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**Article**

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# TAXING MEANS OF AGRICULTURAL PRODUCTION IN GERMANY: A RELATIVELY HIGH TAX BURDEN COMPARED TO OTHER IMPORTANT EU COMPETITORS

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## Introduction

This study<sup>1</sup> examines the taxation of specific means of agricultural production (fertilisers, pesticides, mineral oil products, gas and electricity) in selected EU Member States. The first part highlights the fiscal aspect and describes the legal differences that prevail in the investigated countries. The determination of the tax burden resulting from these different regulations is the second central issue.

The EU Member States exhibit large differences in their tax systems. These discrepancies are not only visible in a different emphasis on both direct and indirect taxes, but also within one tax due to the various definitions of tax bases, tariffs, tax rates etc. These findings also apply to the taxation of agriculture in general and to the taxation of means of agricultural production in particular.

An overview of the tax burden of agricultural inputs in selected EU countries is of particular interest in light of the increasing competition in the agricultural sector following the introduction of the euro. Moreover, the forthcoming EU enlargement and the accession of highly agriculturally oriented countries will lead to further problems.

Therefore, it is necessary to identify the tax distortions occurring in the agricultural sector and to correct them via a political consensus at the EU level. If

such a change does not seem to be plausible or can not be achieved, Germany should, on the one hand, react by adjusting its national tax policies to counteract the effects of the increasing tax competition. On the other hand, pursuing a pan-European solution regarding the taxation of the more problematic agricultural means of production (problematic in the sense of critical from an environmentally-friendly perspective) is advisable for Germany. Additionally, it is also interesting for German agricultural policy to identify the extent to which a reorientation and restructuring of agriculture by tax policy measures can be effectively realised. Some EU countries have already started taxing means of agricultural production more heavily for environmentally-friendly purposes, some time ago. These countries levy taxes on agricultural inputs, which have thus far been tax exempt in Germany. In this context, the question to be addressed is whether these countries achieved the desired goals by tax policy measures, that is, whether employing such instruments can lead to a reorientation of agriculture.

The following taxes and excise duties are the focus of this study

- taxes on fertilisers and pesticides
- vehicle taxes
- mineral oil taxes
- taxes on gas and electricity.

The surveyed countries are Austria, Denmark, France, Italy, Netherlands, Sweden and the United Kingdom.

## Similarities and differences in relevant tax rules

The following table (p. 50–51) provides an overview of all taxes and levies on agricultural means of production prevailing in the countries under consideration.

As can be seen, only Denmark and Sweden levy a tax on *fertilisers*. Danish agriculture follows a quota system while Sweden applies the usual national tax rate on fertilisers. Moreover, both countries as well as France also impose a *pesticide* tax. The only country charging taxes on *antibiotics* and growth promoters is Denmark.

Regarding the *vehicle* taxation, all countries in the survey (except Denmark which applies a reduced rate) provide tax exemptions for all types of agricultural businesses.

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<sup>1</sup> This article is based on the study "The Taxation of Means of Agricultural Production: A Comparative Analysis of Selected EU Countries". The study was conducted by the public finance department of the Ifo Institute for the German Federal Office for Agriculture and Food and completed in November 2003 (Parsche et al. 2003).

The taxation of *fuels* is characterised by large differences among countries. All apply such an excise duty, although agriculture is treated differently at the national level:

- A somewhat complicated system exists in Denmark and Sweden where there are three different kinds of excise duties levied on fuels: energy tax, carbon dioxide tax and sulphur tax.
- German agricultural enterprises do not have to pay any taxes on Diesel oil. Agricultural vehicles apply a constant “Agrardieselsteuersatz”.<sup>2</sup>
- France, Italy and the United Kingdom tax mineral oil for agricultural businesses only at a reduced rate. Only Austrian agricultural businesses do not enjoy any tax relief in this category.

