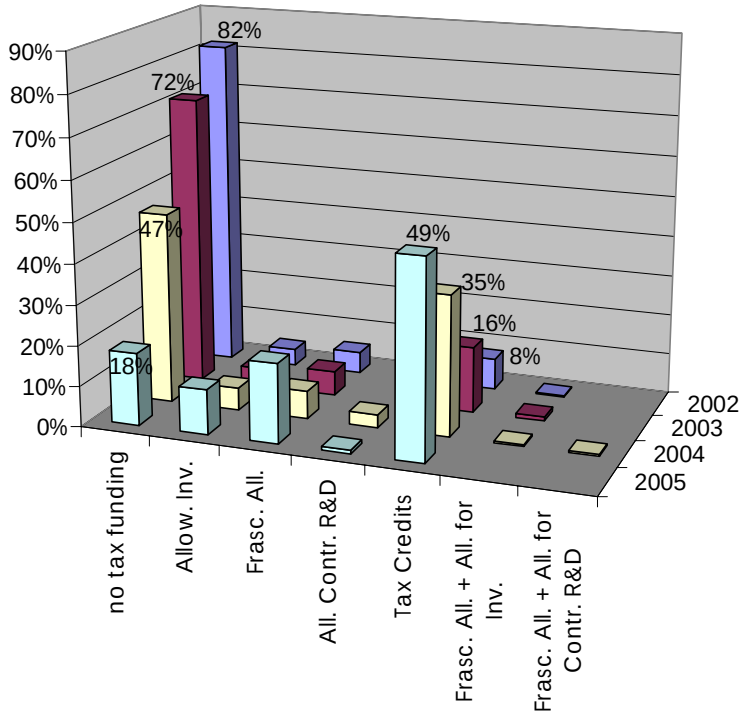
Table 8: Usage of Tax Incentive Measures for R&D — by firm

	Use of one scheme only				*Combination of two schemes*				*Combi-nation of Three Schemes[1)]*	Number of Firms
	Allow-ance for Inven tions	Fras-cati Allow-ance	Allowance for Contract R&D	Tax Credit	Allow-ance for Inv. & Frascati Allow-ance	Allow-ance for Inventions & Tax Credits	Frascati Allow. & Allow. for Contract R&D	*Tax Credits (for internal R&D + Contract R&D)*		
2002	52.9%	16.5%	--	17.8%	9.2%	2.5%	--	--	1.0%	314
2003	42.4%	20.7%	--	24.7%	8.7%	2.7%	--	--	0.8%	368
2004	30.0%	24.0%	--	35.9%	7.8%	1.4%	--	--	0.9%	434
2005	15.6%	18.4%	2.6%	55.2%	3.6%	2.3%	0.6%	*0.8%*	1.2%	533
2006	12.1%	15.9%	1.8%	63.1%	1.8%	1.8%	0.3%	*2.2%*	1.0%	604

Source: WIFO/KMFA (2008): Public support of firms' RTDI activities. Survey for the System Evaluation — WIFO calculations. Notes: 1) either all three allowances or the allowance for inventions plus Frascati tax credit for internal R&D plus Frascati tax credit for contract R&D.

Finally, the survey data was used to calculate some transition statistics. More specifically, for all companies opting for some funding scheme in a given year, we checked the funding status of the previous year and of the following one. Tax credits prove to be the most effective instrument with respect to providing R&D funding to formerly non-tax-funded firms (Figure 14). Nearly every second that did not claim fiscal incentives for R&D in 2005 would claim the tax credit in 2006. In the early years non-tax funding had a nearly permanent status — 82 per cent of the non-funded companies in 2002 would also remain non-tax funded in 2003.. In this way tax credits work like "door openers" to tax funding. Whether tax credits work like door openers to any kind of public funding will be examined in Report 8 of the current System Evaluation.

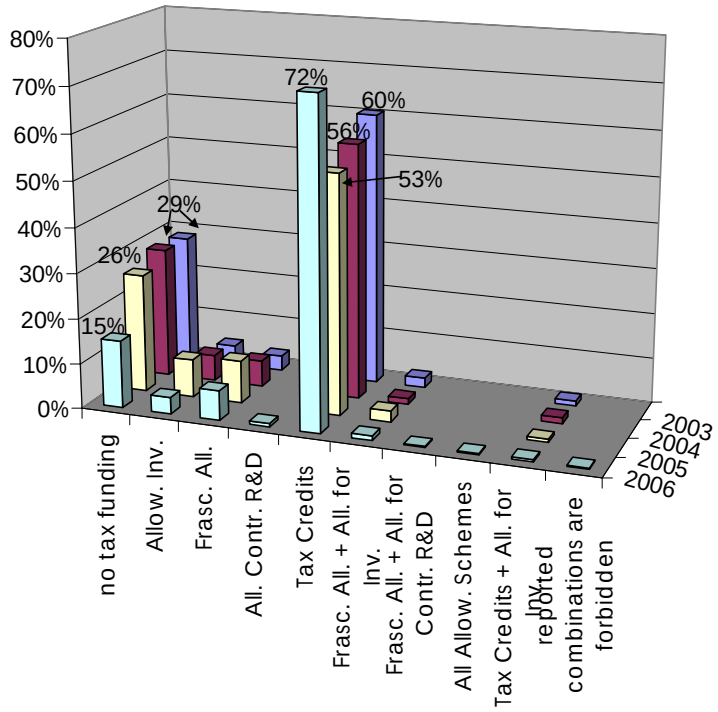
Figure 14: Used schemes by tax-funding entrants



Source: WIFO/KMFA (2008): Public support of firms' RTDI activities. Survey for the System Evaluation Evaluation — WIFO calculations. 1) bars give the funding status in year (t+1) as per cent of the number of non-funded firms in year t

Figure 15 departs from the opposite side, i.e., it looks at the funding status of tax-credit users in the previous year. In the years 2003-2005, between 26-29 per cent of those who claimed tax credits had *not* enjoyed any kind of tax support for R&D in the year before. Tax credits also prove to be a somewhat attractive funding scheme for those who would have claimed allowance schemes in the previous year. The vast majority of tax credit beneficiaries, however, are recruited from tax credit beneficiaries of the preceding year. Once a company has opted for tax credits, there are few incentives to switch funding schemes.

Figure 15: Funding status of tax-credit users in the previous year
In per cent of the beneficiaries of tax credits in t



Source: WIFO/KMFA (2008): Public support of firms' RTDI activities. Survey for the System Evaluation — WIFO calculations

4.5 Barriers to Usage — the User's Perspective

The 2008 survey on public support of firms' RTDI activities asked companies (among many other things) whether they had used tax incentive measures in the period 2002-2006 and if not so, then why. More than 10 per cent of the companies that had been founded before 2006 *and* had been active in R&D and Innovation activities at least every now and then between 2005-2007 *and* reported to have started such activities no later than in 2005, declared upon request that they were not informed about the possibilities of getting tax funding for R&D. We then asked those who were aware of tax funding schemes, but still did not use them, for their reasons. Box 4 gives an impression of the answers. Quite a few companies mentioned insufficient know-how as regards the design of tax funding measures. Moreover, quite a few companies were apparently not properly informed: tax funding via the premium does not depend on profits, nor on sales-figures. Individual persons may also claim fiscal support for research activities; patent filing is not mandatory for any of the measures; beneficiaries of agency funding may at the same time make use of any tax funding instruments (provided the grant does not cover 100 per cent of research cost); and finally, tax funding schemes are certainly open to any thematic area. Adding these misinformed companies to the first group of companies that did not even know about the availability of tax funding

schemes, we see a staggering degree of ignorance. A detailed look into the data confirms initial conjectures that these uninformed and misinformed companies mostly operate on a small scale (10-49 employees) if not a tiny one (less than 10 employees).

Of course the question remains whether these companies would actually qualify for Frascati-based tax funding or whether their "R&D & Innovation" activities in fact constitute (soft) innovation activities only. A disproportionately high number of small and tiny-scaled firms in the above sense would also explain their non-usage of fiscal incentives by unfavourable cost-benefit ratios ("too much effort for too little money").

Finally, the questionnaire asked beneficiaries of fiscal funding to evaluate the current design of fiscal incentives for R&D on a number of criteria, using a five-point scale ("1" denoting "very good" and "5" denoting "very bad"). The criteria along with average grades are listed below:

- Clearness of the structure of fiscal incentives for R&D (2.3)
- Access to relevant information (2.3)
- Quality of advisory services (2.7)
- Transparency of funding criteria (2.5)
- Clearness of application procedure (2.3)
- Compliance Cost: Administrative burden of application procedure (2.7)
- Predictability and long-run availability of fiscal funding (2.4)
- Transparency of funding decisions (2.5)

Table A1-5 in Appendix 1 displays average grades within sectors and within size classes for each of the constitutive criteria.[42] Note that the analyses include only companies that actually used tax incentive schemes. Of course users of the scheme are likely to rate its design—including administrative issues—much better than non-users would. For if individual cost-benefit analyses turns out negative, then the company chooses not to claim fiscal incentives for R&D. However we also find patterns in the kind of answers given depending on firms' size and industry. Firms with less than 50 employees as well as service companies give less favourable assessments. They are less satisfied with any of the criteria under investigation.

In summary, this section suggests that both the availability and the quality of advisory services should be improved to meet the concerns of "marginal" user groups. Providing easy-to-read information would be a natural task for representatives of the business community such as the Chamber of Commerce and the various industry associations. The Associations of the Electric and Electronic Industries, Machinery and Metals have recently published guidelines for respective practitioners.[43] This booklet may serve as a very good practice example for professional representatives of knowledge-intensive services who think about writing publishing similar information material

42 Cells with less than 10 observations are left empty, for small absolute numbers tend to be suggestive of only anecdotic evidence and misrepresent global evidence. Though not displayed in the table, these left out figures do, however enter column totals (average grade within some branche) and row totals (average grade within some size class).

43 Fachverband der Elektro- und Elektronikindustrie und Fachverband der Maschinen & Metallwaren Industrie (2008).

Box 4: *Reasons for non-usage of fiscal measures for R&D*

Zu wenig Gewinn./ Nicht relevant für uns- zu kleine Summe / Forschung ist steuerlich eingeschränkt definiert./ Sowieso negatives Ergebnis./ Als Einzelunternehmen geht das nicht - oder ist schwierig (lt. unseren Infos)./ Steuerberatungskanzlei: "War steuerlich bisher nicht möglich" / Wir sind ein öffentlich finanzierter Dienstleister! / Vorher waren die Aufwendungen zu klein. Wird erst dieses Jahr gemacht. /Erst jetzt bekannt (2008) / Zu aufwendig, zuviel Verwaltung/Dokumentation. Keine Aktivierbarkeit von Softwareunternehmen. /Geringer Anteil. Dafür hätte sich der bürokratische Aufwand nicht rentiert. / Nicht bekannt./ Komplizierte Beweisführung, hoher Aufwand, schwammig. / Reiner Zeitaufwand durch Einzelunternehmer. / War nicht relevant. / Restriktionen nicht erfüllt. / Softwareentwicklungen konnten nicht geltend gemacht werden. /Nicht relevant / bisher nicht relevant / Bedingungen nicht erfüllt. / Weil wir direkte Förderungen in Anspruch genommen haben. / Zu eingeschränkt auf Forschungseinrichtungen! Wir betreiben 60% hochkarätige Forschung, und dürfen keine absetzen! Bitte Regelung ausweiten / Wenig geeignet für KMU mit nicht rein technologischer Forschungstätigkeit. / Das gemeinschaftliche Projekt wurde nicht anerkannt. / Aufwand der Dokumentation / Steuerberater? / Suboptimaler Steuerberater / Da der Umsatz noch zu gering war. / Nicht anwendbar. / Erst 2007 davon erfahren. / Weil es uns gesetzlich verboten ist, diesen Freibetrag bzw. diese Prämie geltend zu machen. / keine Gewinne erzielt / Kriterien unerfüllbar (z.B. Patentschutz) / Zu aufwendig! Keine Mitarbeiter / Weiß ich nicht! / Betrag zu gering / Benötigt Patentanmeldung, ist aber aufwendig. / Unwissenheit / Aufwendige Prozedur, Sehr Zeitaufwendig und Kostspielig / Bürokratie- nicht effektiv. / Möglichkeit war mir nicht bekannt. / Weil keine Forschung betrieben wurde, die dem Unternehmen Kosten verursachte. / Wird derzeit geprüft / Bedingungen nicht erfüllt! / Paßte thematisch nicht, deutsche Mutter / internes PRJ zwischen PEL und PSP. / Leider vergessen. / Da keine Erfindungen im volkswirtschaftlichen Sinne, sowie keine experimentelle Entwicklung. / Info war nicht vorhanden. / Kein Detailwissen-Ablauf? / Keine Notwendigkeit / rechnet sich nicht / Nicht beachtet. / Wurde erst letzte Woche darüber informiert. / Kaum Forschungsaufwand angefallen bzw. zuwenig Aufzeichungen geführt. / Keine Einreichung. / Weder Beitrag noch Prämie wurden unserem Unternehmen zuerkannt. / Offensichtlich konnte der Nutzen nicht gut kommuniziert werden, sonst wäre er geltend gemacht worden. / Unwissenheit. / Weil die Projekte und Summen zu klein sind. / Weil die Voraussetzungen für einen Forschungsfreibetrag nicht gegeben waren. / War damals nicht bekannt / Unwissen / Fiel nicht unter Regelungen. / nicht hoch genug / keine Ahnung. / Interner Zeitaufwand des Firmeninhabers, daher nicht absetzbar. / Bedingungen zur Geltendmachung sind uninteressant. / Nicht gewußt, wie. / Mit Förderung von FFG bereits Vorteile ausgenützt. / Was soll man darauf antworten? Zu faul, vergessen, zu dumm. / Nicht relevant / fehlende Aufzeichnungen / Zu viel Bürokratie! / Keine nennenswerten F&E Aufwendungen / Keine Gewinne, die steuerlich relevant sind. / Zu aufwändig. / Zu wenig Info / Forschung zu geringfügig. / Weil keine passende Innovation als DL vorhanden ist. / Beträge zu gering / Firmengründung 2005; Forschungsfreibetrag bzw. Forschungsprämie werden rückwirkend noch für 2006 beantragt. / Administrativer Aufwand / Thematisch bisher nicht relevant. / Wurde leider nicht berücksichtigt. / Abwarten bis Patentschrift da war. / Geringfügigkeit / Keine eigene Forschung - keine Produktion oder Handel / keine Angabe / Keine Forschungskosten / Zu gering / Keine adequate Forschung. / Aufwendugen gleich 0. / Aufwendungen ungenügend dokumentiert / fehlende Detailaufzeichnungen, fehlende öffentliche Bescheinigungen / Nur Weiterentwicklungen im Auftragsfall / Nicht relevant / War noch nicht bekannt / Gemeinnützigkeit / Zu geringfügig / Kein Anspruch. / weiß ich nicht /Ich bin ein neuer Mitarbeiter und kenne den Grund nicht. Vermutlich meinem Vorgänger unbekannt. / Keine relevanten Beträge / Entwicklungsanlagen werden nach Möglichkeit später verkauft. / Entwicklung: es wurden bestehende Produkte bzw. Betonrezepturen mit neuen (geänderten) Rohstoffen kreiert bzw. neu angepaßt- ist laufend notwendig / Keine Förderungswürdigung / Keine geeigneten Aufwendungen. / Zu geringe Attraktivität. / Versäumnis der Unternehmensleitung / Keine Projekte / Forschungsförderung von Partnern beantragt / Keine entsprechenden Projekte / Aufgabe und Kompetenz der Muttergesellschaft / Hat sich nicht ergeben. / Probleme mit der Dokumentation. / Wurde erst 2007 durch externe Beratung darauf verwiesen. / Zu geringer Forschungsaufwand, zu aufwendige Dokumentation. / Geringfügigkeit / Sehr geringer F&E Aufwand im Verhältnis zur Gesamtleistung / F&E nicht als eigenständige Abteilung/Kostenstelle geführt; vorwiegend EU-Förderungen / Keine passenden Projekte / Keine passenden Aktivitäten / Nicht prioritär gewesen. / viel zu komplexe und kostenintensive Beantragung im Vergleich zum Förderbetrag, - viel zu enger Begriff von "Forschung" / Erstmals Förderung 2007 erhalten. / Bürokratischer Aufwand / Fallen nicht in das Steuerkonzept / Weiß nicht / Sehr kompliziert, aufwendig, für einen sehr geringen Betrag. / Nicht bekannt / Entwicklungen nur Auftragsbezogen- Kundensache

Source: WIFO/KMFA (2008): Public support of firms' RTDI activities. Survey for the System Evaluation

5 Effects of R&D Tax Incentives on Funding Indicators

In Austria, the reach of direct RTDI funding via agencies is quite high. For this reason the wider and admittedly more interesting "real" effects of funding on RTDI input, RTDI output, and economic output can only be assessed at the system level, when the interplay of tax funding measures with measures of direct RTDI funding is explicitly taken into account. Report 8 of the current System Evaluation deals with this wider evaluation approach.

