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B: Big data and tax – domestic and international taxation of data driven business

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Summary and conclusions

The term "*big data*" has been in use since the early 1990s. Thus, big data is not something that is completely new. What has changed within the last three decades, however, is the development of technology that allows higher volumes of data to be processed in a shorter time. Data-driven business models have become increasingly important in order to maintain critical competitive advantages and market shares. True to the motto "knowledge is power", the aim today is to gather more information, which will provide ready-to-use insights for business decisions.

For the legal environment, the challenge is to keep up with the technological developments and the digital transformation. The following analysis shows that Switzerland is not only an attractive location for innovation, but also offers an interesting tax and legal framework that allows data-driven corporations to conduct their business under favourable conditions. Especially the patent box and the R&D super-deduction that were implemented in the last tax reform, have shown that Switzerland is not too late in entering the digital age and providing for sustainable tax models that are particularly attractive to data-driven corporations.

I. Introduction and legal background

An introduction to the legal background applicable to data-related transactions and business models is presented as a starting point for analysing domestic and international taxation of data-driven business from a Swiss law perspective.

1. Definition of (big) data

In Swiss law, there is no general or consistent definition of the term "data". Instead, different definitions apply depending on the field of law and the protective purpose of the respective norm. For example, Swiss data protection law defines (personal) data as, "all information relating to an identified or identifiable person".[2] From a Swiss criminal law perspective, the term "data" generally refers to, "all information in the form of letters, numbers, signs, drawings, etc., which is communicated, processed or stored for further use".[3] In a criminal law

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[2] Art. 3 lit. a of the Federal Act on Data Protection (FADP) (SR 235.1).

[3] Weissenberger Philippe, in: Niggli/Wiprächtiger (eds.), Basler Kommentar Strafrecht, art. 143 StGB n. 6.

context, the term "data" is, therefore, broader than according to data protection regulations as it is not restricted to personal data only. There is, however, one important similarity: both terms may contain (items of) *information*.[4]

In Swiss tax law there is no definition of the term "data" at all. For the purpose of this report and from the author's point of view, it seems appropriate to refer to the terminology provided by the International Organization for Standardization (ISO). According to this definition, the term "data" includes the "reinterpretable representation of information in a formalized manner suitable for communication, interpretation or processing". As such, data can be processed by humans or by automatic means.[5]

2. Tangible vs. intangible property

As described above, the term data may contain (items of) *information* which can be translated into a form that is efficient for processing. It may seem obvious that the nature of digitally held information is not physical. However, it needs to be considered that digitally held information comes along with a data carrier (for example, a server, USB stick, hard drive, etc.), which, in turn, is a physical object. Therefore, the question arises whether this interaction between tangible and intangible objects may have an impact on the qualification of data as intangible property.

From a Swiss tax perspective, determination of taxable factors is generally based on financial statements. Swiss accounting law, however, does not provide any rules on how an asset must be treated if it contains physical and non-physical elements. It may make sense to have a look at the provisions as provided by the Internationale Financial Reporting Standards (IFRS) as an inspiration how of how the above questions may be answered.[6] According to the International Accounting Standards (IAS) 38.04, some intangible assets may be contained in or on a physical substance such as a compact disc, legal documentation or film. If an asset incorporates tangible and intangible elements, it is the entity's responsibility to consider and determine which of the elements is more *significant*. For example, computer software for a computer-controlled machine tool that cannot operate without that specific software is an integral part of the related hardware, and is treated as property, plant and equipment. The same applies to the operating system of a computer. When software is not an integral part of the related hardware, computer software is treated as an intangible asset.

The above statements can also be applied to digital data, as digital data can only be made perceptible (at least for humans) by using a physical substance such as a data carrier. Thus, the important question is what criteria need to be considered when assessing which element is more significant. According to the view represented here, if the data carrier and the data stored on it should be treated as one single asset, the *function* of the physical subject may become a decisive element while conducting this kind of an assessment. If,

4 Schwarz Angelica Maria, Die handels- und steuerrechtliche Behandlung von Daten, Unter besonderer Berücksichtigung von verrechnungspreislichen Aspekten im internationalen Konzernverhältnis, p. 7 et seqq. (hereinafter «Die handels- und steuerrechtliche Behandlung von Daten»).

5 ISO/IEC 2382:2015.

6 The IFRS can, of course, only be used as an aid for interpretation if such provisions are in accordance with the systematical framework of Swiss accounting law (cf. Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 69 et seqq.).

for example, the function of the data carrier is solely limited to carrying or storing digital "data", it does not seem appropriate to consider the intangible element as less significant. This may even apply in the context of big data where the data carriers themselves are often valuable as they are technically designed specifically in order to handle big data volumes.[7] Especially when data is to be considered as strategic asset on the same scale as resources, it appears justified to also recognize its independent character, value and functions.[8] In the context of big data, therefore, qualification as an intangible asset might often seem more appropriate from an overall perspective.

3. Rights to data

In Swiss doctrine, there is a lively discussion about the question whether and in what form a property right in data may be established. In general, the distinction between *personal* and *technical* data is made. This kind of a distinction is crucial, since Swiss data protection law applies to personal data only, whereas technical data does not fall within that scope. The distinction, however, is not always easy to draw, since the answer to the question whether data can be assigned to at least one identifiable person varies depending on the context. For example, information that is recorded by a car may be attributable to a specific person if such data is combined with localization data. In this context, it is to be noted that due to the technical possibilities that are constantly growing, more and more personal references can be made from data that was originally anonymous.[9]

3.1. Personal data

Swiss data protection law does not provide for any property rights to personal data. As a consequence, no such right can be transferred to a third party since there is not a comprehensive right to one's "*own*" data.[10] Nevertheless, for individuals whose personal data is being processed, data protection regulations provide a legal position that is at least quite comparable to a property right. For example, companies that process personal data are generally only allowed to do so if the individual in question agrees to that.[11] Further, data protection law may convey a right to information that allows the individuals to request copies of their processed personal data.[12]

7 Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 128 et seqq. with further references.

8 For the term «data assets» cf. Schwarz Angelica Maria, Daten bilanzieren?, in: Recht relevant für Verwaltungsräte, 5/2021 (hereinafter «Daten bilanzieren?»).

9 Schmid Alain/Schmidt Kirsten Johanna/Zech Herbert, Rechte an Daten – zum Stand der Diskussion, in: sic! 11/2018, p. 2 et seq.

10 Thouvenin Florent, Wem gehören meine Daten? Zu Sinn und Nutzen einer Erweiterung des Eigentumsbegriffs, in: SJZ 113/2017, p. 26.

11 Art. 13 para. 1 FADP.

12 Art. 8 para 1 FADP; Thouvenin, p. 26 et seq.

3.2. *Technical data*

Data that is not considered as personal data, qualify as technical data. This includes, but is not limited to, data generated by machines without direct human intervention. Since Swiss data protection law does not apply to technical data, the question arises whether Swiss law provides for another legal basis that grants or protects possible rights to data.

3.2.1 *De lege lata*

3.2.1.1. *Property law*

Swiss property law does not provide for a definition of the term "property". However, there is a wide consensus that the term refers to *tangible objects* only.[13] As outlined above, data may contain (items of) information and, thus, should likely be qualified as intangible property even if they come along with physical elements. In this sense, Swiss property law cannot grant or protect any rights to data.[14]

3.2.1.2. *Intellectual property law*

The Federal Act on Copyright and Related Rights (CopA)[15] regulates, inter alia, the protection of authors of literary and artistic works. According to article 2 paragraph 1 CopA, the term "works" refers to literary and artistic intellectual creations with individual character, irrespective of their value or purpose. Article 10 paragraph 1 CopA grants the author the exclusive right to decide whether, when and how his work is used. In general, data may fall under the scope of Swiss copyright law as long as they contain an intellectual creation with individual character. However, if data is generated by machines without direct human intervention, there is a lack of an intellectual creation, as intellectual creations require a contribution made by a human. On the other hand, databases may qualify for copyright protection provided that the selection or arrangement of the collected data is an intellectual creation with an individual character (cf. article 4 paragraph 1 CopA).[16]

3.2.1.3. *Law against unfair competition*

Article 2 of the Federal Act on Unfair Competition (UWG)[17] states that every behaviour or business practice that is deceptive or that in any other way infringes the principle of good faith and which affects the relationship between competitors or between suppliers and customers is unfair and illegal. In particular, according to article 5 lit. c UWG, anyone who adopts and exploits the marketable work product of another person without reasonable effort of his own by means of technical reproduction processes, as such is acting unfairly. In general, a big data analysis may represent a marketable work result and, thus, be protected by article 5 lit. c UWG. The following needs to be considered when it comes to assessing whether or not someone's own efforts have been contributed: If data collection is only a

13 Wolf Stephan/Wiegand Wolfgang, in: Geiser/Wolf (eds.), Basler Kommentar, Zivilgesetzbuch II, preliminary remarks to art. 641 et seqq. ZGB n. 5 et seq.