The following characteristics apply to the taxation of *fuel for heating purposes*:

- The Danish excise duty on heating oil is subject to the energy tax as well as to a carbon dioxide and a sulphur dioxide tax component. Agricultural businesses are subject to the normal tax rate.
- German and Swedish agricultural enterprises receive a tax relief whereas France, the United Kingdom, Italy, the Netherlands and Austria subject heating oil in the agricultural sector to the normal tax rate.

The taxation of *electricity* displays the following features in the investigated countries.

- Denmark levies an energy tax as well as a carbon dioxide and a sulphur tax on electricity. The agricultural sector is subject to the normal tax rate, as in Italy, France and in the United Kingdom. Similar provisions are in force in Austria, where agricultural entities can apply for an allowance for duties paid.
- The German electricity tax act provides a reduced tax rate for agricultural entities starting from a minimum annual tax burden.
- Swedish farmers can apply for a tax rebate starting from a minimum energy consumption.

Finally, we consider the taxation of *gas*.

- German and British agricultural firms are liable to the national tax rate on gas. However, Germany provides a tax rebate for agricultural

enterprises if they use gas for heating purposes only.

- Denmark refunds 100 percent of the energy tax and 10 percent of the CO<sub>2</sub> tax and similar arrangements apply to Sweden as well.
- French agricultural entities are subject to the normal tax rate, however, as this tax is paid only at an annual consumption of 5 Mio. kWh and above, one can assume that normal agricultural entities with a low gas consumption do not actually have to pay this tax.
- Italian, Austrian and Dutch agricultural firms are liable to the normal tax regime and only marsh gas in Italy is subject to a reduced tax rate.

The environmentally-friendly tax regulations aim at providing incentives for farmers to pursue an increasingly non-polluting behaviour by reducing the use of fertilisers and pesticides. Several surveys on the effects of such regulations show that these taxes would have to be increased to a large extent to attain a further reduction of the employed means of production (Brockmeier et al. 1994, Carpentier and Salanié 1999 and Hoevenagel and Noort 1999).

The revenues from ecological taxes are often earmarked for specific purposes in the examined countries. For instance, Italy and the Netherlands spend part of these revenues on environmental projects. A further fraction is used within the framework of ecological tax reform. To reduce the burden on labour, these tax revenues enable the reduction of employer contributions for social insurance. From a fiscal perspective such appropriations are questionable. The non-affectation principle forbids linking public spending to the revenue from a particular tax. Thus, it calls for independent preferences on the revenue and on the spending side, with regard to the priorities set. This requirement is only emulated by Sweden. In this country, the receipts from the pesticides and fertilisers tax flow into the general budget. Environmental control measures and support programmes are then financed out of the general budget.

### **Tax burden comparison on the basis of German agricultural model enterprises**

The foregoing European-wide survey reveals that these countries tax the employed means of produc-

<sup>2</sup> Germany has also introduced a sulphur tax starting as of 1 November 2001. As a first step, a sulphur tax of 1.5 cent/l on fuels (petrol and diesel oil) with more than 50 mg sulphur per kg fuel was introduced. The assessment threshold was reduced to 10 mg sulphur per kg, effective 1 January 2003. However, the sulphur tax lost its tax base in both cases since the mineral oil industry reduced the sulphur content of its products accordingly to less than 10 mg/kg.