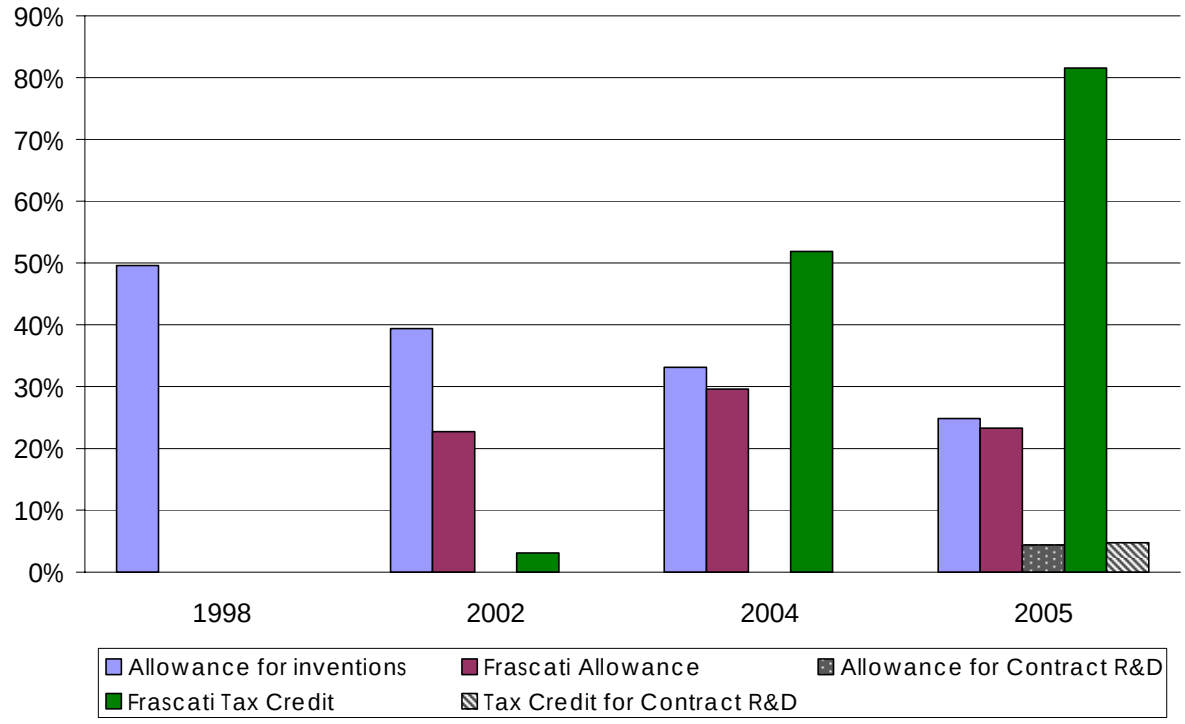
The present chapter sheds some light on the more narrowly defined effects of fiscal incentives for R&D on funding indicators: How many of the potential beneficiaries are in fact supported by these schemes? How do these support quotas develop over time? Is tax funding of R&D neutral across company size and industry affiliation, i.e., would small R&D performers use a given tax instrument just as much as large R&D performers would? Do fiscal funding intensities vary across company size and sector affiliation, i.e., is the share of tax-funded R&D activities about the same across industries? And finally, what can be said about the cost of fiscal funding and the expected cost for the coming years?

This section draws heavily on the biannual national R&D survey of the federal statistical office which reports the number of R&D performers and the amount of R&D expenditure, both across size classes and across 2-digit industry codes. The last four surveys took place in 1998, 2002, 2004, and 2006. Hence "2005-evidence" of the figures and tables displayed in this chapter actually pertains to the extent or amount of fiscal funding in 2005 (enumerator) on the one hand and the extent or amount of "average 2004-2006" R&D (denominator) on the other.

5.1 Access to R&D tax incentives ("Access Quotas")

Figure 16 below presents the proportion of tax-funding beneficiaries within the total number of R&D-performing companies ("support quotas"). In 1998, half of all R&D-active companies made use of the allowance for inventions. Four years later when the Frascati-based schemes had been introduced, this share fell to 40 per cent. It is reasonable to assume that former beneficiaries of the old allowance scheme had switched to the Frascati-based allowance. Though at that time its rate of subsidisation fell way below the respective rate under the allowance for invention (3.4 per cent as opposed to 8.5 per cent), the basis for claims under the former scheme is more broadly defined — at least when it comes to (recently) R&D-active firms. Hence in 2002, the total support quota ranged from 50 per cent to approximately 65 per cent, depending on the number of companies that would use more than one tax funding instrument in tandem. Note that it is not possible to draw on the Frascati allowance and the Frascati tax credit at the same time. For this reason, at least 85 per cent of the total number of R&D-performing companies would make use of at least one tax funding scheme in 2004. In 2005 the fiscal support quota exceeds 100 per cent — even if the possibility of simultaneous use of distinct fiscal funding instruments is accounted for. In other words, any company that spent on R&D claimed fiscal support for R&D, but the R&D-survey of the federal Statistical Office did not cover all of them.

Figure 16: Share of beneficiaries in total number of R&D-performing companies



Source: see Tables A2-1 and A2-2 in Appendix 1; Stastistics Austria R&D Surveys 1998, 2002, 2004, 2006 — WIFO calculations. Note: [1)] Absolute number of R&D-performing companies in 2005 is calculated as the 2004/2006-average. [2)] With regard to the allowance schemes, note that business partnerships subject to income tax are included only in 2005.

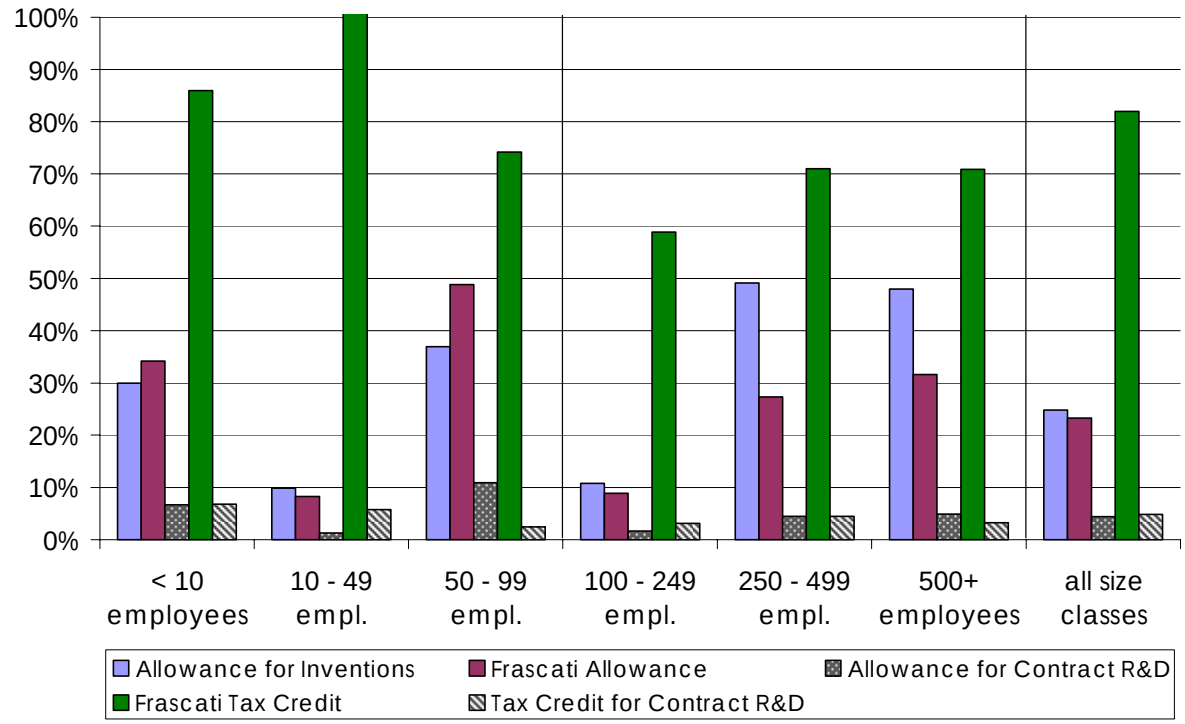
The R&D survey is based on a full sample of companies with 100 or more employees. Smaller companies are covered only to the extent to which they pertain to R&D intensive industries. Also, if funding agencies grant direct R&D support to a small firm, then this company enters the survey.

The upper panel in Figure 17 shows that the R&D statistic misrepresents the extent to which small and very small companies perform R&D. Otherwise it remains incomprehensible why the former chapter found that small companies suffer from distinct disadvantages with respect to access to fiscal funding for R&D. Even if we acknowledge that the 2005 figure on the number of R&D-active companies constitutes only an approximation (since this number is calculated as the average number of the years 2004 and 2006), the support quota with respect to micro companies (those with less than 10 employees) is definitely too high.

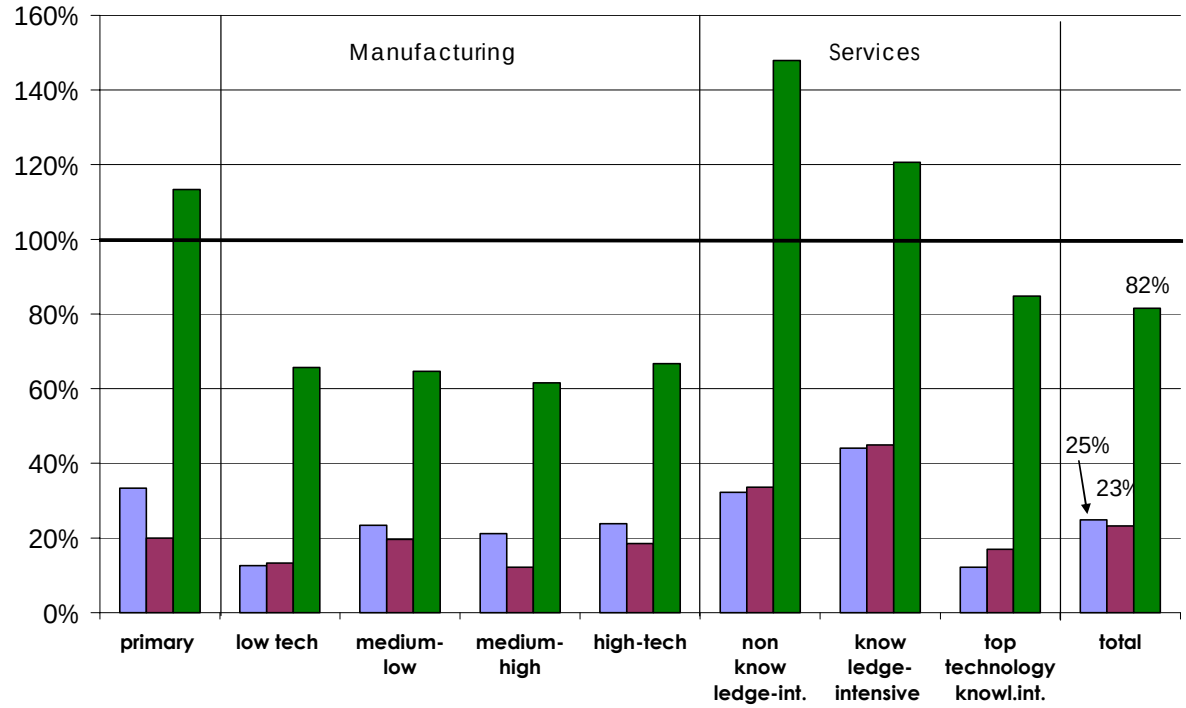
This said, we find that the allowance for inventions is still quite attractive for companies with at least 250 employees: in the top size classes, 50 per cent of the firms still draw on this in 2005. Note also that the supposed "funding access" neutrality across company size classes holds only in the top size classes.

Figure 17: Share of beneficiaries in total R&D-performing companies, 2005

a) Analysis by size of firm



b) Analysis by industrial sectors



Source: panel a) Tables A2-5 and A2-6 in Appendix 2; panel b) Tables A2-3 and A2-4 in Appendix 2; StAt R&D Surveys (2004, 2006) — WIFO calculations. Note: 1) Absolute number of R&D-performing companies in 2005 is calculated as the 2004/2006-average.

The case of under representation certainly holds true for the primary sector, for Office, accounting and computing machinery (NACE 30), for Publishing, printing, and reproduction of recorded media (NACE 22), and, most revealingly, for all service industries except for Transport, storage, and communications (NACE 60-64) and Research and development (NACE 73).[44]

A closer look at the data confirms initial suspicions that the Frascati tax credit reaches far more companies than it should, or that at the very least it reaches companies that are not covered by the R&D survey of the Federal Statistical Office. The lower panel in Figure 17 suggests that neutrality with respect to access to fiscal funding can be confirmed more or less in the case of the manufacturing industries. In particular, the tax credit reaches about the same share of R&D-performing manufacturing firms, regardless of their technological intensity.

5.2 Intensity of Fiscal Support for R&D

The intensity of fiscal support for R&D is calculated as the ratio between the cash value of tax funding and total R&D expenditure as reported in the R&D statistics of the Federal Statistical Office. R&D intensities rose until 2004 when the aggregate figure came to 7.7 per cent. Thereafter it fell to 6.9 per cent (Figure 18). Funding via the Frascati allowance proves to be of no particular importance at any time, reflecting the discussion in the previous sections, in particular in section 2.3: most expenditure items eligible for Frascati Funding can also be claimed under the allowance for inventions, albeit on less favourable terms.

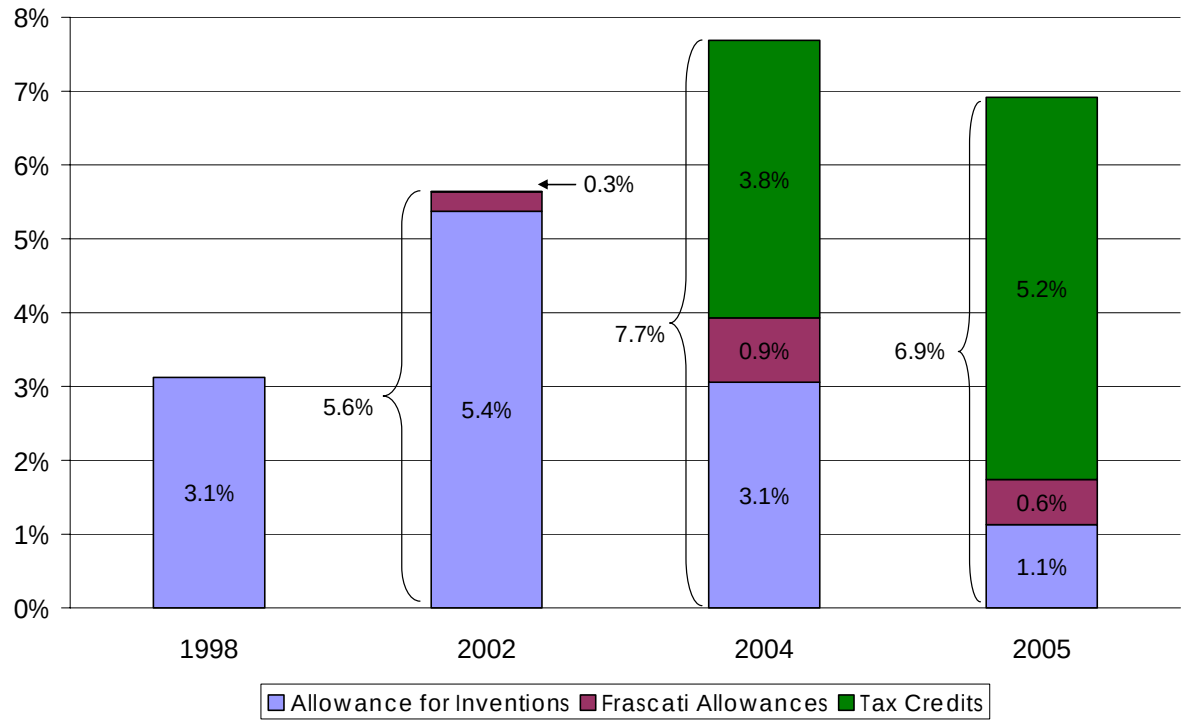
When the Frascati tax credit rate was raised to 8 per cent in 2004, in financial terms, companies would only be marginally better off when using allowance schemes, but could count on earlier cash re-flows when drawing on the Premium. In 2005, the financial advantage of the allowance disappeared entirely. By this account, it is surprising to find that 0.6 per cent of R&D expenditure is still funded via the Frascati allowance.