14 Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 176 with further references.

15 SR 235.1.

16 Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 186 et seqq. with further references; Schmid/Schmidt/Zech, p. 4.

17 SR 241.

by-product of the actual commercial activity of an entity, the data collection itself is not considered as an effort in the sense of the law against unfair competition. Thus, only the efforts relating to subsequent processing of data may be taken into account.[18]

3.2.2. *Doctrine and de lege ferenda*

The above statements show that, to a certain degree, the current law already provides protection regarding technical data. While some authors are of the opinion that this protection is sufficiently comprehensive, others believe that a special data right must be introduced.

3.2.2.1. *Rights to data sources*

Article 641 of the Swiss Civil Code (CC)[19] lays down the principle that the owner of an object is free to dispose of it within the limits of the law. The owner has the right to reclaim it from anyone withholding it from him to protect it against any unwarranted interference. According to article 642 CC, the owner of an object also has ownership of all its constituent parts. A constituent part is anything that, according to local custom, is held to be an essential part of an object and which cannot be detached without destroying, damaging or altering it.

By referring to the above provisions, Kohler does not consider introduction of a special data right to be necessary, as ownership rights not only refer to the object itself but include its components as well. For example, the legal owner of a car is also entitled to use the data collected by a sensor of the car. Whether and to what extent the car manufacturer is entitled to use this technical data depends on the legal framework as well as on the contractual arrangement.[20]

According to Kohler, therefore, the link is made by analysing who has the rights to the data sources. This approach seems to be less of a concern if the data source itself is a physical object (such as a sensor), since in such circumstances the principles provided by Swiss property law may apply. However, it may become more problematic if the data sources themselves are of a digital nature. This could be, for example, the case if the generated data is a result of an internet-based survey that is being conducted anonymously and, thus, cannot be assigned to at least one identifiable person. In addition, a physical source is also missing if data is being transferred from one party to another for the exchange of money.

3.2.2.2. *Res digitalis*

Eckert, on the other hand, argues for an extension of the concept of Swiss property law and qualifies data as *res digitalis*. Legal uncertainty could be significantly reduced by relying on existing principles. This kind of an understanding would lead to the conclusion that data can be allocated to an owner and that owners generally have the rights provided by property law.[21] However, if data qualifies as personal data, data protection law must be applied as *lex specialis*. Data protection law, however, cannot assign ownership to the data to the individual whose personal data is being processed. Instead, the owner of the digital data remains the "owner" of the personal data. However, the owner's rights are restricted by data protection

18 Schmid/Schmidt/Zech, p. 5.

19 SR 210.

20 Kohler Patrick, Rechte an Sachdaten, in: sic! 7-8/2020, p. 412 et seqq.

21 Eckert Martin, Digitale Daten als Wirtschaftsgut: digitale Daten als Sachen, in: SJZ 112/2016, p. 249.

law. The same applies if the data fall within the scope of intellectual property law.[22]

The critical response to this theory is that data qualifies as a public good and, thus, are not comparable with an object as defined by property law. As a public good, data are non-excludable and non-rival. From a legal (and not from a technical) view, data is non-exclusive as various persons may use the data at the same time.[23]

3.2.2.3. Analogous application of property law

Hess-Odoni is also of the opinion that Swiss property law only applies to physical objects. The author proposes introduction of an ownership right to data, which is based on the analogous application of Swiss property law regulations and which should be further developed by case law. The ownership right should include, inter alia, a right of free disposal, a surrender claim and a claim for cancellation. Further, transfer of the entitlement to data should be effected by a written legal assignment in analogy to article 164 et seq. of the Swiss Code of Obligations (CO).[24] [25]

3.2.2.4. Access to data

According to Thouvein/Weber, introduction of data ownership might create more problems than it solves since there would be a lot of open questions regarding specific implementation. In particular, it would need to be defined who would be entitled to the data that was originally collected. This, however, requires a distinction to be made between personal and technical data, which, as described above, is not always easy to draw.[26] In this context, Weber raises the question whether *access* to data generated by machines should be, to a certain extent, uniformly regulated instead of creating a new right. This kind of regulation would need to take specific sectors into account, as a general right to access data can hardly be implemented.[27]

4. Interim conclusion

The above statements show that Swiss law neither provides a uniform definition of the term "data", nor does it provide for an exclusive right to data. The question as to whether and to what extent ownership to data should be introduced remains a controversial issue in both legal writing and public debates. The current discussion of whether or not there should be some type of data ownership will remain controversial, and it is not clear yet whether it will lead to a conclusion and which conclusion that would be.

22 Eckert Martin, Digitale Daten als Wirtschaftsgut: Besitz und Eigentum an digitalen Daten, in: SJZ 112/2016, p. 273 et seq.

23 Schmid/Schmidt/Zech, p. 6.

24 SR 220.

25 Hess-Odoni Urs, Die Herrschaft an Daten, in: Jusletter from 17 May 2004.

26 Thouvein Florent/Weber Rolf H., Zum Bedarf nach einem Dateneigentum, in: Jusletter from 11 December 2017.

27 Weber Rolf H., Zugang zu maschinengenerierten Daten, in: Jusletter from 2 December 2019.

II. Nexus and character

1. General overview of the Swiss corporate tax system

1.1. Applicable regulations

Swiss tax law does not provide for any specific provisions relating to data transactions or data-driven businesses. Swiss income taxes are in general regulated by federal law (Federal Act on the Federal Direct Tax [FDTA])[28] and 26 cantonal tax laws. All cantonal tax laws, however, are required to comply with the harmonization rules as stated in the Federal Act on the Harmonization of Direct Cantonal and Communal Taxes (FHTA).[29] As the name suggests, the FHTA seeks to harmonize and align the principles of cantonal laws with each other and with the FDTA as, for example, for determining taxable profit and taxable capital. Due to harmonization of the tax legislation, most of the cantonal tax regulations are identical or at least very similar to the federal legislation.[30]

Income taxes are levied on the federal, cantonal and communal level. Capital taxes are imposed only at the cantonal and communal level. For the purpose of this branch report, the focus will be on the federal provisions and, thus, on income taxation.

1.2. Taxation of resident corporations

A corporation is considered a Swiss tax resident and, thus, is subject to unlimited tax liability if:

– it is incorporated in Switzerland and, therefore, has its registered seat in Switzerland; or
– its place of effective management is in Switzerland (article 50 FDTA).[31]

On one hand, the legal domicile is determined by the statutes or, respectively, the place where the corporation is formally registered in the commercial registry. On the other hand, there are no provisions defining when a corporation abroad is deemed to be effectively managed in Switzerland. Jurisprudence and practice, however, have generally established that the place of effective management is located where the corporation has its economic and effective center. Thus, and in consideration of the corporate purpose, what is decisive is the location at which the day-to-day business is conducted in line with the corporate purpose.[32]

28 SR 642.11.

29 SR 642.14.

30 The tax rates, however, are at the discretion of the cantons.

31 Similar rules apply for determining the canton of residence within Switzerland (cf. art. 20 FHTA). It is to be noted, however, that, unlike in international tax law, in intercantonal tax law the criteria of registered seat and the place of effective management are not of equal rank. The place of effective management becomes the decisive factor for determining cantonal residency only if the registered seat is merely of a formal nature (Federal Supreme Court Decision 2C_259/2009 of 22 December 2009, consideration 2.1; Oesterhelt Stefan/Schreiber Susanne, in: Zweifel/Beusch (eds.), Kommentar zum Schweizerischen Steuerrecht, Bundesgesetz über die direkte Bundessteuer (DBG), art. 50 DBG n. 17.

32 Federal Supreme Court Decisions 2C_1086/2012 and 2C_1087/2912 of 16 May 2012, consideration 2.2; Oesterhelt/Schreiber, art. 50 DBG n. 14 et seqq.