Tax regulations of agricultural means of production

	Germany	Denmark	France	United Kingdom	Italy	Netherlands	Austria	Sweden
Tax on fertilisers	No	Quota system or exemption	No	No	No	No	Abolished 1994	€ 0.198/kg nitrogen. € 3.291/kg cadmium
Pesticide tax	No	Depending on the substance for pest control	7 categories of noxiousness	No	No	No	No	€ 2.185/kg active constituent
Tax on antibiotics and growth promoters	No	Depending on the employed substance	No	No	No	No	No	No
Vehicle tax	Exemption	Reduced tax rate: € 8.75	Exemption	Exemption	Exemption	Exemption	Exemption	Exemption
Excise duty on diesel oil for agricultural commercial vehicles	For 2002 and 2003: Normal tax rate less tax allowance The remainder is € 255.60 per 1000 l, that is € 0.2556/l	Tax rate for agriculture 2002 and 2003: € 0.0327/l	A reduced tax rate on diesel oil applies to agriculture; this rate amounts to the rate on heating oil: 2002 and 2003: € 0.0566/l	A so-called "red diesel" is employed in agriculture: 2002: € 0.0438/l 2003: € 0.0588/l	General tax rate for 2002 and 2003: € 0.40324/l Agriculture is however liable only for up to 22% of the usual tax rate: € 0.0887/l	2002: € 0.1918/l 2003: € 0.1970/l Light fuel oil (sum of compulsory stock levy, regulatory energy tax, reduced excise duty on mineral oil).	For 2002 and 2003: general tax rates, no tax relief. € 0.282/l	Sum of energy and CO <sub>2</sub> -tax, no sulphur tax 2002: € 0.3425/l 2003: € 0.3487/l
Excise duty on light fuel oil used for heating purposes	Normal tax rate 2002 + 2003: € 61.35 per 1000 l Allowance*: 2002: 16.36 per 1000 l 2003: 8.18 per 1000 l	Tax rate for agriculture: 2002 and 2003: € 0.284/l	No tax relief for agriculture: 2002 and 2003: € 0.0566/l	No tax relief for agriculture, normal tax rate: 2002: € 0.0382/l 2003: € 0.0521/l	Agriculture is subject to the normal tax rate: 2002 and 2003: € 0.1509/l	2002: € 0.1918/l 2003: € 0.1970/l Light fuel oil (sum of compulsory stock levy, regulatory energy tax, reduced excise duty on mineral oil).	Oil used for heating purposes: € 0.042/l	Light fuel oil for heating purposes is subject to only 25% of the general CO <sub>2</sub> -tax. 2002: € 0.0591/l 2003: € 0.0597/l
Electricity tax	Normal tax rate 2002: € 0.0179/kWh 2003: € 0.0205/kWh up to a tax burden of 51.1 per calendar year, above reduced tax rate 2002: 20% of the regular tax rate; 2003: 60% of the regular tax rate; € 0.0123/kWh	Tax rate for agriculture: 2002 and 2003: € 0.0756/kWh	Tax rates on electricity locally by the communes and the départements. They are not allowed to exceed 8% for the communes and 4% for the départements. No tax relief for agriculture.	No tax relief for agriculture, normal tax rate: 2002 and 2003: € 0.0090/kWh	There are no exceptions for agriculture: 2002 and 2003: 0.0031 €/kWh Important to notice: There are surcharges levied by municipalities – between € 0.0185 and € 0.02/kWh – and by provinces – € 0.009/kWh – A average amount: € 0.03135/kWh	Electricity is subject only to the regulatory energy tax < 10.000 kWh 2002: € 0.0601/kWh 2003: € 0.0639/kWh 10.000-50.000 kWh 2002: € 0.0200/kWh 2003: € 0.0207/kWh > 50.000 kWh 2002: € 0.0061/kWh 2003: € 0.0063/kWh	General tax rate: € 0.015/kWh Large agricultural enterprises can apply for an allowance for energy taxes paid.	Electricity consumption for normal use: 2002: € 0.0217/kWh 2003: € 0.0249/kWh If electricity is used for agricultural purposes, the tax paid above 1000 SEK (€ 109.7) can be refunded.