With the exception of the smallest firms, for which there are no reliable data on R&D expenditure, fiscal funding proves to be remarkably neutral across company sizes (upper panel in Figure 19). Small deviations from the overall figure (fiscal funding intensity of 6.9 per cent in 2005) can, in principle, be explained with reference to different types of ownership, different priorities of tax funding instruments, and differing access to direct RTDI support from funding agencies. With respect to the latter we note that only R&D expenditure which is not covered by non-refundable grants is eligible for tax funding. It is certainly true that large, but not very large companies (i.e., companies with 100-249 employees) are characterised by a below average direct funding intensity, so more scope for tax funding remains. However, the finding that companies in this size class show a below-average fiscal funding intensity as well is a bit puzzling.[45]

44 See Table A1-6 in Appendix 1

45 The interplay between direct funding and fiscal funding of R&D is analysed in detail in Workpackage 12 of the current System Evaluation.

Figure 18: Intensity of Fiscal Support for R&D
Aggregate Perspective, selected years



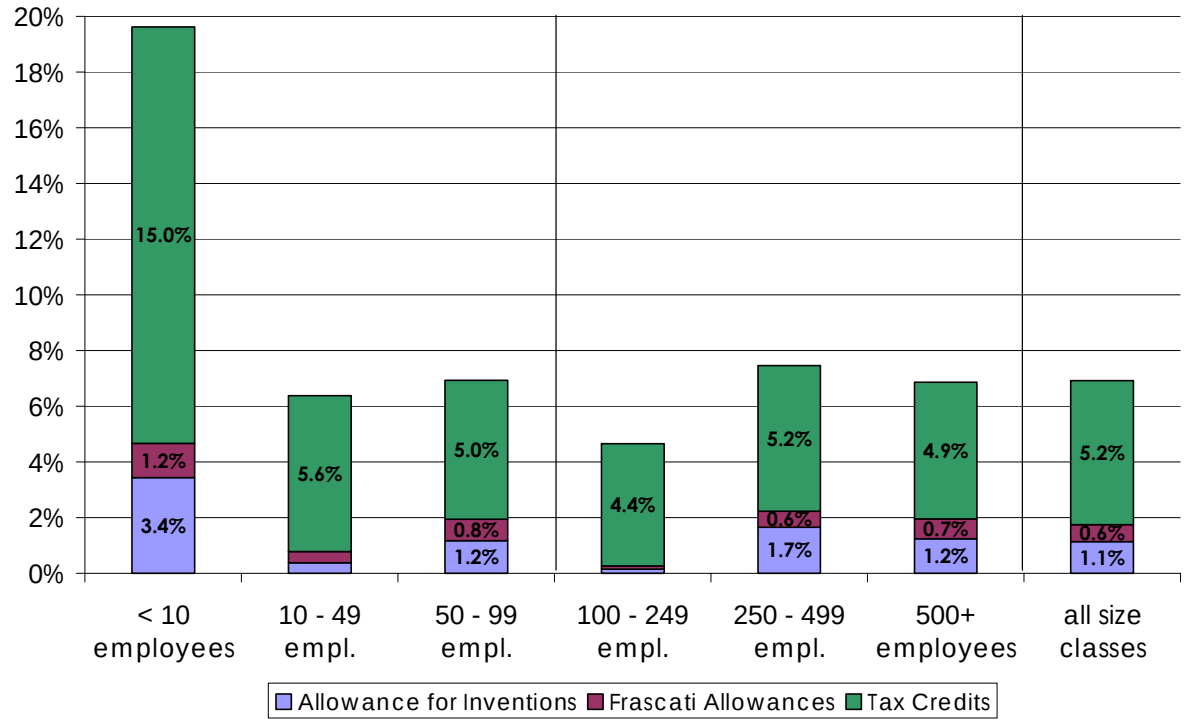
Source: see Tables A2-1 and A2-2 in Appendix 2; StAt R&D Surveys (1998, 2002, 2004, 2006) — WIFO calculations. Note: [1)] R&D expenditure in 2005 is calculated as the 2004/2006-average; [2)] Business Partnerships liable for income tax only included in 2005.

Table A1-7 in Appendix 1 displays fiscal support intensities by two-digit industries. As compared to the former evidence "by size class", the statistics are presented at a still higher degree of disaggregation and, as an immediate consequence, tax funding intensities vary more. Still, some figures are definitely higher than would be expected. In Table A1-7 data are marked red if observed funding intensities exceed the theoretical upper limits applying to the volume-based components of incorporated entities (which is regarded as the benchmark or "default" user profile). Observations must be regarded as unreasonably high if they exceed rates of fiscal subsidisation that would apply to companies liable for income tax that draw on the most generous instrument (the allowance for inventions) on the most favourable terms (incremental-rate-based component). These entries are marked red and bold.

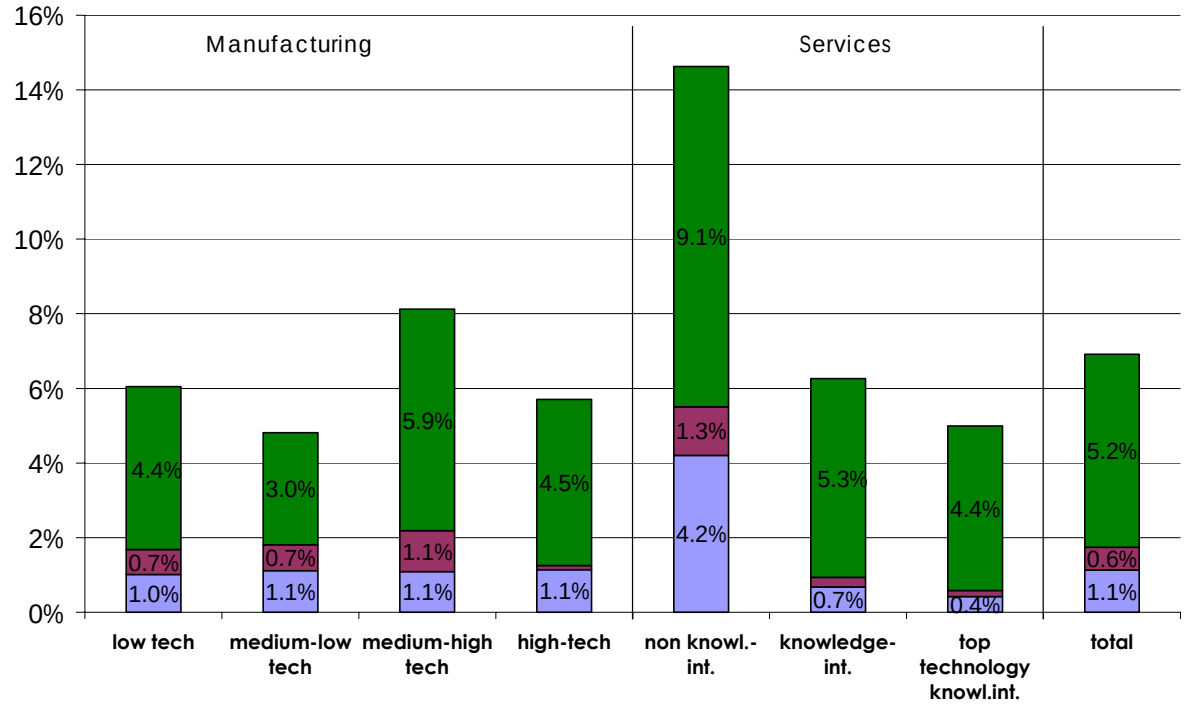
It turns out that worrisome or unreasonably high fiscal support intensities result in most cases from incomplete collection of data — Textiles, Pulp, and Paper and especially Medical, Precision, and Optical instruments come as notable exceptions. Furthermore we note that fiscal support intensities in the knowledge-intensive service sector generally do not exceed the theoretical upper limit. This is remarkable since it was shown (see lower panel of Figure 17) that services are not adequately covered by the R&D survey (hence the denominator is too small).

There remains some concern as regards the extent of tax support for high tech companies and top-technology using knowledge-intensive services, since their fiscal funding intensities fall short of the aggregate figure (lower panel in Figure 19).

Figure 19: Intensity of Fiscal Support for R&D, 2005
a) Analysis by size classes



b) Analysis by industrial sectors



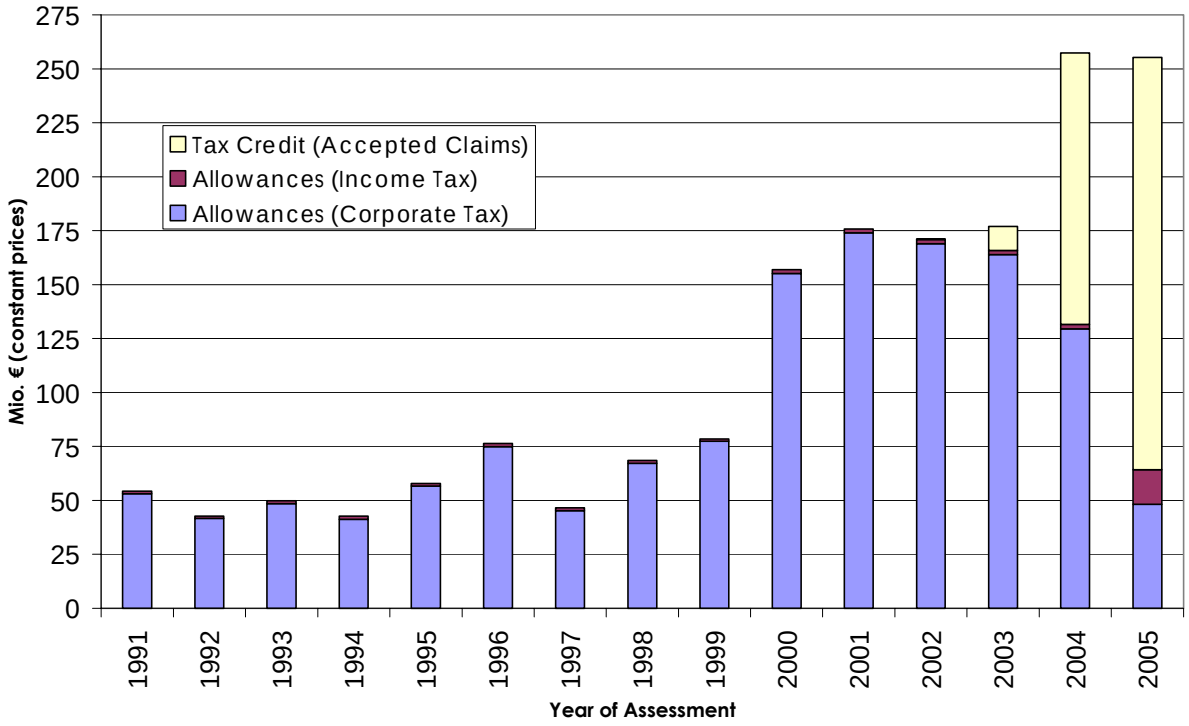
Source: panel a) Tables A2-5 and A2-6 in Appendix 2, panel b) Tables A2-3 and A2-4 in Appendix 2; StAt R&D Surveys 2004 and 2006 — WIFO calculations. Note: [1)] R&D expenditure in 2005 is calculated as the 2004/2006-average. [2)] The "totals" include the Primary Sector, which is not displayed.

5.3 Effects on the Budget

The cost of fiscal funding developed in three stages (Figure 20). In the 1990s the allowance for inventions implied foregone tax revenue between € 50-75 million per year (measured at constant prices of the year 2000). In 2000, the allowance rate increased substantially[46] and so did the cost, which came to € 175 million. The introduction of the Frascati-based schemes in 2002 initially had little effect on fiscal cost. Things changed once the tax credit rate rose to 8 per cent in 2004. Fiscal support for R&D for assessment year 2005 cost slightly more than € 250 million. Measured in current prices, total cost of R&D funding for the year 2005 amounted to € 276.7 million. This falls way behind the forecast figures of the Ministry of Finance (€ 418 million).

46 Allowance rates since 2000: 25%/35% per cent. Before: 12%/18%.

Figure 20: Cost of Fiscal Support for R&D — Evidence by Assessment Years
At constant prices (2000 = 100)



Source: See TableA2-1 and A2-2 in Appendix 2 — WIFO calculations. Note: [1)] Business partnerships subject to income tax are included only in 2005.

A key advantage of fiscal funding is its predictability — on the side of the firm. Fiscal authorities, however, have less control over funding expenses once the criteria for eligibility have been determined, so that eventually legal titles work against their ability to forecast, to plan, and to control cash-outflow. In this regard , the Ministry of Finance estimates annual forecasts to improve the basis for planning. We had a closer look at these publications and found them not very useful. Estimates appear to be more or less static, i.e., more recent information rarely leads to corrections of older projections (Table 9). This is hard to understand since the Ministry of Finance can order aggregate statistics on firms' tax accounts at any time and at least in year (t+2) information on assessment year t should be pretty reliable. The recent public debate on the pros and cons of fiscal funding for R&D has suffered a lot from systematic overestimations of cost. General non-availability of tax statistics and/or inability to read these statistics properly (and to identify their pitfalls) was definitely a hindrance. The 2008 report of the Austrian Court of Audit may serve as a prominent example of confusing the general public. The wording is inconsistent and even knowledgeable people read the report about ten times and remain unsure whether the figures refer to mere allowances or actually to fiscal cost.

We definitely recommend that the ministry devote more effort to estimating fiscal cost of tax incentive schemes for R&D. If it is not possible to allocate more resources to careful monitoring, then such estimates should not be published as they are useless, if not harmful to evidence-based policy making. No data is better than faulty data.

In light of earlier poor estimates we received the recent projections of the cost of the tax credit scheme with some caution. It became apparent that the Ministry of Finance simply extrapolated current R&D figures with an annual growth rate of 8 per cent and then calculated the disbursement cost for a given year by multiplying R&D investment of the same year with 0.08 (the current rate of the Tax Credit). This is wrong.

1) So far, the eligibility of extramural research for tax funding is limited. First, research activities contracted out to grouped companies do not qualify for funding and second, eligibility is further restricted by a cap at € 100,000 per company and year.
2) It is true that throughout the last 25 years R&D investment by the private sector grew at an average annual rate of 8 per cent. However, R&D investment is certainly not independent of economic performance. In the period 1981-2008, R&D grew on average twice as fast as GDP. This factor is declining in the current decade, when it has ranged between 1.6 and 1.74. The decline mirrors the end of the catching-up period.
3) Finally, since 2005 the tax credit can only be claimed together with the tax return which is due on April first of the subsequent year. The tax office then needs some time for investigation. Actual disbursements for assessment year t hardly ever materialise in year (t+1), but rather in (t+2), or later.

