

Zurich University of Applied Sciences

Department General Management

Institute of Innovation and Entrepreneurship

Master Thesis

**Actor analysis of Leu, a blockchain-based
UBI complimentary currency**

Author:

Lukas Schädler

Supervisors:

Dr. Lukas Braunreiter

Florian Spychiger

Submitted on

June 15, 2023

Study program:

MSc in Business Administration – Major Innovation and Entrepreneurship

W.MA.BA.21HS.IEa

Imprint

Project: Master Thesis
Title: Actor analysis of Leu, a blockchain-based UBI complimentary currency
Author: Lukas Schädler
Date: June 15, 2023
Keywords: complementary currency, universal basic income, local currency
Copyright: Zurich University of Applied Sciences

Study program:

MSc in Business Administration – Major Innovation and Entrepreneurship W.MA.BA.21HS.IEa
Zurich University of Applied Sciences

Supervisor 1:
Dr. Lukas Braunreiter
Zurich University of Applied Sciences
Web: [Link](#)

Supervisor 2:
Florian Spychiger
Zurich University of Applied Sciences
Web: [Link](#)

Abstract

Leu is a new complementary currency that has been launched in 2022 in Zurich. Leu has a set of unique attributes that sets it apart from other complementary currencies. It is distributed in physical meetings as a universal basic income and has a built-in demurrage-mechanism. No research has been conducted on Leu at the time of writing this thesis.

The actors of Leu are analyzed using qualitative methods. In a first step, the community that attends the physical meetings is explored using participant observation. In a second step, deeper insights are created using interviews which are analyzed with a qualitative content analysis.

The results of this thesis suggest, that Leu has the potential to be used as a part of the solution to longstanding societal issues such as inequality. While the creators of Leu have succeeded in launching a local currency that is highly accessible and has limited inflation, the launch has also brought forward issues that hinder the formation of a circular economy that is based on Leu.

Acknowledgements

I would like to thank Dr. Lukas Braunreiter and Florian Spychiger for the support they provided me when writing this thesis.

Contents

Abstract	III
Acknowledgements	IV
List of Figures	IX
List of Abbreviations	X
1 Introduction	1
1.1 Goals and methodology	2
1.2 Structure	2
2 State of the research	4
3 Leu	6
3.1 Origins and development	6
3.2 Goals	7
3.3 Implementation	7
3.3.1 Demurrage	8
3.3.2 Local focus	8
3.3.3 Distribution	9
3.3.4 Key signing cycles	9
3.3.5 Blockchain infrastructure	10
3.4 Financing	12
4 Complementary currencies	13
4.1 Historic context	13
4.1.1 Inequality	13
4.1.2 Complementary currency timeline	14

4.2	Definition	15
5	Methodology	19
5.1	Research design	20
5.2	Definition of sub-groups	20
5.3	Participant observation	21
5.4	Expert interviews	22
5.5	Construction of the interview guidelines	23
5.6	Pretest	25
5.7	Sampling	26
5.8	Contacting the interview partners	27
5.9	Transcription	27
5.10	Qualitative content analysis	28
5.10.1	Determination of the units of analysis	31
5.10.2	Deductive category application	31
5.10.3	Inductive category building	32
5.10.4	Inter-coder reliability check	33
5.10.5	Topic matrix	34
5.10.6	Case summaries	34
5.10.7	Evaluation of the codes	34
6	Results	36
6.1	Participant observation	36
6.1.1	The Leu gathering process	36
6.1.2	Interactions at Leu gatherings	37
6.2	Case summaries	38
6.2.1	Alain Brenzikofer - Encointer association	38
6.2.2	Malik El Bay - Dezentrum	39
6.2.3	Gesa Feldhausen - Dezentrum	40
6.2.4	Philipp Probst - Spheres GmbH	41
6.2.5	Andrew Katumba - Isule Coffee	41
6.2.6	Gathering participant 1	42
6.2.7	Gathering participant 2	43
6.2.8	Gathering participant 3	44
6.2.9	Gathering participant 4	44
6.2.10	Gathering participant 5	45