Continued

	Germany	Denmark	France	United Kingdom	Italy	Netherlands	Austria	Sweden
Tax on gas used for heating purposes	Normal tax rate 2002: € 0.0035/ kWh 2003: € 0.0055/ kWh Allowance*: 2002: € 0.0013/kWh 2003: € 0.0015/kWh	Tax rate for agriculture 2002 and 2003: Natural gas € 0.0021/kWh Liquified petroleum gas: € 0.0026/kWh	Agriculture is subject to the normal taxation: 2002 and 2003: Natural gas € 0.0012/kWh Tax is levied only starting from an annual consumption above 5 Mio. kWh. Liquified petroleum gas € 0.0/kWh	No tax relief for agriculture; Normal tax rate: 2002 and 2003: Natural gas € 0.0021/kWh Liquified petroleum gas € 0.00096/kWh	No special tax relief for agriculture: 2002 and 2003: Marsh gas € 0.00096/kWh Liquified petroleum gas € 0.01357/kWh	Natural gas is subject to both the compulsory stock levy and the regulatory energy tax. 5,000-170,000 m <sup>3</sup> 2002: € 0.0053/kWh 2003: € 0.0055/kWh	General tax rate for gas. 2002 und 2003: Natural gas € 0.003535/kWh Liquified petroleum gas € 0.00307/kWh	Reduced rate for agriculture: 2002 (2003): Natural gas € 0.0034 (0.0034)/kWh Liquified petroleum gas € 0.0044 (0.0045)/kWh
Liquid petroleum gas	Normal tax rate 2002: € 38.34/1000 kg 2003: € 60.60/1000 kg Allowance*: 2002: € 10.22/1000 kg 2003: € 14.02/1000 kg	100% refund of the energy tax and 10% refund of the CO <sub>2</sub> tax.		Liquified petroleum gas € 0.00096/kWh		170,000-1 million. m <sup>3</sup> 2002: € 0.0016/kWh 2003: € 0.0017/kWh	Large agricultural enterprises can apply for an allowance for energy taxes paid	Refund possibilities (see energy tax) 100% of the E-tax and 25% of the CO <sub>2</sub> tax.

**Allowance:** There is no tax rebate for the tax on mineral oil if the allowance for light heating oil, natural gas and liquid gas does not exceed a threshold of € 205.00.

Source: Mennel and Förster (2002); OECD; Eco-Tax Database; European Commission (2002); ECOTEC Research and Consulting (2001); Inventar der Steuern (2000); for country sources see the ones specified under country-specific references.

tion, however there are major differences in the tax base in general, in the tax exemptions in particular and in the de facto applied tax rates.

A simple examination of the general body of tax rules (including the beneficial individual regulations) is not a proper method of assessing the actual tax burdens prevailing in the considered countries. Such a method does not permit international comparisons, and thus we undertook several computations on the basis of well-defined model cases.

In defining these model examples it is important to address the question of the exact scope of the analysis, since tax burden comparisons can be carried out from different perspectives. Accordingly, one can build model enterprises for each particular country and determine the respective national tax burden. Such an analysis would show how typical German farms are taxed, compared to typical French or Italian farms, whereas the purpose of this study is to show what kind of a tax burden a German farm would face in each of the surveyed countries. Such a comparison does not give any insight into how exactly a typical French or Italian farm is taxed. It identifies, however, which tax burden would arise for German farms if they applied the foreign tax laws. This type of analysis is particularly important in the light of the increasing demand to adopt foreign regulations into German tax law. An adequate evaluation requires both a thorough assessment of individual advantageous regulations as well as of the tax burden as a whole (Parsche et al 2001).

In connection with the model calculations it is meaningful to use profits of enterprises as the benchmark, especially for a comparison of income taxes in the EU (Parsche and Steinherr 1995). The examination of production taxes should rather involve the use of the so-called size range of economic entities (ESU = European Size Units).<sup>3</sup> Two main reasons support such a classification of agricultural enterprises. The first is the professional context: For a comparative study of national production taxes one should draw on enterprises of equal capacity or with the same volume of production. The second important reason relates to statistical data which usually employ the ESU for classifications.

