BAK economic intelligence

BAK Taxation Index: STAF Analysis

Tax Burden with R&D Instruments 2022

July 2022

Clients
Swiss Federal Tax Administration (ESTV)
Tax and revenue offices, macroeconomic committees and economic development authorities of the cantons of Appenzell A.Rh., Basel-Stadt, Bern, Glarus, Grisons, Lucerne, Nidwalden, Obwalden, Schaffhausen, Schwyz, St. Gallen, Thurgau, Uri and Zurich

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Background

The Tax Reform and AHV financing STAF (or TRAF), which came into force at the federal level on January 1, 2020, is the most important Swiss tax reform in decades and has significantly changed the Swiss tax landscape. The vast majority of cantons has already fully implemented the STAF by 2022. Among other things, the reform introduced instruments to provide tax benefits for research and development activities (STAF R&D instruments). These internationally accepted tax instruments serve to promote innovation activity.

In additional analysis of the BAK Taxation Index we calculate the EATR tax burden (i.e., average effective tax rate) when the newly introduced STAF R&D instruments are used. The analysis is conducted for the reference year 2022 and considers the cantonal implementation of the patent box, the additional R&D deduction and the relief restriction. The analysis is based on the "BAK Research Intensive Companies Model." With this model the influence of R&D incentives on the EATR tax burden can be examined for various scenarios (cf. methodology box on the last page).

The effects of R&D instruments on the tax burden are measured based on three different types of investments (or companies), which differ in terms of the assumed research intensity:

- 20% patent investment = Diversified investment of 20% in a self-produced patent and 80% in machinery, buildings, stocks, financial assets (in equal shares). This corresponds to a company with average research intensity.[1]

- 60% patent investment = Diversified investment of 60% in a self-produced patent and 40% in machinery, buildings, stocks, financial assets (in equal shares). This corresponds to a very research-intensive company.

- 100% patent investment = Pure patent investment (self-produced patent). This is an edge case.

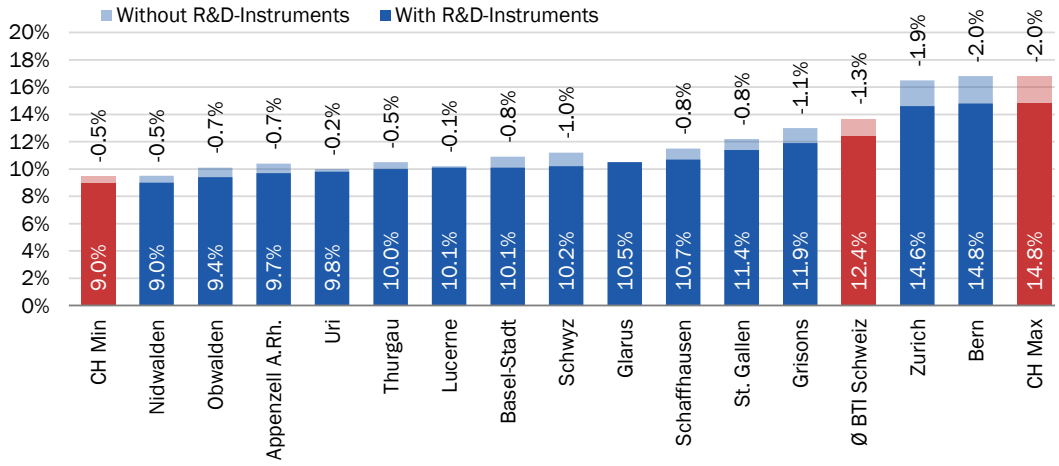
The parameters for this STAF analysis were collected in a cantonal survey conducted in March 2022. For the few cantons that did not provide data, the parameters were researched during the same period based on publicly available material. The parameters of the R&D instruments on which the calculations are based are listed in the annex.

The calculations were carried out for all 26 cantons. The following statements refer to all cantons, but concrete values are only published for the 15 cantons involved in the project.