6.2.11	Gathering participant 6	46
6.2.12	Gathering participant 7	46
6.3	Motivation for involvement with Leu	47
6.3.1	Ideology	47
6.3.2	Social interactions	48
6.3.3	Monetary gains	48
6.3.4	Self-education	48
6.4	Leu adoption factors for businesses	48
6.4.1	Marketing	49
6.4.2	Business directory	49
6.4.3	Customer acquisition	49
6.4.4	Flexibility	49
6.4.5	Increased revenues	50
6.4.6	Local business network	50
6.4.7	Communication and education	50
6.5	Leu adoption factors for individuals	50
6.5.1	Communication and education	50
6.5.2	Community building	51
6.5.3	Collaboration with other communities	51
6.5.4	Reacting to community input	51
6.6	Succes factors for a circular economy	51
6.6.1	Local circular ecosystem	52
6.6.2	Involving the city	52
6.6.3	Expansion of acceptance area	52
6.6.4	Buyback program	52
6.6.5	Leu as salary	52
6.7	Issues with Leu	53
6.7.1	Lack of spending opportunities	53
6.7.2	No circularity	54
6.7.3	Meetups are hard to access	54
6.7.4	Potential waste of effort	54
6.7.5	Increased consumption	54
6.8	Features of Leu	55
6.8.1	Open for anyone	55
6.8.2	Digital Identity	56

VIII

6.8.3	No inflation	56
6.8.4	Democratic governance	56
6.8.5	Transparency	56
6.8.6	Localized currency	56
6.8.7	Redistribution of wealth	57
6.8.8	Accessibility	57
6.9	Problems addressed by Leu	57
6.9.1	Supporting local businesses	57
6.9.2	Sustainability	57
6.9.3	Reducing Inequality	58
6.9.4	Education about the monetary system	58
6.10	Expert interview summary	58
7	Discussion	60
7.1	The Leu ecosystem	60
7.2	Business adoption	61
7.3	Individual adoption	62
7.4	Advantages of Leu	63
7.5	Classification of Leu	64
8	Conclusion and recommendations	66
A	Project documentation	68
	Bibliography	69

List of Figures

3.1	Leu blockchain infrastructure. Own figure.	12
4.1	Ideal-types of currency schemes (Blanc, 2011)	16
4.2	Four CC Generations (Blanc, 2011)	17
5.1	Flow chart for inductive category building and deductive category application. cf. (Mayring & Fenzl, 2019).	30
6.1	Amount of segments per issue with Leu. Own figure.	53
6.2	Amount of segments per feature of Leu. Own figure.	55
7.1	Features of Leu compared to the third generation schema definition. Own figure.	65

List of Abbreviations

LETS	Local Exchange Trading System
CCs	Complementary Currencies
UBI	Universal Basic Income
IOU	I Owe You
GP1	Gathering Participant 1
GP2	Gathering Participant 2
GP3	Gathering Participant 3
GP4	Gathering Participant 4
GP5	Gathering Participant 5
GP6	Gathering Participant 6
GP7	Gathering Participant 7

Dedicated to all the people who are building a better future

Chapter 1

Introduction

The field of research of this thesis has been a target of intense debate in the recent years. The concept of universal basic income has gained traction in public discussions, politics and academia. There was even a chance of a government led universal basic income being implemented in Switzerland. The citizens of Switzerland voted on the introduction of a universal basic income and declined it in 2016 (Bundesamt für Sozialversicherungen BSV, 2022). Other countries are also debating whether or not to implement a form of universal basic income (Straubhaar, 2017). The push for a universal basic income is driven by the automation of an increasing amount of jobs and a raise in inequality. A raise in inflation has also led to discussions about monetary policy in general and how the monetary system could be improved.

Complementary currencies could provide a solution to these problems that is not driven by the state. The potential for a successful implementation of a complementary currency in Switzerland has been proven by WIR, which has been established in 1934 and is still actively used today (WIR Bank Genossenschaft, n.d.).

Despite being declined by the Swiss citizens, the idea of implementing a universal basic income in Switzerland has persisted. As a result, Leu has been established in 2022 as a new form of complementary currency for Zurich (Encounter Association, n.d.-c). It is distributed as a universal basic income every ten days to anyone who attends a gathering in Zurich (Encounter Association, n.d.-c).

