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The "Crypto Nation" Switzerland 2018

Laufendes Lehrprojekt

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Abstract
This evaluation case study analyzes developments related to crypto assets and the underlying crypto technology in the case of Switzerland. The canton of Zug was the first public institution worldwide to accept the cryptocurrency Bitcoin as an official means of payment in 2016. Since then the Zug region has developed into "Crypto Valley" by attracting around 350 blockchain companies and the foundation behind the cryptocurrency Ethereum. However, in 2018 the value of Bitcoin sharply dropped. Moreover, numerous cases of cyber thefts have been reported worldwide recently. In this context, is the idea for Switzerland to focus on the crypto industry providing an opportunity for the country to claim its leading position in innovation and technology? Or would this be rather a risk for the country and its financial sector? The students are asked to undertake an evaluation based on a SWOT analysis and the Porter Diamond Model.

** This case study was written by Dr. Galia Kondova, under the supervision of Professor Dr. Mike Domenghino and Dr. Andreas Butz. Valuable input on the blockchain technology was provided by Professor Dr. Walter Dettling. The usual caveats apply to the case study. A follow-up on developments after May 28, 2018 is planned in a (B) case.*

1 Didactic Notes

1.1 Learning Goals

This case is an interdisciplinary evaluation case study that aims to encourage the cross-subject strategic management thinking of students at the end of their BA studies or at the beginning of a MA program. It can be used to analyze major trends in the development of new financial assets like crypto assets and new technologies like the blockchain. Moreover, the economic impacts of these developments are to be evaluated within the framework of strengths, weaknesses, opportunities, and threats (SWOT) analysis in the case of Switzer-land. Furthermore, any competitive advantages for the region/country are to be explored by applying the Porter Diamond Model. Following the taxonomy of Bloom (1956), by the end of the case study work the students should be able to:

- Describe the nature of the cryptocurrencies and the blockchain technology
- Write an evaluation on the dynamics/recent developments related to crypto assets in Switzerland based on a SWOT analysis
- Write an evaluation on the crypto industry in “Crypto Valley” Zug and in Switzerland based on the Porter Diamond Model
- Brainstorm on further actions to be undertaken by various stakeholders

1.2 Target Audience

The case is an interdisciplinary one. It can be used in a finance course, a macroeconomics course, or a business information technology course, preferably at the end of a BA program in International Management, Business Administration, Business Informatics, and Business Information Technology or at a MA or MBA program in one of these areas.

1.3 Teaching Method Approach

The case study teaching method implies a student-centered active learning activity. For the success of this method, it is important that students first understand the contents and their tasks so that they could independently work on possible solutions. The moderating role of the lecturer is to help pull the “big picture” out of the details. In this context, this case is tackled over two teaching session. In the first session, the case and the tasks are presented to the students. Any clarifying questions on the case and the analytical techniques (SWOT and Porter Diamond) to be applied are addressed. The students then prepare their evalua-tions and action plans in self-study using the online available sources referred to in the case. The results are posted as Power Point presentations on the school electronic learning platform so that all participants get acquainted with the results prior to the second and final session. During the second teaching session, there is a debriefing and two to three individu-al presentations representative for the major viewpoints. These are then followed by a panel discussion among the various stakeholders (classroom role-play) which is moderated by the lecturer and open to questions from the whole class. The suggested time breakdown is as follows:

- Opening session with case presentation and discussion: 90 minutes
- Student presentations and class discussion: 90 minutes
- Panel discussion (classroom role-play) and wrap-up: 45 minutes

1.4 Teaching History of the Case

This case was taught in the spring semester 2018 in a finance course to three classes of stu-dents at the end of their BA studies in, respectively, International Management, Business Information Technologies, and Business Informatics at a University of Applied Sciences in Switzerland. This (A) version of the case study is based on developments up to May 28, 2018. A follow-up on the further developments will be described in a forthcoming (B) case.

