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Digitalisation and foreign trade

1.1 The digitalisation of the world economy

Technological advances in information and communication technology (ICT), upgraded infrastructure and technical developments – such as *cloud computing*, *artificial intelligence*, *big data* and the *Internet of Things* – are shaping the global economy of the 21st century. Whereas to begin with the focus was on simplifying processes through ICT, the digital transformation, which has accelerated over the last ten years or so, can increasingly be described as the “*digitisation of everything*”.¹ This is affecting the whole economy and is changing business models, production processes, consumer habits and the world of work. Following the transition from a manufacturing to a service-oriented economy, we are currently seeing a process of transformation toward an information economy. This process has been given various names, such as “*Industry 4.0.*”,² “*Fourth Industrial Revolution*”³ and “*Digital Transformation*”.⁴ The basic content of these concepts is the same: it is not only about improving and accelerating the status quo, but also about fundamental, qualitative change.

The Federal Council wishes to create good framework conditions so that digitalisation can make a lasting contribution to safeguarding and enhancing prosperity.⁵ In its 2016 foreign trade report, the Federal Council already emphasised the importance of digitalisation for Switzerland’s status as a location for business.⁶ This chapter looks at recent developments in *digital commerce*⁷ and their potential impact on Switzerland.

1.1.1 Digitalisation is changing the structures of trade

Today, digital transactions play a key part in commercial trade. The increase in the volume of transactions and the rise of new players and business models are increasingly changing those sectors of the economy that have so far been less affected by globalisation – such as personal and in-house services.⁸

1 Cf. Ernst&Young, *The Digitisation of Everything*, London 2011.

2 German Federal Ministry of Education and Research BMBF, *Industrie 4.0*, www.bmbf.de/en/index.html > *Research > Digitale Wirtschaft und Gesellschaft > Industrie 4.0*.

3 Klaus Schwab, *The Fourth Industrial Revolution*, Munich 2016.

4 This is in line with the terminology used by the Federal Council. Cf. *Zielbild für die digitale Transformation der Bundesverwaltung und den Aufbau der digitalen Infrastrukturen*. <https://www.news.admin.ch/news/message/attachments/55503.pdf>

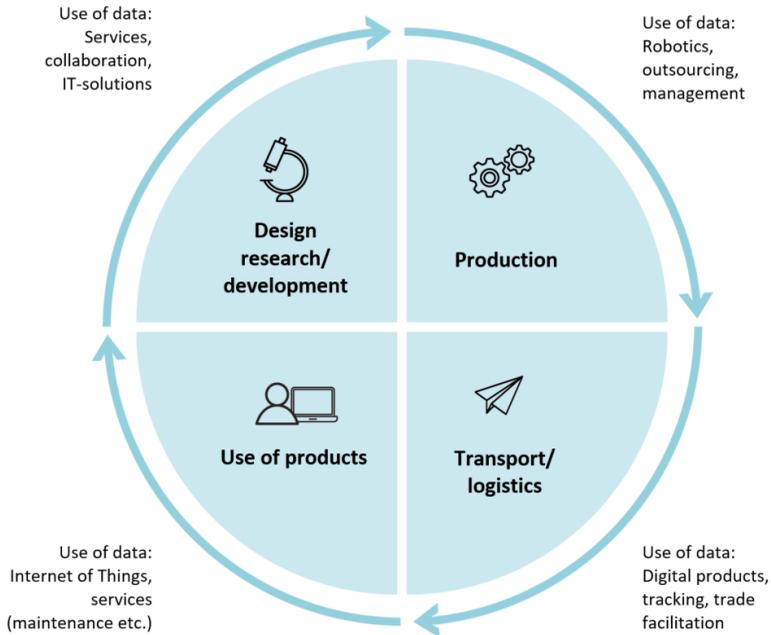
5 Cf. legislative planning 2015–2019, objective 3 and legislative planning 2019–2023, Guideline 1 “Die Schweiz sichert ihren Wohlstand nachhaltig und nutzt die Chancen der Digitalisierung”; Federal Council report on the key conditions for the digital economy, 2017.

6 2016 Federal Council Report on Foreign Economic Policy, section 1 “Exploiting the opportunities of globalisation and digitalisation”.

7 So far, there is no generally accepted definition of digital commerce, or e-commerce as it is sometimes known. In principle, the term refers to economically motivated cross-border transactions supported by digital means.

8 Cf. for example Richard Baldwin, *The Globotics Upheaval*, London 2019.

The international division of labour is becoming increasingly pronounced. Individual production stages take place in different countries and regions. It is no longer just the end-product that is traded internationally but also, in particular, intermediate and semi-finished products.⁹ These global value chains (GVCs), into which the Swiss economy is integrated¹⁰ more than most, are being transformed by the advance of digitalisation. Increasingly, there is a *digital thread* based on cross-border data flows permeating the entire value chain – from research and development, design, production, transport and logistics through to use by the end customer.¹¹



Among other things, the use of digital technology reduces transaction costs, improves and accelerates the coordination of production processes, facilitates the opening-up of larger markets along with economies of scale and network effects – as well as the personalisation of products and feedback between product development and user behaviour. This is deepening the digital integration of production and trade. This trend is being significantly influenced by technologies such as *blockchain*

9 Federal Council Foreign Economic Policy Report 2014, feature topic "Impacts of the global value chains on the economy".
 10 Carsten Nathani et al., Die Volkswirtschaftliche Bedeutung der globalen Wertschöpfungsketten für die Schweiz (The economic significance of global value chains for Switzerland), study commissioned by SECO, Bern 2014.
 11 Presentation supplemented according to: OECD, Trade and Cross Border Data Flows, June 2019.

(*Distributed Ledger Technology*, DLT) and by the use of artificial intelligence. One example of note is the potential inherent in DLT for trade finance, for the traceability of natural resources and for the energy and transport sectors.

The physical presence of a supplier in a market is becoming less important thanks to technological progress. Digital products and services are becoming easier to trade. While the way in which these processes are recorded for statistical purposes differs around the world in terms of calculation methods and results, the WTO puts growth in global service exports at 7.4 per cent in 2017 (as against 10.7 per cent for goods exports over the same period, with trade in services tending to show more dynamic growth).¹² There is therefore potential for further productivity increases, for example through *outsourcing*¹³ of services previously performed in-house (e. g. accounting, IT and customer service). This is creating opportunities for small and medium-sized enterprises (SMEs) in particular, and is making it easier for developing countries to access markets and integrate themselves into the global system of production and trade (cf. section 1.3.5).

While some digital commerce takes place entirely in digital form, digital technologies are also changing the “analogue” economy. Digitalisation is blurring the distinction between trade in goods and services.¹⁴ This may be due to the products themselves – for example through *additive manufacturing* (3D printing)¹⁵ – or to the increasing bundling of goods and services (e.g. lifts marketed along with maintenance and monitoring services). Goods manufacturing is increasingly integrating added value from services provided by third parties. Digital services are also *converging*: Consumer access can take place via an increasingly small number of terminal devices (such as smartphones) and platforms are offering a broader range (such as payments via social networks) and are competing with established providers in the sectors concerned.¹⁶ Intangible assets and intellectual property are becoming more important, particularly for knowledge-based economies such as Switzerland (cf. section 2.3).