1.1 Goals and methodology

This master thesis aims to analyze the current user base of Leu and to explore which actors make up the Leu ecosystem after one year of its existence. Further, it wants to analyze the adoption of this new form of currency in Zurich with a focus on the drivers and blockers of adoption. Using the results of the first two goals, it aims to establish a first assessment of how Leu can be categorized in relation to existing forms of complementary currencies.

Based on this research setting, five research questions were developed:

- Who are the actors of the Leu ecosystem?
- Which factors drive the adoption of Leu for businesses and which factors hinder it?
- Which factors drive the adoption of Leu for individuals and which hinder it?
- Which problems are solved by Leu and how does it solve them?
- How can Leu be classified in the field of complementary currencies?

The first four research questions are exploratory in nature and aim to give an overview of who uses Leu and why they use it. The second and third question also aim to provide the basis for inputs for the further development of Leu. Because of their exploratory nature, these questions will be answered by using qualitative methods. The output of this process is then used in combination with a literature research to answer the fifth research question.

The initial data collection of this thesis is conducted in the form of participant observation in the Leu ecosystem. The observations are then written down and summarized. Further data for this thesis is collected by conducting expert interviews with actors of the Leu ecosystem. The interviews are then transcribed and analyzed using a qualitative content analysis.

1.2 Structure

Chapters 2, 3 and 4 cover the state of the research. Existing studies related to Leu and their relevance to this thesis are analyzed in chapter 2. Chapter 3 covers Leu. It explores the origins and development of Leu and the goals that the Encointer association has with Leu. The implementation of Leu with its features are also explained in this chapter. Chapter 4

provides an overview of the field of complementary currencies. First, the historic context and relevance of complementary currencies is showcased. In a second step, a definition of complementary currencies is presented, which includes a framework for the classification of complementary currencies.

The methodology used for the exploratory research is covered in chapter 5. This chapter explains the reasoning of why qualitative methods were chosen over quantitative methods and explains the reasons behind the choice of the specific research design. Further, the specific steps that were taken to successfully apply the methods are explained in detail. The results of the research are presented in a descriptive manner in chapter 6. First, a summary of the ethnography is presented, followed by case summaries of the interviews that have been conducted for this thesis. Next, the codes which are a product of the qualitative content analysis are evaluated.

Chapter 7 discusses the results in the context of the research questions of this thesis. The final chapter, chapter 8 contains a conclusion of the thesis with recommendations for future research.

Chapter 2

State of the research

No research has been conducted on Leu specifically at the time of writing this thesis. The closest related research in terms of the implementation of Leu has been conducted on the topic of Encointer. The Encointer white paper by Brenzikofer (2020) described the initial technical setup of Encointer, the technology behind Leu, which is described in 3.3. Further papers have been written about the scalability and the security of the protocol (Guicciardi, 2022; Hoffmann, 2021). Encointer was further analyzed from a economic perspective with the goal of analyzing whether complementary currencies with universal basic income can reduce inequality (Lamsallak, 2021). All of this research can be seen as relevant to this thesis because it describes the characteristics of Leu in a theoretical manner. The application of those concepts in reality, however, has not yet been researched.

Literature on Swiss complementary currencies exists, but is mainly focused on WIR, a local barter currency and banking network (Sahakian, 2014; Seyfang, 2000). This research is relevant to this thesis because it shows that complementary currencies can succeed in Switzerland. WIR can be seen as a precursor to Leu. It is based on the principle of *Freigeld* which was invented by Silvio Gsell and promotes the circulation of money (Sahakian, 2014). This is similar to another concept of Gsell, *Schwundgeld*, which the demurrage mechanism of Leu is based on (Brenzikofer, 2020). Despite those similarities, the adoption criteria for WIR and Leu are likely not similar. Leu has a unique combination of attributes that differentiates it from other Swiss-based complementary currencies and complimentary currencies worldwide. No literature on community research for a purely digital, blockchain-based complimentary currency that is distributed as a universal basic income and has built-in demurrage could be discovered in the literature research.

Leu presents new approaches for long-standing problems with complementary currencies. Fare and Ahmed (2017) have concluded in their meta analysis of literature on complementary currencies that increasing the legitimacy of complementary currencies is important for their adoption. According to Fare and Ahmed (2017), "civil society is not widely seen as an authority that is able to guarantee the validity and stability of a currency". As a solution, they propose that authorities need to recognize and validate the currency (Fare & Ahmed, 2017). This is relevant to this thesis because Leu is taking a different approach to solve this problem that does not necessarily need to involve authorities to be trusted. It achieves this by being built on blockchain technology, which makes it tamper-proof.