Swiss resident corporations are generally subject to unlimited taxation on their annual worldwide income. Based on domestic provisions, an exemption is made for income attributable to foreign permanent establishments (PEs) and real estate situated abroad (article 52 FDTA). Such income, however, will be considered when determining the applicable tax rate (*Progressionsvorbehalt*).

1.3. Taxation of non-resident corporations

Corporations that are incorporated in a foreign jurisdiction and not effectively managed in Switzerland are considered as non-resident. Non-resident corporations may only be subject to Swiss taxation if a certain economic nexus to Switzerland is established. This kind of a nexus could, in particular, be triggered by income attributable to a Swiss PE (article 51 FDTA)[33].

Article 51 paragraph 2 FDTA defines a PE as a fixed place of business, in which the activities of an enterprise are carried out in full or in part. Article 51 lists a number of examples of PEs, such as a branch, sales office, manufacturing plant or a permanent agency. It is to be noted that Swiss law does not require the presence of human personnel (even though the wording "in which" implies so). Instead, a place of business may also be established by machines or equipment.[34] This definition based on Swiss domestic law widely corresponds with the definition provided by article 5 of the OECD's Model Income Tax Convention (OECD-MC). Whether and to what extent the Swiss definition is broader or narrower than the treaty definition needs to be defined on an individual basis taking specific tax treaty provisions into account.

Based on the wording of article 51 FDTA, it is not entirely clear to what extent preparatory or auxiliary activities are deemed to constitute a Swiss PE in the international context. In *intercantonal* cases, the Federal Supreme Court defines a PE as a fixed place of business with which an enterprise engages in an *essential qualitative and quantitative part* of its technical or commercial activity.[35] In international cases, however, article 51 FDTA does not necessarily exclude activities that are of preparatory or auxiliary nature. It is always required though that the performed activities in question are *significant* throughout the value chain.[36] In addition, it is to be considered that the Federal Supreme Court tends to apply a broader interpretation of the term "PE" when it comes to inbound cases.[37] In 2012 the Federal Supreme Court ruled that higher requirements may be imposed on PEs abroad than on those in Switzerland.[38] In Swiss doctrine this decision has been widely criticized.[39]

For the sake of completeness, it is noted that unlike many other countries, Switzerland

[33] According to art. 51 FDTA, this kind of a nexus could also be established by income in connection with Swiss real property or income derived from Swiss partnerships.

[34] Oesterhelt Stefan/Schreiber Susanne, in: Zweifel/Beusch (eds.), Kommentar zum Schweizerischen Steuerrecht, Bundesgesetz über die direkte Bundessteuer (DBG), art. 51 DBG n. 32.

[35] BGE 110 Ia 190, consideration 3; BGE 95 I 431, consideration 3; BGE 80 I 194, consideration 4b; De Vries Reilingh Daniel, in: Zweifel/Beusch/Mäusli-Allenspach (eds.), Interkantonales Steuerrecht, § 11 n 11 et seqq.

[36] Oesterhelt/Schreiber, art. 51 DBG n. 43.

[37] Cf. art. 52 para. 1 DFTA for outbound constellations.

[38] BGE 139 II 78, consideration 3.1.

[39] Cf. Schreiber Susanne/Schwarz M. Angelica, Ausgewählte Urteile des Bundesgerichts zum internationalen Steuerrecht, in: ASA 87, 6-7, 2018-2019, p. 367.

did not introduce the concept of an agent PE into its tax legislation.

1.4. Determination of taxable income

1.4.1. In general

With regard to Swiss resident corporations, taxable income is primarily determined based on the statutory financial statements prepared in accordance with the statutory provisions contained in the CO (known as the principle of determinacy; *Massgeblichkeitsgrundsatz*). In the case of non-resident corporations, branch accounts may serve as a basis. Specific tax adjustments may apply in order to adequately account for the different objectives of commercial and tax law.

Gross income of a corporation includes most income streams. In general, no distinction is made between different sources or categories of income.[40] For example, capital gains realized by corporations are generally taxed like ordinary income.[41] Further, interest or royalties and service fees are also generally subject to ordinary taxation. All expenses that are commercially justified and meet the arm's length principle are generally tax deductible. With the latest Swiss tax reform, however, exceptions to this general rule have been implemented (cf. below).

1.4.2. Swiss tax reform

On 19 May 2019, the vote regarding tax reform and AHV financing (STAF) was accepted. The main point of STAF was to abolish certain tax privileges[42] that internationally have been considered as harmful tax practice. In order for Switzerland to continue to be an attractive business location with competitive fiscal conditions (at least from the perspective of the OECD), various measures have been implemented that are considered as non-harmful (and, thus, within the OECD guidelines). The Swiss *patent box* and the *super-deduction* for research and development (R&D) may become relevant to data-driven businesses (cf. below).

2. Residence and nexus of data-driven corporations

2.1. Place of effective management

The above principles show that based on Swiss domestic tax law data-driven corporations may only be considered Swiss tax residents and, thus, subject to unlimited tax liability, if their registered seat or place of effective management is in Switzerland. With regard to the place of effective management, it is to be noted that whereas processing and management of data used to take place under the responsibility of specific departments, the question of

[40] Cf. Stocker Raoul/Schmid Patrick, Switzerland, in: Haslehner/Lamensch (eds.), Taxation and Value Creation, p. 567.

[41] Depending on cantonal law, exemption may apply with regard to gains realized on the sale of real property.

[42] These kinds of tax privileges refer to holding, domicile and mixed companies at the cantonal level and to taxation as principal and the finance branch regime at the federal level.

how to deal with big data topics nowadays is mostly answered by company management.[43] This especially applies where data analysis is made on a group-wide basis. This is an important reason why management information systems showing the most important key performance indicators (KPIs) on a screen surface (e.g., management dashboards, scorecards or cockpits) have become increasingly important.[44]

Therefore, in order for data-driven corporations to establish their place of effective management in Switzerland, data-related activities (e.g., selling, organizing, analysing, etc.) must be put into the context of the corporate purpose. In this sense, it may be useful to distinguish between (i) companies with mainly physical value chains, which are enriched with digital elements making production more intelligent and (ii) companies with mainly or solely digital or virtual value chains. For example, a car manufacturer intends to speed up the transition from manufacturing to sales. For that reason, the company enriches its physical value chain with collected data in order to digitalize its manufacturing process which, in turn, should lead to enhanced efficiency and cost management. In other words, smart technology is used to implement its industry 4.0 strategy. The physical product (here the car) is still the primary source of value, but data is used to improve the product or service offering. Companies whose business models are purely data-based are in contrast to this. Typical examples are data providers or data brokers. Data providers usually gather and sell raw data without adding significant value to it, whereas data brokers gather and combine data from different sources and create additional value with analytics. Both sell (items of) information that, depending on the grade of refinement, needs to be further processed or offers usable insights without further processing. Unlike the production sector, the business models of these companies are significantly or exclusively based on the concept of a virtual value chain.

For the car manufacturer, data fulfils a *supporting* function, whereas for data providers or brokers data is the *primary purpose* of the business concept. Thus, the question whether or not the place of effective management is in Switzerland cannot be answered equally for all companies using data as a business opportunity, and a case-by-case analysis is required. However, as a general rule, it can be assumed that the more business functions are focused on the use of data, the more important the question becomes as to *where* such data related decisions are made. This applies, in particular, to cases in which C-level functions (e.g., Chief Digital Officer [CDO], Chief Data Officer [CDO], Chief Analytics Officer [CAO] or Chief Innovation Officer [CIO]) are specifically created for big data-related decisions to build analytically mature organizations.

2.2. Swiss PE

2.2.1. De lege lata

Limited tax liability requires a certain economic nexus to Switzerland. With regard to data-driven corporations, this kind of a nexus may particularly be established by a PE on Swiss territory. This, however, regularly presupposes that the business is conducted to a certain degree at a fixed place. It can be concluded, therefore, that in Swiss tax law there is (at least currently) no legal basis that would allow taxation of internationally operating

[43] Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 29.

[44] Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 27.

data-driven corporations with a registered seat or place of effective management outside of Switzerland without a physical market presence in Switzerland. This even holds true if data-driven businesses create value on Swiss territory or if the data-based business model opens access to the Swiss market or Swiss customer segments as long as no fixed place of business is established on Swiss territory. This especially applies where data network effects occur. The term "data network effects" describes a process in which a product or service improves when more users join the network since this leads to generation of more data. For example, as more people from a specific region use a specific navigation app, the more data the company (as the provider of such app) has available to refine key features such as traffic predictions, route suggestions or estimated arrival times. Thus, a solely virtual economic presence (even if significant) does not lead to establishment of a Swiss PE based on current Swiss tax law.