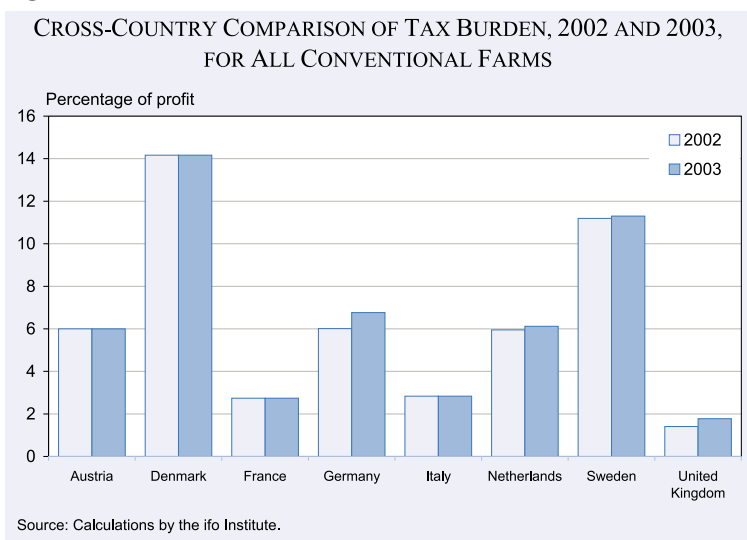
<sup>3</sup> European Size Units (ESU's) are a measure of farm business size where 1 ESU is equal to 1,200 ECU (Euro) of Standard Gross Margin.

The following comparison serves as an indicator for both the magnitude and the composition of the tax burden on agricultural entities. A proper comparability is ensured by taking the production circumstances of German agricultural firms of different production profiles and size as a starting point.<sup>4</sup> Accordingly, the replication of these enterprises using the available data is the calculation basis for the cross-country tax burden comparison. Thus we investigated the taxation of the selected production means in the three different types of agricultural production: farming, milk production and processing entities as well as the production means of all agricultural entities, including those with other production specifics. The data base is derived from the Nutrition and Agricultural Policy Report by the Federal Ministry of Consumer Protection, Food and Agriculture 2003.<sup>5</sup>

A further comparison examines the taxation of conventional versus ecological agricultural entities. Figure 1 shows the results of the analysis of model agricultural enterprises and reveals a clear increase in the tax burden of German farms between 2002 and 2003. Only the Danish and Swedish tax regulations lead to a high burden on profits of agricultural companies of 14.2 percent and 11.2 percent respectively. This is basically the result of the high taxation on heating oil, natural gas and electricity in these countries. The tax rates applied in Germany, the Netherlands and Austria lead to a tax burden on profits that is slightly below average (6.3 percent). British tax regulations pose the lowest burden, although the year-to-year increase of approx. 25 percent is quite remarkable. Apart from the extremely high tax burdens in Denmark and Sweden, German

<sup>4</sup> This paper investigates only entities with different production profiles. The study mentioned in footnote 1 also features the effects on enterprises of different size.  
<sup>5</sup> See <http://www3.verbraucherministerium.de/index0002559>  
 CCADA1EC8AAD56520C0A8E066.html.