Chapter 3

Leu

3.1 Origins and development

Encounter, the technical foundation that Leu is built on, was first mentioned by Brenzikofer (Brenzikofer, 2020) in a white paper. All Encounter-based currencies follow the same basic rules, but each local community is able to set the parameters of the currency themselves (Brenzikofer, 2020). The first currency created on the Encounter platform was Leu, a currency focused on the Zurich region. Two years later, Leu has been launched as a first pilot project on the Encounter platform on the 3rd of May 2022 (Encounter Association, 2023a; leu.zuerich [@leu_zuerich], 2022). Since its launch, Leu has issued a community income to people that attended the Leu key signing cycles, which are further described in 3.3.4. The Leu community has grown to over one hundred participants and the money supply has grown to over 23'000 Leu in circulation (Encounter Association, 2023a). The adoption of Leu is also growing among businesses. Currently, nine businesses that accept Leu as a form of payment for their goods and services are listed on the Leu-website (Encounter Association, n.d.-b).

Initially, 22 Leu were distributed to each attendee of a key signing cycle, which take place every ten days (Encounter Association, 2023a). The issuance has since doubled to 44 Leu per attendee every ten days (Encounter Association, 2023a). After an initial spike of attendees that attended the key signing cycles after the launch of Leu, the number of attendees sharply decreased in the following months (Encounter Association, 2023a). At the lowest point since launch, a key signing cycle attracted less than ten attendees (Encounter Association, 2023a). After the issuance of Leu at the key signing cycles was doubled, the number of attendees stabilized at around 30 persons per key signing cycle (Encounter Association,

2023a). Data shows, that the group that attends the key signing cycles mainly consist of a core group of 20 people that attend almost each key signing cycle while the rest of the attendees visits the key signing cycles less frequently (Encointer Association, 2023a).

3.2 Goals

In the white paper for Encointer, Brenzikofer (2020) lists some of the goals that he aims to achieve with Encointer. The Encointer association aims to reduce financial inequality by issuing currencies that have built-in mechanisms that combat the accumulation of capital (Brenzikofer, 2020). Additionally, Brenzikofer (2020) hopes to increase financial inclusion of marginalized individuals by providing a income that can be claimed by anyone without the need for registration. The Encointer website lists further goals of Encointer (Encointer Association, n.d.-a). By providing a local currency, Encointer offers a mechanism to increase the local money supply, while ensuring its continuous circulation (Encointer Association, n.d.-a). This should lead to a community currency that is valued based on local supply and demand, which would allow for an economy that is decoupled from the globalized market (Encointer Association, n.d.-a). In addition to that, Encointer should provide a unique digital identity to the user, verifying them as a real person (Encointer Association, n.d.-a). Brenzikofer (2020) wants to reach those goals by the means of localized currencies that get distributed as a universal basic income.

3.3 Implementation

In order to achieve those goals, Encointer currencies, such as Leu, are created using a unique set of rules. These rules are encoded in the currency itself and thus do not need a central party that enforces them (Brenzikofer, 2020). The details of the technical implementation of Leu are highly technical. Because the technical implementation details are not relevant to the research question of this thesis, they will not be discussed. However, the features of Leu are still described in a non-technical fashion because they are relevant to the way that Leu works as a currency. Specifically, they influence the interactions that users have with the currency as well as the funding available to the Encointer association, which is discussed in 3.4.

3.3.1 Demurrage

The first feature that differentiates Leu from other currencies is a built-in demurrage mechanism (Brenzikofer, 2020). The word demurrage alludes to a mechanism that was first described by Gsell (1949). Gsell (1949) believed that the primary use case of money should be its usage as a means of exchange. According to Gsell (1949), the owner of a currency with a stable value has an unfair advantage against the owner of goods. Goods such as produce quickly depreciate in value as their quality gets worse. The seller of the produce is thus incentivized to sell the produce while it still has value. The party with money can use this time pressure to their advantage when negotiating a price. Demurrage means that money, like the goods that it is exchanged for, should "rust" and depreciate over time (Gesell, 1949). In practice, this means that money does not only lose buying power through inflation, but also the domination of each unit of currency goes down over time. This would shift bargaining power away from the capital owner as now both parties have an incentive to facilitate the exchange in a timely manner to avoid a loss of value of their goods (Gesell, 1949). There have been various attempts at implementing demurrage since Gsell first mentioned the mechanism (B. Lietaer, 2004; North & Weber, 2013; Schwarz, 2021). Currencies such as the Chiemgauer, which exists both in digital and physical form, have implemented demurrage successfully and are still running today (De La Rosa & Stodder, 2015).