Trade in small consignments on online platforms has increased significantly, even with customs barriers still in place. In 2015, the global shipping volume was estimated at around USD 260 billion, with domestic shipments accounting for the bulk of this figure (approx. 76 %). However, the volume of cross-border shipments is growing almost twice as fast as that of domestic shipments. The OECD is expecting growth of 25 percent per year up to 2020.¹⁷ On 4 September, the Federal Council

12 Cf. www.wto.org > news and events > press releases > 2018 > strong trade growth in 2018 rest on policy choices.

13 Report on the central framework conditions for the digital economy, Federal Council Report of 11 January 2017.

14 Cf. Federal Council report in response to postulate 11.3461 (Pfister).

15 Auswirkungen der Digitalisierung auf Beschäftigung und Arbeitsbedingungen - Chancen und Risiken, Federal Council report in response to postulates 15.3854 (Reynard) of 16 September 2015 and 17.3222 (Derder) of 17 March 2017.

16 Cf., for example, Torsten Körber, Analoges Kartellrecht für digitale Märkte?, *Wirtschaft und Wettbewerb*, vol. 65, no. 2, pp. 120-132.

17 www.oecd.org > trade > opinion > parcels trade: the good, the bad, and the ugly?

adopted a report in which it assessed various measures aimed at meeting the challenges posed by customs clearance in cross-border online trade.¹⁸

Digitalisation also raises competition policy issues. Thus, digital platforms give rise to new bilateral or multilateral markets¹⁹ where both suppliers and consumers tend to benefit from a concentration on a small number of services, which means that strong market positions can be established. Important markets, such as those for *cloud* or search services, are dominated by a small number of global providers, mainly from the USA. In addition to positive customer benefits, this can also lead to increased costs when changing supplier (*vendor lock-in*) and hence dependencies. Given that the impact on overall economic wellbeing remains unclear, competition policy interventions are being discussed with justified restraint.

1.1.2 Unimpeded cross-border data flows: the basic requirement

Digital commerce is dependent on cross-border data flows which enable the *digital thread* in value chains, the provision of digital services and the participation of consumers.

The global geography and dynamics of cross-border data flows are fundamentally different from those of analogue trade flows. During transmission, data is divided up into individual packets, which reach the addressee via various electronic paths²⁰ depending on network capacity.²¹ Even supposedly domestic transactions are often cross-border. If, for example, an online service of a Swiss provider is called up in Switzerland, the request can go to one or more servers abroad, (e. g. if the provider uses foreign services). The same applies to data storage. When using *cloud services*, data can be stored simultaneously at different locations (“mirrored” or “duplicated”).²² Today’s Internet and the economic transactions taking place over it therefore depend on data flowing across borders with as little hindrance as possible. At the same time, this raises questions of regulatory sovereignty, for instance with regard to data protection and the issue of where digitally generated profits should be taxed (cf. section 1.3.2).

There has been no let-up in the exponential growth of cross-border data flows.²³ For example, the OECD estimates that by 2015 the total volume of global data flows

18 Gleich lange Spieße für alle Online-Versandhändler, Federal Council report of 4 September 2019 in response to postulate 17.4228 (Moser) of 15 December 2017.

19 Bilateral or multilateral markets take place on platforms offered by one or more companies where distinct user groups come together. The use of the platform is influenced by network effects. This means that the more participants of one group use the platform, the more attractive the platform becomes for the users of the other groups and vice versa.

20 Cf. for example Barbara van Schewick, *Internet Architecture and Innovation*, MIT Press 2012.

21 OFCOM, Report of 23 October 2014 on the Working Group on Net Neutrality.

22 www.kmu.admin.ch > Leitfaden Cloud-Computing.

23 Up until now trade statistics have not specifically reported digitally traded goods and services. While the OECD, for example, is endeavouring to improve coverage (cf. OECD, *Measuring the Digital Transformation, A Roadmap for the Future*, 11 March 2019, available at: https://www.oecd-ilibrary.org/science-and-technology/measuring-the-digital-transformation_9789264311992-en) it is currently only possible to highlight individual aspects.

stood at 8 zettabytes²⁴ – an eightfold increase since 2010.²⁵ Current estimates expect this volume to increase nearly fortyfold by 2020. However, it is difficult to determine the direct commercial usability of this data.

1.2 Policy responses and regulation

All over the world, regulation of the digital economy is developing very rapidly, inconsistently and in a wide range of areas. It is applied to the three levels of the Internet: *physical* (networks and infrastructure), *logical* (digital infrastructure, i.e. protocols and algorithms) and *content* (data, products and services).²⁶ There is a conflict between the global nature of the Internet and national legislation. Solutions under international law can therefore make an important contribution toward legal certainty. Accordingly, multilateral forums (OECD, G20, WTO) have been addressing the issue for some time. To date, though, international economic law has primarily been regulated by bilateral and regional economic and trade agreements (cf. section 1.2.5). This entails the risk of fragmentation into regional sets of regulations.²⁷

Differing global approaches: tendency toward bloc formation?

Differing regulatory approaches to cross-border data flows (cf. section 1.2.2) are tending to cause blocs of like-minded groups of states to form. One such bloc can be identified around the USA, which itself does not so far²⁸ have any extensive legal framework covering such matters as data protection and is seeking a liberal application of economic law to cross-border data flows, along with the dismantling and prevention of restrictions. This contrasts with a group that has coalesced around China, Russia, Turkey and Vietnam and others. This group advocates a restrictive vision of Internet control (sometimes referred to as *cyber sovereignty*) to justify intervention in the cross-border data flows. Similar tendencies are also apparent in some European countries.²⁹ However, there is another group consisting of the EU and the EEA/EFTA countries whose focus is on safeguarding individual rights such as the protection of personal data. While localisation obligations for non-personal data are rejected as protectionist, particularly by the EU, overall this group is critical of obligations under international law in relation to cross-border data flows, as these conflict with its data protection legislation.³⁰ Switzerland basically falls into this group because of its approach to data protection (among other factors).

24 For comparison: One gigabyte = 10^9 bytes. One zettabyte = 10^{21} bytes.

25 OECD, “Data-driven Innovation: Big Data for Growth and Well-being”, OECD Publishing, 2015.

26 After Benkler/Lessig.

27 Cf. also Lionnet Philippe, *Weltwirtschaft und Handel: Fortschreitende Normierung oder neue Gräben?*, in: *Die Volkswirtschaft*, no. 8–9, 2019.

28 Legislative processes relating to this area are underway in various US states (e. g. California).

29 Cf. Karen Leigh, Stepan Kravchenko and Saritha Rai, *How ‘Cybersovereignty’ Splits the Once World Wide Web*, Bloomberg, 2 May 2019.

30 A decision on the free movement of non-personal data within the EU’s digital single market was taken on 28 May 2019. Cf. Regulation (EU) 2018/1807 of the European Parliament and of the Council of 14 November 2018 on a framework for the free flow of non-personal data in the European Union, OJ L 303, 28.11.2018, p. 59.