WIFO is in parts publicly funded and has some forecast experience. We would certainly be very willing to help the Ministry of Finance to make projections of the future cost of tax funding.

Table 9: Cost of Fiscal Funding - Forecast Figures

In € million (current prices)

		Forecasts concerning assessment year																					
		1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Forecasts as based on information of year	1986	15	22	73	Expenditure for the development, improvement or protection of inventions useful to the economy; preferential treatment of donations for science and research																			
	1987		22	73	73																			
	1988			73	73	73																		
	1989						51	Allowance for inventions; preferential treatment of donations for science and research																
	1990						27	33																
	1991						27	33	33															
	1992								33	33														
	1993									33	33													
	1994				33			33		33	33	33												
	1995											33	33											
	1996												33	33										
	1997					33				33			33	33	33									
	1998														58	73								
	1999															73	80							
	2000									33			44			73	80	87						
	2001																	130	130					
	2002																		130	140				
	2003	Allowances for inventions; Frascati allow.; pref. treatment of donations for science and research, Training premium, Frascati tax credit											58			80			130	140	230			
	2004	Allowances for inventions, Frascati allowance, Pref. treatment of donations for science and research, Training allowance																		140	230	250		
		Frascati tax credits														130					5	32		
	2005	Allowances for inventions, Frascati allowance, Pref. treatment of donations for science and research, Training allowance																			230	250	300	
		Frascati tax credits (+ tax credit for contract R&D)																			5	32	121	
	2006	Allowances for inventions, Frascati allowance, Preferential treatment of donations for science and research, Training allowance																				250	200	200
		Tax Credits																				32	121	157

Source: Ministry of Finance, Förderungsberichte 1984-2006

6. Concluding Policy Recommendations

The current Austrian system of indirect research subsidies is complex and characterised by several inconsistencies. It distinguishes between:

- the basis for claims: expenditures relating to inventions valuable to the economy vs. expenditures as defined by the OECD´s Frascati manual
- the focus of interventions: the "old" allowance scheme focuses on the economic *results* of R&D activities and thereby it classifies as an ouput-based measure, whereas the Frascati based schemes classify as input-based measures.
- the timing of close examination: the output-based claims are audited ex ante, while input-based claims are audited ex post
- the eligibility for support relating to contract R&D: cap vs. no cap
- the type of benefits: tax allowances reduce the tax base, while tax credits reduce the tax liability by a certain share of the qualifying expenditures.
- the calculation of the allowance: volume-based schemes vs. increment-based scheme
- corporate structure of companies: the subsidy component is different of incorporated vs. non-incorporated companies
- the authority in charge of administration: ministry of economics vs. tax authorities

This system is hard to explain to outsiders, especially to those who are not familiar with the German language. Current information material of the stated-owned agency in charge of promoting the business location Austria is heavily directed towards German companies. This strategy will not suffice in future times. Firstly, because Germany is seriously thinking about the introduction of tax incentives for R&D; there is tough pressure not alone from the side of industry, but also from scientific advisory bodies. The chancellor and her party are campaigning the introduction of R&D tax credits. Secondly, and more importantly, Austria should make strong efforts to attract *and maintain* top R&D players from all over the world and not make do with providing favourable conditions for largely technological development (and less so for research) for German-based companies. At present, multinational firms increasingly relocate headquarters or R&D-competences.

The intensity of fiscal subsidisation has decreased over time. While the relative generosity of R&D tax treatment in Austria used to rank top by international comparison, today it is only average or even slightly below. Decreasing comparative advantage are attributable to lower corporate tax rates in Austria which reduces the attractiveness of allowance-based schemes. At the same time, other countries increasingly rely on tax funding schemes for R&D.

The structural effects of tax subsidies across industries or size are low. This comes as an immediate reflection of their "neutral" design, i.e. the content and character of R&D projects is immaterial for access to funding as long as the general eligibility criteria ("R&D-investment") are met.

In summary, the analyses suggest that first, fiscal funding is much cheaper than expected. Second, it is certainly a good tool for supporting well-established R&D performers. Third, the current design of the scheme does not really address innovation activities of service firms. The

last section drafts some policy recommendations to further improve the design of fiscal incentives for R&D.

6.1 New Structure of Tax Incentive Schemes for R&D

The current structure of tax incentive schemes for R&D seems unnecessarily complex.

Abolish Frascati allowance. The relative advantage of the Frascati-based allowance scheme over its tax credit counterpart rises and falls with the level of the income tax rate, undermining the long-term predictability of fiscal R&D incentives.

While tax credits were originally introduced to assist loss-making companies that would not benefit from allowances, they now offer more advantages for profitable companies as well. Accordingly, very few firms now make use of Frascati-based allowances. Abolishing the Frascati allowance would not harm anyone but would simplify the design of the tax funding scheme and improve its reliability and long-term stability.

Increase rate of Frascati Tax Credit. Currently allowances are more beneficial only for non-incorporated entities. Such preferential treatment is not justified in any way and should be repealed. With respect to the volume-based components, a pareto optimal redesign of the current structure of fiscal incentives for R&D is achieved when the premium rate rises to 12.5 per cent of eligible R&D expenditure.

Abolish incremental components. In theory incremental tax funding provides better incentives to foster *additional* R&D expenditure, hence it supposedly supports both R&D newcomers as well as discontinuous/occasional R&D performers. Nonetheless there are three good reasons to abolish the incremental component.

1) Incremental schemes are hard for fiscal authorities to administer. Matters get awkwardly complex for grouped companies.

2) One of the core aims of tax support for R&D is to make R&D expenditures more consistent. For discontinuous R&D performers, the incremental-based schemes set incentives to merely optimise the timing of R&D projects. This has been one of the core experiences with the late incremental-based investment premium.

3) As for R&D entrants, there remains considerable doubt whether slightly increased rates of subsidisation would suffice to make R&D affordable. It is recommended instead that R&D entrants be able to count on substantial financial support of the funding agencies.

Abolish claims on the basis of economic performance measures and innovation output. We furthermore suggest that claims be based only on the Frascati definition of R&D. To the extent to which the allowance for inventions addresses economic results of R&D activities, we note that these materialise only in the long run and are extremely hard to trace. According to the Federal Ministry of Economics, roughly three out of four companies asking for a certificate filed a patent application and base their current claims on further developments thereof. If the allowance in question does not grant recurring rewards for past achievements, then the term “further developments” calls for some clarification. In principle the company has to disentangle sunk research cost from research expenditure that contributed to economic success, since only the latter qualify for fiscal support. For these reasons, the cost of rigid administration as well as the compliance cost of the scheme is very high, in principle. In

practice, it seems that claims are rather decided in the affirmative if applicants are economically successful plus — for the time being — innovative in some unspecified way.

Given the fundamental difficulty, if not impossibility, of attributing economic success to well defined R&D inputs, this approach is a very reasonable second-best option. The first-best solution would be to address R&D inputs in a direct manner.

Closely related to this, we note that, by construction, the basis for the allowance for invention claim discriminates against long time-to-market research. More particularly, it discriminates against basic research activities. It has been repeatedly argued that just these kinds of activities push a successful R&D player (like Austria) to the top group.[47] Irrespective of reasonable criticism of mere RTI-input goals such as an R&D quota of 3 (or 4) per cent, there remains broad agreement that R&D is a core driver for both productivity and efficiency.[48] Though it must be conceded that the crucial transformation from innovation input to economic output is a complex, non-linear something within a black box,[49] it is equally true that it works. Ultimately any input-based approach to funding has great trust in the invisible hand.

To the extent that the allowance for inventions is rewarded on the basis of research results (patents), it does not discriminate against basic research. However, such companies would not be worse off when making use of the Frascati-based scheme — at least when it comes to intramural R&D activities. Moreover, by drawing on a Frascati-based scheme, the company could count on earlier payouts.

Finally, the empirical evidence of this report has shown that claims on the basis of economically useful inventions are the least suited to address knowledge-intensive services. With a share of 30 per cent of the allowances going to low-tech sectors and traditional services, it is the least suitable to encourage structural change in the direction of a knowledge-based economy.

Abolish caps on Contract R&D Tax Credit. At this stage there is little demand for the Frascati-based instruments that promote the contracting out of R&D. Presumably the cap acts as a deterrent, and respective companies are much better off when claiming the allowance for inventions, which is more generous with respect to the funding of extramural research activities. It is recommended that the cap be abolished. At first sight, this provision would merely compensate former users of the allowance for invention. More profoundly, and seen from a system perspective, the major concern is to increase R&D *in general* and to promote open innovation. Integrating external knowledge in the process of innovation will speed up and improve its function.

47 McMorrow et al. (2008), McMillan et al. (2000), Narin et al. (1997)

48 Falk (2009), Falk et al. (2008), Wieser (2005), Griffith et al. (2004), Coe and Helpman (1995).

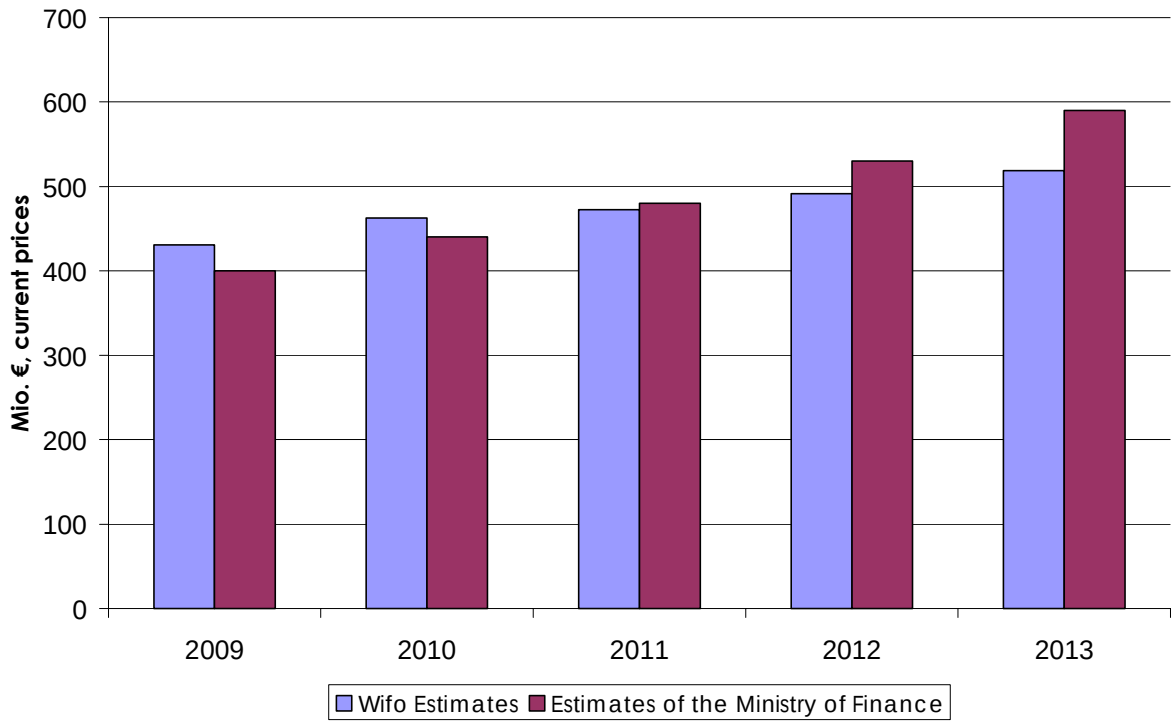
49 David et al. (2000)

6.2 *Cost of (new) Tax Funding Scheme for R&D — Estimates*

Figure 21 reports the estimated cost of the tax credit for the years 2009-2013. WIFO estimates are based on the following assumptions:

We start at the aggregate 2006 R&D expenditure (financing) of (i) the Business Enterprise Sector and (ii) abroad. The resulting sum X is reduced by the amount of external R&D commissioned to grouped companies. While such expenses are not eligible for funding, we propose to include extramural research commissioned to non-grouped companies in the assessment base. It is assumed that eligible R&D (i.e., X minus research commissioned to grouped companies) grows by 8 per cent between 2006 and 2007. Thereafter eligible R&D increases at a rate equal to 1.8 times the GDP-growth-rate. For the latter we draw on recent WIFO forecasts.[50] It is assumed that cash disbursement in year t depends on projected R&D expenditure of the year (t-2), which would be the year of assessment. The tax credit rate is 10 per cent. Based on these assumptions cost of the new Tax Credit scheme would develop as depicted in Figure 21 (blue bars). We benchmark these estimates against recent projections of the Ministry of Finance. The underlying assumptions of the Ministry of Finance were not made explicit.

Figure 21: Cost of Tax Credit
Disbursement years



Source: Statistics Austria (Global estimate), reported in Austrian Research and Technology Report 2008, p. 159 (Table 1 of the Data Appendix); Statistics Austria: R&D Survey 2006, Table 22; Baumgärtner et al. (2009)

50 Baumgärtner et al. (2009).

6.3 *Monitoring Fiscal Funding of R&D*

Improve ex-post administration. We recommend responding to widespread concerns about improper use of public money ("watering can"). This would strengthen the credibility of tax funding instruments and thereby increase its acceptance beyond the still-narrow sphere of immediate beneficiaries. We also recommend responding to firms' concerns of improper auditing, for greater legal certainty constitutes a core advantage of tax funding as opposed to discretionary funding via agencies. Both concerns are addressed by establishing a pool of highly qualified auditors. Each auditor should hold a university degree in engineering or science. Furthermore, it is recommended that auditors be independent from both the Ministry of Economic Affairs and the Ministry of Finance. Dependency in one direction tends to result in too much emphasis on economic success rather than on research agendas. Dependency in the other direction leads to too much concern about (short-term) losses of tax revenue. In the Netherlands any firm that draws on fiscal funding schemes (about 16,000) faces close investigation by research auditors every four to five years.

Improve the data basis on tax funding of R&D. In-depth evaluations of the working of fiscal support for R&D rest upon relevant, reliable, and topical data. Currently the data basis is non-transparent and largely miserable. Because of this, it is very difficult to make the advantages and disadvantages of tax funding of R&D visible. We suggest the following measures to address data problems in a rigorous way.

Improve collection of data. All expenditures eligible for Frascati-based tax funding should, in principle, show up in the biannual R&D survey of the Federal Statistical Office, since this survey also draws on the Frascati concept for R&D. Hence, research figures reported to the tax office should comply with research figures reported to the Statistical Office. To make sure that funding statistics match R&D statistics, fiscal benefits for R&D should only be granted to companies that participate in the survey — no reporting, no money. Such plain logic fits with the prime justification for making tax schemes more responsive to R&D activities, namely to increase R&D expenditure, to increase the R&D basis (i.e., the number of R&D performers), and to improve the R&D quota.

One additional (branched) question suffices to considerably improve the statistical basis for the evaluation of tax funding instruments ("Did you claim tax benefits for the preceding business year? If so, how much?").

Expand documentation of data. The data should enter the Statistical Office's report on the R&D survey which is usually published just under two years after the reporting period ends. The report should contain two additional tables. The first one should display the amount of tax funding by industry, a second table should repeat this exercise by size classes. In accordance with the familiar tables of the R&D-survey, a separate column in each of the two tables would display the number of tax funding beneficiaries within industries and size classes of firms.

Widen access to data. After the micro data is made unanimous, free access to it should be granted. If policy makers commission an in-depth evaluation of fiscal instruments for R&D, the contractor should be given full access to the non-anonymous dataset.