1.5 Teaching Experience

The described approach and structure in section 1.3. Teaching Method Approach has prov-en to be the most conducive one to pursuing the learning goals outlined in Section 1.1. Learning Goals. In particular, an opening session is crucial so that the different aspects of this complex case are highlighted to the students, the assignment tasks are clarified, and the methodological framework (SWOT and Porter Diamond) to be applied by the students in the analysis is discussed. In order for each student to acquaint themselves with the com-plexity and the interconnectedness of the case study, it has proven more efficient if stu-dents work individually in self-study to read all background materials and prepare their evaluations in the form of presentations. The presentations posted on the electronic learning platform of the school are accessible to all participants and present a good preparation for the final session where a panel discussion (classroom role-play) is being conducted. The teaching experience shows that both business informatics as well as business management students normally demonstrate high intrinsic motivation to work on the case study mainly due to the up-to-datedness of the topic. Some of the students already have contacts to blockchain companies or crypto asset managers. Some students have themselves investments in crypto currencies and are closely following the subject. Therefore, there are usually many volunteers to present their assessments as well as take part in the panel discussion. Comments on the Teaching Materials

The case study is based on public materials that are accessible online. The internet links to each of the background materials are provided in the form of footnotes to the respective sections as well as in the bibliography. In the case study itself only selected relevant infor-mation, usually in the form of exhibits, has been included. The students are to be made aware that they have to do background readings in self-study by accessing the online materials in order to be able to make a well-informed evaluation. Moreover, the internet links to online sources explaining the analytical techniques (SWOT and Porter Diamond) are also provided in the study for those of the students that might need to refresh their knowledge on these methods.

2 Introduction

On January 18, 2018, the Swiss economics minister, Mr. Johann Schneider-Ammann, reit-erated at the Crypto Finance Conference in St. Moritz that he wants Switzerland “to be the crypto-nation in five or ten years” . In his speech, he also praised the canton of Zug as a model for Switzerland to become the “crypto nation”. The city and canton of Zug was namely the first public institution worldwide to accept bitcoin as a means of payment as announced in May 2016. Since then the Zug region has developed into “Crypto Valley” by attracting around 350 blockchain companies as well as the foundation behind the crypto-currency Ethereum (cf. the section on the Crypto Industry in Zug). As of October 2017, Switzerland took world’s second place after the US in funds generated from initial coin offerings of coins/tokens (see figure 1) (Atkins, 2018a). As of March 2018, Ethereum is the second largest cryptocurrency in terms of market value after Bitcoin as outlined in the April 2018 Global Financial Stability Report (GFSR) of the International Monetary Fund (IMF) (p. 22).

Less than a month later and following a sharp decrease in value of the bitcoin (see figure 2), the Neue Zürcher Zeitung (NZZ) newspaper announced on February 10, 2018 “the bitcoin bubble had burst out and there were serious concerns about the Zug Crypto Valley”. In addition, the cantonal police of Zurich has published that two investors have stolen IO-TA (a cryptocurrency) equivalent to one million Swiss francs. Moreover, local politicians

have expressed concerns about "intransparency" behind the crypto currencies and the po-tential damage on Zug's reputation (Atkins, 2018b).

Is crypto for real or just a bubble? Is the crypto industry providing an opportunity for Switzerland to claim its leading position in innovation and technology? Or would this be rather a risk for the country and its financial sector? What are the major advantages, disadvantages, chances and risks behind the crypto assets and the crypto technologies like blockchain? What are the crucial success factors for Switzerland to establish itself as a world leader in the crypto technology industry? Moreover, what role should the Swiss authorities and the various stake-holders play in supporting the "crypto nation" vision?

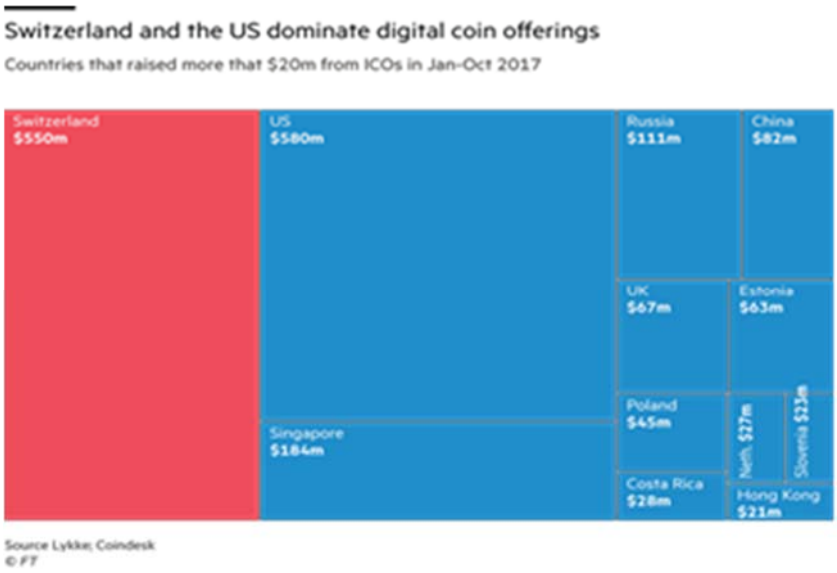


Figure 1: Initial Coin Offerings (Financial Times, March 20, 2018)