1.2.1 The open Internet and *net neutrality*

The Internet is global, but is *physically* composed of a multitude of individual networks. In each of these networks, various providers (*Internet Service Providers*, ISPs), such as national telecommunications companies, are active. The basic principle of data transmission is *best effort*: all data is transmitted in the same way regardless of sender, recipient, purpose or content, as long as sufficient capacity is available. Therefore, anyone transmitting data worldwide does not need to have agreements with individual ISPs. The latter also work on a largely interoperable basis at the *logical level*. This *net neutrality* has enabled countless innovations and has established the open Internet as the central communication infrastructure of globalisation.

If this fundamental principle is to be guaranteed, discriminatory interference with data traffic needs to be prevented. One challenge lies in the differing band needs of data flows – video services such as *Netflix* and *YouTube* currently already generate more than half of cross-border data flows by data volume.³¹ Important providers can use and provide privileged connections with “*leased lines*”, for example. Despite some controversy over the matter, price differentiations with regard to the bandwidth granted already exist today. Some ISPs also selectively grant their customers discounted access to some services (“*zero rating*”).

The legal anchoring of net neutrality varies from region to region. The USA is currently refraining from introducing any binding regulation of net neutrality.³² By contrast, in the EU the principle has been enshrined in law.³³ At the same time, interventions in net neutrality are not unusual in other countries. In China in particular, the *Cyber Security Law* of 2016 introduced a comprehensive legal basis for state intervention that extends to the complete blocking of foreign and domestic services. In addition, governments are increasingly restricting access to the Internet for political reasons.³⁴ This includes, for example, breaches of net neutrality during the election campaign in Venezuela, Internet shutdowns in Iraq and Cameroon and the systematic blocking of sites in Spain in the run-up to the referendum in Catalonia. In Switzerland, the principle underlying the Telecommunications Act,³⁵ revised during the year under review, will apply in future: All data are to be treated equally, but providers of special services will be able to structure their offerings flexibly as long as this does not impair the quality of the Internet connection.³⁶

31 Sandvine, Internet Phenomena Report, 2018.

32 While the US regulatory authority FCC presented proposals for Open Internet Principles in 2014, these have now been replaced by the Restoring Internet Freedom Order, which is more focused on transparency and the market.

33 Regulation (EU) 2015/2120 of the European Parliament and of the Council of 25 November 2015 laying down measures concerning open internet access.

34 Between 2016 and 2018, 371 partial or total shutdowns of access were registered, most of them in Asia, www.accessnow.org. Cf. Judith Kormann, Joana Kelen, NZZ, 9 July 2019.

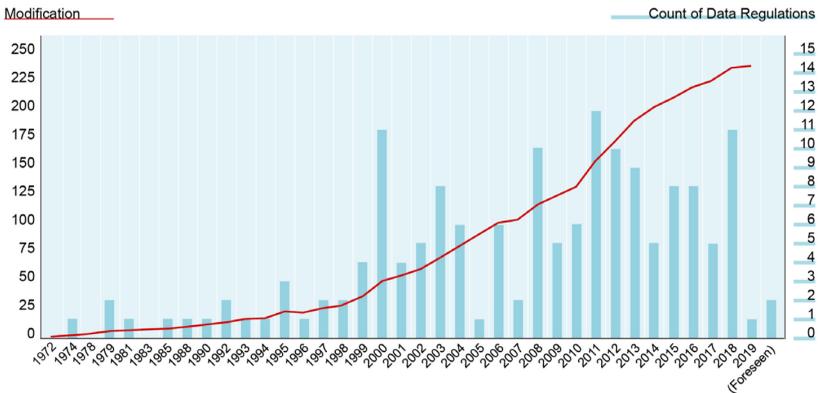
35 Telecommunications Act (SR **784.10**).

36 Special services are services offered by providers in addition to Internet access which are transmitted over the same line – such as voice telephony via fourth generation mobile telephony (VoLTE) and certain television services (IPTV). Cf. www.bakom.admin.ch > Das OFCOM > Organisation > Legal framework > Federal laws > FMG-Revision 2019.

1.2.2 Regulation of data transmission and *digital barriers to trade*

Digital barriers to trade are increasingly emerging worldwide. On the basis of the *Digital Services Trade Restrictiveness Index* (DSTRI), the OECD notes that seven of the G20 countries restrict international trade in digital services more in 2018 than in 2014. Only three countries have become more liberal.³⁷ The index tracks trade-distorting measures that become accentuated in a digitalised world. These include regulations requiring documents to be in qualified written form or requiring the establishment of a company or the appointment of a legal representative in the target market. For bundled goods, there is an interdependence between market access with regard to both the product and the provision of services.³⁸ For instance, if the maintenance a machine requires is subject to barriers, the suppliers of such machines will be at a competitive disadvantage.

In addition, a growing number of countries are taking measures at the *content* level of the Internet. These relate to the systematic restriction of the cross-border data flows (e.g. direct access restrictions or localisation requirements requiring the storage of certain data within a given jurisdiction). The following chart³⁹ shows the



tendency for such regulation to increase.

The motives for such measures vary. Some may be designed to protect privacy. The localisation of certain data may also be made mandatory on the grounds that this is the only way to guarantee access by law enforcement and supervisory authorities and for auditing purposes. In addition, restrictions may also be imposed for the purpose of protecting national security interests. While exceptions are provided for in WTO law and preferential trade agreements, there is potential for abuse. The

37 OECD Digital Services Trade Restrictiveness Index (DSTRI), 2018, <https://oe.cd/stri-db>.

38 The service component does not necessarily have to be digital, however: provision of services in person is of particular importance for maintenance work.

39 Data regulations cover such matters as cross-border data flows and localisation requirements for data storage. The number of rules depends on the structure of a country's national rules. Source: Casalini and Lopez-Gonzalez (2019), "Trade and cross-border data flows".

technical and regulatory instruments for restricting cross-border data flows can also be used for industrial and economic policy purposes, for example to protect domestic suppliers from foreign competition.⁴⁰ The emergence of *digital protectionism*⁴¹ has thus become a topic of discussion.

1.2.3 Extraterritorial application of legislation

The cross-border nature of digital commerce is in conflict with the territoriality principle, i.e. the exclusive competence of authorities applying legislation within their national territory. This can be seen, for example, in the extraterritorial application of rules based on the origin of the data concerned. For example, the EU's General Data Protection Regulation⁴² (GDPR) also imposes obligations on persons domiciled abroad who offer goods and services to customers in the EU single market and in doing so process their personal data. The GDPR harmonises data protection law in the EU and is the most developed set of data protection rules globally. Because of the importance of the EU single market and its extraterritorial applicability, the GDPR could establish itself as the international standard.⁴³ Another example is the US *Clarifying Lawful Overseas Use of Data (CLOUD) Act* of 23 March 2018. This obliges American companies to guarantee US investigation authorities direct access to data even if it is not stored in the USA itself. It also provides for the possibility of negotiating bilateral agreements (*executive agreements*) to regulate the modalities of such requests from the authorities and the hand-over of data on the basis of reciprocity. Given the growing economic importance of data storage in Switzerland and given that data processing is part of the day-to-day business of international companies based in Switzerland, this extraterritorial application of legislation potentially has a direct impact on Swiss companies and hence on Switzerland as a location for business.