7. Appendix

7.1 Additional Results

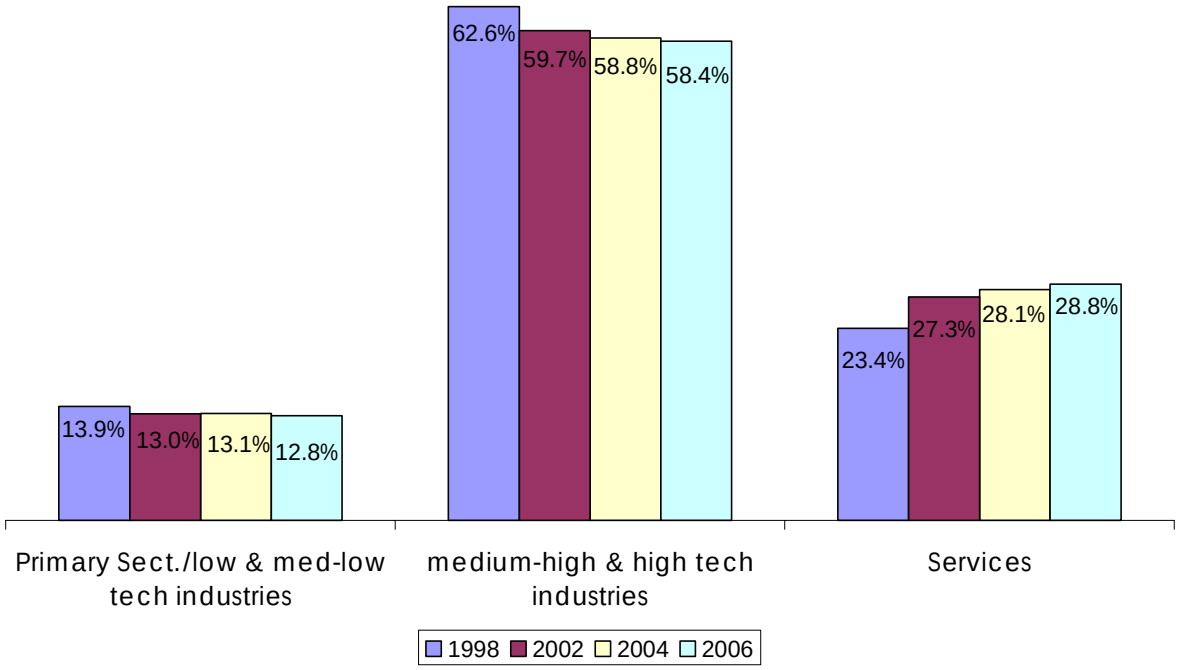
TableA1-1: Rates of Tax Subsidies per € 1 R&D Expenditure[1)]

Firms liable for Income Tax (1980 — 1999)

Taxable Income in €	Marginal Income Tax Rate	Allowance for Inventions
	since 1980	
3,634 and less	23%	1.15%
more than 3,634	28%	1.40%
7,267	33%	1.65%
10,901	38%	1.90%
14,535	43%	2.15%
17,441	48%	2.40%
20,348	52%	2.60%
23,255	55%	2.75%
36,336	58%	2.90%
72,673	60%	3.00%
109,009	62%	3.10%
	since 1982	
3,634 and less	21%	1.05%
more than 3,634	27%	1.35%
7,267	33%	1.65%
10,901	39%	1.95%
14,535	45%	2.25%
18,168	51%	2.55%
21,802	55%	2.75%
36,336	58%	2.90%
72,673	60%	3.00%
109,009	62%	3.10%
	since 1988	
3,634 and less	21%	2.52% / 3.78%
more than 3,634	27%	3.24% / 4.86%
7,267	33%	3.96% / 5.94%
10,901	39%	4.68% / 7.02%
14,535	45%	5.40% / 8.10%
18,168	51%	6.12% / 9.18%
21,802	55%	6.60% / 9.90%
36,336	58%	6.96% / 10.44%
72,673	60%	7.20% / 10.80%
109,009	62%	7.44% / 11.16%
	1989-1999	
3,634 and less	10%	1.20% / 1.80%
more than 3,634	22%	2.64% / 3.96%
10,901	32%	3.84% / 5.76%
21,802	42%	5.04% / 7.56%
50,871	50%	6.00% / 9.00%

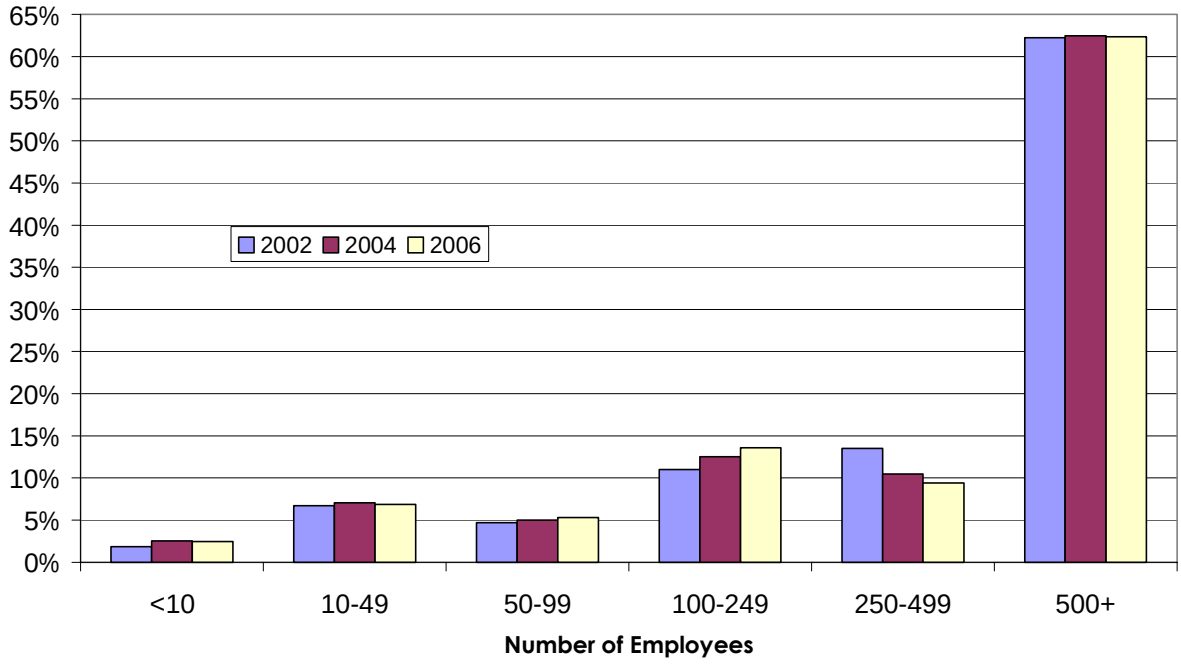
Source: Income Tax Statistics - WIFO calculations; Note: [1)] For the allowance schemes the rates of R&D subsidisation are calculated by multiplying the allowance rate by the marginal income tax rate.

Figure A1-1: Sectoral Shares in R&D Expenditure — 1998-2006



Source: Statistics Austria, R&D Surveys 1998, 2002, 2004, 2006 — WIFO calculations.

Figure A1-2: Distribution of R&D Expenditure by Size Classes — 1998-2006



Source: Statistics Austria, R&D Surveys 2002, 2004, 2006 — WIFO calculations.

Table A1-2: Allowance for Inventions — Distribution by Industry, 1995-2005

ÖNACE	Industry	Share in Allowances for Inventions 1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	Average
32	Radio, TV and communications equipment and apparatus	31.0%	34.3%	10.6%	43.2%	40.8%	40.5%	42.1%	31.4%	33.5%	21.6%	23.0%	32.0%
24	Chemicals & chemical products	14.9%	10.9%	16.1%	11.8%	10.4%	21.9%	9.8%	14.8%	11.4%	11.3%	4.1%	12.5%
29	Machinery	7.4%	22.1%	18.8%	16.8%	10.3%	6.9%	6.5%	7.5%	5.9%	7.1%	23.1%	12.0%
74	Business services	19.6%	11.0%	19.9%	1.9%	8.1%	1.8%	8.0%	3.4%	3.1%	5.8%	4.1%	7.9%
34	Motor vehicles and parts	6.0%	5.2%	13.5%	6.9%	5.3%	5.6%	5.1%	6.3%	8.7%	11.6%	0.4%	6.8%
50-52	Wholesale, retail trade and motor vehicle repair	2.4%	2.8%	6.4%	3.5%	4.1%	5.0%	2.8%	3.1%	3.1%	4.7%	19.3%	5.2%
33	Medical, precision and optical instruments, watches and clocks (instruments)	1.6%	1.7%	1.0%	1.5%	2.0%	1.9%	2.0%	8.4%	9.5%	15.5%	3.2%	4.4%
31	Electrical machinery and apparatus n.e.c.	2.2%	3.3%	1.4%	2.0%	3.6%	2.9%	5.4%	4.2%	4.2%	4.7%	1.0%	3.2%
35	Other transport equipment	3.5%	0.1%	3.9%	2.6%	3.0%	2.4%	1.9%	3.1%	4.3%	0.4%	3.4%	2.6%
27	Basic metals	0.8%	2.3%	2.1%	2.3%	1.8%	1.2%	1.3%	2.4%	3.8%	4.1%	1.1%	2.1%
28	Fabricated metal products	1.2%	0.8%	0.9%	1.2%	1.4%	1.3%	1.5%	1.3%	1.2%	1.1%	2.8%	1.3%
72	Computer, software consultancy and supply	0.1%	0.1%	0.2%	0.1%	0.9%	1.1%	2.2%	2.9%	0.9%	1.7%	2.6%	1.2%
45	Construction	0.0%	0.0%	0.3%	0.0%	0.5%	0.0%	0.2%	0.4%	0.2%	0.2%	0.8%	0.3%
		Share in number of supported firms											Average
32	Radio, TV and communications equipment and apparatus	4.3%	5.2%	4.5%	4.6%	3.6%	3.0%	3.9%	2.7%	2.0%	2.0%	3.1%	3.5%
24	Chemicals & chemical products	8.9%	9.3%	10.2%	6.8%	6.6%	5.8%	5.5%	6.9%	6.1%	6.1%	3.1%	6.9%
29	Machinery	19.8%	19.3%	17.4%	15.7%	15.4%	13.7%	17.2%	12.5%	14.5%	13.3%	18.7%	16.1%
74	Business services	6.2%	7.0%	9.1%	9.1%	7.3%	12.5%	10.1%	10.6%	11.8%	13.6%	13.4%	10.1%
34	Motor vehicles and parts	1.9%	2.6%	1.9%	1.7%	2.1%	2.1%	2.1%	1.6%	1.4%	1.8%	1.6%	1.9%
50-52	Wholesale, retail trade and motor vehicle repair	7.4%	10.0%	12.8%	12.3%	13.3%	12.2%	9.5%	15.0%	12.0%	13.6%	10.6%	11.7%
33	Medical, precision and optical instruments, watches and clocks (instruments)	5.8%	7.0%	6.4%	6.6%	7.1%	6.4%	6.3%	5.0%	5.5%	5.4%	7.5%	6.3%
31	Electrical machinery and apparatus n.e.c.	6.6%	8.5%	5.3%	5.7%	7.1%	5.2%	5.6%	3.9%	2.9%	2.3%	2.8%	5.1%
35	Other transport equipment	1.9%	0.4%	1.1%	0.9%	1.4%	0.7%	0.5%	0.5%	0.5%	0.5%	0.6%	0.8%
27	Basic metals	4.3%	4.1%	4.9%	5.4%	4.0%	2.7%	3.1%	3.2%	4.5%	3.2%	3.1%	3.9%
28	Fabricated metal products	7.0%	6.3%	5.7%	7.4%	7.3%	6.1%	6.3%	6.8%	6.1%	5.7%	8.1%	6.6%
72	Computer, software consultancy and supply	1.2%	1.1%	1.5%	1.7%	3.1%	3.9%	5.3%	5.9%	6.4%	5.9%	6.9%	3.9%
45	Construction	1.9%	0.7%	3.0%	2.3%	2.8%	2.7%	3.4%	3.7%	5.2%	5.7%	3.7%	3.2%

Source: see Table A2-3 in Appendix 2 — WIFO calculations.

Note: [1)] For companies subject to income tax, disaggregated data by industry is only available for assessment year 2005. To maintain the ceteris-paribus setting, the analysis reported in this table therefore excludes these firms. [2)] Industries are not listed if the average proportion for both items falls below 2.5%

Table A1-3: Frascati Allowance — Distribution by Industry, 2002 - 2005

ÖNACE	Industry	Share in Frascati Allowance 2002	2003	2004	2005	Average
34	Motor vehicles and parts	2.9%	0.9%	6.2%	52.2%	15.6%
24	Chemicals & chemical products	17.6%	30.0%	8.5%	0.7%	14.2%
29	Machinery	13.1%	11.0%	16.9%	9.0%	12.5%
50-52	Wholesale, retail trade and motor vehicle repair	7.5%	15.8%	8.0%	9.6%	10.2%
74	Business services	5.2%	8.8%	11.6%	3.7%	7.3%
33	Medical, precision and optical instruments, watches and clocks (instruments)	5.7%	5.0%	14.1%	2.9%	6.9%
32	Radio, TV and communications equipment and apparatus	15.6%	7.9%	2.3%	0.5%	6.6%
72	Computer, software consultancy and supply	6.7%	5.3%	4.1%	1.6%	4.4%
31	Electrical machinery and apparatus n.e.c.	6.1%	3.3%	1.7%	4.8%	4.0%
28	Fabricated metal products	3.3%	2.6%	6.2%	2.5%	3.7%
27	Basic metals	0.7%	2.0%	5.0%	1.7%	2.4%
25	Rubber & plastic products	0.7%	0.3%	1.2%	5.1%	1.8%
45	Construction	0.2%	0.4%	0.3%	0.5%	0.3%

		Share in number of supported firms 2002	2003	2004	2005	Average
34	Motor vehicles and parts	2.3%	1.6%	1.7%	0.7%	1.6%
24	Chemicals & chemical products	6.0%	4.9%	5.2%	1.9%	4.5%
29	Machinery	8.7%	10.8%	11.3%	11.2%	10.5%
50-52	Wholesale, retail trade and motor vehicle repair	14.1%	15.7%	13.8%	12.7%	14.1%
74	Business services	13.8%	14.9%	13.8%	18.0%	15.1%
33	Medical, precision and optical instruments, watches and clocks (instruments)	4.0%	3.9%	4.0%	4.9%	4.2%
32	Radio, TV and communications equipment and apparatus	2.7%	2.6%	1.5%	2.2%	2.3%
72	Computer, software consultancy and supply	12.1%	9.0%	7.3%	8.2%	9.2%
31	Electrical machinery and apparatus n.e.c.	3.0%	2.2%	2.3%	2.2%	2.5%
28	Fabricated metal products	5.0%	5.7%	6.9%	7.5%	6.3%
27	Basic metals	1.3%	2.4%	3.3%	3.0%	2.5%
25	Rubber & plastic products	2.7%	2.6%	3.1%	3.7%	3.1%
45	Construction	3.4%	5.3%	3.3%	3.4%	3.8%

Source: see Table A2-3 in Appendix 2 — WIFO calculations.