With regard to data collection, a more differentiated approach is required. The question whether collection of data from Swiss sources may establish a Swiss PE depends on the nature of the data source. For example, collection of personal data from human beings may not establish a PE since persons, for obvious reasons, cannot be regarded as a fixed place of business. The possibility that these persons may be in a fixed place of business at the time of data collection does not alter the fact that (i) the premises are not at the disposal of the data-driven corporation and (ii) these persons cannot be regarded as personnel of the company.

The situation, however, may be different if technical data is collected from sensors that are on Swiss territory (e.g., car sensors, weather stations, cameras, GPS sensors, telephone poles, machine sensors and smart devices, which together form the Internet of Things [IoT], etc.). Whether or not a sensor can be regarded as a fixed place of business mainly depends on its nature and purpose. Similar to servers, sensors may, in theory, establish a PE as the presence of human personnel is not a requirement. The discussion surrounding the question of under which criteria a server may establish a PE is more of an academic one, and the author is unaware that this issue has ever been addressed by the Federal Supreme Court.[45] According to Swiss doctrine, a server will particularly only qualify as a PE if it is considered to be fixed, operates with a certain degree of autonomy and is at the disposal of the corporation.[46] With regard to sensors, this leads to the following conclusion: Sensors that are mobile (e.g. car sensors) are not fixed and, thus, are not able to establish a PE. Fixed sensors, such as weather stations, may establish a PE as long as the data extracted from them is part of the core business of the corporation and not only of an insignificant nature. Here again, this question can only be answered if a specific business purpose is taken into account. Further, if raw data is extracted, the corporation may be required to further process the data at its headquarters. This may be an important aspect as extraction of raw data can be degraded to a preparatory function.

2.2.2. *De lege ferenda*

In the context of the OECD's work on digital taxation (the two-pillar approach), the State Secretariat for International Finance (SIF) published a statement in November 2019

[45] In this context, however, it is worth mentioning that in 1903 the Federal Supreme Court characterized vending machines as a PE in an intercantonal constellation (cf. BGE 29 I 8).

[46] Lehmann Daniel, E-Commerce: Steuerliche Rahmenbedingungen, eine Standortbestimmung, in: Steuer Revue No. 1/2001, p. 6.

acknowledging the progress on BEPS 2.0. According to this announcement, Switzerland is committed to tax sovereignty and fair tax competition. Thus, the SIF considers that a binding minimum tax level generally hampers innovation and growth.[47] As a response to the OECD's Statement on a Two-Pillar Solution to Address the Tax Challenges Arising from the Digitalisation of the Economy published on 8 October 2021,[48] the SIF released another statement calling for legal certainty in the implementation of the key parameters in international corporate taxation. According to the SIF, the new taxing rights for market jurisdictions are moderate, and unilateral digital taxes are to be abolished with binding effect. Other points of importance for Switzerland, however, are still open and to be detailed in the coming months. The SIF highlighted again that Switzerland is committed to rules that foster innovation and prosperity, that are applied uniformly worldwide and that are subject to a dispute settlement mechanism. The aim is to create legal certainty for the companies concerned. Switzerland is critical of the OECD's timetable, as it does not yet sufficiently respect national legislative processes. Thus, it will not be possible for Switzerland to introduce the new rules by 2023, as envisaged by the OECD. In parallel with the ongoing work of the OECD, the Federal Department of Finance, in close collaboration with other departments and the involvement of the cantons, cities, businesses and academia, will, by the first quarter of 2022, draw up internationally accepted proposals for the Federal Council that will continue to offer businesses the best possible framework conditions for sustainable growth.[49]

2.3. Income taxation

As stated above, income derived from data transactions or analysis is generally subject to Swiss taxation. However, an exemption may apply if the data architecture containing the big data solution qualifies as a patent or similar right. Further, corporations implementing a data-based business model may be eligible for the R&D super-deduction.

2.3.1. Patent box

As of 1 January, Swiss tax reform introduced the patent box at the cantonal and communal levels reducing corporate income tax from qualifying patents and similar intellectual property rights. The benefits granted under the patent box regime are not automatically granted. Instead, a company must file a written request together with supporting documents.[50]

47 The SIF announcement is available at <https://www.sif.admin.ch/sif/en/home/dokumentation/fokus/digitalbesteue rung.html> (last visited: 12 December 2021).

48 The statement is available at <https://www.oecd.org/tax/beps/statement-on-a-two-pillar-solution-to-address-the-tax-challenges-arising-from-the-digitalisation-of-the-economy-october-2021.pdf> (last visited: 12 December 2021).

49 The SIF announcement is available at <https://www.sif.admin.ch/sif/en/home/documentation/press-releases/me dienmitteilungen.msg-id-85410.html> (last visited: 12 December 2021).

50 It is to be noted that, although it was intended in the BEPS Action plan 5, Switzerland does not include inventions in the patent box by small and medium-sized enterprises (SMEs), which are not protected by a patent.

To put it in a nutshell, the patent box allows income from patents and similar intellectual property rights to the extent that it is based on qualifying R&D expenses in Switzerland, to be reduced up to a maximum of 90% (depending on the cantonal implementation; the relief is, however, subject to an overall maximum deduction of 70% of taxable profit). To enter the patent box, previously incurred R&D expenses from developing the patents in question will have to be taxed at the applicable corporate income tax rate. Resident corporations as well as PEs of non-resident corporations are eligible to benefit from the patent box.[51]

2.3.1.1. General requirements

a) Qualifying patents and similar rights

The Swiss patent box regime not only covers Swiss but also foreign patents. According to the Federal Act on Patents for Inventions (PatA),[52] patents are granted for new inventions applicable in industry (article 1 PatA). An invention is considered to be new if it does not form part of the state of the art (article 2 PatA). Products as well as processes can be patented as long as the invention solves a problem in a new, non-obvious and technical way. Further, the patent box also covers similar (Swiss or foreign) rights such as supplementary protection certificates or topography rights.[53] Categorization of boxes may be based on the number of patents, products or product lines.

b) Determination of privileged income

Determination of privileged income requires two steps: As a first step, usually a residual method is applied in order to identify privileged income.[54] The starting point is the profit resulting from a specific product. If such profit cannot be determined reliably, the total profit of the corporation will be used and reduced by (ordinarily taxed) profits that are not related to the patents or similar rights. As a second step, the identified privileged income will be adjusted by the *modified nexus approach*. This means that only the income attributable to domestic R&D costs can benefit from the tax discount. The nexus ratio is calculated as the ratio of qualifying R&D costs (cost related to R&D activities performed by the corporation and/or unrelated parties) to the total R&D costs (also including any patent acquisition costs). Not qualifying, for example, are expenditures for contract research by foreign group companies. The nexus quotient can be a maximum of 100%. The up-lift[55] is limited to 30% of qualifying expenses.[56] Multiplication of the residual profit with the nexus factor results in what is known as box profit (*Boxengewinn*).

51 Bertschinger Michael/Mühlemann Marco, Die neue Patentbox – bundesrechtliche Vorgaben und kantonale Umsetzung, in: Steuer Revue No. 75/2020, p. 178.

52 SR 232.14.

53 Cf. Hinny Pascal, Unternehmenssteuerreform (STAF), Praxiskommentar, p. 57 et seqq.

54 Bertschinger/Mühlemann, p. 183.

55 The purpose of the up-lift is to ensure that the nexus approach does not penalize taxpayers excessively for acquiring IP or outsourcing R&D activities to related parties. The up-lift still ensures that taxpayers only receive benefits if they themselves undertook R&D activities, but it acknowledges that taxpayers that acquired IP or outsourced a portion of the R&D to a related party may themselves still be responsible for much of the value creation that contributed to IP income (Hinny, p. 66 with reference to OECD/G20, BEPS-Action 5, Final Report, 28, ciph. 41.