Currencies that are set up using Encointer have implemented demurrage in the protocol of the currency itself (Brenzikofer, 2020). Currently, the demurrage for Leu is set at 5.6% monthly (Encointer Association, n.d.-c). This rate is high compared to the 2% demurrage that other complementary currencies such as the Chiemgauer and Sol-Violette have in place (De La Rosa & Stodder, 2015). Compared to other currencies, such as the Chiemgauer, where the demurrage happens once a month, the decline in value for Leu happens on a rolling basis (Brenzikofer, 2020; De La Rosa & Stodder, 2015).

3.3.2 Local focus

A further characteristic of Leu is its focus on being a local currency. By design, Leu and other Encointer currencies are meant to be used in a localized context (Brenzikofer, 2020). Encointer currencies ensure this by requiring its users to be in a specific, randomly assigned location in the area that the currency wants to be used in (Brenzikofer, 2020). Encointer currencies are therefore able to localize the money creation process (Brenzikofer,

2020). There is little incentive for businesses that are not in the vicinity of the gatherings where Leu is created to accept it as a form of payment since they in turn will need to find a business that accepts Leu to spend their income. For example, if a business in Beijing accepted Leu as a form of payment, they would need to spend the Leu they received from their business transaction in Zurich, as there is no liquidity or demand for Leu in Beijing.

Encounter aims to use this focus of a localized currency to start a circular ecosystem (Encounter Association, n.d.-a). In the case of Leu, this means that the goal is to create a circular ecosystem that is local to Zurich. In practice, this means that Leu is created at the gatherings, then spent at local businesses for goods and services. The businesses in turn use the Leu they receive either on B2B purchases or as a payout to their employees.

3.3.3 Distribution

Leu and other Encounter currencies are distributed as a form of universal basic income, where each participant of a key signing cycle receives 44 Leu (Brenzikofer, 2020). Universal basic income is a payment that gets distributed to all people belonging to the community, for example citizens of a state (Straubhaar, 2017). As it is implied in the name, a universal basic income is paid out without any requirements to anyone that meets the criteria to be included in the community of recipients (Straubhaar, 2017). In order to be included in the Leu community, the only criteria that needs to be met is the physical attendance of a key signing cycle.

3.3.4 Key signing cycles

In the case of Leu, the distribution of the currency is bound to a process called proof-of-personhood (Brenzikofer, 2020). By attending what Encounter calls a key signing cycle, also called gathering in the communication materials, a person can prove their status as a real human (Brenzikofer, 2020). This is done by a process of mutual confirmation of the participants of a key signing cycle that is written on the Encounter blockchain (Brenzikofer, 2020). Only a person that attends a key signing cycle is eligible to receive the basic income (Brenzikofer, 2020). This process needs to be repeated every ten days to renew the eligibility (Brenzikofer, 2020). This is required to protect the process from a sybil attack (Brenzikofer, 2020). A sybil attack is the process of creating multiple identities in order to game the system (Douceur, 2002). The proof-of-personhood process ensures that a real human is tied to an account by having all the key signing cycles taking place at the same

time, making it impossible for a person to attend two key signing cycles and receiving the universal basic income twice (Brenzikofer, 2020).

3.3.5 Blockchain infrastructure

While a Leu user interacts directly with the blockchain, the user experience of the app has been built in a way that allows users without any prior blockchain knowledge to send and receive Leu. However, the blockchain plays an essential role in the backend of Leu despite the lack of visibility for most users, both in the implementation of the unique feature set of Leu described in 3.3 and the financing of Encounter, which is further discussed in 3.4.

In order to gain a better understanding about this aspect of Leu, this section contains an introduction to blockchain technologies and their advantages. Further, this section covers the technical backend setup of Leu and how it is secured.