Note: [1)] Analysis excludes companies liable for income tax since for these a breakdown by 2-digit industries is only available for 2005. [2)] Industries are not listed if the average proportion for both items falls below 2.5%

TableA1-4: Frascati Tax Credit — Distribution by Industry, 2002 - 2005

		Share in Frascati Tax Credit				Average
	Industry	2002	2003	2004	2005	(2003-05)
32	Radio, TV and communications equipment and apparatus	0.2%	10.9%	19.9%	12.5%	14.5%
74	Business services	0.0%	19.3%	7.8%	6.7%	11.3%
31	Electrical machinery and apparatus n.e.c.	14.3%	5.5%	14.7%	10.9%	10.4%
73	Research and Development	12.3%	10.5%	8.1%	6.8%	8.5%
29	Machinery	4.3%	1.9%	10.8%	11.7%	8.1%
24	Chemicals & chemical products	42.8%	2.2%	10.8%	9.9%	7.6%
50-52	Wholesale, retail trade and motor vehicle repair	0.0%	11.5%	3.1%	4.8%	6.5%
72	Computer, software consultancy and supply	0.0%	6.4%	3.7%	5.3%	5.1%
33	Medical, precision and optical instruments, watches and clocks (instruments)	0.0%	4.3%	0.9%	7.9%	4.4%
65-67	Financial intermediation & Insurance	21.9%	8.2%	2.1%	2.3%	4.2%
34	Motor vehicles and parts	0.0%	1.5%	2.3%	4.2%	2.7%
35	Other Transport Equipment	0.0%	1.2%	4.3%	2.3%	2.6%
28	Fabricated metal products	0.9%	1.3%	1.5%	2.7%	1.8%
45	Construction	0.0%	1.0%	1.2%	0.9%	1.0%
75-93	Community, social and personal service activities, etc.	1.8%	1.0%	0.5%	0.7%	0.7%

		Share in number of supported firms				Average
	industriy	2002	2003	2004	2005	(2003 - 2005)
32	Radio, TV and communications equipment and apparatus	1.7%	0.8%	2.0%	1.5%	1.4%
74	Business services	10.0%	13.6%	13.5%	13.4%	13.5%
31	Electrical machinery and apparatus n.e.c.	3.3%	2.8%	3.3%	2.8%	3.0%
73	Research and Development	10.0%	6.7%	7.4%	5.8%	6.6%
29	Machinery	10.0%	5.1%	6.9%	8.0%	6.7%
24	Chemicals & chemical products	11.7%	4.4%	2.4%	4.2%	3.7%
50-52	Wholesale, retail trade and motor vehicle repair	8.3%	14.6%	13.1%	13.8%	13.8%
72	Computer, software consultancy and supply	8.3%	12.6%	15.1%	12.4%	13.4%
33	Medical, precision and optical instruments, watches and clocks (instruments)	3.3%	4.1%	3.2%	3.4%	3.6%
65-67	Financial intermediation & Insurance	1.7%	0.5%	0.3%	0.6%	0.5%
34	Motor vehicles and parts	0.0%	0.8%	1.0%	1.0%	0.9%
35	Other Transport Equipment	1.7%	0.5%	0.4%	0.3%	0.4%
28	Fabricated metal products	6.7%	4.1%	4.0%	4.8%	4.3%
45	Construction	1.7%	4.4%	5.1%	4.7%	4.7%
75-93	Community, social and personal service activities, etc.	3.3%	4.1%	3.5%	2.9%	3.5%

Source: see Table A2-4 in Appendix 2 — WIFO calculations.

Note: [1)] Industries are not listed if the average proportion for both items falls below 2.5%

Table A1-5: Barriers to Usage — the Users' Perspective[1)]

	Number of employees						
	<10	10-49	50-99	100-249	250-499	500+	Total
	Clearness of the structure of fiscal incentives for R&D s						
Low-tech industries					2.2		2.2
Medium low-tech industries		2.0	2.2	2.4	2.4	2.0	2.3
Medium high-tech industries	2.2	2.5	2.4	2.0	2.0	1.9	2.2
High-tech industries	2.9	2.7	2.0	2.1		1.6	2.3
Non-knowl. int. Services	2.8	2.3					2.6
Knowledge-intensive services	2.7	2.7					2.7
Top technology using knowl.-int. services	2.5	2.1		2.1			2.3
Total	2.6	2.4	2.4	2.2	2.2	2.0	2.3
	Access to relevant information						
Low-tech industries					2.0		2.1
Medium low-tech industries		2.3	2.0	2.3	2.1	2.0	2.2
Medium high-tech industries	2.3	2.5	2.1	2.1	1.9	2.0	2.2
High tech industries	2.4	2.4	1.9	2.0		1.6	2.0
Non-knowl. int. services	2.6	2.5					2.5
Knowledge-intensive services	2.5	2.8					2.6
Top technology using knowl.-int. services	2.6	2.3		2.0			2.4
Total	2.5	2.4	2.3	2.1	2.0	2.0	2.3
	Quality of Advisory Services						
Low tech industries					2.2		2.3
Medium low-tech industries			2.9	2.8	2.3	2.5	2.6
Medium high-tech industries	2.9	3.0	2.6	2.5	3.1	2.5	2.8
High tech industries	2.8	2.9	2.7	2.0		2.3	2.6
Non-knowl. int. services	2.8	3.1					2.8
Knowledge-intensive services	3.1	3.3					3.1
Top technology using knowl.-int. services	3.1	2.5					2.9
Total	2.9	2.8	2.8	2.7	2.6	2.6	2.7
	Transparency of funding criteria						
Low tech industries					1.9		2.2
Medium low-tech industries				2.7	2.3	2.2	2.5
Medium high-tech industries	2.4	2.9	2.6	2.5	2.1	2.3	2.5
High tech industries	2.8	2.8	2.5	2.3		1.9	2.5
Non-knowl. int. services	2.5	2.4					2.6
Knowledge-intensive services	2.9	2.9					2.9
Top technology using knowl.-int. services	2.7	2.5		2.1			2.5
Total	2.7	2.7	2.6	2.5	2.2	2.4	2.5

… continued: Table A1-5: Barriers to Usage — the Users' Perspective[1)]

	Number of Employees						
	<10	10-49	50-99	100-249	250-499	500+	Total
	Clearness of application procedure						
Low-tech industries					2.2		1.9
Medium low-tech industries		2.4		2.2	2.2	1.9	2.2
Medium high-tech industries	2.4	2.9	2.3	2.2	2.3	2.0	2.4
High-tech industries	2.2	2.6	1.9	2.2		1.9	2.2
Non-knowl. int. services	2.5	2.2					2.5
Knowledge-intensive services	2.4	2.7					2.6
Top technology using knowl.-int. services	2.3	2.3		1.7			2.2
Total	2.4	2.5	2.3	2.2	2.2	2.1	2.3
	Compliance Cost *(Administrative burden of application procedure)*						
Low tech industries					2.5		2.6
Medium low-tech industries				2.7	2.6	2.4	2.7
Medium high-tech industries	2.7	3.3	3.0	2.6	2.7	2.3	2.8
High tech industries	2.8	2.8	2.2	2.8		2.4	2.5
Non-knowl. int. services	2.7	2.7					2.8
Knowledge-intensive services	2.4	3.0					2.6
Top technology using knowl.-int. services	2.5	2.4		2.6			2.5
Total	2.6	2.8	2.7	2.7	2.5	2.5	2.7
	Predictability and long-run availability of funding						
Low-tech industries					2.1		2.2
Medium low-tech industries				2.6	2.9	1.8	2.6
Medium high-tech industries	2.6	2.8	2.6	2.3	2.5	1.9	2.4
High-tech industries	2.7	2.3	2.3	2.2		1.8	2.2
Non-knowl. int. services	2.6	2.8					2.6
Knowledge-intensive services	2.7	2.7					2.6
Top technology using knowl.-int. services	2.5	2.2		2.3			2.4
Total	2.7	2.5	2.5	2.4	2.3	2.1	2.4
	Transparency of funding decisions						
Low-tech industries					2.3		2.4
Medium low-tech industries		2.9		2.5	2.1	1.9	2.5
Medium high-tech industries	2.9	2.9	2.5	2.5	2.1	2.0	2.5
High-tech industries	2.8	2.5	2.1	1.9		1.8	2.2
Non-knowl. int. services	2.7	2.7					2.7
Knowledge-intensive services	2.5	2.7					2.6
Top technology using knowl.-int. services	2.5	2.3		2.2			2.4
Total	2.7	2.6	2.5	2.4	2.1	2.2	2.5

Source: WIFO/KMFA (2008): Public support of firms' RTDI-activities. Survey for the System Evaluation — WIFO calculations; Notes: [1)] the questionnaire asked companies to rate the current design of fiscal incentives for R&D using the criteria specified above (clearness of funding scheme, access to relevant information etc.). Assessment is based on a 5-level scale where "1" denotes "very good" and "5" denotes "very bad". The table displays average grades within branches and within size classes. Cells with less than 10 observations are left empty. .

Table A1-6: Share of Beneficiaries in Total Number of R&D-Performing Companies

Analysis by 2-digit industries

ÖNACE		1998	2002	2004	2005
01, 02, 05	Agriculture, hunting	100.0%	50.0% - 75.0%	100.0% - 116.7%	222.2% - 244.4%
10-14	Mining & quarrying	50.0%	66.7% - 66.7%	72.7% - 100.0%	95.2% - 133.3%
15-16	Food, beverages & tobacco	3.0%	11.1% - 14.8%	37.0% - 46.9%	70.2% - 73.8%
17	Textiles	30.0%	25.0% - 43.8%	64.3% - 96.4%	89.3% - 96.4%
18-19	Wearing apparel, leather and shoes	16.7%	15.4% - 15.4%	47.1% - 58.8%	71.0% - 90.3%
20	Wood & cork (not furniture)	18.2%	30.2% - 39.5%	72.0% - 88.0%	88.2% - 109.8%
21	Pulp, paper & paper products	21.1%	50.0% - 75.0%	59.1% - 90.9%	73.5% - 81.6%
22	Publishing, printing & reproduction of recorded media	16.7%	60.0% - 100.0%	100.0% - 166.7%	118.2% - 145.5%
23	Coke, refined petroleum products and nuclear fuel	0.0%	33.3% - 66.7%	0.0% - 0.0%	66.7% - 133.3%
24	Chemicals & chemical products	40.0%	50.6% - 80.0%	56.7% - 94.4%	97.9% - 113.8%
25	Rubber & plastic products	16.3%	20.6% - 32.4%	45.6% - 63.2%	65.3% - 83.3%
26	Non-metallic mineral products	14.3%	23.7% - 33.9%	41.2% - 55.9%	68.2% - 81.8%
27	Basic metals	51.4%	45.5% - 59.1%	67.4% - 106.5%	99.0% - 124.8%
28	Fabricated metal products	24.1%	36.5% - 53.0%	62.6% - 88.6%	97.3% - 127.2%
29	Machinery	27.4%	29.5% - 41.7%	45.9% - 72.1%	68.2% - 94.3%
30	Office, accounting & computing machinery	83.3%	90.0% - 110.0%	125.0% - 200.0%	183.3% - 200.0%
31	Electrical machinery and apparatus n.e.c.	28.6%	30.4% - 44.3%	54.7% - 69.8%	77.4% - 89.3%
32	Radio, TV and communications equipment and apparatus	40.0%	36.2% - 55.3%	59.2% - 81.6%	70.4% - 90.7%
33	Medical, precision and optical instruments, watches and clocks (instruments)	34.3%	35.6% - 51.7%	55.1% - 85.7%	81.4% - 107.8%
34	Motor vehicles and parts	22.2%	30.3% - 51.5%	50.0% - 76.3%	55.3% - 73.7%
35	Other transport equipment	20.0%	30.0% - 50.0%	54.5% - 81.8%	51.9% - 66.7%
36	Other manufacturing n.e.c.	15.0%	15.3% - 23.7%	62.0% - 80.0%	71.7% - 90.6%
37	Recycling	.	0.0% - 0.0%	25.0% - 25.0%	125.0% - 125.0%

Table A1-6 concluded

		1998	2002	2004	2005
40-41	Electricity, gas and water supply	0.0%	29.4% - 47.1%	106.3% - 118.8%	117.1% - 126.8%
45	Construction	20.0%	43.4% - 64.2%	112.5% - 162.5%	143.8% - 165.8%
50-52	Wholesale, retail trade and motor vehicle repair	93.5%	63.3% - 95.2%	125.7% - 171.3%	172.0% - 202.7%
55	Hotels and restaurants	--	-- -- --	-- - -- --	-- -- --
60-64	Transport, storage and communications	28.6%	21.4% - 21.4%	50.0% - 68.8%	43.9% - 43.9%
65-67	Financial intermediation & Insurance	25.0%	36.4% - 72.7%	40.0% - 70.0%	152.9% - 200.0%
70, 71, 74	Real estate & renting and business services	39.4%	35.3% - 60.4%	119.7% - 161.1%	177.3% - 225.4%
72	Computer, software consultancy and supply	8.0%	21.9% - 41.7%	88.5% - 103.1%	117.6% - 130.6%
73	Research and development	14.7%	16.1% - 28.6%	60.4% - 66.2%	79.0% - 89.9%
75-93	Community, social and personal service activities, etc.	25.0%	41.7% - 58.3%	257.9% - 300.0%	427.9% - 530.2%
	Total	49.6%	39.4% - 65.2%	81.5% - 114.6%	104.8% - 138.8%

Source: see Tables A2-3 and A2-4 in Appendix 2; StAt R&D Surveys (1998, 2002, 2004, 2006) — WIFO calculations.

Notes: [1)] Absolute number of R&D-performing companies in 2005 is calculated as the 2004/2006-average; [2)] for the years 2002 and the following ranges are tabled (more than one instrument available); [3)] before 2005: sectoral data only available for companies subject to corporate tax.

Table A1-7: Intensity of Fiscal Support for R&D

Analyses by 2-digit industries, selected years		1998	2002	2004	2005[1), 2)]
01, 02, 05	Agriculture, hunting	2.2%	n.a.	8.8%	15.0%
10-14	Mining & quarrying	n.a.	10.0%	14.1%	**22.3%**
15-16	Food, beverages & tobacco	0.1%	0.6%	2.5%	4.1%
17	Textiles	1.8%	5.5%	5.3%	9.0%
18-19	Wearing apparel, leather and shoes	0.2%	0.1%	2.3%	4.6%
20	Wood & cork (not furniture)	0.3%	2.7%	5.6%	4.6%
21	Pulp, paper & paper products	1.1%	5.3%	21.1%	11.9%
22	Publishing, printing & reproduction of recorded media	0.5%	2.2%	3.7%	3.8%
23	Coke, refined petroleum products and nuclear fuel	0.0%	6.0%	0.0%	2.2%
24	Chemicals & chemical products	3.8%	11.1%	11.2%	7.1%
25	Rubber & plastic products	0.5%	0.6%	1.7%	5.1%
26	Non-metallic mineral products	0.6%	0.8%	1.3%	3.0%
27	Basic metals	2.7%	5.3%	7.1%	2.4%
28	Fabricated metal products	1.6%	3.9%	7.8%	9.7%
29	Machinery	6.0%	3.8%	7.0%	8.9%
30	Office, accounting & computing machinery	11.6%	**43.9%**	**30.7%**	**19.5%**
31	Electrical machinery and apparatus n.e.c.	1.4%	5.6%	**17.6%**	14.7%
32	Radio, TV and communications equipment and apparatus	5.0%	7.6%	6.2%	4.1%
33	Medical, precision and optical instruments, watches and clocks (instruments)	2.0%	**17.8%**	**20.8%**	15.4%
34	Motor vehicles and parts	2.5%	3.5%	5.6%	5.2%
35	Other transport equipment	3.1%	10.8%	10.5%	6.9%
36	Other manufacturing n.e.c.	1.0%	2.9%	4.4%	5.0%
37	Recycling	n.a.	n.a.	15.1%	12.5%
40-41	Electricity, gas and water supply	0.0%	1.6%	**36.5%**	**39.2%**
45	Construction	0.2%	5.7%	11.1%	11.6%
50-52	Wholesale, retail trade and motor vehicle repair	4.2%	5.6%	**14.1%**	13.1%
55	Hotels and restaurants	--	--	--	.
60-64	Transport, storage and communications	0.2%	7.2%	6.6%	3.8%
65-67	Financial intermediation & Insurance	0.1%	6.9%	6.9%	13.5%
70, 71, 74	Real estate & renting and business services	1.1%	2.6%	8.3%	5.8%
72	Computer, software consultancy and supply	0.1%	5.2%	5.6%	7.5%
73	Research and development	0.1%	1.4%	3.0%	3.9%
75-93	Community, social and personal service activities, etc.	3.2%	13.8%	**22.8%**	**26.6%**
	Total	3.12%	5.64%	7.68%	6.91%
Theoretical upper limits of fiscal funding intensity depending on type of ownership[3)]					
Firms liable for					
...Corpo-	Volume-based component	4.08	8.5%	8.5%	8%
rate tax	Incremental component	6.12%	11.9%	11.9%	8.75%
...Income	Volume-based component	12.5%	12.5%	12.5%	12.5%
tax	Incremental component	17.5%	17.5%	17.5%	17.5%

Source: see Tables A2-3 and A2-4 in Appendix 2; StAt R&D Surveys (1998, 2002, 2004, 2006) — WIFO calculations; Note: [1)] R&D expenditure in 2005 is calculated as the 2004/2006-average; [2)] Business Partnerships liable for income tax only included in 2005; [3)] see Tables 3 and 4 in Section 2.2.1