Figure 2: Bitcoin Price Development and Price Changes (Swissquote.ch)

3 Cryptocurrencies

The European Central Bank in its 2015 report "Virtual currency schemes – a further analy-sis" defines the cryp-tocurrencies as "a type of unregulated, digital money, which is issued and usually controlled by its developers, and used and accepted among the members of a specific virtual community." Although thought as a medium of

exchange and a unit of ac-count, virtual currencies proved themselves of being capable to also fulfil the function of being a store of value. The three most widely traded cryptocurrencies are currently the Bitcoin, Tether and the Ethereum (see figure 3). As of April 12, 2018, there are 1 565 freely exchangeable virtual currencies listed on the crypto asset exchange CoinMarketCap (CoinMarketCap, 2018).

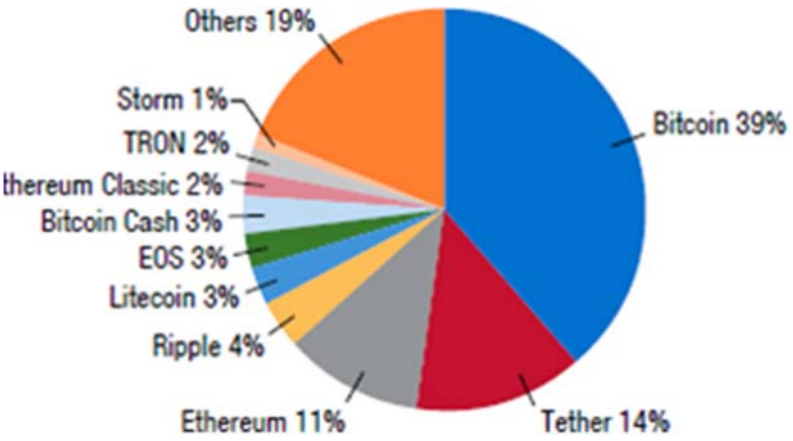


Figure 3: Trading Volume Share across Crypto Assets (IMF GFSR 2018)

3.1 Bitcoin and the Blockchain Technology

Bitcoin is a decentralized, peer-to-peer electronic payment system, first introduced in a self-published paper by an anonymous individual or group called Satoshi Nakamoto in October 2008. According to Nakamoto (2008), the idea of Bitcoin is to create “an electronic pay-ment system based on cryptographic proof instead of trust, allowing any two willing parties to transact directly with each other without the need for a trusted third party”. The crypto technology behind the Bitcoin is called distributed ledger technology (DLT), or blockchain technology (Nakamoto, 2008), and aims “to circumvent a lack of trust among trading par-ties” (Nakamoto, 2008).

Mining is the process how Bitcoins are distributed in the economic system, since the net-work has no central authority that regulates the supply of Bitcoins, but its major purpose is to keep the network functioning by maintaining the public ledger. Figure 4 coming from the IMF Staff Discussion Notes (SDN) of January 2016, provide an illustrative example of the distributed ledger system similar to Blockchain.

While processing the transactions of Bitcoin users, miners add these transaction records to the ledger, confirming a transaction has taken place and thus preventing double spending. The data of previous Bitcoin transactions is saved in blocks and the ledger contains several blocks – the so-called “block chain”. The Blockchain runs on an algorithm that requires a huge energy consumption to support the computer processing work. In addition the process usually takes about 10 minutes to be completed. Furthermore, Bitcoin was designed to have a limit of 21 million of Bitcoins that can be mined in total. Another restraint as outlined in figure 4 is that “the mechanism could break down” under certain conditions (He et al., 2016).

