

**SVI 1999/317**

**Taxation of cars with a bonus malus system**

**(Besteuerung von Autos mit einem Bonus  
Malus System)**

## Summary

### Defining the tasks and objectives

The present study goes more into detail than existing treatises on the subject of the bonus/malus system, and makes use of the canton of Ticino as a concrete example. It is unable to offer definitive recommendations however, as too many political questions remain unanswered. These are alluded to briefly, with an indication as to the amount of "room for manoeuvre". On the critical question of introducing an actual bonus/malus system this study looks at nine different approaches and assesses the likely effects in each case. Other aspects covered include the legal basis, the data structure for financing and assessing the impact, the administrative aspects of implementation and flanking measures in the area of marketing.

In the summer of 2001 the canton of Ticino launched a new four-year programme for the promotion of "efficient vehicles" (VEL2). A follow-up, cost-neutral bonus/malus system (VEL3) would subsequently offer financial incentives to automobiles with low CO<sub>2</sub> emissions. A parliamentary initiative in this sense is currently under consideration by the Swiss federal government.

### Legal basis

The cantons have the legal authority to introduce a bonus/malus system for vehicles of all kinds, insofar as the federal government does not exercise its prior right to do so. Such a possibility has already been ruled out by the federal government in its message to parliament on the subject of the federal energy law. The legal basis still has to be created at the cantonal level: a bonus/malus system based on the motor vehicle tax would merely require amendment of existing legislation, whereas an entirely new law would be required for a system linked to a vehicle's first registration. In the first case a dual taxation system would be necessary, due to the incomplete availability of specific CO<sub>2</sub> emission figures for all vehicles, so that vehicles registered prior to 1997 would continue to be taxed according to the existing formula.

## Approaches

Three basic approaches are possible:

**A** A bonus/malus system based on the existing instrument of the **motor vehicle tax**

**B** A new tax at the time of the **1<sup>st</sup> registration**

**AB Combining** A and B: a malus at the level of the motor vehicle tax, a bonus as a contribution to the purchase price.

The impact of a bonus/malus system is considerably greater at the time of the first registration of a vehicle than is the case with the motor vehicle tax solution, since the former can have a direct influence on the decision to purchase the vehicle. The motor vehicle tax on the other hand has less of a psychological impact on the buying decision, being an annual tax. Finally, the effect of any such measure naturally depends to a great extent on the rate of the tax, and political acceptability plays a decisive role in determining this.

On the assumption that most people who want to buy a car have a basic type in mind (compact, an estate car or van, a de luxe vehicle, etc.) and will only consider the argument of consumption in that context, the question of further differentiation arises. It is with this in mind that a total of nine approaches have been prepared and assessed, as presented in the chart.

Differentiation	Approach A (motor vehicle tax)	Approach B (1 <sup>st</sup> registration)	Approach AB (combination of A/B)
Power rating + total weight (existing)	<b>A0</b>		
No differentiation	<b>A1</b>	<b>B1</b>	<b>AB1</b>
Power rating (kW)	<b>A2</b>	<b>B2</b>	<b>AB2</b>
Unladen weight (kg)	<b>A3</b>	<b>B3</b>	<b>AB3</b>

The formulae for the approaches are defined in such a way that a third of purchasers benefit from a bonus (and about two thirds suffer a malus). The benchmark limitation for specific CO<sub>2</sub> emissions has been set at 173 g/km.

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The following maximum values should not be exceeded, bearing in mind the need for political acceptability. Whether or not the discretionary benchmark figures given below prove to be politically acceptable will be revealed only within the next few years in political discussions.

	Motor vehicle tax	1 <sup>st</sup> registration
Maximum bonus	CHF 800	CHF 6,000
Maximum malus	Doubling of the present tax rate	CHF 4,000

The following table gives the most important results for each of the nine approaches.