1.2.4 Regulatory interoperability and mutual recognition of adequacy

Whether foreign regulators will consider it acceptable for sensitive data to be processed in Switzerland will increasingly depend on how the Swiss legal framework is assessed by foreign authorities. This will be important for all Swiss companies that process foreign customers' data in the course of their business activities. For Switzerland, the main focus here is on the GDPR. Under the GDPR, the European Commission is authorised to determine whether a third country offers an adequate level

40 Cf. Susan Ariel Aaronson, What are we talking about when we discuss digital protectionism?, Institute for International Economic Policy Working Paper Series, July 2017.

41 Cf. Aaronson for example.

42 Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC.

43 So far, Australia (Privacy Amendment) and Brazil (Lei Geral de Proteção de Dados), for example, have based their national data protection legislation on the GDPR. The California Consumer Privacy Act of the US state of California is also based partly on the GDPR.

of data protection such that exchanges of personal data can be permitted without further requirements.⁴⁴ An adequacy decision is a unilateral act of the EU Commission against which the country it relates to cannot appeal.⁴⁵ The decision on whether to extend the adequacy decision relating to Switzerland, which is very important for the Swiss economy, is due to be taken in 2020 (cf. section 1.3.1). By the same token, the unconditional transfer of personal data from Switzerland also requires the level of protection provided by the jurisdiction in question to be recognised by the Federal Data Protection and Information Commissioner (FDPIC).⁴⁶ If this trend continues, it will increasingly pose question of whether different national data protection rules are mutually compatible – which is in turn linked to the question of international standards.

1.2.5 Developments in international economic law

Aspects of digitalisation with a bearing on trade have been addressed by international trade and economic law since the mid-1990s.⁴⁷ So far, though, multilateral institutions have not been able to counter the increase in measures with the potential to restrict trade by introducing common rules. The existing and growing divergences between regions and countries with different regulatory traditions highlight the need for common minimum standards with a view to creating a level playing field for all market participants.

Bilateral and regional free trade agreements

Bilateral and regional trade agreements increasingly contain provisions regulating digital commerce.⁴⁸ As the chart below⁴⁹ shows, this trend includes general rules on *e-commerce* as well as specific provisions on cross-border data flows. While these agreements have become an important source of law, they are only binding on the participating states.

44 Art. 25 GDPR. So far, Andorra, Argentina, Canada (trading organisations), the Faroe Islands, Guernsey, Israel, the Isle of Man, Japan, Jersey, New Zealand, Switzerland, Uruguay and the USA (limited to the framework of the Privacy Shield) have been recognised. During the year under review, the EU has concluded discussions on adequacy with Japan and talks are still underway with South Korea.

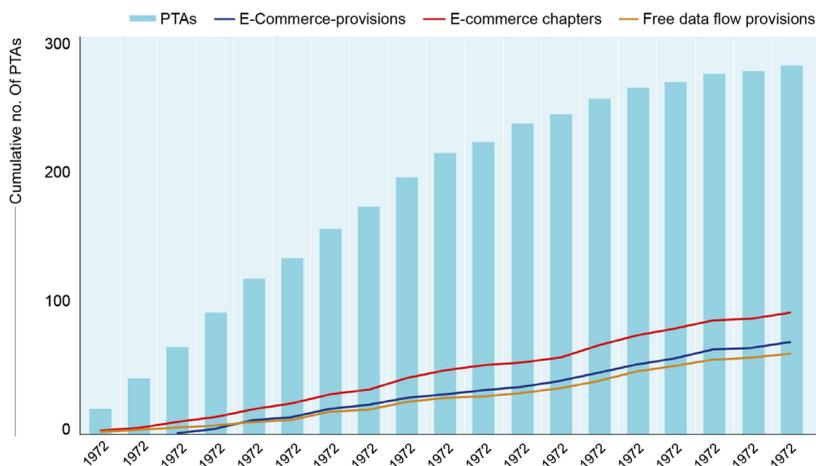
45 Comparable with adequacy decisions in other areas, such as financial market regulation. Cf. Communication from the EU Commission dated 29 July 2019 on equivalence in the area of financial services.

46 Edoeb.admin.ch > Data Protection > Commerce and Economy > Transborder data flows.

47 Cf. Burri/Cottier, Digital technologies and international trade regulation, in: Burri/Cottier, Trade governance in the digital age, Cambridge 2015, pp. 1–14.

48 World Trade Institute, University of Bern, TAPED database. Cf. also: Manfred Elsig, Sebastian Klotz, Data flow-related provisions in preferential trade agreements, preliminary draft 2018.

49 Source: TAPED database.



Compared to older agreements, the *Comprehensive and Progressive Trans-Pacific Partnership* (CPTPP) and the *United States-Mexico-Canada Agreement* (USMCA) concluded in 2018 provide for a substantial deepening of the rules governing digital commerce.⁵⁰ For example, the parties to these agreements undertake not to introduce any arbitrary restrictions on cross-border data flows and not to require any localisation of data processing. Restrictions based on overriding public interests remain possible, but are subject to a proportionality test. Other provisions include a commitment not to discriminate against *digital products* based on their origin, the recognition of digital signatures as equivalent to handwritten ones, an indefinite ban on levying customs duties on electronic communications and mandatory disclosure of software source code as a condition for market access. These two agreements have thus established new standards of economic law.

The EU's latest FTAs with Turkey and Mexico also include further developments in the area of digital commerce, but reflect the EU's more restrictive regulatory approach to transfers of personal data. The Federal Council is examining how far Switzerland's FTAs should undergo further development in this area in the future (cf. section 1.3.1). The equivalence of Swiss data protection legislation (cf. sections 1.2.4 and 1.3.1) to the EU legal framework will be crucial in determining how the Swiss position is aligned on this issue.

Plurilateral e-commerce negotiations at the WTO

The WTO provides an important legal and institutional framework for establishing global rules governing digital commerce over the longer term. Its basic principles – non-discrimination (most-favoured-nation status and national treatment) and transparency – are also important for digital commerce. The WTO Dispute Settlement Bodies have already examined issues relating to trade in digital services in light of

50 Cf. also Mira Burri, Wie soll man die globalen Datenflüsse regulieren, in: Die Volkswirtschaft, no. 8–9, 2019.

WTO law and have issued binding rulings.⁵¹ Since May of the year under review, 82 WTO members,⁵² including Switzerland, have been negotiating clarifications and additions to the WTO rules on digital commerce⁵³ as part of a plurilateral initiative. The aim of the negotiations is to promote digital commerce by avoiding unnecessary barriers to trade and unwarranted protectionism while developing common basic principles for national regulation (e. g. localisation). The existing standards applicable to bilateral and regional free trade agreements form the starting point. The negotiations are currently broad in scope and cover digital commerce issues such as recognition of digital signatures, localisation of data storage and consumer protection (e.g. combating spam). Accordingly, the participating members address a wide variety of regulatory approaches (cf. section 1.2.2). Switzerland is an active participant in these negotiations. The negotiating group, which represents about 90 per cent of world trade, has the potential to establish rules with a global impact.