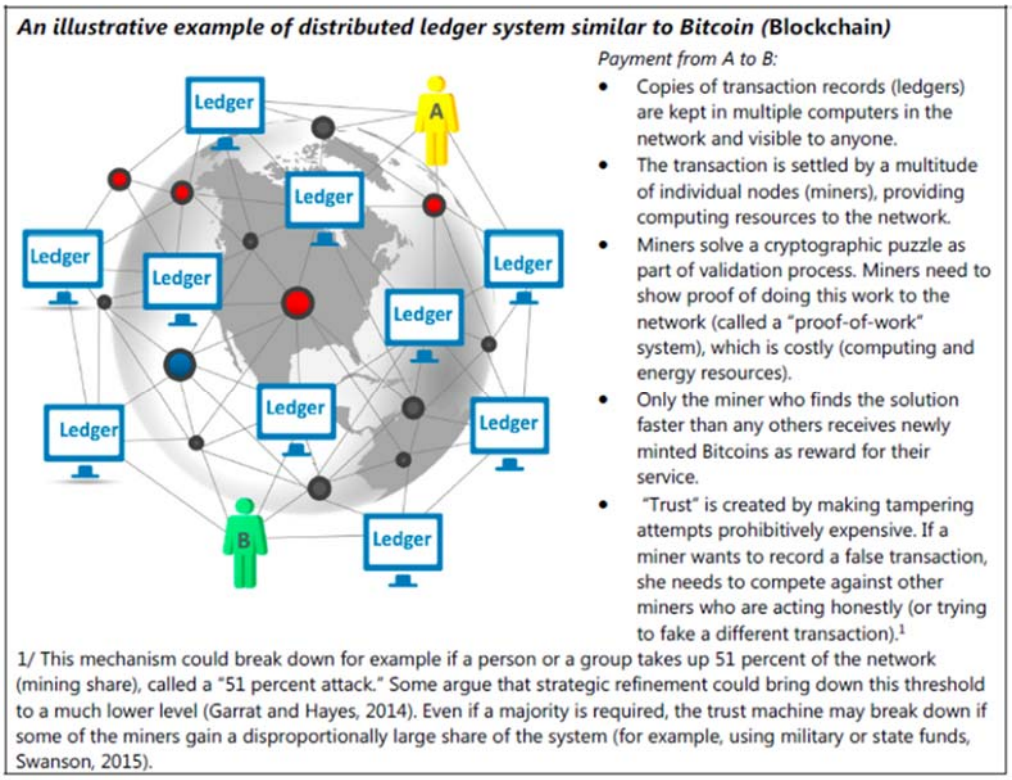


Figure 4: Distributed Ledger System (IMF Staff Discussion Notes SDN/16/03)