7.2 Data

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C) Distribution by company size in 2005

Table A2-5: R&D Tax Allowances

Table A2-6: R&D Tax Credits

Table A2-1: R&D Tax Allowances 1981 – 2005

Values in € 1,000 at Current Prices

	Allowance for Inventions (§4 Abs. 4Z4a Income Tax Act)						**Frascati Allowance (§4 Abs. 4Z4 Income Tax Act)**						**Allowance for Contract R&D (§4 Abs. 4Zb Income Tax Act)**					
	Corporate Tax		Income Tax				Corporate Tax		Income Tax				Corporate Tax		Income Tax			
			Individual Person		Partnership				Individual Person		Partnership				Individual Person		Partnership	
Year	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
1981	37	25,282	n.a.	n.a.	n.a.	n.a.												
1982	33	33,042	n.a.	n.a.	n.a.	n.a.												
1983	45	66,454	n.a.	n.a.	n.a.	n.a.												
1984	59	118,515	n.a.	n.a.	n.a.	n.a.												
1985	78	220,279	n.a.	n.a.	n.a.	n.a.												
1986	85	130,177	n.a.	n.a.	n.a.	n.a.												
1987	101	165,687	n.a.	n.a.	n.a.	n.a.												
1988	116	184,970	n.a.	n.a.	n.a.	n.a.												
1989	134	207,809	n.a.	n.a.	n.a.	n.a.												
1990	146	229,755	n.a.	n.a.	n.a.	n.a.												
1991	182	154,608	240	2,330	n.a.	n.a.												
1992	200	126,140	292	1,688	n.a.	n.a.												
1993	206	150,406	325	2,625	n.a.	n.a.												
1994	237	115,850	257	3,015	n.a.	n.a.												
1995	257	162,091	200	2,467	n.a.	n.a.												
1996	270	216,976	199	2,869	n.a.	n.a.												
1997	265	130,281	239	2,734	n.a.	n.a.												
1998	351	194,880	280	2,456	n.a.	n.a.												
1999	422	225,122	285	1,960	n.a.	n.a.												
2000	670	456,493	247	3,294	n.a.	n.a.												
2001	622	521,675	213	3,622	n.a.	n.a.												
2002	622	491,799	143	2,076	n.a.	n.a.	298	20,901	143	2,076	n.a.	n.a.						
2003	560	425,531	142	1,986	n.a.	n.a.	491	78,286	142	1,986	n.a.	n.a.						
2004	557	316,326	146	2,402	n.a.	n.a.	478	87,943	151	2,206	n.a.	n.a.						
2005	321	141,774	154	2,272	87	17,107	267	66,517	186	1,950	74	12,989	26	388	36	309	38	364

Source:

Columns 2 and 3: Corporate Tax Statistics 1981 – 2004 (jeweils: Gesamtdarstellung der Buch- und Nichtbuchführungspflichtigen Körperschaften, Steuer- und Nullfälle insgesamt; Tabelle 1.B: Sondererhebungsmerkmale); Data for 2005: Communication from the Ministry of Finance as of September 11, 2008.

Columns 4, 5, 10 and 11: Income Tax Statistics 1991 – 2003 (A. Steuer- und Nullfälle insgesamt; Table 4.1 Sondererhebungen nach Einkommenstufen, bzw. Gewinn mindernde Freibeträge, Rückstellungen und Rücklagen nach Einkommensstufen); Note that Income Tax Statistics subsume the allowance for inventions and the Frascati allowance. For 2002 and 2003 half of the cases and half of the allowances are assigned to each scheme. Data for 2004: Communication from the Ministry of Finance as of April 1, 2008; Data for 2005: communication from the Ministry of Finance as of September 11, 2008.

Columns 6, 7, 12, 13, 18, 19: Communication from the Ministry of Finance as of October 23, 2008

Columns 8 and 9: Data for 2002 and 2003: Communication from the Federal Statistical Office (Statistics Austria) as of April 3, 2008; Data for 2004: Corporate Tax Statistics 2008, Table 1.B); Data for 2005: Communication from the Ministry of Finance as of September 11, 2008

Columns 14-17: Communication from the Ministry of Finance as of June 13 and September 11, 2008

Table A2-2: R&D Tax Credits 2002-2005

Values in € 1,000 at Current Prices

	Frascati Tax Credit (§ 108c and §4 para. 4Z Income Tax Act)						Tax Credit for Contract R&D (§ 108c and §4 para 4Zb Income Tax Act)					
Firms liable for	Corporate Tax		Income Tax		Other		Corporate Tax		Income Tax		other	
Year	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
2002	43	477	5	-2	12	-246						
2003	268	8,272	58	108	64	3,234						
2004	786	92,411	143	406	172	40,737						
2005	1451	155,798	153	467	243	50,272	85	449	4	2	19	86

Source: Communication from the Federal Ministry of Finance as of June 19, 2008;

Table A2-3: R&D Tax Allowances by 2-digit ÖNACE-Industry: 1995 – 2005

Values in € 1,000 at current prices		1995		1996		1997		1998		1999		2000		2001	
ÖNACE	Industry	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
1	Agriculture, hunting	4	199	3	107	2	69	2	52	1	34	1	56	1	92
2	Forestry	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Fishery	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10-14	Mining & quarrying	2	1,006	2	2,779	1	100	3	3,839	3	546	8	902	5	584
15	Food & beverages	2	102	2	106	2	60	2	41	5	219	3	4	3	140
16	Tobacco products	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Textiles	3	305	2	397	4	308	6	959	6	1,443	6	1,959	6	5,321
18	Wearing apparel and fur	0	0	1	33	1	69	0	0	0	0	0	0	0	0
19	Leather products & footwear	1	0	0	0	1	105	2	22	3	118	2	37	4	142
20	Wood & cork (not furniture)	5	61	6	409	4	94	6	88	7	513	8	662	11	879
21	Pulp, paper & paper products	2	564	2	500	5	857	4	373	5	1,022	12	1,497	12	1,450
22	Publishing, printing & reproduction of recorded media	1	51	1	71	0	0	1	57	1	84	4	240	3	507
23	Coke, refined petroleum products and nuclear fuel	1	1,898	1	2,342	0	0	0	0	0	0	1	3,002	1	3,344
24	Chemicals & chemical products	23	24,139	25	23,689	27	20,972	24	22,907	28	23,378	39	99,874	34	51,234
25	Rubber & plastic products	5	845	5	582	4	509	8	620	11	1,082	16	3,356	18	2,298
26	Non-metallic mineral products	5	2,071	7	453	5	586	8	788	8	3,673	14	4,897	12	1,115
27	Basic metals	11	1,244	11	5,068	13	2,690	19	4,452	17	4,019	18	5,586	19	6,602
28	Fabricated metal products	18	1,878	17	1,638	15	1,226	26	2,338	31	3,067	41	5,979	39	7,906
29	Machinery	51	12,014	52	48,031	46	24,454	55	32,754	65	23,288	92	31,553	107	33,912
30	Office, acc. & comp. machinery	4	298	4	231	1	839	5	1,580	4	1,630	4	446	5	422
31	Electrical machinery and apparatus n.e.c.	17	3,622	23	7,139	14	1,857	20	3,935	30	8,119	35	13,450	35	28,061
32	Radio, TV and communications equipment and apparatus	11	50,181	14	74,516	12	13,815	16	84,204	15	91,797	20	185,006	24	219,675
33	Medical, precision and optical instruments, watches and clocks	15	2,543	19	3,656	17	1,283	23	2,851	30	4,402	43	8,844	39	10,173
34	Motor vehicles and parts	5	9,659	7	11,374	5	17,569	6	13,439	9	11,915	14	25,634	13	26,554
35	Other transport equipment	5	5,609	1	128	3	5,083	3	5,121	6	6,719	5	10,784	3	10,143
36	Other manufacturing n.e.c.	4	178	5	373	2	215	6	592	5	655	9	2,182	9	2,722
37	Recycling	0	0	0	0	0	0	0	0	0	0	0	0	0	0

... Table A2-3 continued

ÖNACE	Industry	1995		1996		1997		1998		1999		2000		2001	
		Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
40-41	Electricity, gas and water supply	0	0	1	1,117	0	0	0	0	1	43	5	498	3	129
45	Construction	5	53	2	36	8	369	8	88	12	1,033	18	168	21	1,286
50-52	Wholesale, retail trade and motor vehicle repair	19	3,892	27	6,141	34	8,392	43	6,788	56	9,186	82	22,693	59	14,404
55	Hotels and restaurants	0	0	0	0	0	0	0	0	0	0	3	2,189	0	0
60-64	Transport, storage and communications	0	0	0	0	0	0	2	111	2	3,868	8	7,553	2	6,804
65-67	Financial intermediation & Insurance	1	1	2	90	1	37	2	113	2	119	6	117	0	0
70-71	Real estate and renting	9	2,646	4	1,666	7	2,337	5	2,537	4	2,331	16	1,850	11	6,450
72	Computer, software consultancy and supply	3	223	3	309	4	297	6	135	13	2,107	26	5,141	33	11,366
73	Research and development	4	3,043	1	4	1	23	5	268	9	261	17	1,787	22	25,673
74	Business services	16	31,721	19	23,970	24	25,968	32	3,706	31	18,340	84	8,058	63	41,991
75-93	Community, social and personal service activities, etc.	11	3,534	1	20	2	99	3	120	2	113	10	487	5	296
1-93	Total	257	162,091	270	216,976	265	130,281	351	194,879	422	225,122	670	456,493	622	521,675

... Table A2-3 continued

ÖNACE	Industry	2002: Allowance for...				2003: Allowance for...				2004: Allowance for ...			
		Inventions		Frascati R&D		Inventions		Frascati R&D		Inventions		Frascati R&D	
		Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
1	Agriculture, hunting	1	59	0	0	0	0	2	3	1	4	0	0
2	Forestry	0	0	0	0	0	0	0	0	0	0	0	0
5	Fishery	0	0	0	0	0	0	0	0	0	0	0	0
10-14	Mining & quarrying	6	754	0	0	4	683	1	43	3	153	1	71
15	Food & beverages	3	134	8	142	6	184	9	258	8	158	9	651
16	Tobacco products	0	0	0	0	0	0	0	0	0	0	0	0
17	Textiles	8	4,496	5	216	6	2,357	7	467	9	2,360	7	608
18	Wearing apparel and fur	1	3	0	0	1	13	0	0	0	0	1	48
19	Leather products & footwear	1	10	0	0	1	20	1	18	2	99	1	23
20	Wood & cork (not furniture)	13	1,042	3	25	13	758	10	165	8	532	12	368
21	Pulp, paper & paper products	12	1,804	5	287	7	1,537	5	199	7	5,238	7	1,654
22	Publishing, printing & reproduction of recorded media	4	204	5	85	4	149	2	19	6	437	2	42
23	Coke, refined petroleum products and nuclear fuel	1	2,879	1	142	1	2,651	0	0	0	0	0	0
24	Chemicals & chemical products	43	72,820	18	3,687	34	48,407	24	23,519	34	35,724	25	7,444
25	Rubber & plastic products	14	1,036	8	136	15	1,042	13	271	12	913	15	1,044
26	Non-metallic mineral products	14	1,605	6	107	15	1,303	9	294	10	1,198	11	780
27	Basic metals	20	11,595	4	154	25	16,379	12	1,537	18	12,841	16	4,430
28	Fabricated metal products	42	6,554	15	683	34	5,192	28	2,074	32	3,609	33	5,488
29	Machinery	78	36,917	26	2,745	81	25,118	53	8,645	74	22,459	54	14,844
30	Office, acc. & comp. machinery	9	8,864	1	22	8	8,906	6	360	9	8,347	7	1,860
31	Electrical machinery and apparatus n.e.c.	24	20,527	9	1,265	16	17,665	11	2,600	13	15,017	11	1,517
32	Radio, TV and communications equipment and apparatus	17	154,498	8	3,261	11	142,547	13	6,214	11	68,318	7	2,022
33	Medical, precision and optical instruments, watches and clocks	31	41,191	12	1,187	31	40,513	19	3,896	30	49,179	19	12,392
34	Motor vehicles and parts	10	30,913	7	601	8	36,906	8	742	10	36,774	8	5,487
35	Other transport equipment	3	15,114	1	33	3	18,334	2	124	3	1,202	2	381
36	Other manufacturing n.e.c.	9	2,034	5	557	10	781	11	1,373	9	1,210	10	2,069
37	Recycling	0	0	0	0	0	0	0	0	0	0	0	0

... Table A2-3 continued

ÖNACE	Industry	2002: Allowance for...				2003: Allowance for...				2004: Allowance for ...			
		Inventions		Frascati R&D		Inventions		Frascati R&D		Inventions		Frascati R&D	
		Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
40-41	Electricity, gas and water supply	5	293	3	348	3	132	3	267	2	300	5	1,838
45	Construction	23	1,914	10	43	29	1,003	26	315	32	676	16	263
50-52	Wholesale, retail trade and motor vehicle repair	93	15,158	42	1,577	67	13,147	77	12,355	76	15,022	66	7,078
55	Hotels and restaurants	0	0	1	1	1	38	1	1	0	0	1	1
60-64	Transport, storage and communications	3	10,688	0	0	3	13,463	2	102	3	330	2	29
65-67	Financial intermediation & insurance	4	973	3	189	3	544	1	7	3	623	1	49
70-71	Real estate and renting	7	4,172	4	135	4	4,839	3	77	6	5,942	6	459
72	Computer, software consultancy and supply	37	14,471	36	1,398	36	3,873	44	4,141	33	5,313	35	3,597
73	Research and development	18	10,485	8	735	9	1,991	10	1,238	9	2,312	11	745
74	Business services	66	16,917	41	1,095	66	13,102	73	6,898	76	18,293	66	10,195
75-93	Community, social and personal service activities, etc.	2	1,674	3	42	5	1,954	5	66	8	1,743	11	466
1-93	Total	622	491,799	298	20,901	560	425,531	491	78,286	557	316,326	478	87,943

... Table A2-3 continued

		2005: Allowance for Inventions (§4 para. 4Z4a Income Tax Act)						2005: Frascati Allowance (§4 para 4Zb Income Tax Act)					
		Corporate Tax		Income Tax				Corporate Tax		Income Tax			
				Individual Person		Partnership				Individual Person		Partnership	
ÖNACE	Industry	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
1	Agriculture, hunting	0	0	1	0	0	0	0	0	2	3	0	0
2	Forestry	0	0	0	0	0	0	0	0	0	0	0	0
5	Fishery	0	0	0	0	0	0	0	0	0	0	0	0
10-14	Mining & quarrying	3	934	0	0	1	875	1	29	0	0	0	0
15	Food & beverages	2	349	0	0	1	164	5	53	1	31	2	24
16	Tobacco products	0	0	0	0	0	0	0	0	0	0	0	0
17	Textiles	1	115	0	0	1	35	3	197	0	0	1	1,382
18	Wearing apparel and fur	0	0	0	0	2	193	3	44	0	0	0	0
19	Leather products & footwear	0	0	0	0	1	3	0	0	0	0	0	0
20	Wood & cork (not furniture)	4	57	3	77	4	528	6	131	1	19	1	2
21	Pulp, paper & paper products	1	263	0	0	1	31	0	0	0	0	2	4
22	Publishing, printing & reproduction of recorded media	3	719	0	0	0	0	2	0	0	0	1	91
23	Coke, refined petroleum products and nuclear fuel	1	1,163	0	0	0	0	0	0	0	0	0	0
24	Chemicals & chemical products	10	5,813	2	62	3	2,454	5	451	2	48	2	200
25	Rubber & plastic products	9	2,066	0	0	4	1,805	10	3,383	0	0	1	1,055
26	Non-metallic mineral products	5	92	0	0	4	57	5	224	2	5	3	100
27	Basic metals	10	1,559	0	0	3	200	8	1,158	0	0	1	181
28	Fabricated metal products	26	3,914	2	19	11	1,497	20	1,693	7	114	6	297
29	Machinery	60	32,679	1	46	15	2,059	30	5,962	3	92	8	7,366
30	Office, acc. & comp. machinery	2	5,107	0	0	0	0	4	903	0	0	1	5
31	Electrical machinery and apparatus n.e.c.	9	1,476	0	0	1	2,186	6	3,174	1	31	3	127
32	Radio, TV and communications equipment and apparatus	10	32,594	1	8	0	0	6	322	1	3	2	91
33	Medical, precision and optical instruments, watches and clocks	24	4,585	1	3	2	1,281	13	1,947	3	42	1	397
34	Motor vehicles and parts	5	561	0	0	2	67	2	34,707	0	0	0	0
35	Other transport equipment	2	4,839	0	0	0	0	1	1	0	0	0	0
36	Other manufacturing n.e.c.	8	2,459	1	0	1	45	5	186	0	0	1	180
37	Recycling	0	0	0	0	0	0	1	2	1	2	0	0