56 Cf. Hinny, p. 65 et seqq.

The above information can be graphically illustrated as follows:

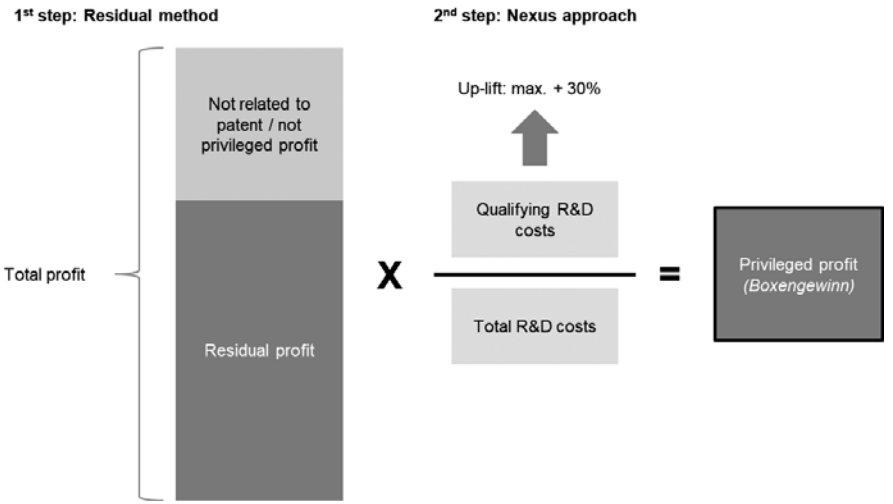

Figure 1: Swiss patent box (illustration inspired by Dietschi Marc/Taddei Pascal, Die Schweizer Patentbox, article available at <https://www.kalaidos-fh.ch/de-CH/Blog/Posts/Archiv/sr-1191-Die-Schweizer-Patentbox> (last visited: 12 December 2021).

c) Reduction

A maximum of 90% of adjusted box income will be reduced. Thus, at least 10% will be taxed ordinarily (for the overall maximum deduction cf. above). Although the cantons may legislate a less generous exemption, most of the cantons have adopted the maximum exemption rate (e.g., Zurich, Basel-City, Basel-Land, Berne, Schwyz or Zug).

To enter the patent box, previously incurred R&D expenses that arose to develop the patents in question will have to be taxed at the applicable corporate income tax rates.

2.3.1.2. Patent protection for big data solutions

Big data solutions can be extremely complex, and as the technological environment is of a dynamic nature, the big data landscape is still evolving. In the past, data were often in silos – collected and analysed for single purposes as the costs for storage and testing models were high. With the availability of new technologies, this has now changed, and corporations are eager to bring large datasets together while applying a strategy of data linkage and integration allowing them to make decisions group-wide that are better informed or to make powerful predictions.

The foundation of big data analytics is known as *big data architecture*.[57] The term "big data architecture" describes the overarching system used to manage large amounts of data so that they can be stored, managed, analysed and exploited for business purposes. In

[57] Cf. Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 14 et seqq.

other words, big data architecture is a system consisting of different layers and components handling data during data storage, processing, analysis and visualization. There are no strict rules about how big data architecture needs to be designed. Instead, a different data vision needs to be designed depending on the business model as big data strategy should align to corporate business objectives. For example, a big data architecture may be based on a so-called *data warehouse* and, here again, there are various models how a data warehouse and the processes therein may be structured.

Whether or not data-driven businesses can benefit from the patent box, primarily depends on whether the implemented big data system or components thereof can be considered as an innovative invention and, thus, qualify for a patent registration – either in Switzerland or abroad. A glance in the public database *Swissreg*, which registers Swiss patents, shows that it is indeed possible to patent (at minimum) aspects of an overall big data project respectively big data solution. Such projects/solutions are typically based on or combined with software and algorithms. Although there is the general rule in Swiss patent law that software cannot be protected by way of a patent, exceptions may, however, apply if the developed software is linked with a technical innovation (e.g., a sensor or a smart device collecting or analysing data or if an AI-guided machine makes decisions or takes actions based on the software it runs).[58]

Data-driven corporations using big data analysis for improving their products or services will likely determine privileged income based on the residual method as the patent will be contained in the product (unless the corporation keeps a separate product-based profit and loss account). The determination of privileged income might be a challenge, as the corporation will need to justify why the specific amount "x" is to be allocated to the product "y". Further, an increase of profit must also be causally linked to the patent. As mentioned above, it is possible to categorize the boxes based on patents, products or product lines. It is to be assumed that data-driven corporations will categorize their boxes based on products or product lines if not all inventions are patentable (or will not be made public) but, nonetheless, are somehow integrated in the product. Since the modified nexus approach will ensure that there is enough substance in Switzerland, data-driven corporations that intend to use the patent box regime are well advised to implement a structure that ensures that there are enough domestic R&D costs.

2.3.2. R&D super-deduction

2.3.2.1. General requirements

Cantons may grant additional deductions for R&D expenditures. The amount of these additional deductions can be up to a maximum of 50% of commercially justified R&D costs. However, only domestic expenditures are taken into consideration and may benefit from the additional R&D super-deduction. In addition, a flat-rate allowance of 35% is added for staff costs to account for other R&D costs, and 80% of the incurred R&D costs contracted from related and third parties in Switzerland can be considered for the R&D super-deduction. Maximum tax relief on profits arising from the patent box and a potential R&D super-deduction cannot exceed 70% of the net profit if a lower relief cap is not applicable

[58] Federal Council Dispatch of 21 March 2018 on Tax Proposal 17 (TP17) (Botschaft vom 21. März 2018 zum Bundesgesetz über die Steuervorlage 17 [SV17]), BBI 2018 p. 2550.

according to cantonal law. Most of the Swiss cantons have implemented the R&D super-deduction (e.g., Zurich, Geneva, Schwyz or Zug with a super-deduction of 150% and an overall limitation of 70% or Basel-Land with a super-deduction of 120% and an overall limitation of 50%).

In accordance with the Federal Act on the Promotion of Research and Innovation (RIPA),[59] R&D is defined as follows:

Scientific research (research) means the method-based search for new knowledge; it covers in particular:

1. *basic research: research, the main goal of which is to gain knowledge;*
2. *applied research: research, the main goal of which is to contribute solutions to practical problems; and*
3. *science-based innovation (innovation) means the development of new products, methods, processes and services in industry and society through research, particularly applied research and the exploitation of its results.*

Whether or not the definition of R&D as provided in the OECD's Frascati Manual 2015 is relevant for Swiss tax purposes, is controversial. According to the OECD's Frascati Manual, the term "R&D" requires an activity that is *novel*, *uncertain*, *creative*, *systematic* as well as *transferable* or *reproductible*. Whereas the Swiss Tax Conference (SSK)[60] is of the opinion that the OECD's Frascati Manual serves as an interpretation aid,[61] Swiss tax doctrine takes a more critical view.[62] For example, according to Hinny, the OECD's Frascati Manual is not decisive, as there is neither a legal basis nor a basis in the legislative materials which could justify an approach taking the OECD's definition into consideration. According to this author, the definition as shown in the RIPA as well as the relevant legislative materials rather show the legislator's intention to offer a *wide scope* for the application of the R&D super-deduction. The application of the R&D super-deduction, however, will unnecessarily be narrowed down by the criteria "creative", "uncertain", "systematic" as well as "reproductible", for which a legal basis is missing anyway.[63]

2.3.2.2. R&D super-deduction for data-driven corporations

Thus, with regard to data-driven corporations, the question arises whether and to what extent activities linked to big data projects and, in particular, data analysis may qualify for the R&D super-deduction.

According to the opinion presented here, a narrow interpretation of the term "R&D" would indeed not be in line with the legislator's intention as presented in the Federal

59 SR 420.1.

60 The SSK is a Swiss association founded in 1919. Members of the SSK are all cantonal tax administrations as well as the Swiss Federal Tax Administration (SFTA).

61 Cf. SSK, Analyse zum zusätzlichen Abzug von Forschungs- und Entwicklungsaufwand nach den Art. 10a und Art. 25 Steuerharmonisierungsgesetz, published on 4 June 2020, p. 5 et seqq.

62 Cf. Hinny, p. 120 et seqq.; Schwarz Angelica Maria, Big data and tax – domestic and international taxation of data driven business, presentation held at the extraordinary general meeting of IFA Switzerland on 10 February 2022; cf. also Bucher Viktor/Bucher Livio, Zusätzliche Abzüge für Forschung & Entwicklung, webinar held on 14 October 2021 (the speakers seem to take a more neutral view but also mentioned the critical voices raised in connection with the OECD›s Frascati Manual).