Leu is able to automate the process of demurrage and facilitate a trusted distribution of its basic income because it is based on blockchain technology. The emergence of contemporary blockchain technology can be attributed to the initial proposition put forth by the enigmatic individual known as Satoshi Nakamoto (2008) when they released the Bitcoin white paper. Nakamoto's objective with Bitcoin was to construct a decentralized electronic cash system that operates on a Peer-to-Peer network (Nakamoto, 2008).

Numerous endeavors were undertaken by various entities in the pursuit of establishing a digital currency. Prominent instances encompass DigiCash, Bit Gold, and PayPal. Bit Gold introduced a novel concept of a non-fungible currency operating on a decentralized network, serving as a potential substitute for gold (Szabo, 2008). However, similar to other predecessors, Bit Gold faced challenges in resolving the double-spending issue, which pertains to the potential to spend a digital coin twice. (Szabo, 2008). DigiCash employed blind signatures to ensure transaction anonymity and primarily targeted adoption by financial institutions, particularly banks (Schoenmakers, 1997). The DigiCash system effectively mitigated the issue of double spending. This was achieved through a process of deanonymizing the sender. However, it is noteworthy that the system lacked an inherent mechanism to proactively prevent double spending from occurring in the first instance (Schoenmakers, 1997). Compared to the two prior examples, PayPal is a successful means of payment, but it relies on a centralized infrastructure (Trautman, 2016).

Nakamoto (2008) solved the double spending issue by recording all Bitcoin transactions

on a public ledger that is stored in a distributed manner. In a public blockchain, all transactions are therefore inherently transparent and retained by every participant within the network (Nakamoto, 2008). This means, that the blockchain operates through the collaboration of multiple parties who maintain copies of the ledger and add new transactions in the form of blocks as they are generated. (Nakamoto, 2008). Bitcoin was the first iteration of a blockchain-based application.

In a blockchain-system, participants of the system are encouraged to not act maliciously by an incentive structure (Nakamoto, 2008). The security of a blockchain can be ensured in different ways. Bitcoin introduced proof-of-work, which has the block producers (miners) solve a cryptographic puzzle in order to gain the right to attach the next block of transactions to the chain (mining) (Nakamoto, 2008). Another notable mechanism of protecting the network is called proof-of-stake. In proof-of-stake networks, blocks are produced by participants that stake the native currency of the network in order to gain the right to produce blocks (Nguyen et al., 2019).

Leu is issued using the Encointer parachain, which gets its security from the Kusama blockchain. A parachain is a sovereign blockchain that profits from security guarantees in the form of locked capital (stake) of a central blockchain (beacon chain) (Burdges et al., 2020). The beacon chain has a limited amount of slots for parachains (Burdges et al., 2020). These slots are auctioned off to the highest bidder who has the right to use the slot for the duration of a pre-defined time frame (Burdges et al., 2020). The bid is locked during this time frame and gets released back to the bidder when the time frame closes (Burdges et al., 2020). Because of the limited supply, parachain slots can be expensive, some slots ended up costing hundreds of thousands of dollars (parachains.info, n.d.).

In order to combat the free rider problem, which is prevalent in open source technologies and push the development of common goods, the Web3 foundation that developed Kusama offers parachain slots for projects that develop common goods (Petrowski, 2021). The Encointer association applied for a common good slot on the 19th of May 2021 (Encointer Association, 2021). This application was accepted and Encointer was subsequently granted a parachain slot (Encointer Association, 2021). This enables Encointer to benefit from the Kusama security without having to pay for a parachain slot.