**Figure 1**

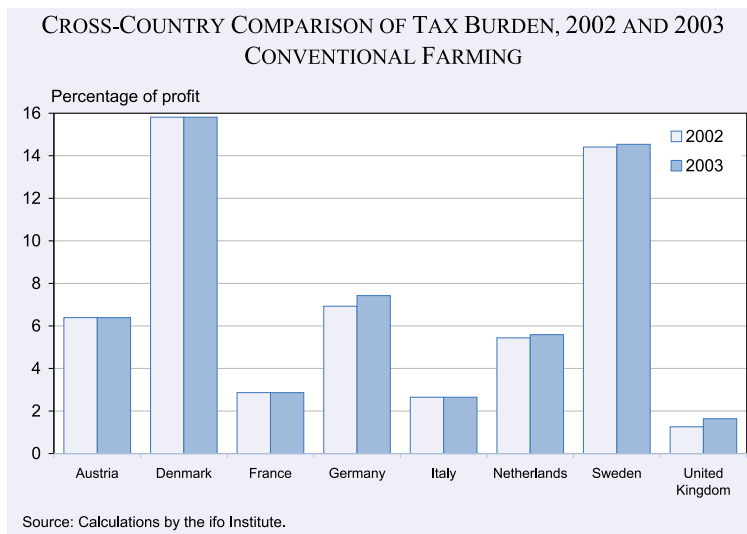


tax regulations result in a relatively high taxation particularly in comparison to important competitors in the agricultural sector such as France, Great Britain and Italy.

A detailed examination of farming, milk production and processing entities delivers essentially similar results. The tax burden in farming (Figure 2) is consistently above the level of the model companies taken altogether. The high Swedish tax burden can be attributed to the rather high taxation of fertilisers and pesticides.

The counterpart to farming is dairy farming. They are subject to the lowest tax burden of all examined sectors (Figure 3). This is particularly because the analysed means of production are only used to a limited extent. Fuel oil, gas and electricity play a subor-

**Figure 2**



dinate role in milk production and only diesel fuel is employed in extensive amounts. This situation results in a lower tax burden on profits of Danish dairy farms compared to other agricultural entities since diesel fuel is subject to a much lower tax rate than the other means of production.

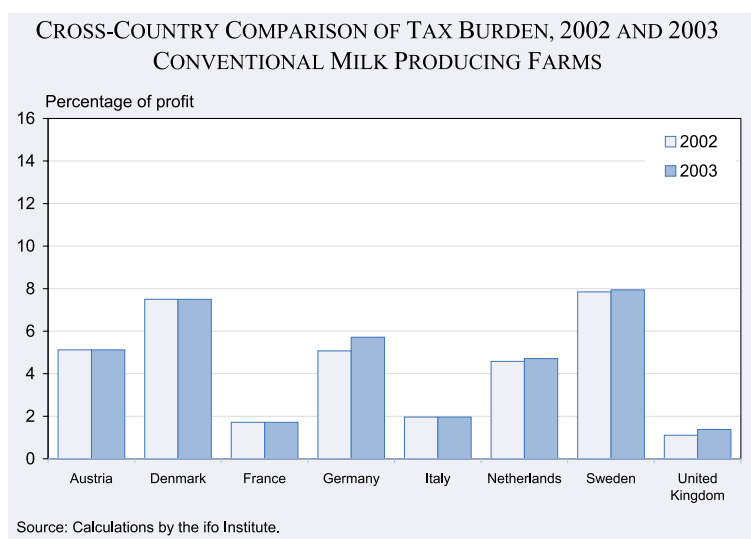
A cross-country comparison of farm processing entities leads to a relatively homogeneous picture if one does not take Denmark into account (Figure 4). It is precisely the Danish tax burden which deviates from those of the other countries. This is a result of the extensive use of fuel oil, natural gas and electricity as sources of energy, all of which are subject to heavy taxation. Such a tax treatment clearly raises the average tax burden of processing farms.

With regard to the tax-burden comparison of ecological and conventional farms a rather surprising result for Germany is observed at first glance. The ecological model farms face a much higher burden of taxation on profits than comparable conventional ones (Figure 5). This is mainly the consequence of the high taxation of diesel oil in Germany. Thus, this is a very important factor for German ecological farms since their cultivated areas are about one third larger than those of conventional farms. Similar results apply, albeit on a smaller scale, with respect to Austrian tax regulations. In all the other surveyed countries ecological farms face a lower or equal tax burden than conventional farms.