4 Switzerland – One of the Most Competitive Countries in the World

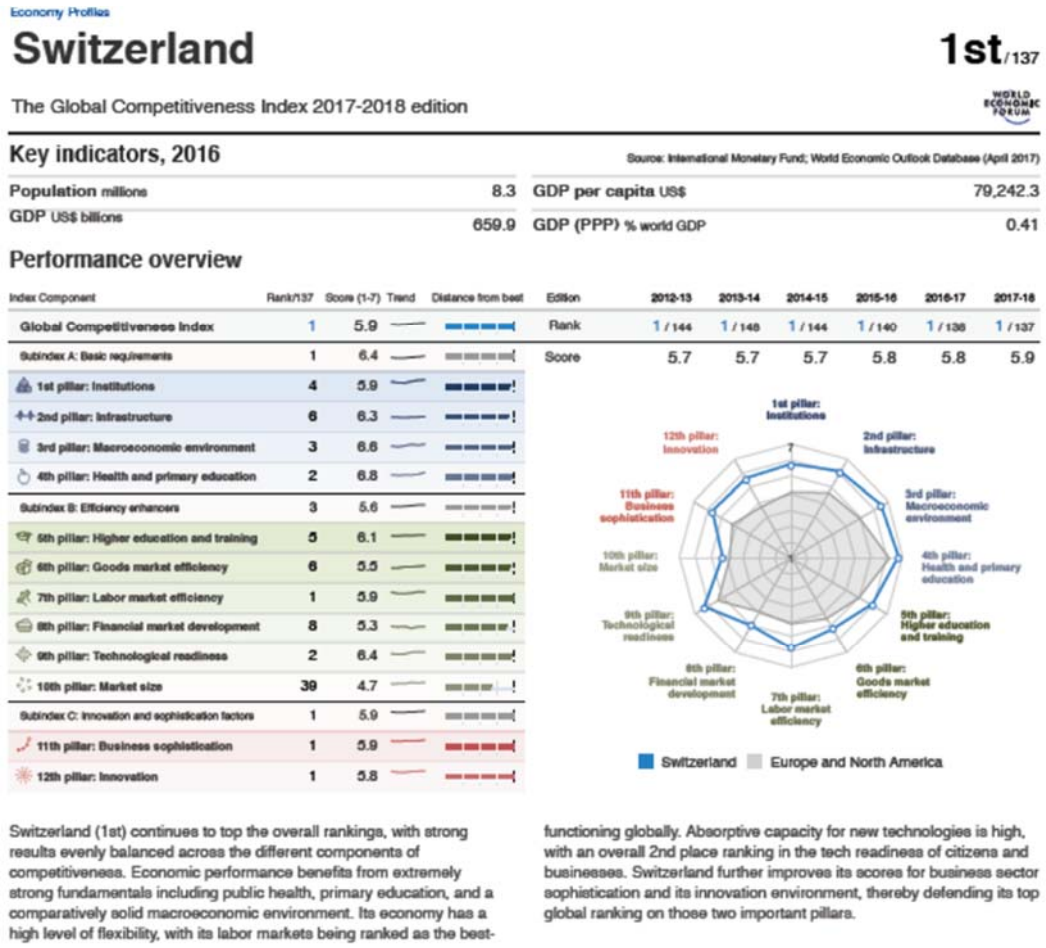
In his speech of January 18, 2018, the Swiss economics minister also emphasizes the fact that Switzerland is ranked first in the 2017-2018 Global Competitiveness Report (GCR) of the World Economic Forum . The country is a world leader in business sophistication and innovation and labor market efficiency (see figure 5). Another strength of Switzerland as emphasized in the GCR is that the "absorptive capacity for new technologies is high, with an overall 2nd place ranking in the tech readiness of citizens and businesses" (WEF 2018, p.137). Do the crypto technologies provide an opportunity for the country to claim its lea-ding position in innovation and technology? Or would this be rather a risk for the country and its financial sector? What are the major advantages, disadvantages, chances and risks behind the crypto assets and the crypto technologies like blockchain framed into a SWOT analysis?

5 Zug – the Crypto Valley

The economics minister highlights in his speech of January 18, 2018 his close contact with the local authorities in Zug on issues related to the Crypto Valley there. This strengthens the image of the canton of Zug of having "proactive and solution-oriented authorities" as also cited in the "Zug: financial cluster" (Canton of Zug, 2018a) . The business friendly envi-ronment is definitely an important factor for the FinTech companies in the blockchain business to form their hub in the Crypto Valley Zug. Moreover, the canton of Zug was ranked on the first place in the Credit Suisse Location Quality Ranking 2017 (see firgure 6).

Moreover, in its publication "Zug: small world - big business", the canton of Zug empha-sizes the highly diversified industries operational in the region. In addition to finance, this includes commodity trading, wholesale and distribution of brands, life sciences (Pharma /Biotech /Med Tech), high tech industry, information and communication technology (ICT), financial services (PE/Family Offices/Fintech), and sports articles (Canton of Zug, 2018b).

Put within the Porter Diamond Model on competitiveness, the above-mentioned related and support industries seem to fulfill one important facet of the model's diamond on competi-tiveness. However, are the additional crucial factors in place in the case of Crypto Valley Zug?



Economy Profiles

Switzerland **1st**/137

The Global Competitiveness Index 2017-2018 edition

Key indicators, 2016

Source: International Monetary Fund; World Economic Outlook Database (April 2017)

Population millions	8.3	GDP per capita US$	79,242.3
GDP US$ billions	659.9	GDP (PPP) % world GDP	0.41

Performance overview

Index Component	Rank/137	Score (1-7)	Trend	Distance from best
Global Competitiveness Index	1	5.9		
Subindex A: Basic requirements	1	6.4		
1st pillar: Institutions	4	5.9		
2nd pillar: Infrastructure	6	6.3		
3rd pillar: Macroeconomic environment	3	6.6		
4th pillar: Health and primary education	2	6.8		
Subindex B: Efficiency enhancers	3	5.6		
5th pillar: Higher education and training	5	6.1		
6th pillar: Goods market efficiency	6	5.5		
7th pillar: Labor market efficiency	1	5.9		
8th pillar: Financial market development	8	5.3		
9th pillar: Technological readiness	2	6.4		
10th pillar: Market size	39	4.7		
Subindex C: Innovation and sophistication factors	1	5.9		
11th pillar: Business sophistication	1	5.9		
12th pillar: Innovation	1	5.8		