[1] The BAK Taxation Index is calculated for a highly profitable manufacturing company.

Tax burden for companies with average research intensity

Abb. 1: EATR tax burden for a 20% patent investment



Remarks: The figure shows only the cantons involved in the project, the canton with the lowest (CH Min) or highest taxes for companies (CH Max) as well as the GDP-weighted average of all 26 cantons. Depicted is the effective average tax rate (EATR) applicable to companies without (light) and with (dark) use of the STAF R&D instruments (relief limitation considered) in Swiss cantons (measured at the cantonal main location) in % in the year 2022. Relief through use of R&D instruments in %-points (above the columns).
Source: BAK Economics, ZEW

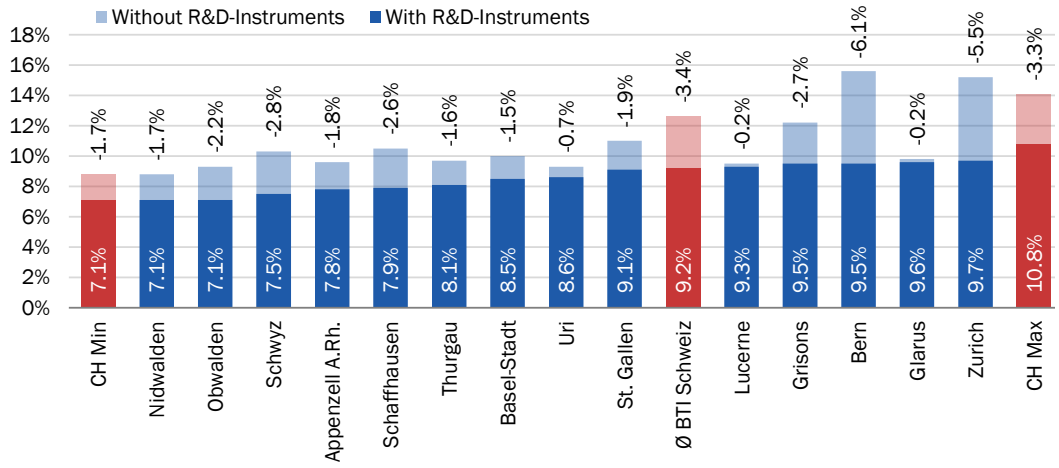
The impact of the STAF R&D instruments on the EATR tax burden for a 20% patent investment or an average research-intensive company can be summarised as follows:

- The use of STAF R&D instruments leads to a moderate reduction of the GDP-weighted BTI average by -1.3 percentage points. This corresponds to a reduction of the tax burden by less than one tenth. Depending on the canton, the reduction ranges from -2.0 percentage points (Berne) to no reduction (Glarus).

- The cantonal ranking remains mostly unchanged. With rank shifts between +2 ranks and -4 ranks, the activation of R&D incentives in the case of a 20% patent investment has only a small impact on the positioning of the cantons. Nidwalden continues to occupy first place, while Berne remains in last place.

Tax burden for very research-intensive companies

Abb. 2: EATR tax burden for a 60% patent investment



Remarks: The figure shows only the cantons involved in the project, the canton with the lowest (CH Min) or highest taxes for companies (CH Max) as well as the GDP-weighted average of all 26 cantons. Depicted is the effective average tax rate (EATR) applicable to companies without (light) and with (dark) use of the STAF R&D instruments (relief limitation considered) in Swiss cantons (measured at the cantonal main location) in % in the year 2022. Relief through use of R&D instruments in %-points (above the columns).
Source: BAK Economics, ZEW

The main findings on the impact of the STAF R&D instruments for a 60% patent investment % or a very research-intensive company are as follows:

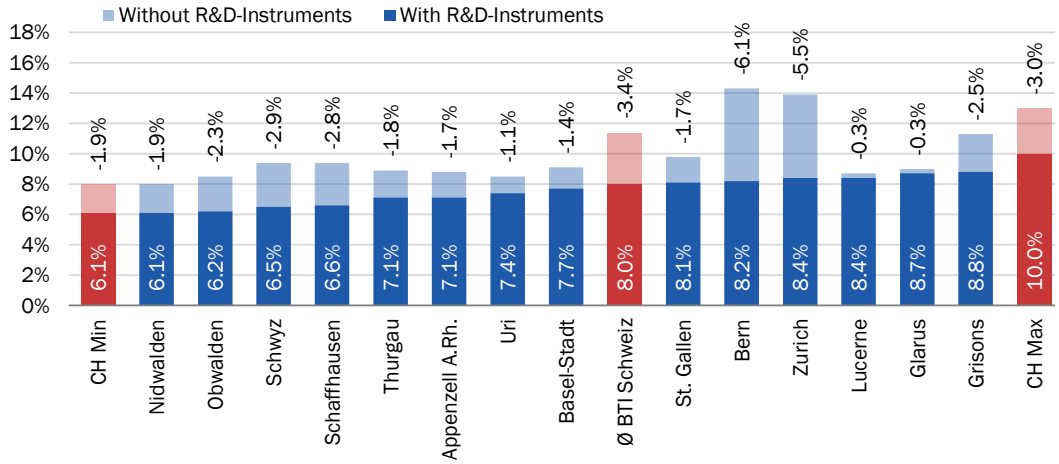
- The use of STAF R&D instruments significantly reduces the EATR tax burden: The GDP-weighted BTI average decreases by -3.4 percentage points, which corresponds to a reduction of the tax burden by a quarter. Depending on the canton, the reduction ranges from -6.1 percentage points (Berne) to a modest -0.2 percentage points (Glarus).

- The EATR ranking starts to change noticeably in the case of a 60% patent investment. Nidwalden leads the ranking together with Obwalden. The ranking improvements of the cantons with generous R&D incentives are in some cases considerable: for example, Berne, Schaffhausen and Schwyz gain between 6 and 8 ranks.

- The canton of Zurich gains only 3 ranks but shows a significant reduction in the tax burden by -5.5 percentage points.

Tax burden for pure research activity (edge case)

Abb. 3: EATR tax burden for a 100% patent investment



Remarks: The figure shows only the cantons involved in the project, the canton with the lowest (CH Min) or highest taxes for companies (CH Max) as well as the GDP-weighted average of all 26 cantons. Depicted is the effective average tax rate (EATR) applicable to companies without (light) and with (dark) use of the STAF R&D instruments (relief limitation considered) in Swiss cantons (measured at the cantonal main location) in % in the year 2022. Relief through use of R&D instruments in %-points (above the columns).
Source: BAK Economics, ZEW

In the edge case of a pure patent investment, the influence of the R&D instruments increases further but remains limited due to the relief restriction. The relief restriction binds now in almost all cantons. The main results are:

- The STAF R&D instruments reduce the EATR tax burden of a pure patent investment significantly: The GDP-weighted BTI average falls by -3.4 percentage points, which corresponds to a reduction in the burden of almost a third.[2] The relief in individual cantons varies between -6.1 percentage points (Berne) and -0.3 percentage points (Glarus and Lucerne).

- The EATR ranking changes significantly for a 100% patent investment. However, the canton of Nidwalden remains at the top. From the cantons involved in the project, Berne, Schaffhausen, Schwyz and Zurich gain more than 5 ranks.

[2] The absolute reduction in the burden when using R&D instruments is identical in the case of a 100% and a 60% patent investment, with -3.4 percentage points in each case. However, it should be noted that the EATR burden without the use of R&D instruments is smaller in the 100% than in the 60% case. The reason is that these are different investments (diversified investment with a patent share of 60% vs. an investment with a patent share of 100%) that are treated differently for tax purposes.