	Highest bonus	10% receive at least	Highest malus	10% pay at least	Average value (sales weighted)	Total malus	Total bonus
<b>A0</b>	--.--	--.--	<i>1680.--</i>	<i>1144.--</i>	<i>454.--</i>	<i>20.523m</i>	<i>0.--</i>
<b>A1</b>	<i>700.--</i>	<i>226.--</i>	<i>2698.--</i>	<i>1262.--</i>	<i>449.--</i>	<i>23.121m</i>	<i>2.805m</i>
<b>A2</b>	<i>580.--</i>	<i>228.--</i>	<i>4645.--</i>	<i>1044.--</i>	<i>417.--</i>	<i>21.720m</i>	<i>2.866m</i>
<b>A3</b>	<i>818.--</i>	<i>323.--</i>	<i>2708.--</i>	<i>1291.--</i>	<i>440.--</i>	<i>24.324m</i>	<i>4.414m</i>
<b>B1</b>	<b>6000.--</b>	<b>2389.--</b>	<b>3377.--</b>	<b>1614.--</b>	<b>- 36.--</b>	<b>9.944m</b>	<b>10.519m</b>
<b>B2</b>	<b>4189.--</b>	<b>1858.--</b>	<b>6740.--</b>	<b>1297.--</b>	<b>59.--</b>	<b>8.320m</b>	<b>9.262m</b>
<b>B3</b>	<b>5546.--</b>	<b>2014.--</b>	<b>3020.--</b>	<b>1520.--</b>	<b>28.--</b>	<b>10.117m</b>	<b>10.574m</b>
<b>AB1</b>	<b>2500.--</b>	<b>1021.--</b>	<i>2698.--</i>	<i>1218.--</i>		<i>21.766m</i>	<b>4.832m</b>
<b>AB2</b>	<b>644.--</b>	<b>317.--</b>	<i>4849.--</i>	<i>1025.--</i>		<i>21.374m</i>	<b>1.329m</b>
<b>AB3</b>	<b>3059.--</b>	<b>1466.--</b>	<i>2989.--</i>	<i>1429.--</i>		<i>26.108m</i>	<b>8.598m</b>

Figures in **bold type** refer to a bonus/malus at the time of the 1<sup>st</sup> registration (one-off). Figures in *italic* refer to the motor vehicle tax (annual).

The range of amounts is given by these values, which vehicles can exceed or undershoot by a maximum of 10% (the maximum values are isolated cases which are not very representative). For approach A due to the bending of the function curve these values lie in the vicinity of the benchmark with the same order of magnitude as the current motor vehicle tax. A payable (negative) motor vehicle tax (approaches A1 – A3) in 10% of cases amounts to approx. CHF 300 (a year). In the case of a contribution to the purchase price the 10% value is between CHF 4,000 – 6,000 for the bonus. The corresponding malus is in the 2,000 – 3,000 range.

The turnover, i.e. the bonus and malus total, for approaches involving the motor vehicle tax (A1 – A3, AB1 – AB3) is in the range of CHF 3 million. For approaches based on the 1<sup>st</sup> registration (B1 – B3) the value is about CHF 9 million. As the data for the vehicle stock covers only 25% of the actual number of vehicles on the road, the values for the motor vehicle tax correspond more or less to the third year following introduction of the bonus/malus system, when the new assessment formula for old vehicles is applied for the first time with a change of registered user. As time goes on these bonus/malus totals will begin to approach the level of those for 1<sup>st</sup> registrations.

### **Impact assessment**

The theory of price sensitivity holds that the impact of a bonus/malus system in terms of CO<sub>2</sub> reduction will be relatively modest. In the case of the approaches studied here and the maximum values adopted the annual reduction of CO<sub>2</sub> is in the range of a few points per-thousand. The method is indeed appropriate only to a limited extent for this kind of research, for in the first place the experimental values adopted for the "price elasticity" parameter lack a solid basis, and secondly the impact of the flanking measures (e.g. on the behaviour of dealers) cannot be determined. However on the basis of complementary plausibility considerations and canton Lucerne's experience with a tax rebate it can be safely concluded that a significant reduction of CO<sub>2</sub> emissions is a realistic expectation. Given the likely progress of the technology involved, the CO<sub>2</sub> reduction objectives of the federal CO<sub>2</sub> law may thus be considered realistic.