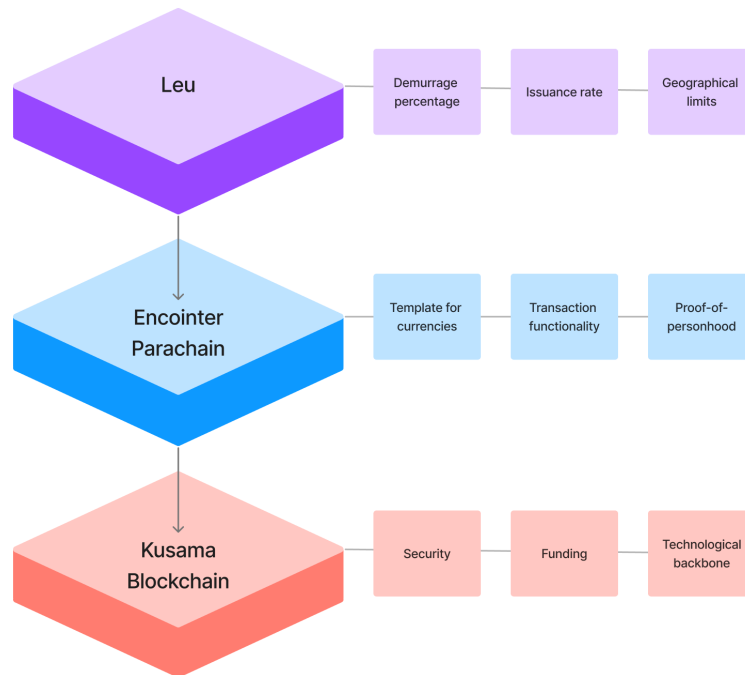


Figure 3.1: Leu blockchain infrastructure. Own figure.

3.4 Financing

Currently, the development of Leu and the costs of business development are covered by grants that the Encointer association has received. The Web3 Foundation, which is supporting the development of the Kusama blockchain, has a grants program in place (Web3 Foundation, 2023). The Encointer association first applied for a grant from the Web3 Foundation in 2020 (Brenzikofer, 2020). This grant request was subsequently granted. Since then, the Encointer association has received further funding from the Web3 Foundation. The last grant that was granted to the Encointer association was the biggest yet in terms of monetary value. The funding for the last grant round covers the first two quarters of 2023 (Encointer Association, 2022). The proposal for this grant includes business development costs as well as further improvements to the Encointer blockchain and the user experience (Encointer Association, 2022). In total, the Encointer association requested a total of CHF 610'000 in grants for the first two quarters of 2023 (Encointer Association, 2022). Prior to this grant, the Encointer association spent a total of CHF 1'058'500 on the development of Encointer between 2020 and November of 2022 (Encointer Association, 2022).

Chapter 4

Complementary currencies

4.1 Historic context

Money has been around for thousands of years and has existed in many different forms (Davies, 2010). Early forms of money were natural objects such as cowries that were used around the world as currency (Davies, 2010). Money then evolved from natural objects to man-made currencies such as coins made from metal (Davies, 2010). Later on, money transformed from metal to paper money that served as an IOU that could be redeemed for legal tender or gold (Davies, 2010). In the next iteration, money went from being backed by precious metals to being arbitrarily controlled by central banks after the collapse of the Bretton Woods system (Davies, 2010). The latest iteration of money has been started by an anonymous person or collective called Satoshi Nakamoto. By proposing a byzantine fault tolerant mechanism, Nakamoto (2008) launched a censor-resistant peer-to-peer digital currency. Since the launch of Bitcoin, hundreds of blockchain-based currencies have been launched with a multitude of use cases.

4.1.1 Inequality

While money has changed from locally used to globally traded, from being backed by assets to being backed by belief and from physical to digital, one aspect of money has not changed over its entire existence: Inequality. Over the centuries, there have been reoccurring efforts of the ruling classes in different societies to explain the need for inequality (Piketty, 2022). Despite those efforts, people have identified issues caused by inequality. Thus, inequality has been a theme in literature throughout the last centuries. In 1755,

Rousseau (2002) disassembled human nature and came to the conclusion that private property is the main source of inequality amongst humans. Over one hundred years later, Marx (2020) wrote his monumental book "Das Kapital" that serves as a cornerstone of socialist thinking until today. Marx (2020) brought forward, that capitalism is a temporary chapter in human history that will be followed by communism. According to Marx (2020), this systemic change will be enforced by a revolution of the working class that is triggered by an increase in inequality which is a product of capitalism itself. While the many of the predictions of Marx have been refuted since, a rise in inequality has been documented (Piketty, 2020).