Global use of new technologies

Current technological developments and their associated challenges are global in nature. Examples include *DLT*, *cloud computing* and *artificial intelligence*. Accordingly, they have become much discussed topics on the international agenda (e.g. at the UN, UNESCO, Council of Europe and the EU, as well as in technical bodies such as the *Institute of Electrical and Electronics Engineers (IEEE) Standards Association*). This May, the OECD became the first international organisation to adopt basic recommendations at ministerial level in relation to the use of artificial intelligence. These include respect for democratic values and human rights, transparency, accountability, liability and security.⁵⁴ Developing countries are also addressing the issue of digitalisation. This is because they see opportunities to benefit from this economic revolution – or because they see risks in missing them.

Development of international rules for the digital economy at the OECD

As an organisation that establishes standards, the OECD can be expected to play an important part in the development of international rules for digital commerce in the future. The organisation plans to develop interdisciplinary knowledge of digital transformation as part of its *Going Digital Initiative*.⁵⁵ This includes analysing issues ranging from the definition and measurement of digital commerce and the importance of market openness in the digital age through to the restriction of services and the impact of regulating cross-border data flows or new technologies such as additive manufacturing. As a first step, this work can lead to preliminary stages of

51 Including Mexico - telecoms, US - gambling, China - audiovisual products.

52 Albania, Argentina, Australia, Bahrain, Benin, Brazil, Brunei Darussalam, Canada, Chile, China, Cameroon, Côte d'Ivoire, Costa Rica, El Salvador, EU, Georgia, Honduras, Hong Kong, China, Indonesia, Iceland, Israel, Japan, Kazakhstan, Kenya, Kuwait, Laos, Liechtenstein, Malaysia, Macedonia, Mexico, Moldova, Mongolia, Montenegro, Myanmar, New Zealand, Nicaragua, Nigeria, Norway, Panama, Paraguay, Peru, Qatar, Russia, Saudi Arabia, Singapore, Switzerland, South Korea, Taiwan (Chinese Taipei), Thailand, Turkey, Ukraine, USA, Uruguay, United Arab Emirates.

53 In the WTO, “digital commerce” (the term used in the USMCA and the OECD) is referred to as “electronic commerce” (e-commerce). The use of this term originates from a WTO work programme on e-commerce launched in 1998 (Work Programme on Electronic Commerce, 1998).

54 OECD, Recommendation of the Council on Artificial Intelligence, 22 May 2019.

55 <https://www.oecd.org/going-digital/>

joint recommendations (*best practices*), promote a coherent and comprehensive political approach to digital transformation, and be incorporated, for example, into WTO negotiations or free trade agreements. Switzerland is also actively involved in this work with a view to representing its interests and identifying any risks at an early stage.

Developing *soft law* forms an important part of the OECD's work and that of other international organisations. Although not legally binding, soft law can be politically effective by specifying certain forms of conduct. The Federal Council wants to involve Parliament in this area in a more targeted manner. In line with postulate 18.4104 of 26 June, it notes that *soft law* has become an instrument used to shape international relations.⁵⁶ It points out ways in which Parliament can participate in a more targeted manner while maintaining the constitutional separation of powers and the ability to act in foreign policy. Information provision and reporting on soft law to Parliament are to be improved.

1.3 Challenges and opportunities for Switzerland in a digital global economy

Switzerland is currently rated positively in international rankings relating to digitalisation.⁵⁷ This is partly due to its attractive operating environment, which includes high-quality infrastructure in the areas of telecommunications and electric power. In addition, Switzerland has a very strong education and research base. Another of its strengths is the high level of private sector and state investment in ICT by international standards: adjusted for purchasing power, this increased from CHF 6,932 million to CHF 24,527 million between 1996 and 2016 – an annual growth rate of 6.5 per cent. In 2016, almost three-quarters of this was invested in software and databases, a good sixth in communications technologies and the rest in information technologies. The following chart⁵⁸ shows the development of investment in information and communication technologies in Switzerland.

56 www.eda.admin.ch > News > Parliament to be more closely involved in soft law projects

57 Cf. World Economic Forum, Networked Readiness Index 2016: ranked 7th; International Institute for Management Development, World Digital Competitiveness Ranking 2018: ranked 5th.

58 Source: Federal Statistical Office (FSO)



An economy’s capacity to exploit the growth and innovation potential of digitalisation also depends on the number of employees trained in the ICT sector. In 2017, 5995 ICT qualifications were obtained in Switzerland – six times more than in 1990. However, there is still a very noticeable shortage of skilled workers in the ICT sector in particular.⁵⁹ The number of ICT patent applications testifies to the importance of the ICT sector for research and development activities. In 2016, Switzerland filed 33.8 ICT patent applications per million inhabitants, putting it in eighth place among the OECD nations. Sweden came first (147.4), followed by Korea (108.7), Finland (93.6) and Israel (92.2). Switzerland, as a location for research, services, finance and employment, has so far responded successfully to the challenges of digitalisation. The recent significant growth in specific sectors of the economy, such as the operation of data centres, shows the potential of the digital economy in Switzerland, but also the need for efficient infrastructure.⁶⁰

However, Switzerland is heavily dependent on foreign information and communication manufacturers. The hardware and software solutions developed and used worldwide cannot be expected to be 100 per cent secure. This means that unauthorised access cannot be ruled out. Instead of excluding a particular manufacturer from a market-leading country, Switzerland strives to weigh up the risks and pros and cons of a product and take measures to identify and prevent unauthorised access to systems and data at the earliest possible stage. One particular challenge is the question of how Switzerland should position itself in the face of the bloc formation that is also emerging in the production of ICT goods – for example in relation to 5G technology.

“Digital Switzerland” strategy

In September 2018, the Federal Council adopted the national “Digital Switzerland” strategy.⁶¹ This lays down guidelines for government action in the field of digitalisation and identifies potential for cooperation between public authorities, business,

59 SECO, Fachkräftemangel in der Schweiz, 2016. www.seco.admin.ch > Economic situation & Economic policy > Wirtschaftspolitik > Arbeitsmarkt > Fachkräftebedarf.

60 Cf. Deloitte, Data centres in Switzerland, www2.deloitte.com > corporate-finance > data-centres in switzerland, Langenegger Markus, Wirtschaft wächst dank Digitalisierung, in: Die Volkswirtschaft, 26.10.2015 and Stefan Betschon, Der grosse Sprung in die Cloud, Neue Zürcher Zeitung, 29.8.2019.

61 www.strategy.digitaldialog.swiss.

science, civil society and political institutions. Society and business are to be given space for digital development. Political bodies and public authorities are to facilitate and support digital transformation wherever possible. For this, they must create the appropriate operating environment. In the business domain, the strategy aims to enable Switzerland to seize its opportunities in terms of the virtual international economic area, to ensure that it can exploit digital markets and to avert the risk of exclusion. Additional objectives are high labour force participation in the digital age, space for the development of new business models and a broad start-up scene that swiftly brings innovation to market. In addition, an innovative global Fintech sector shall ensure that the Swiss financial sector is competitive and enable Swiss agriculture to benefit from technological developments.

Impact of digitalisation on the Swiss labour market

The development of the labour market reflects specific effects of the trend toward digitalisation and automation. A look back at technological innovation over recent decades shows that the Swiss labour market is highly adaptable relative to other countries. However, employment is increasingly shifting to sectors with high skill requirements.