This applies only to CO<sub>2</sub> emissions generated by the private vehicles registered in canton Ticino (this vehicle segment is responsible for 70 per cent of CO<sub>2</sub> emissions caused by Swiss inland

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transport. Neither vehicles in transit nor commercial traffic have been taken into consideration in this context.

Extensive secondary effects are to be expected from any bonus/malus system applied to automobiles, which in general can be credited to the public's increasing awareness of the CO<sub>2</sub> problem. These range from a more energy-saving behaviour when behind the wheel (Ecodrive) to greater utilisation of public transport, the avoidance of unnecessary journeys, and greater use of renewable sources of energy. The arrival in the market of alternative propulsion concepts will play a particularly important role, thanks to the large-scale fleet test with lightweight electric vehicles begun in 1995, VEL2 and to the introduction of the bonus/malus system in canton Ticino,.

### **Administrative aspects**

There are a number of important administrative details to consider when introducing a bonus/malus system. These fall mainly into the following three categories: creation of the necessary legal basis, data collection, setting target values and adapting these. The problems likely to arise are all solvable however. The cantonal highways authority is the most suitable choice for implementation.

### **Advantage and disadvantages of bonus/malus systems**

The following is a general summary of the main advantages and disadvantages to be expected in various contexts from the introduction of a bonus/malus system:

*Advantages and disadvantages of a bonus/malus system:*

- + Instrument for the reduction of CO<sub>2</sub> emissions (accompanied by other measures)
- + Key element of canton Ticino's strategy for the promotion of efficient motor vehicles
- + Greater awareness of the need for sustainable mobility among the general public of Ticino
- + Meets the requirements of the CO<sub>2</sub> law (CO<sub>2</sub> not necessary)
- Need for a new law
- CO<sub>2</sub> reduction depends greatly on flanking measures

- Difficulty of defining a cost-neutral calculation formula when introducing the system (without experimental values)
- Additional administrative costs (can be held within manageable limits if system is carefully planned)

*Bonus/Malus on the basis of motor vehicle tax or 1<sup>st</sup> registration?*

Bonus/malus based on motor vehicle tax (approaches A1 – A3)

- + No new legal basis necessary, but simply amendment to existing legislation
- Requires dual tax system (for old vehicles)
- Requires a negative motor vehicle tax (annual bonus for owner of economic automobile), in order to have sufficient impact

Bonus/malus based on 1st registration (approaches B1 – B3)

- + Has direct impact at decisive moment of purchase
- + Is easier to communicate
- + Eliminates problem of older vehicles
- A completely new system requiring a new legal basis (innovative nature as a positive argument?)
- Involves additional administrative costs

A combination of a bonus with 1<sup>st</sup> registration/malus on motor vehicle tax (approaches AB1 – AB3)

- Requires a dual tax system (for older vehicles)
- + Does not require new legal basis, but simply amendment of existing legislation
- + Offers bonus as a real incentive in the form of a one-off contribution, whereas the malus on the motor vehicle tax has psychologically less of an impact

*Further differentiation*

- + Reduction of the differences in bonus/malus between big and small (heavy and light) automobiles, or (in case of engine power) higher taxation of engine power.
- Influence of equipment (tyres, air-conditioning) on CO<sub>2</sub> emissions
- Transparency of approach (will purchaser be able to identify bonus and/or malus without help?)

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### **Unanswered questions**

The following list contains the most important themes, which it is has either not been possible to study thoroughly in the present context, or which constitute points of discussion of a political nature, in which case the present study limits itself to showing the amount of "room for manoeuvre":

- Data: influence of variations within a given model type
- Determination of formula for calculation of the bonus/malus: mathematical formulae and values for vehicle types, maximum values for bonus/malus, benchmark
- Determination of long-range target values
- How to deal with older vehicles: new taxation system when change of registration?
- Other vehicle groups (heavy vehicles, two-wheelers, etc.).
- How to deal with existing vehicles in approach A: introduction of new motor vehicle tax only for existing vehicles and only after change of registration?
- Influence of greater or smaller increase in number of electric vehicles (awareness)
- Development of sustainability strategy
- Method for identifying specific CO<sub>2</sub> emissions for alternative fuels
- Clarification as to whether or not departure from the principle of a standard taxation system to a dual one is acceptable