Edition	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18
Rank	1 / 144	1 / 148	1 / 144	1 / 140	1 / 138	1 / 137
Score	5.7	5.7	5.7	5.8	5.8	5.9

Switzerland (1st) continues to top the overall rankings, with strong results evenly balanced across the different components of competitiveness. Economic performance benefits from extremely strong fundamentals including public health, primary education, and a comparatively solid macroeconomic environment. Its economy has a high level of flexibility, with its labor markets being ranked as the best-functioning globally. Absorptive capacity for new technologies is high, with an overall 2nd place ranking in the tech readiness of citizens and businesses. Switzerland further improves its scores for business sector sophistication and its innovation environment, thereby defending its top global ranking on those two important pillars.

Figure 5: GCR Economy Profiles: Switzerland 2017-2018 (World Economic Forum Global Competitiveness Report 2017-2018)

5.1 The Crypto Industry in Zug and the FinTech Industry

According to a publication of the Swiss Crypto Valley Association, the Crypto Valley in Zug disposes of an "excellent startup ecosystem of more than 350 blockchain companies" (Swiss Crypto Valley Association 2018). The crypto businesses are typically involved in activities like initial coin offerings and mining, consultancy on crypto investments and crypto asset management, development of blockchain-based products, etc. (see figure 7).

Moreover, the Associations's publication indicates that most of the blockchain companies belong to the FinTech cluster comprising of companies active in analytics, payment, dis-tributed ledger technology, deposit and lending, investment management, and payment.

This fact raises the logical question whether there is a rivalry or rather cooperation between the blockchain fintech companies and the major players in the financial sector, namely the Swiss banks.

According to the IFZ FinTech Study 2018, the FinTech companies present no competition to the banks but are rather cooperation partners or suppliers to the banks (Hochschule Lu-zern, 2018).

On the other hand, finew.com reports in an article as of March 13, 2018 of a “suspi-cious banking industry” towards crypto companies and of the trend for banks to slowly retrieve from crypto-related cooperation projects (Finews, 2018).

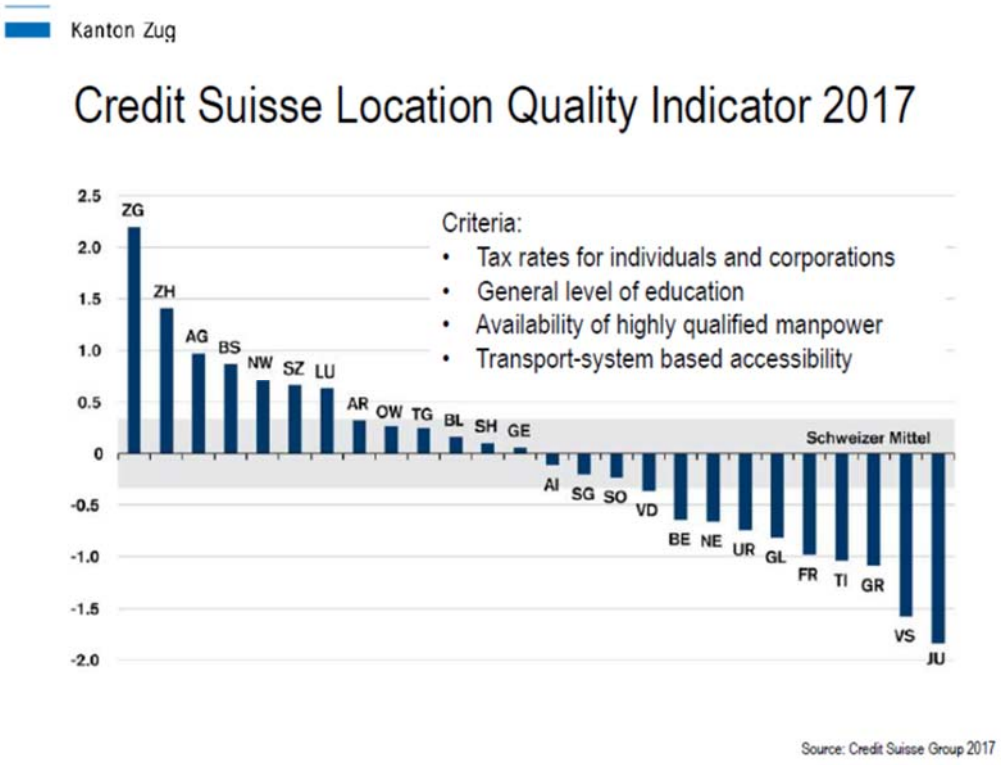


Figure 6: Canton of Zug Leads the Credit Suisse Location Quality Ranking 2017 (Cantonof Zug)