... Table A2-3 concluded

		2005: Allowance for Inventions (§4 para. 4Z4a Income Tax Act)						2005: Frascati Allowance (§4 para. 4Zb Income Tax Act)					
		Corporate Tax		Income Tax				Corporate Tax		Income Tax			
				Individual Person		Partnership				Individual Person		Partnership	
ÖNACE	Industry	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
40-41	Electricity, gas and water supply	0	0	2	45	0	0	1	41	0	0	1	6
45	Construction	12	1,164	2	11	2	139	9	313	3	12	1	219
50-52	Wholesale, retail trade and motor vehicle repair	34	27,367	14	96	9	543	34	6,375	8	74	8	477
55	Hotels and restaurants	0	0	0	0	0	0	0	0	1	0	0	0
60-64	Transport, storage and communications	0	0	0	0	0	0	1	10	0	0	0	0
65-67	Financial intermediation & insurance	1	632	2	3	1	40	1	3	0	0	0	0
70-71	Real estate and renting	5	190	10	228	0	0	7	362	7	154	1	13
72	Computer, software consultancy and supply	22	3,662	5	173	5	313	22	1,084	12	87	13	590
73	Research and development	8	1,535	8	401	3	1,258	5	915	17	164	2	23
74	Business services	43	5,827	38	376	10	1,333	48	2,465	40	327	7	97
75-93	Community, social and personal service activities, etc.	1	53	21	111	0	0	3	382	29	331	3	55
	None/missing	0	0	40	613	0	0	0	0	45	411	2	10
1-93	Total	321	141,774	154	2,272	87	17,107	267	66,517	186	1,950	74	12,989

Source: Corporate Tax Statistics 1995-2004; Frascati allowance for 2002 and 2003: Communication from the Federal Statistical Office (Statistics Austria) as of April 3, 2008; All data for 2005: Communication from the Ministry of Finance as of September 11 and October 23, 2008

Note: For companies subject to income tax the sectoral distribution of allowances is available for the year 2005 only.

Table A2-4 Frascati Tax Credit by 2-digit ÖNACE-Industries: 2002 – 2005

Values in € 1,000 at Current Prices

		2002: companies liable for ...						2003: companies liable for ...					
		Corporate Tax		Income Tax		Other		Corporate Tax		Income Tax		Other	
ÖNACE	Industry	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
1	Agriculture, hunting	1	0	0	0	1	-54	1	0	0	0	0	0
2	Forestry	0	0	0	0	0	0	0	0	0	0	0	0
5	Fishery	0	0	0	0	0	0	0	0	0	0	0	0
10-14	Mining & quarrying	0	0	0	0	0	0	0	0	0	0	0	0
15	Food & beverages	0	0	1	0	0	0	4	27	3	2	4	22
16	Tobacco products	0	0	0	0	0	0	0	0	0	0	0	0
17	Textiles	1	-5	0	0	0	0	2	84	1	1	1	19
18	Wearing apparel and fur	0	0	0	0	0	0	0	0	0	0	1	6
19	Leather products & footwear	0	0	0	0	0	0	1	1	1	1	1	16
20	Wood & cork (not furniture)	1	1	0	0	0	0	5	12	2	2	1	3
21	Pulp, paper & paper products	1	0	0	0	0	0	2	26	0	0	0	0
22	Publishing, printing & reproduction of recorded media	1	9	0	0	0	0	2	59	0	0	0	0
23	Coke, refined petroleum products and nuclear fuel	0	0	0	0	0	0	0	0	0	0	0	0
24	Chemicals & chemical products	4	278	0	0	3	-6	14	269	0	0	3	-17
25	Rubber & plastic products	0	0	0	0	0	0	6	80	0	0	0	0
26	Non-metallic mineral products	0	0	0	0	0	0	6	88	0	0	1	3
27	Basic metals	2	-3	0	0	0	0	3	8	0	0	3	98
28	Fabricated metal products	3	6	0	0	1	0	12	150	1	0	3	3
29	Machinery	4	16	0	0	2	11	14	247	1	0	5	-22
30	Office, acc. & comp. machinery	0	0	0	0	1	-88	5	143	0	0	1	1
31	Electrical machinery and apparatus n.e.c.	0	0	0	0	2	91	7	473	1	1	3	168
32	Radio, TV and communications equipment and apparatus	1	1	0	0	0	0	2	1,260	0	0	1	7
33	Medical, precision and optical instruments, watches and clocks	2	-9	0	0	0	0	13	270	0	0	3	229
34	Motor vehicles and parts	0	0	0	0	0	0	3	176	0	0	0	0
35	Other transport equipment	1	-1	0	0	0	0	2	137	0	0	0	0
36	Other manufacturing n.e.c.	0	0	0	0	0	0	7	231	0	0	0	0
37	Recycling	0	0	0	0	0	0	1	9	0	0	0	0

... Table A2-4 continued

		2002: companies liable for ...						2003: companies liable for ...					
		Corporate Tax		Income Tax		Other		Corporate Tax		Income Tax		Other	
ÖNACE	Industry	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
40-41	Electricity, gas and water supply	0	0	0	0	0	0	3	16	0	0	0	0
45	Construction	0	0	0	0	1	-6	8	48	2	6	7	60
50-52	Wholesale, retail trade and motor vehicle repair	3	2	1	-3	1	-195	43	658	5	7	9	667
55	Hotels and restaurants	0	0	0	0	0	0	0	0	2	0	0	0
60-64	Transport, storage and communications	0	0	0	0	0	0	2	484	0	0	1	0
65-67	Financial intermediation & Insurance	1	139	0	0	0	0	2	957	0	0	0	0
70-71	Real estate and renting	1	-1	0	0	0	0	5	82	1	1	0	0
72	Computer, software consultancy and supply	4	-26	1	0	0	0	35	700	8	25	6	13
73	Research and development	6	78	0	0	0	0	21	1,209	4	4	1	8
74	Business services	4	-19	2	1	0	0	30	252	16	51	7	1,939
75-93	Community, social and personal service activities, etc.	2	12	0	0	0	0	6	104	9	7	1	4
	None/missing	0	0	0	0	0	0	1	11	1	0	1	5
1-93	Total	43	477	5	-2	12	-246	268	8,272	58	108	64	3,234

... Table A2-4 continued

		2004: companies liable for ...						2005: companies liable for ...					
		Corporate Tax		Income Tax		Other		Corporate Tax		Income Tax		Other	
ÖNACE	Industry	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
1	Agriculture, hunting	2	124	2	1	1	134	3	128	1	0	2	146
2	Forestry	1	3	0	0	0	0	2	10	0	0	0	0
5	Fishery	0	0	0	0	0	0	0	0	0	0	0	0
10-14	Mining & quarrying	5	368	0	0	2	6	8	466	0	0	1	12
15	Food & beverages	14	113	2	14	4	46	38	531	4	16	8	57
16	Tobacco products	0	0	0	0	1	51	0	0	0	0	1	75
17	Textiles	5	235	1	0	5	86	14	1,462	1	0	6	79
18	Wearing apparel and fur	0	0	0	0	2	7	2	61	0	0	2	7
19	Leather products & footwear	3	8	0	0	1	85	3	44	0	0	1	59
20	Wood & cork (not furniture)	11	447	5	11	8	19	23	346	6	16	8	55
21	Pulp, paper & paper products	6	188	0	0	0	0	15	1,533	0	0	1	113
22	Publishing, printing & reproduction of recorded media	6	336	1	5	0	0	8	408	0	0	2	16
23	Coke, refined petroleum products and nuclear fuel	0	0	0	0	0	0	1	9	0	0	0	0
24	Chemicals & chemical products	20	13,205	0	0	6	1,257	71	18,630	0	0	12	1,783
25	Rubber & plastic products	14	174	0	0	2	470	32	756	0	0	4	618
26	Non-metallic mineral products	13	352	1	0	3	23	29	1,171	1	0	5	792
27	Basic metals	10	647	1	1	4	117	31	1,404	1	1	9	352
28	Fabricated metal products	33	1,141	5	33	6	820	71	3,837	8	11	15	1,781
29	Machinery	60	13,771	2	9	14	698	123	21,628	3	5	31	2,512
30	Office, acc. & comp. machinery	8	566	0	0	0	0	17	1,492	0	0	0	0
31	Electrical machinery and apparatus n.e.c.	23	3,789	2	1	11	15,909	39	4,468	2	2	14	18,161
32	Radio, TV and communications equipment and apparatus	18	26,545	0	0	4	93	23	25,686	0	0	6	276
33	Medical, precision and optical instruments, watches and clocks	26	861	2	7	7	352	52	15,112	2	5	12	1,265
34	Motor vehicles and parts	7	512	0	0	4	2,546	13	5,294	0	0	6	3,462
35	Other transport equipment	3	227	0	0	1	5,451	3	82	0	0	3	4,764
36	Other manufacturing n.e.c.	15	609	2	1	4	47	29	1,658	1	0	2	28
37	Recycling	1	68	0	0	0	0	3	64	0	0	0	0

... Table A2-4 concluded

		2004: companies liable for ...						2005: companies liable for ...					
		Corporate Tax		Income Tax		Other		Corporate Tax		Income Tax		Other	
ÖNACE	Industry	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount	Cases	Amount
40-41	Electricity, gas and water supply	9	789	0	0	3	1,248	16	883	1	50	5	2,323
45	Construction	38	1,106	7	13	11	491	68	1,412	5	9	19	524
50-52	Wholesale, retail trade and motor vehicle repair	101	2,309	18	42	25	1,834	219	9,319	22	30	29	532
55	Hotels and restaurants	0	0	2	0	0	0	2	4	1	0	1	0
60-64	Transport, storage and communications	6	2,583	0	0	0	0	7	1,627	0	0	1	22
65-67	Financial intermediation & insurance	3	2,763	0	0	0	0	9	4,758	2	0	1	9
70-71	Real estate and renting	11	344	5	8	0	0	13	463	5	22	1	34
72	Computer, software consultancy and supply	126	4,167	23	73	17	647	208	7,957	17	47	18	2,949
73	Research and development	63	7,801	12	27	7	2,995	91	10,828	13	25	9	3,212
74	Business services	108	5,311	25	83	16	5,077	204	10,084	38	177	20	3,682
75-93	Community, social and personal service activities, etc.	13	626	23	36	2	6	36	1,287	18	19	3	127
	None/missing	4	327	2	41	1	221	10	1,344	5	33	4	532
1-93	Total	786	92,411	143	406	172	40,737	1536	156,246	157	469	262	50,358
					Of which Tax Credit for Contract R&D			85	449	4	2	19	86

Source: Communication from the Federal Ministry of Finance dated June 19, 2008;

Table A2- 5: R&D Tax Allowances in 2005 — Distribution by Size Classes

Values in € 1,000 at Current Prices

	Allowance for "inventions useful to the economy" (§4 para. 4Z4a Income Tax Act)					
	Corporate Tax		Income Tax			
			Individual Person		Partnership	
Size Classes:	Cases	Amount	Cases	Amount	Cases	Amount
No employees	8	1,085	60	414	7	1,166
Up to 5 employees	27	3,478	51	763	9	2,195
6-49 employees	34	2,895	21	376	8	268
50-100 employees	71	7,297	17	633	17	583
101-249 employees	31	2,288	5	88	9	353
250-500 employees	77	14,099	0	0	22	6,049
More than 500 employees	73	110,631	0	0	15	6,493
Total	321	141,774	154	2,272	87	17,107

	Frascati Allowance (§4 para. 4Z4 Income Tax Act)					
	Corporate Tax		Income Tax			
			Individual Person		Partnership	
Size Classes:	Cases	Amount	Cases	Amount	Cases	Amount
No employees	6	150	70	340	0	0
Up to 5 employees	34	1,810	65	707	10	152
6-49 employees	23	456	22	392	8	1,523
50-100 employees	86	3,050	26	435	27	1,033
101-249 employees	31	1,747	2	46	4	178
250-500 employees	41	6,465	1	31	13	1,075
More than 500 employees	46	52,839	0	0	12	9,028
Total	267	66,517	186	1,950	74	12,989

	Allowance for contract R&D (§4 para. 4Zb Income Tax Act)					
	Corporate Tax		Income Tax			
			Individual Person		Partnership	
Size Classes:	Cases	Amount	Cases	Amount	Cases	Amount
No employees	3	35	12	126	3	1
Up to 5 employees	0	0	15	97	3	25
6-49 employees	1	13	3	60	4	1
50-100 employees	8	54	6	26	17	95
101-249 employees	4	82	0	0	3	2
250-500 employees	4	81	0	0	5	173
More than 500 employees	6	122	0	0	3	66
Total	26	388	36	309	38	364

Source: Communication of the Federal Ministry of Finance as of June 13, September 11 and October 23, 2008.

Table A2-6: R&D Tax Credits in 2005 — Distribution by Size Classes[1)]

Values in € 1,000 at Current Prices

	Frascati Tax Credit (§108c and §4 para. 4Z Income Tax Act)		*Tax Credit for Contract R&D (§108c and §4para.. 4Zb Income Tax Act)*	
Size Classes:	Cases	Amount	Cases	Amount
No employees	151	9,052	13	39
Up to 5 employees	314	5,662	24	108
6-49 employees	663	15,346	37	215
50-100 employees	211	10,285	7	37
101-249 employees	245	22,967	13	42
250-500 employees	143	20,623	9	50
More than 500 employees	130	122,520	6	46
Total	1857	206,453	109	537

Source: Communication of the Federal Ministry of Finance dated July 3, 2008

Note: [1)] Breakdown by type of ownership is not available.

Table A2-7: Industry by Technology Intensity

Primary sector	1 Agriculture, Hunting
	2 Forestry
	5 Fishery
	10-14 Mining & Quarrying
Low Tech Industries	15 Food & Beverages
	16 Tobacco products
	17 Textiles
	18 Wearing apparel and fur
	19 Leather products & footwear
	20 Wood & Cork (not furniture)
	21 Pulp, Paper & Paper products
	22 Publishing, Prining & Reproduction of recorded Media
	36 Other Manufacturing n.e.c.
	37 Recycling
Medium-Low Tech Industries	23 Coke, Refined Petroleum Products and Nuclear Fuel
	25 Rubber & Plastic Products
	26 Non-metallic Mineral Products
	27 Basic Metals
	28 Fabricated Metal Products
Medium-High Tech Industries	24 Basic Chemicals
	29 Machinery
	31 Electrical Machinery and Apparatus n.e.c.
	34 Motor Vehicles and parts
	35 Other Transport Equipment
High Tech Industries	30 Office, Accounting & Computing Machinery
	31 Electrical Machinery and Apparatus n.e.c.
	32 Radio, TV and communications equipment and apparatus
	33 Medical, Precision and Optical Instruments, Watches and Clocks

	Services
Non-Knowledge Intensive Services	40-41 Electricity, Gas and Water Supply
	45 Construction
	50-52 Wholesale, retail trade and motor vehicle repair
	55 Hotels and restaurants
	75-93 Community, social and personal service activities, etc.
Knowledge Intensive Services	60-64 Transport, storage and communications
	65-67 Financial intermediation & Insurance
	70, 71 Real estate and renting
	74 Business Services
Top-Technology Using Knowledge Intensive Services	72 Computer, Software consultancy and supply
	73 Research and Development

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