63 Cf. Hinny, p. 120 et seqq.

Council's Dispatch regarding the Tax Proposal 17. It is to be noted, however, that the relevant dispatch does not ignore the OECD's Frascati Manual entirely (it can certainly be debated whether and to what extent such general reference has any significance for the interpretation of R&D).[64] Due to the fact that there is an explicit reference to the R&D definition as provided in the RIPA, it seems important to also take its scope of application into account: The RIPA governs the specifics of the funding activities of, for example, Innosuisse, a federal entity under public law which goal is to promote *science-based innovation* in the interest of the economy and society in Switzerland.[65] When having a look at the projects promoted/funded by Innosuisse, it becomes clear that digitalization projects (for example in the area of industry 4.0 or [software systems and services for] predictive maintenance) are also included.[66] This leads to the conclusion that various activities performed by data-driven corporations should qualify as R&D, such as implementation of an organized data architecture that may include collecting, processing, evaluating, analysing or refining data. In this context, it should be remembered that data may contain (items of) information, and if the information is exploited correctly, it may lead to new knowledge and bring data-generated insights to life. Thus, big data strategies cannot be reduced to simple data collection which would be excluded from the R&D super-deduction. Instead, big data projects usually go much further than that and it is recommended to take a closer look at the complexity and functionality of the data architecture, particularly to identify the original knowledge gap.

The above shows that the R&D super-deduction might be an interesting tool for data-driven corporations aiming to reduce their taxable profit by a deduction that is higher than the amount effectively expensed through the P&L. As the R&D super-deduction can be claimed for certain costs relating to personnel and contract research, data-driven corporations may consider implementing a Swiss structure that allows them to maximize this tax incentive (e.g., having a centralized data unit in Switzerland by hiring talent that can drive data-led innovations).

III. Application of treaty principles

1. Overview

Switzerland currently has double taxation agreements (DTAs) with over 100 countries (including all EU and EFTA countries) and is seeking to extend its agreement network further. Most treaties generally follow the OECD-MC. The following will focus on selected treaty aspects that may become relevant for Swiss resident and non-resident corporations pursuing data-driven business models.

64 Dispatch of the Federal Council regarding the Tax Proposal 17 dated 21 March 2018 (BBl 2018/18.031), p. 2551 et seq.

65 Cf. also Hinny, p. 110 et seqq.

66 Cf. Innosuisse›s official website <www.innosuisse.ch> (last visited: 1 March 2022)

2. Specific treaty aspects

2.1. *PE*

2.1.1. *Fixed place of business and right of use – Big data in the cloud*

Various data-driven corporations are merging their big data strategy with cloud computing services in order to add more capacity to their in-house data warehouse. As big data projects require immense infrastructure resources, cloud computing service providers offer a less costly solution especially for corporations in the early stages of becoming data driven. Particularly when it comes to data mining, cloud computing has made the analytics process less costly and more efficient. For big data-driven corporations, the question, therefore, arises whether and to what extent there is an increased PE exposure when they become customers of a cloud computing service provider (either in inbound or outbound constellations).

Whereas software and websites never pass the place of business test, data centers (which represent the infrastructure for a cloud service) may be an eligible place of business. An evaluation of rights of use is necessary in order to determine whom such a place of business is to be allocated to (cloud provider vs. data-driven corporation as a customer).[67] In the context of e-commerce, the OECD Commentary of the Model Tax Convention on Income and Capital as it read on 21 November 2017 (OECD Commentary) states that web hosting arrangements are typically not sufficient to obtain rights of use to physical servers.[68] At first glance, this may appear contradictory as the OECD Commentary also uses the expression "*otherwise at disposal*".[69] In Swiss doctrine, it is argued that the perception of a cloud as constituting a permanent establishment on its host server would be contrary to the spirit of the special rules on e-commerce, whose purpose is to prevent the owner of a website from having a PE in a country. Thus, requiring mere factual use would make the right-of-use requirement redundant, which clearly cannot be the intention of the OECD. This is why the mere digital presence of an enterprise in a country, at least today, should not amount to sufficient rights of use. In addition, it is to be noted that customers who use cloud computing services do not have any rights to a specific server but rather to abstract, virtual servers at the software level.[70]

2.1.2. *Preparatory or auxiliary activities – data collection*

In contrast to Swiss domestic law, article 5 paragraph 4 OECD-MC contains a list of activities that do not establish a PE. Switzerland has more or less adopted this provision in many of its DTAs (e.g., with Germany, the US, France, the Netherlands or the UK). Since DTAs restrict the contracting states' taxation right, the list of exceptions has an important function when assessing whether or not a non-resident corporation establishes a Swiss PE since the domestic PE definition can, in many regards, go further than the treaty definition (inbound

67 Weisser Alexander, International Taxation of Cloud Computing, Permanent Establishment, Treaty Characterization, and Transfer Pricing, p. 175 et seqq.

68 OECD Commentary 2017, art. 5 OECD-MC n. 124.

69 OECD Commentary 2017, art. 5 OECD-MC n. 10.

70 Weisser, p. 185.

constellations). As electronic or digital goods are not covered by article 5 paragraph 4 lit. b and c OECD-MC, lit. d and e may become relevant for data-driven corporations.[71]

Article 5 paragraph 4 lit. d OECD-MC relates to fixed places of business that are used solely to collect information for enterprises. If a fixed place of business is maintained solely for that purpose, it will need to be determined whether collection of information goes beyond the preparatory or auxiliary threshold.[72] Activities intrinsically related to collection of information (e.g., storage, processing and, to a limited degree, information hunting) should also fall within the scope of this exception clause. However, what goes beyond a systematic arrangement and filtering of information should fall outside the scope.[73]

As stated above, it is considered that data may represent *information*. Depending on the condition of the data (raw vs. processed data), such information is exploitable or non-exploitable. Whether or not collection of data qualifies as a preparatory or auxiliary activity needs to be determined taking the specific corporate purpose and business model into account. For data-driven corporations whose core purpose consists of collecting and selling raw data, data collection normally will not qualify as preparatory or auxiliary. A different view may be taken if a company collects data in its raw form so that it can convert or process them into a more readable format. If data processing is the main business purpose, collection of raw data may qualify as preparatory. In this writer's opinion, collection of data should qualify as an auxiliary activity if a company's value chain is mainly a physical one and data analytics are used as a tool to improve efficiency or reduce costs. In such a case, the captured information will be integrated in a physical value chain, which makes the data as a supporting element. The same holds true for corporations collecting data through a fixed place for the purpose of market research or the like. In this context, it may make sense to distinguish between external and internal data. External data provided to data consumers may indicate that the data themselves are the business asset and, thus, collecting them is not only a preparatory activity as long as they do not need to be significantly processed further (directly consumable information). These data are the service. When leveraging internal data, however, often another product or service is in the foreground. The question is, therefore, whether the business is built around data or data around the business.

Therefore, data-driven, non-resident corporations generally do not establish a Swiss PE if data are being solely collected on Swiss territory or from Swiss sources. The latter particularly applies if domestic law would define a sensor as a fixed place of business.

For the sake of completeness, it is noted that the wording of article 5 paragraph 4 lit. d OECD-MC limits its scope of application to collection of information for the benefit of the *enterprise*. If data is collected for different group companies, it would need to be analysed whether there is an applicable DTA for each group company restricting Switzerland's taxation right. It may, therefore, be critical for treaty shopping considerations whether the (unprocessed) data are made available to other group companies after collection when an enterprise claims the exception clause of article 5 paragraph 4 lit. d OECD-MC.

71 Cf. OECD Commentary 2017, art. 5 OECD-MC n. 66. The OECD Commentary explicitly states that the term «*goods*» refers to tangible products and does not cover data. Based on this, it seems that the OECD qualifies data as intangible property without specifying what data exactly is. This is not necessarily obvious, as the comments on treatment of data from a property law (cf. above) and accounting law perspective (cf. below) have shown.

72 OECD Commentary 2017, art. 5 OECD-MC n. 69; cf. art. 13 of the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent Base Erosion and Profit Shifting (MLI) (SR 0.671.1) and the reservations made by Switzerland.

73 Weisser, p. 72.

2.2. *Character of income*

Allocation of taxing rights mainly depends on the treaty characterization of income streams. Here again, Switzerland's DTAs mainly follow the structure of the OECD-MC and distinguish, inter alia, between income from immovable property (article 6 OECD-MC), business profits (article 7 OECD-MC), royalties (article 12 OECD-MC) and other income (article 21 OECD-MC).