**Conclusion**

The purpose of this study is to give an overview of the diversity of tax burdens on the examined agricultural entities. This investigation enables us to identify possible distortive effects of taxation on a country's competitiveness. An overview of the tax burden of agricultural inputs in selected EU countries is of particular interest in the light of the

**Figure 3**

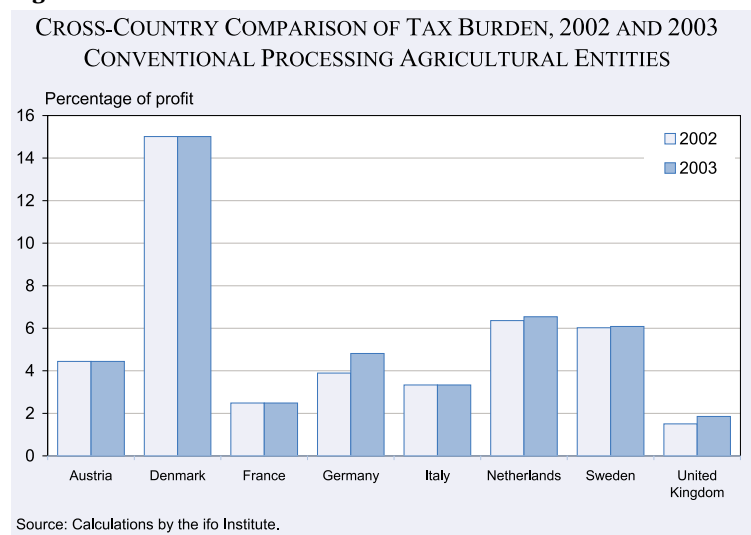


increasing competition in the agricultural sector following the introduction of the euro. Moreover, the forthcoming EU enlargement and the accession of countries with a high agricultural orientation will lead to further problems.

The determination of the tax burden resulting from the different regulations and related to the profit of a model agricultural entity is thus a central issue. The analysis shows, for instance, that German tax regulations lead to a high tax burden on the employed production factors compared to important competitors in the agricultural sector such as France or Italy.

Moreover, this study provides a solid foundation for the present discussion regarding the effects of taxes as steering devices towards the restructuring

**Figure 4**



of the agricultural sector. We therefore show which countries employ ecological taxes and what kind of instruments tend to be primarily used. In general, the findings suggest that the tax regulations on agricultural means of production do result in clear differences in the tax burdens. The German, Swedish and Danish regulations lead to rather high burdens. Surprisingly, it appears that environmentally-friendly agricultural entities are more heavily taxed than conventional ones in Germany. Moreover, it is shown that applying ecological taxes on agricultural inputs did not achieve the desired results. However, it can be asserted that without such taxes and excise duties, the burden on cultivated fields derived from fertilisers and pesticides would be above the present levels.

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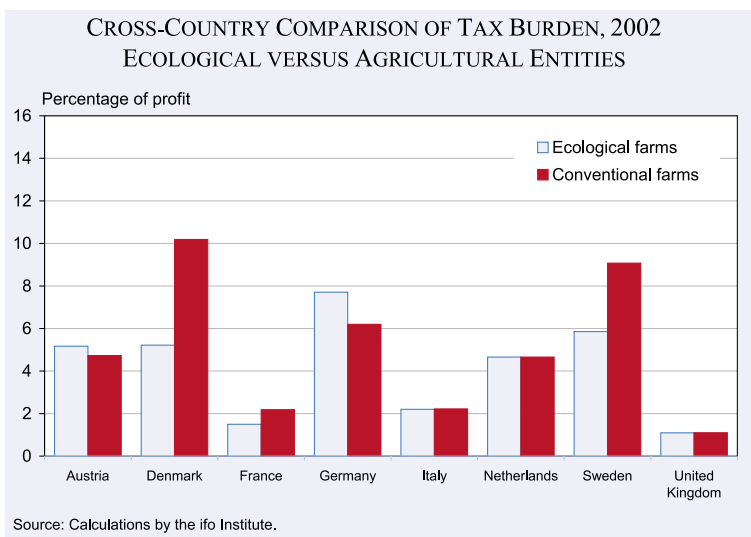
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**Figure 5**



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