Conclusion

The analysis of the impact of the STAF R&D instruments on the EATR tax burden shows that these R&D instruments can significantly reduce the tax burden on research-intensive companies. Some cantons with a high ordinary tax burden but generous R&D instruments (e.g., Berne and Zurich) can move from the bottom of the ranking towards the middle because of the R&D instruments. However, this only applies to investments where the patent has a very high share of the total investment, or in other words, to very research-intensive companies.

Methodology

The **BAK Taxation Index for companies** measures the effective average tax rate (EATR) for companies in all 26 cantons and their main international competitor locations. It includes all types of taxes and regulations relevant to investors at the various levels of government.

- The index is calculated for a company in the manufacturing sector, which is composed to equal parts of different types of assets (acquired intangible assets, industrial buildings, machinery, financial assets, inventories), is financed through different sources of financing (retained earnings, debt, new equity) and achieves a pre-tax return of 20%.
- The calculation takes into account the various taxes for companies, the interaction between these taxes, and the main rules used to determine the tax bases (e.g., the rules on depreciation and inventory valuation). The analysis includes all government levels of a location (e.g., for a Swiss canton: federal, cantonal, municipal and parish levels). This allows meaningful national and international comparisons of tax burdens. In contrast, a comparison based solely on statutory tax rates would lead to an incomplete representation of taxes for companies.

The **BAK Research Intensive Companies Model** was developed within the framework of the project BAK Taxation Index to calculate the effective average tax rate (EATR) when using the newly introduced STAF (or TRAF) R&D instruments (patent box, R&D deduction, incl. relief limitation). The main difference to the standard model of the BAK Taxation Index is that not an acquired but a self-created intangible asset (patent) is assumed. The tax burden when using the STAF R&D instruments is calculated for three different types of investments or companies, which differ in their research intensity:

- Average research-intensive company: Diversified investment of 20% in a self-created patent and 80% in machinery, buildings, inventories, financial assets (in equal parts).
- Very research-intensive company: Diversified investment of 60% in a self-created patent and 40% in machinery, buildings, inventories, financial assets (in equal parts).
- Companies with exclusively research activity: patent investment (self-generated patent) at 100%. This represents an edge case.

Note: Due to the different assumptions regarding intangibles between the BAK Taxation Index standard model (acquired patent) and the BAK Research Intensive Companies Model (self-generated patent), the resulting EATR burdens in the case of a 20% patent investment (patent has the same weight in both models) may (slightly) differ even if the STAF R&D instruments (in the BAK Research Intensive Companies model) are assumed not to be used.

For detailed information on the methodology of the BAK Research Intensive Companies Model – including the modelling of the Swiss specifics of the relief restriction – see BAK Economics (2022): «BAK Forschungsintensive Unternehmen: Methodenbericht» (in German)

Annex: STAF R&D instruments 2022

	Patentbox in %	R&D deduction in %	Relief restriction in %
Aargau	90	50	70
Appenzell A.Rh.	50	50	50
Appenzell I.Rh.	50	50	50
Basel-Landschaft	90	20	50
Basel-Stadt	90	No	40
Bern	90	50	70
Fribourg	90	50	20
Genève	10	50	9
Glarus	10	No	10
Grisons	90	50	55
Jura	90	50	70
Lucerne	10	No	20 *
Neuchâtel	20	50	40
Nidwalden	90	No	70
Obwalden	90	50	70
Schaffhausen	90	No	70
Schwyz	90	50	70
Solothurn	90	50	70
St. Gallen	50	40	40
Ticino	90	50	70
Thurgau	40	30	50
Uri	30	No	50
Vaud	60	50	50
Valais	90	50	50
Zug	90	50	70
Zurich	90	50	70

Remarks: *In Lucerne the relief restriction is 70% in the case of an old law step-up and 20% otherwise.
Source: BAK Economics, ZEW