Figure 7: The Crypto Community in Zug (Swiss Crypto Valley Association)

5.2 Swiss Regulation on Initial Coin Offerings (ICOs) and the FinTech Companies

On February 16, 2018, Finma, the Swiss financial sector regulator, published guidelines on ICOs. Finma’s guide-lines distinguish between three categories of ICOs, namely, “payment ICOs” (functioning as means of payment),

"utility ICOs" (conferring digital access rights to an application or service), and "asset ICOs" (giving rights to earnings).

The April 2018 IMF GFSR provides an overview of the policy responses of other major countries to cryptocurrency developments. The report states namely that "in the United States, the Commodity Futures Trading Commission sees crypto assets as a commodity, whereas the Internal Revenue Service considers them property, and the Securities and Ex-change Commission (SEC) has acted on a case-by-case basis, including by halting some ICO". Further on, the report states that "China, and Korea have cracked down on some trading activities" (IMF 2018, p.26).

In addition, figure 8 outlines a summary of the Swiss FinTech regulatory framework which also addresses the money laundering concerns related to crypto assets.

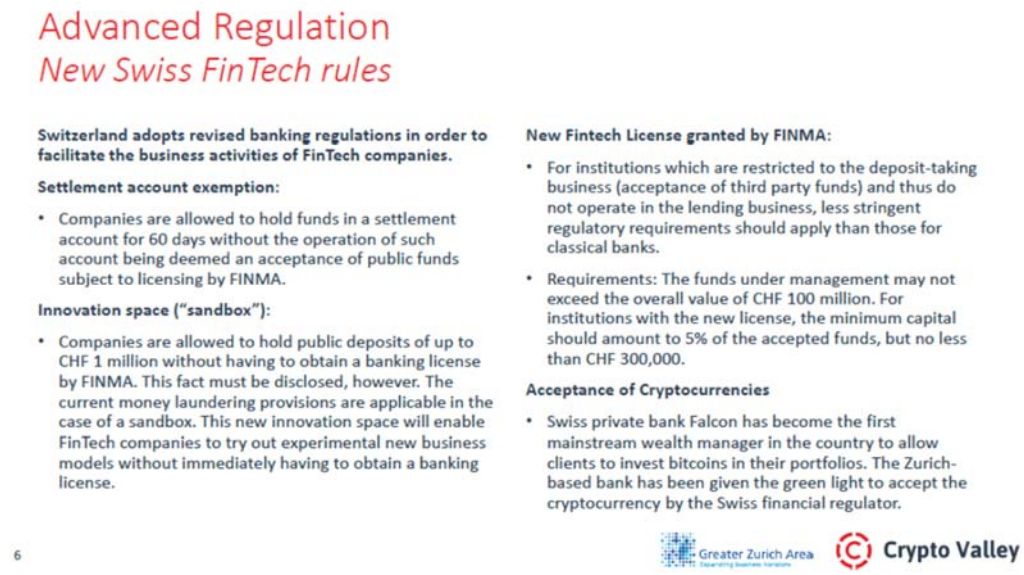


Figure 8: Swiss FinTech Rules (Swiss Crypto Valley Association)

6 Assignment Questions

1. What factors would facilitate the Zug area to defend and build its position as a driving force behind the "crypto nation" Switzerland? Please undertake a Diamond analysis on the Zug Crypto Valley. Please use the analytical data and reports on Zug referred to in the case study and the information on the GCR Report on Swit-zerland as a substitute information in the absence of relevant information on Zug.

2. What are the strengths, weaknesses, opportunities and threats (SWOT) for the out-spreading of the crypto currencies and crypto technologies in general? And in the case of Switzerland in particular?

3. Following the above analyses, please make an initial assessment of Mr. Schneider-Ammann's statement? Is this just a vision or is it an implementable goal to be bro-ken down into objectives and specific action steps that could be pursued by the government, cantons, companies, associations, the national bank and education in-stitutions in Switzerland? Is it realistic to expect banks to be integrated into a co-opetition model and if so, how?