Between 1998 and 2018, the number of office workers, skilled tradespeople and agricultural specialists fell by a total of around 234 000. The same period saw the creation of numerous employment opportunities for management-level staff and in the service and sales sectors, particularly in academic and technical professions. In net terms, the number of people in employment has increased by more than 839 000 or 22 per cent.⁶² Changes within sectors are even more pronounced. Technical progress is creating areas of activity that require new skills. So far, employees have risen to these challenges by continuously upgrading their skills. In Switzerland, income distribution shows few if any signs of becoming polarised.

The Federal Council believes that in future too we can expect to see continuous structural change, rather than a disruptive macroeconomic trend.⁶³ This is also the impression conveyed by a recent OECD forecast,⁶⁴ according to which 14 per cent of jobs in the OECD countries are highly vulnerable to automation, while a further 32 per cent could see significant changes in their activity structure over the coming decades. Nevertheless, digitalisation may pose further challenges for the Swiss labour market in the future that are not completely foreseeable at the present time. If the Swiss labour market is to continue to benefit from digitalisation, it needs to maintain and further strengthen its high degree of adaptability. Education and training policy need to be aligned even more closely with the skills required. Measures have already been taken to this end,⁶⁵ notably through the action plan for digitalisa-

62 BFS/SAKE, analysis by SECO.

63 Auswirkungen der Digitalisierung auf Beschäftigung und Arbeitsbedingungen – Chancen und Risiken. Report in response to postulates 15.3854 (Reynard) “Automatisierung. Chancen und Risiken” of 16 September 2015 and 17.3222 (Derder) “Digitale Wirtschaft. Die Arbeitsplätze der Zukunft und Massnahmen für ihre Förderung in der Schweiz identifizieren” of 17 March 2017.

64 OECD Better Work Initiative.

65 www.admin.ch > Start > Documentation > Press releases > Bundesrat verabschiedet Bericht und Massnahmen zu Auswirkungen der Digitalisierung auf den Arbeitsmarkt.

tion in the ERI sector.⁶⁶ To identify new challenges, the Federal Council also decided in November 2017 to monitor developments in the context of the digitalisation of the labour market. In October 2018, the head of Economic Affairs, Education and Research (EAER), together with the national employer and employee federations, signed a tripartite declaration on the “future of work and social partnership in Switzerland in the age of digitalisation of business”. In doing so, they demonstrated their confidence in social partnership as a means of meeting the challenges of tomorrow’s world of work. At this June’s International Labour Conference, Switzerland also committed itself to an ambitious declaration on the future of work that will address the challenges and opportunities resulting from the digital transformation of work.

Digitalisation in the context of promoting Switzerland as a location for business

Using the instruments of export promotion and location promotion as well as policies focused on SMEs, tourism and the regions, the drive to promote Switzerland as a business location also involves prioritising digitalisation.⁶⁷ In the case of location-promoting instruments geared towards foreign trade, this has a bearing on various channels. The government-sponsored export promoter *Switzerland Global Enterprise* (S-GE) provides Swiss exporters with even faster access to market information via its extended online offerings. Digitalisation is also playing an increasingly important part in efforts to promote Switzerland as a business location. In tourism policy, it is particularly important for players to have the right data-handling skills – so that, for example, they can work on international tourist markets. Reducing the administrative burden on business is a key issue for SME policy. Expanding the electronic processing of administrative tasks (*e-government*) is aimed at achieving further progress on this front. Compared with other countries, Switzerland still has some catching up to do, especially in the area of “basic services”.⁶⁸ Administrative efficiency gains also particularly benefit exporters in the SME sector who need to compete globally. With its digital areas of activity, the 2020–2023 campaign to promote Switzerland as a business location aims to encourage the country’s SMEs and regions to systematically exploit the opportunities offered by digitalisation so that they can hold their own against international competitors.

Digitalisation of the Swiss financial centre

The financial services sector is seeing the emergence of new products and business models worldwide. Digital financial services from Switzerland can be made more easily accessible for a global market. This is opening up new opportunities for innovative companies, although foreign supervisory law also places special demands on export-oriented Swiss companies and fintech firms. Swiss financial service providers have access to new technical possibilities such as *cloud outsourcing*, which can increase their innovative capacity and cut costs. Swiss consumers can enjoy new services and investment products (payment systems, *crypto-assets*, online bank accounts, etc.). Both the Swiss financial market and the Swiss authorities need

66 www.sbfi.admin.ch > SERI > Digitalisation > Action Plan for Education, Research and Innovation (ERI) 2019–2020

67 Federal Council dispatch of 20 February 2019 on the 2020–2023 campaign to promote Switzerland as a business location, FOBL 2019 2365.

68 Cf. eGovernment Benchmark Report 2018, www.egovernment.ch > Benchmark Report

to keep pace with these fast-moving developments. The Federal Council is therefore constantly taking measures to boost the innovative capacity of the Swiss financial sector in the digital environment. For example, during the year under review the implementing provisions for the new Fintech licence were introduced (as of 1 January) and in March the Federal Act on the adaptation of federal law to developments in distributed ledger technology (DLT) underwent the consultation process.⁶⁹

1.3.1 Safeguarding cross-border data flows

Restrictions on cross-border data flows from Switzerland to important partner countries and vice versa can have negative effects on the whole economy. These can be counteracted by including relevant commitments in Switzerland's trade agreements and by actively participating in multilateral work such as that of the WTO and the OECD (cf. section 1.2.5). At the same time, the level of data protection is to be maintained and aligned with international standards.

Revision of the Swiss Data Protection Act, and the EU adequacy decision

The Swiss Data Protection Act (FADP)⁷⁰ has not kept up with the rapid pace of technological development. The Federal Council wishes to update it to reflect the changes in technological and social conditions that have taken place, particularly with a view to improving the transparency of data processing and strengthening the self-determination of data subjects.⁷¹ At the same time, as part of the root-and-branch overhaul of the Data Protection Act, the Federal Council proposes to ratify the revised Council of Europe Convention 108⁷² and adopt Directive (EU) No. 2016/680 on data protection in criminal proceedings, in line with its obligations under the Schengen Association Agreement.⁷³ The overhaul is also intended to align the FADP more closely on the requirements of the EU GDPR Regulation. This is crucial to ensuring that the EU continues to recognise Switzerland as a third country with an adequate level of data protection and that cross-border data flows remain unobstructed by any additional administrative measures (contractual guarantees or sufficient binding company rules). If the EU Commission were to withdraw or suspend the adequacy decision, this could potentially make it more difficult or even impossible to store and process data from Switzerland's most important sales market (the extent of such restrictions has so far remained unclear, however). This would put pressure on the business models of numerous Swiss companies, especially SMEs. The question of adequacy in data protection is also to be seen in the general context of European policy (cf. section 3).

69 www.admin.ch > Documentation > Press releases > Federal Council initiates consultation on improving framework conditions for blockchain/DLT

70 Federal Act of 19 June 1992 on Data Protection (SR 235.1).

71 www.bj.admin.ch > State & Citizen > Bills still under discussion > Stärkung des Datenschutzes

72 Council of Europe, ETS No. 108, Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data.

73 Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen acquis (SR 0.362.31).