2.2.1. *Cloud computing*

As mentioned before, cloud computing contains various services and may allow for access to shared networks of storage, servers and applications on the internet. Data-driven corporations deciding to outsource their IT solutions will have to pay a certain fee to cloud computing service providers. Depending on the specific service, an application service provider agreement (ASP) is usually concluded. In Swiss doctrine, the ASP agreement is described as a service agreement not falling under a specific classification (*Innominatvertrag*).[74]

According to the view presented here, income derived from such services does not fall within the scope of article 6 OECD-MC since virtual storage rooms do not represent immovable property. This may even apply if the server(s) should be regarded as a fixed place of business. Of course, a different view would need to be taken if the physical data center would be rented out.[75]

It is less clear, however, whether such income should qualify as royalties rather than business profits. According to the OECD Commentary, income from software transactions may be characterized as royalties, and research among the OECD member states has revealed that software rights are usually protected under copyright rules. In Switzerland, for example, computer programs are protected by copyright as explicitly stated in article 2 paragraph 3 CopA. Consequently, payments for the right to use software may fall within the scope of article 12 OECD-MC.[76] As royalties are paid for the use of intellectual property or rights to use it, article 12 OECD-MC does not apply to payments for alienation of all rights attached to intellectual property. Whether article 7 OECD-MC or article 13 OECD-MC applies in such cases, depends on the extent of the transferred rights.[77]

Whether or not article 12 OECD-MC applies in the context of cloud computing, cannot be conclusively answered as a variety of services may be offered under cloud computing agreements. According to the writer's opinion, it needs to be analysed in each separate case which rights the cloud computing customer acquires under the specific arrangement. For example, where cloud computing services are limited to providing the customer access to an internet-based interface (thus, without entailing the transfer of additional works that are subject to copyright), the fees should rather fall within the scope of article 7 OECD-MC instead of article 12 OECD-MC.[78]

74 Straub Wolfgang, Cloud-Verträge – Regelungsbedarf und Vorgehensweise, in: AJP 2014, p. 906.

75 Cf. Weisser, p. 225 et seqq.

76 OECD Commentary 2017, art. 12 OECD-MC n. 12 et seqq.

77 Müller Andreas/Linder Thomas, in: Zweifel/Beusch/Matteotti (editors), Kommentar zum internationalen Steuerrecht, art. 12 OECD-MC n. 79.

78 Cf. Weisser, p. 235 et seqq. for further information.

2.2.2. Personal data as payment for free online services

"*If you are not paying for the product, you are the product,*" is a common sentence used to describe a business model where the consumed online services are funded by the proceeds of personal data. It is a form of data acquisition that various data-driven corporations have been making use of in past years. From an international tax perspective, the question arises whether and to what extent there is an allocation right for such "*proceeds*".

Interestingly, the term "proceeds" is not defined in article 3 OECD-MC, even though it is frequently used. This is remarkable since profit allocation between a headquarter and its PE is based on the premise that there is any profit at all that could be allocated. Thus, a data-driven corporation that admits having a PE in a specific state could still argue that zero profit is to be allocated abroad, since the PE itself does not generate any proceeds by collecting data for its services (which from the point of view of the consumers are "*free*").

According to the opinion presented here, the question whether and to what extent data may be considered as proceeds cannot be answered in general terms as data do not have a value per se (unlike, for example, bitcoins with a market value). For example, whereas patient records could have a value for pharmaceutical companies, logistic companies are more interested in information concerning warehouse management or geolocation data. Once the value of the data proceeds has been determined, it would need to be analysed whether they fall within the scope of article 21 OECD-MC.

IV. Transfer pricing

There are a lot of open questions when it comes to big data and transfer pricing. On one hand, there are various conceivable constellations of how data-related intercompany transactions can be designed. For example, MNEs may consider establishing a data company that centrally processes (raw) data that was collected group wide. In a second step, this (processed) data could be licensed or sold back to the group companies in various jurisdictions. On the other hand, valuation of data may be difficult since the value highly depends on the information content and the business purpose. This especially becomes problematic when the value of data is integrated in the product or service. There often is no market for specific data, which leads to the next question whether both external and internal data should be relevant for transfer pricing aspects.

It would extend the scope of this report to cover each conceivable question. Instead, the following section focuses on selected aspects that may become relevant for data-driven corporations.

In general

Switzerland does not have specific transfer pricing legislation, and there are no particular documentation requirements in this respect. Nevertheless, under general tax provisions (in particular, article 58 FDTA), related-party transactions must be at arm's length and commercially justified. The OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations as they read in July 2017 (OECD TP-Guidelines) are only a source of interpretation without binding force. Nonetheless, the DEMPE approach is constantly

followed by the Swiss tax authorities, which may become an important element when defining intercompany data transactions.[79]

1. Assessment of functions and risks

1.1. *Data activities as a contributor to DEMPE analysis*

Application of data analytics and AI to data may provide critically valuable input within a value chain. With the use of big data, traditional value chains will become more interactive and more connected. The table below provides an example of how intercompany data activities may be classified in a DEMPE analysis.[80]

Functions	Activities

Development	• Research activities, such as:
	  • Definition of big data strategy
	  • Analysis how to digitalize value chain
	  • Search for data sources and systems for data collection
	  • Drafts in connection with IT architecture or cloud computing
	• Development activities, such as:
	  • Implementation of big data strategy including cloud computing services
	  • Construction of IT architecture
	  • Data collection

Enhancement	• Test runs in connection with IT architecture and data processing • Search for alternatives • Improvement of data quality and data sources • Improvement of tools and algorithms for data analytics
Maintenance	• Measures for keeping data pool up to date • Application management • Update of data storage, data processing and data analytics software
Protection	• Draft and implementation IT security concept • Implementation of data security measures • Licensing or accessing rights
Exploitation	• Decision making process regarding data exploitation (e.g., sale, licensing, processing data)

Figure 2: Data activities as a contributor to DEMPE analysis (cf. also Schwarz*, p. 448).*

As can be seen from the above information, the systematic focus of DEMPE is based on where value is created rather than on where the value creating activities have their *effects*. As the OECD's Inclusion Framework[81] shows, the question is to what extent the DEMPE approach is suitable for data-driven corporations. From the author's point of view, the answer to this question is affirmative, as the numbers of data-driven corporations will

79 Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 352 et seqq. for further information (especially with regard to the question whether the OECD TP Guidelines should be applied statically or dynamically).

80 Cf. Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 448.

81 With regard to Switzerland, it remains to be seen whether and to what extent Pillar 1 and 2 will be integrated in Swiss legislation and practice.

increase and, thus, the DEMPE analysis would become obsolete in the future.[82] Further, the above information also shows that capital is not contemplated in the DEMPE framework. With regard to data-driven corporations, this, however, should not be neglected as set-up and maintenance of IT infrastructures could be associated with high costs.

1.2. *Data activities as risk-taking functions*

As there are a lot of open questions about legal ownership of data, big data strategies can also involve high risks. An area of exposure could be, for example, where data protection law introduces a right for individuals to have personal data erased. Of course, when talking about big data, usually a large volume of data is processed. Nonetheless, such claims should be adequately taken into account when defining transfer prices.

2. Data as hard-to-value intangibles

Due to the fact that there usually is no market for data, data could be identified as hard-to-value intangibles (HTVI) in specific cases. According to the OECD TP-Guidelines, the tax administration may consider *ex post* outcomes as presumptive evidence about the appropriateness of *ex ante* pricing arrangements.[83] According to the view presented here, there is no legal basis in Swiss legislation that would allow application of this kind of an approach. The OECD's concept is basically retrospective taxation instead of actual taxation.[84] In an intercantonal constellation, the Swiss Supreme Court explicitly stated that actual taxation should apply, provided that neither tax avoidance nor simulation exists.[85]

V. Value-added tax (VAT)

1. In general

Swiss VAT is payable for goods or services supplied by businesses that are taxpayers for VAT purposes, for imported goods and for services received from abroad. Certain goods and services are exempt from VAT (e.g. financial services, real estate transactions and transfer of shares; cf. article 21 of the Federal Act on Value Added Tax [VAT Act]).[86] Exports and turnover generated abroad are not subject to Swiss VAT. Any legal entity (e.g., a subsidiary

[82] Should the OECD›s two-pillar journey reach its goal, the question arises whether and to what extent Pillar 1 may affect the DEMPE analysis. EconPol Europe (European Network for Economic and Fiscal Policy Research) expects that Pillar 1 will affect only 78 of the world›s 500 largest companies (press release available at <https://www.econ pol.eu/press_releases/2021-07-05> (last visited: 13 December 2021).