4. Add any additional comments or issues you may consider pertinent to the case.

Bibliography

Atkins, R. (2018a). Switzerland embraces cryptocurrency culture. Financial Times. https://www.ft.com/content/c2098ef6-ff84-11e7-9650-9c0ad2d7c5b5. Accessed on 28.05.2018

Atkins, R. (2018b). Swiss authorities tread wary path through 'Crypto Valley.' Financial Times. https://www.ft.com/content/bea458ba-25fc-11e8-b27e-cc62a39d57a0. Accessed on 28.05.2018

Bank for International Settlement. (2017). Central bank cryptocurrencies. Bank for International Settlement. https://www.bis.org/publ/qtrpdf/r_qt1709f.pdf. Accessed on 28.05.2018

Bloom, B. (1956). Taxonomy of educational objectives. N.Y.: Longmans, Green.

Bouveret, A., & Haksar, V. (2018). What Are Cryptocurrencies? BACK TO BASICS. International Monetary Fund Finance and Development Series. http://www.imf.org/external/pubs/ft/fandd/2018/06/what-are-cryptocurrencies-like-bitcoin/basics.pdf. Accessed on 28.05.2018

Canton of Zug. (2018a). Cluster Fact Sheets. Canton of Zug. https://www.zg.ch/behoerden/volkswirtschaftsdirektion/kontaktstelle-wirtschaft/publikationen-wirtschaftsforderung/cluster-fact-sheet. Accessed on 28.05.2018

Canton of Zug. (2018b). Zug: Small World - Big Business. Canton of Zug. https://www.zg.ch/behoerden/volkswirtschaftsdirektion/kontaktstelle-wirtschaft/publikationen-wirtschaftsforderung/film-und-praesentationen. Accessed on 28.05.2018

CoinMarketCap. (2018). All Cryptocurrencies. CoinMarketCap. https://coinmarketcap.com/all/views/all/. Accessed on 28.05.2018

European Central Bank. (2015). Virtual currency schemes: a further analysis. Frankfurt am Main: European Central Bank. http://bookshop.europa.eu/uri?target=EUB:NOTICE:QB0415134:EN:HTML. Accessed on 28.05.2018

Finews. (2018, March 13). «Crypto Nation» Switzerland's Aspirations Meet Reality. Finews. https://www.finews.com/news/english-news/31038-crypto-nation-switzerland-zug-johann-schneider-ammann. Accessed on 28.05.2018

He, D., Habermeier, K., Leckow, R. (2016). Virtual Currencies and Beyond: Initial Consid-erations. IMF Staff Discussion Notes, 16(03), 1. https://doi.org/10.5089/9781498363273.006. Accessed on 28.05.2018

Hochschule Luzern. (2018). Switzerland has progressed into a leading global FinTech hub. Hochschule Luzern. https://www.hslu.ch/en/lucerne-university-of-applied-sciences-and-arts/about-us/medien/medienmitteilungen/2018/02/28/fintech-study. Accessed on 28.05.2018

International Monetary Fund. (2018). Global Financial Stability Report April 2018: A Bumpy Road Ahead. International Monetary Fund. https://www.imf.org/en/Publications/GFSR/Issues/2018/04/02/Global-Financial-Stability-Report-April-2018. Accessed on 28.05.2018.

Mulder, P. (2016). Porter Diamond Model, a great competitive advantage analysis. Toolshero. https://www.toolshero.com/strategy/porter-diamond-model/. Accessed on 28.05.2018

Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System. https://www.bitcoin.org/. Accessed on 28.05.2018

Neue Zürcher Zeitung. (2018). Die Bitcoin-Blase platzt – im Zuger Crypto Valley wachsen die Bedenken. NZZ. https://www.nzz.ch/schweiz/die-bitcoin-blase-platzt-im-zuger-crypto-valley-wachsen-die-bedenken-ld.1354992. Accessed on 28.05.2018

Swiss Crypto Valley Association. (2018). About Crypto Valley. Swiss Crypto Valley Association. https://cryptovalley.swiss/mdocuments-library/. Accessed on 28.05.2018

World Economic Forum. (2018). The Global Competitiveness Report 2017-2018. World Economic Forum. https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018/. Accessed on 28.05.2018