The “Privacy-Shield” approach

The *Swiss-US Privacy Shield* provides the basis for the transfer of personal data from Switzerland to the USA without additional contractual guarantees. It replaces the *Swiss-US Safe Harbor regime* (2009–2015), which was repealed in parallel with the *EU-US Safe Harbour* following the ECJ’s *Schrems* ruling.⁷⁴ The regime provides for self-certification by companies in the US, whereby they undertake to comply with the *Privacy Shield* data protection principles (including the right of data subjects to access their data as well as information on how it is used). Switzerland recognises the level of protection as adequate for such companies. Swiss residents can submit requests for access by US authorities to an ombudsman in the US State Department via the FDPIC. The *Swiss-US Privacy Shield* already covers more than 3 000 certified US companies.

Further development of bilateral economic agreements

In the framework of free trade agreements, Switzerland has so far negotiated texts on *e-commerce* with six trading partners.⁷⁵ These provisions are less comprehensive and detailed than the texts of recent agreements reached by other countries, for example as part of the CPTPP (cf. section 1.2.5). If it is to avoid indirect discrimination against its companies and against Switzerland as a location for business, Switzerland might need to consider more extensive commitments. In addition to clarifications, for example on the question of how general rules should be applied to digital commerce, these commitments may on the one hand relate to specific barriers to digital commerce – such as the localisation of data storage – and, on the other hand, to the anchoring of general policy objectives (consumer protection, data protection, cyber security, etc.). The year under review also saw the start of relevant conceptual work in the context of EFTA.

1.3.2 Taxation of the digital economy

The digitalisation of the economy also raises questions about the taxation of international companies. May 2019 saw the OECD adopt a work programme to address this issue. The final report on long-term measures should be available by the end of 2020. These will be based on two pillars. Pillar 1 aims to ensure that in future a larger proportion of consolidated profits will be taxed in the market states.⁷⁶ Pillar 2 aims to ensure minimum taxation of multinational corporations.

As an innovative, export-oriented country with a small domestic market, the future rules threaten to result in Switzerland losing a considerable amount of revenue from the taxation of earnings. It is not currently possible to put a precise figure on the scale of the loss. Switzerland is nevertheless actively participating in the OECD’s work towards a multilateral solution. The alternative would be an increasing prolif-

74 ECJ, Judgment of the Court (Grand Chamber) of 6 October 2015, Maximilian Schrems v Data Protection Commissioner, Preliminary ruling, Case C-362/14.

75 In the EFTA FTAs with Turkey, Central America (Costa Rica, Guatemala, Panama), Peru, the Gulf Cooperation Council (GCC) and Colombia and in Switzerland’s bilateral FTA with Japan.

76 The countries in which the consumers of digital services are located.

eration of national measures such as digital taxes, which several states have already introduced or are planning to introduce. This could potentially be more detrimental to the Swiss economy in the long term. Switzerland is working to ensure that taxation continues in principle to take place at the place of performance-related value creation and that the share of the tax base allocated to the market states for taxation purposes is moderate. On the question of minimum tax rates, Switzerland warns against growth-inhibiting redistribution effects, restrictions on competition between locations and additional burdens for companies.

In Switzerland, 1 January of the year under review saw the entry into force of the mail order arrangements of the partially amended Value Added Tax Act⁷⁷ and the partially amended Value Added Tax Ordinance of 1 January 2018.⁷⁸ The new arrangements are intended to eliminate domestic companies' competitive disadvantages compared with their foreign competitors as a result of value-added tax.⁷⁹

1.3.3 Cyber security and industrial espionage

Digitalisation exposes the Swiss economy to significant security risks, as recent cyber-attacks against companies have shown.⁸⁰ The perpetrators are not just individuals. In recent years, some countries have increasingly relied on cyber espionage as a means of gaining access to companies' business secrets and intellectual property. The stolen information then benefits their own companies and flows into their technical development with a view to strengthening their competitiveness. Swiss companies, too, are sometimes targeted by such activities in individual cases. The theft of business or manufacturing secrets cannot be ruled out. There have also been widespread attacks by groups of perpetrators or individuals with the aim of damaging the reputation of the company concerned or extorting money.⁸¹

Such attacks take various forms, including infection with computer viruses, blackmail by means of *ransomware*, deliberate overloading of infrastructure (*denial of service*, DoS), data theft and spam. The more digitalisation permeates the business processes of Swiss companies, the more serious these risks become. This also applies to SMEs: 23 000 companies (4 %) are estimated to have fallen victim to blackmail in 2017, while some 209 000 (36%) are likely to have been affected by malware such as viruses or Trojans.⁸² In addition to companies, infrastructure critical to the Swiss economy is also exposed to cyber risks.⁸³

Cyber security: Federal Council strategy

The Federal Council believes that international cooperation and confidence building can make a significant contribution to minimising cyber risks. Switzerland therefore

77 SR 641.20

78 SR 641.201

79 www.efd.admin.ch > Topic > Taxes > National taxation > Revision of value added tax

80 Cf. Giorgio V. Müller, *Cyberattacken gehören zum Geschäftsalltag – 40 % aller Schweizer Firmen mittlerweile betroffen*, NZZ, 10 January 2019.

81 Cf. for example MELANI semi-annual report 1/2019 dated 29 October 2019.

82 GFS-Zürich, *Cyberisiken in Schweizer KMUs*, December 2017.

83 Cf. SFOE, *Digitalization in the energy sector*, report of 11 December 2018.

advocates a secure, open and free cyberspace based on clear rules and mutual trust: The basis for this is established by ensuring that international law is also enforced in cyberspace. Universal human rights such as the protection of privacy must be guaranteed and freedoms such as freedom of expression and freedom of the press must be defended. Switzerland is promoting the development and expansion of its own capacity and is actively involved in building international trust. Where possible, it supports and develops capacity building in third countries and conducts consultations with selected countries on cyber foreign security policy. In the framework of its own intergovernmental initiatives (e.g. the Expert Dialogue on the Application of International Law in Cyberspace) and through active participation in multilateral dialogues (e.g. the Sino-European Cyber Dialogue), Switzerland also supports the recognition, observance and enforcement of international law in cyberspace. In doing so, it is always guided by the basic principle of the shared responsibility of all actors for national and international cyber stability.

The Federal Council's National Strategy for the Protection of Switzerland against Cyber Risks 2018–2022 and its implementation plan – drawn up in cooperation with business, the cantons and the universities – forms the basis for efforts to counter cyber risks at national and international level.

Industrial cyber espionage

Switzerland is affected by industrial espionage, which is increasingly taking the form of cyber espionage. Swiss companies too are strategic targets for foreign intelligence services – for example with the aim of gaining economic advantages, or goods and knowledge for the production of weapons of mass destruction. Since 2015, the Federal Intelligence Service (FIS) has recorded an increasing number of cyber attacks on Swiss businesses. These are aimed on the one hand at stealing business and manufacturing secrets and, on the other, at acquiring information ahead of company takeovers. Digital interconnections are exacerbating these problems. The new Intelligence Service Act (IntelSA)⁸⁴ provides the FIS with a legal basis for taking measures on the instructions of the Federal Council to protect Switzerland as a business, economic and financial centre. Such measures will be taken, for example, if industries of national importance are affected. As well as engaging in counter-espionage, the FIS also helps protect the economy through the “*Prophylax*” prevention and sensitisation programme, which has been underway since 2004 (advising companies, universities, research institutes, etc.) and by strengthening the Reporting and Analysis Centre for Information Assurance MELANI (subsidiary support for Switzerland's critical infrastructure in its information-safeguarding processes).