[83] OECD TP-Guidelines, ciph. 6.192.

[84] Thus, Switzerland has not adopted the HTVI approach into its legislation (cf. OECD›s questionnaire on the implementation of the HTVI approach in Switzerland available at <https://www.oecd.org/ctp/transfer-pricing/htvi-monitoring-response-switzerland.pdf> (last visited: 13 December 2021).

[85] BGE 146 II 97; cf. also Schwarz, p. 457 et seqq.

[86] SR. 641.20.

or a branch) performing an income-producing commercial activity is required to register for and charge VAT if the total of supplies of goods, services and self-consumption worldwide exceeds CHF 100,000 per annum (article 10 VAT Act). The current standard VAT rate is 7.7%.

Personal data as "payment" for the use of digital content is an economic reality. The question under which circumstances data-driven corporations are subject to Swiss VAT is twofold: On one hand, it needs to be analysed whether the digital product qualifies as a supply in the sense of article 3 lit. c VAT Act. On the other hand, data must qualify as consideration in the sense of article 3 lit. f VAT Act. The following will solely focus on the consideration aspect.[87]

2. Data as consideration for VAT purposes

According to article 3 lit. f VAT Act, the term "*consideration*" means an asset that the recipient expends in return for receipt of a supply. Article 24 VAT Act provides that the tax is, in general, calculated on the consideration actually received. Further, for barter transactions, the market value of each supply is deemed to be the consideration for the other supply.

According to Swiss doctrine, whether or not data qualifies as consideration needs to be answered in the light of the principle of *competitive neutrality* as stated in article 1 para. 3 lit. a VAT Act. As mentioned before, a subjective evaluation rather than an objective evaluation must be made as data does not have a value per se. In this sense, it is argued that, in an individual case, data may qualify as consideration, particularly if (i) the received data has a monetary value for the specific company and (ii) there is a reciprocal (synallagmatic) relationship between the parties. A reciprocal relationship is not to be assumed if the digital service can also be used without providing its data or if the user did not consent to the use of its data.[88]

There are various methods that could be used to determine the value of data. For example, according to a cost-based approach, the costs for collection, storage or maintenance could be evaluated. On the other hand, the value can be calculated based on future cash flow using a benefit-oriented approach.[89]

VI. Tax accounting

1. Authoritative principle

As mentioned before, Swiss tax law generally follows the authoritative principle. This leads to the general rule that transactions that are permitted under Swiss commercial law must also be considered for Swiss income tax purposes. The question of how data and data-related transactions are treated from an accounting perspective may, therefore, become highly relevant for data-driven corporations. For example, whether or not data can be treated as a corporate asset that can be listed on the company's balance sheet may become crucial

87 For further references cf. Hug Thomas, Daten als mehrwertsteuerliches Entgelt?, in: zsis 3/2020 art. no. 11.

88 Hug, p. 7 et seqq.

89 Hug, p. 10.

for various tax aspects. Commercially permitted depreciation of data, for instance, could reduce taxable income. Further, if data is to be treated as a corporate asset, the question arises whether and to what extent non-compliant use of data should be reflected on the liability side of the balance sheet (breaches of data protection law provisions may serve as an example). If a company is confronted with a claim for cancellation of data, it may be obliged to make provisions in order to cover possible future liability. This in turn could have an impact on taxable income as provisions are expensed via the profit and loss statement (P&L).[90]

Accounting treatment of data and data transactions has only rarely been discussed in Swiss doctrine so far, and there are a lot of open questions that, for the purpose of this report, cannot all be answered. The following is, therefore, limited to giving a brief introduction to the topic of whether and to what extent data can be counted as a balance sheet asset according to Swiss accounting provisions[91] as provided in article 957 et seqq. CO.[92]

2. General requirements

According to article 959 paragraph 2 CO, items must be entered on the balance sheet as assets if (i) due to past events they (ii) may be disposed of, (iii) a cash flow is probable (*wahrscheinlicher Nutzenzufluss*) and (iv) their value can be reliably estimated. Other assets may not be entered on the balance sheet.

Swiss accounting law is supported by the fundamental principle of *prudence* as stated in article 958c paragraph 1 CO. Thus, and in contrast to IFRS, Swiss accounting law does not follow the *true and fair view* or the *fair presentation concept*. Instead, article 958 paragraph 1 CO "only" provides that financial reporting is intended to present the economic position of the undertaking in such a manner that third parties can make a *reliable assessment* of it.

3. Data asset

3.1. Probable cash flow

The question whether or not collection of data may lead to a probable cash flow cannot be answered for all companies equally as the value of data depends on its information content. For example, health records may be useful for companies in the pharmaceutical industry but probably not for logistics companies. Further, raw data are usually not directly usable unless they can be sold as such. Therefore, the probability of cash flow is first and foremost a *subjective* evaluation, which, however, does not exclude the fact that an assessment cannot be made based on objective, measurable criteria (otherwise the evaluation would become a purely discretionary matter). Such criteria, for example, may be the condition,

[90] For further information, cf. Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 57 et seqq.; Schwarz, Daten bilanzieren?, p. 1; Schwarz Angelica Maria, Bilanzierung von Daten, in: Springer Essentials, p. 11 et seqq.

[91] For further information regarding the question how data is to be treated under IFRS, cf. Schwarz Angelica Maria, Future Data Assets, Welchen Wert haben technische Daten in Bilanzen?, VDI-Thesen und Handlungsfelder, October 2021.

[92] For further information also with regard to IFRS treatment (especially IAS 38), cf. Schwarz, p. 57 et seqq.

quality or availability of the data. Regarding the latter, it is to be noted that the sale of data that is also publicly available, is not likely to lead to a probable cash flow as they are accessible to everyone. This often concerns data provided by public authorities (e.g., since 2014 Switzerland has been following an open government data strategy). Nonetheless, a probable cash flow may still result from further development and analysis of this kind of data if this is intended by the company. Either way, a probable cash flow can only be assumed if the company specifically plans to exploit its data. The fact that a company is sitting on a pile of data does not automatically mean that it will turn a profit from the data if it does not have the expertise, purpose or IT equipment to analyse such volumes of data.[93]

3.2. *At the disposal of the company*

The requirement that data must be at the disposal of the company does not necessarily postulate legal ownership. Instead, this prerequisite is to be understood as an *economic power* over the data, which can be determined based on criteria such as risk, opportunity, benefit, liability, etc. Further, in order for data to be considered at the disposal of the company, the company needs to have physical or virtual access to the data pool. However, it cannot be presumed that the data carrier itself must also be at the disposal of the company; otherwise data that is stored in an externally rented cloud could never be allocated to a data-driven corporation using this kind of a tool.[94]

3.3. *Reliable estimation*

If the probability of cash flow is foremost a subjective evaluation, the question arises of how the value of data can be objectively estimated. According to the view presented here, the following distinction is to be made: On one hand, data that has been acquired from a third party has passed a market test (*derivative Daten*). In this case, the acquisition costs can serve as a reliable basis for estimation. On the other hand, a reliable estimation is more problematic for data that has been collected and processed by the company itself (*originäre Daten*). If a data-driven corporation wants to use the costs for establishment of a big data project, it first needs to analyse whether Swiss accounting law per se allows self-created intangibles to be listed on the balance sheet. Swiss accounting law does not explicitly prohibit inclusion of originally created intellectual property on the balance sheet. However, in contrast to development costs, future benefits from research costs are highly uncertain, which is why they usually are treated as expenses.[95]

The above information shows that under certain conditions data can be treated as a balance sheet asset. If the requirements for including an asset on the balance sheet are met, it is necessary to include that asset on the balance sheet under Swiss accounting law. It is, therefore, quite surprising that even though it is indisputable that data are an important asset for data-driven corporations it is not yet common practice to include these kinds of assets on the balance sheet or report them in another way in the financial statements.

93 Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 149 et seqq.
94 Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 157 et seqq.
95 Schwarz, Die handels- und steuerrechtliche Behandlung von Daten, p. 165.


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