1.3.4 Digitalisation at the border (DaziT)

With its DaziT⁸⁵ programme, the Federal Customs Administration (FCA) is making the transition⁸⁶ to the digital age. Customs formalities and the collection of duties

⁸⁴ Federal Act on the Intelligence Service of 25 September 2015 (SR 121).

⁸⁵ The programme's name “DaziT” is composed of the Romansh word for customs (dazi) plus the letter “T” as in “transformation”.

will be digitalised from start to finish. Launched on 1 January 2018, the DaziT programme will run until the end of 2026. Once the programme has been implemented, the administrative cost of cross-border goods traffic alone is set to decrease by CHF 125 million per year.⁸⁷

A noticeable acceleration in international trade in goods can be achieved if the simplification and digitalisation of customs procedures is planned and implemented in a coordinated manner on both sides of the border. Trade between Switzerland and the EU is governed by various customs conventions.⁸⁸ In the interests of efficient border processes, the Federal Council attaches great importance to coordination with digitalisation projects of Switzerland's European partners.

1.3.5 Digitalisation in Switzerland's international development cooperation

Digitalisation is also playing an increasingly important part in international development cooperation. In particular, Switzerland supports digitalisation initiatives aimed at promoting sustainable economic development and closing the *digital divide*⁸⁹ between industrialised and developing countries, as well as within countries. One of Switzerland's main priorities is the digitalisation of public institutions. The aim here is primarily to improve access to institutions, reduce bureaucracy and combat corruption. In this context, Switzerland also champions the security and confidentiality of personal data. Moreover, Switzerland supports SMEs in developing countries in digitalisation processes with a view to making them more competitive and integrating them into the global economy. It supports the development of digital services and works to remove barriers to market entry. To contain the negative impact of digitalisation and automation processes on labour markets, Switzerland also supports the development of technical expertise with targeted training programmes, particularly for disadvantaged population groups.

Switzerland's activities also take account of the country's own interests. By financing digitalisation initiatives and providing bilateral technical support, Switzerland is building alliances with partner countries. In this way it can, for example, strengthen its positions in international bodies responsible for developing norms and standards for new technologies. Switzerland also contributes to the stability of the international financial system by strengthening the ability of local central banks and financial

86 Cf. FOBL 2017 1719 as well as Isabelle Emmenegger, Zollverwaltung definiert sich neu, Die Volkswirtschaft 5/2017, p. 55 et seq., Basil Stamm / Ingo Strasser, Zollprogramm "DaziT" entlastet Unternehmen, Die Volkswirtschaft 5/2017, p. 57 et seq., Christian Bock, Zoll der Zukunft, Foreign Trade 1/2017, p. 57 et seq.

87 Cf. Basil Stamm / Ingo Strasser, Zollprogramm «DaziT» entlastet Unternehmen, Die Volkswirtschaft 5/2017, p. 57 et seq.

88 In particular, the Convention of 20 May 1987 on the simplification of formalities in trade in goods (SR 0.631.242.03), the Convention of 20 May 1987 on a common transit procedure (SR 0.631.242.04) and the Agreement of 25 June 2009 between the European Community and the Swiss Confederation on the simplification of inspections and formalities in respect of the carriage of goods and on customs security measures (SR 0.631.242.05).

89 The term describes disparities in access to and use of ICT – and notably of the Internet – between economies and population groups, due to technical and socio-economic factors. This is a prominent topic of debate in multilateral institutions.

supervisory authorities to deal with risks in the fields of cybercrime, money laundering and illegal financial flows. The use of new technologies also makes it possible to improve traceability, particularly with regard to the quality and sustainability of products exported to Switzerland, and to meet stakeholders' information needs in this context. These technologies also contribute to the fight against piracy, counterfeiting and smuggling.

1.3.6 Environmental dimension of digital change in the economy

Digital change in the economy also needs to be considered from an environmental perspective. New technologies, especially DLT, promise more sustainable value chains and, above all, better traceability of the natural resources processed in those value chains. However, digital change is based on infrastructure that requires the extraction of large quantities of mineral resources.⁹⁰ Finally, digitalisation – and particularly the use of DLTs – generally results in very high power consumption. Care therefore needs to be taken to ensure that activities related to digital change are implemented in an environmentally sound manner.

1.4 Conclusions

Switzerland is one of the economies most closely integrated into global value chains. It is well positioned to hold its own in a global economy shaped by digital transformation. On the one hand, the digitalisation of the Swiss economy is already well advanced, while on the other hand stable, principle-based and technology-neutral regulations (in comparison with those of other countries) contribute to innovation and low adjustment costs for companies. For the Federal Council, the overriding objective in the digital age is to exploit the potential of increased labour productivity as an important driver of economic growth and to secure maximum labour force participation and high-quality jobs. This means preserving and expanding the strengths of Switzerland's labour market and education policy.

At the same time, however, Switzerland's economic interdependence presents it with particular challenges. Increasing restrictions on cross-border data flows, barriers to digital commerce and the emerging formation of regulatory blocs could hit Switzerland harder than economies with larger domestic markets. This makes it crucial to ensure that data can flow across borders as freely as possible. At the same time, important public interests need to be safeguarded, such as the high level of protection for personal data and the protection of companies and infrastructure from cyber attacks and industrial espionage.

90 Cf. Jan C.T. Bieser, Lorenz M. Hilty, Chancen und Risiken der Digitalisierung für den Klimaschutz in der Schweiz, study by the University of Zurich, Zurich 2017.

The room for manoeuvre of national governments and international organisations is increasingly influenced by the global challenges associated with the dynamically developing global digital economy. In this context, smaller countries such as Switzerland will find it particularly difficult to enforce independent national regulations. International cooperation, legally anchored mutual recognition of regulations and “smart” regulatory approaches with the participation of stakeholders are becoming increasingly important. Moreover, it is in Switzerland’s interest to support developing countries so that they can participate in the digitalised world economy.

With a view to ensuring the freest possible cross-border data flows to Switzerland’s most important import and export market, the equivalence of Swiss data protection legislation with that of the EU is crucial. EU data protection legislation has the potential to develop into an important international standard.

At international level, it is also in Switzerland’s interest to work towards recommendations, standards and rules that are as far as possible agreed at global level – whether in the WTO, the OECD or other bodies. As the ongoing talks at the OECD regarding the taxation of the digital economy show, for example, there is a need to identify potentially detrimental regulatory developments at an early stage and ensure that Switzerland’s position is put forward.

Finally, we should be looking at continuing to develop free trade agreements and possibly other instruments of international economic law specifically in relation to such matters as cross-border data flows, localisation requirements and administrative simplifications. The aim here is to counter any future discrimination against Swiss economic operators and to contribute to the legal certainty of digital commerce with Switzerland’s key trading partners.