With the record sales figures that the book "Capital in the 21st century" achieved, Piketty restarted the inequality-discussion in the current century (Gerstle, 2022). His research shows, that inequality, both in terms of income as well as wealth has increased in the last centuries (Piketty, 2020). Chancel et al. (2022) have shown that both income inequality and especially inequality of wealth have been on a sharp rise after a drop caused by the two world wars. This would not be of concern if supply-side economics would actually produce favorable outcomes for society as its proponents claim. Supply-side economics aim to increase supply by reducing regulations, cutting taxes and promoting free trade (Goodwin et al., 2019). In theory, this system would increase general prosperity by providing incentives to work and take risks which would in turn promote growth of the economy and rise general prosperity (Goodwin et al., 2019). However, research has shown that a rise in inequality leads to negative societal outcomes. Specifically, an increase in inequality leads to an increase of crime rates, decreased trust and decreased happiness (Barone & Mocetti, 2016; Kelly, 2000; Kennedy et al., 1998; Krohn, 1976; Oishi et al., 2011; Rufrancos & Power, 2013). All of those outcomes can be considered negative for society as a whole.

The emergence of these issues has lead to a call for a reform of the monetary system to tackle them (B. Lietaer & Dunne, 2013; Seyfang & Longhurst, 2013). Complementary currencies have emerged over forty years ago and present a alternative solution to state-issued monetary systems (Blanc, 2011).

4.1.2 Complementary currency timeline

The first new monetary system was set up in the early nineteenth century and had a social character (Fare & Ahmed, 2017). It was a scheme where the currency was denominated in hours of labor (Fare & Ahmed, 2017). During the Great Depression in the 1930s, local

scrip currencies were used to encourage monetary circulation (Fare & Ahmed, 2017). Those currencies were the first implementations of the demurrage mechanism, which is described in 3.3.1.

In their literature review about complementary currency systems, Fare and Ahmed (2017) point out that the introduction of the local exchange trading system (LETS) in 1983 started a new wave of complementary currencies (Fare & Ahmed, 2017). Since then, between 3'500 and 4'500 new complementary currencies have been launched (Fare & Ahmed, 2017). This new wave of complementary currencies differs from previous complementary currencies (Fare & Ahmed, 2017). Complementary currencies used to be created to combat crises and ceased to exist when the crisis was over (Fare & Ahmed, 2017). Fare and Ahmed (2017) suggest, that newer complementary currencies are meant to be permanent and accomplish goals other than the mitigation of crises.

4.2 Definition

The new form of complementary currencies described in 4.1.2 have been circulating for over forty years (Blanc, 2011). The research about the field, however, is still young and no common understanding of the terminology surrounding them has been established (Blanc, 2011; Lenis Escobar et al., 2020). Further terms that have been found in the literature are "community currency", "alternative currency" and "local currency" that can all be used interchangeably or to describe certain aspects of one another (Balaguer Rasillo, 2021; Blanc, 2011; Lenis Escobar et al., 2020). While there is no standardized definition of complementary currencies, the following attributes are often represented in the literature: Complementary currencies are a form of currency that is not meant to replace the national currency of any given nation. A complementary currency is therefore not issued by a sovereign government and is a monetary unit, which is exchanged in order to facilitate the exchange of goods or services that are denominated in it (Blanc, 2011; Fare & Ahmed, 2017; B. A. Lietaer, 2002; Peacock, 2014). Even though the research field of complementary currencies is still young, several papers analyzing implementations of complementary currencies in countries all over the world have been written (Gómez, 2012; B. Lietaer, 2004; North & Weber, 2013; Sahakian, 2014; Thiel, 2011).

Blanc (2011) suggests that a classification of complementary currencies needs to account for their differences from current money systems. Blanc uses "CCs" as a umbrella term

Nature of projects	Space considered	Purpose	Guiding principle	Denomination (English / Spanish / French)
"CCs"				
Territorial	Geopolitical space (territory politically defined)	Defining, protecting and strengthening a territory	Redistribution or political control	Local currencies / Monedas locales / Monnaies locales
Community	Social space (pre-existing or ad hoc community)	Defining, protecting and strengthening a community	Reciprocity	Community currencies / Monedas sociales / Monnaies sociales
Economic	Economic space (production and exchange)	Protecting, stimulating or orientating the economy	Market	Complementary currencies / Monedas complementarias / Monnaies complémentaires

Figure 4.1: Ideal-types of currency schemes (Blanc, 2011)

for complementary currencies. To keep the wording in this thesis consistent, the term complementary currencies is used instead of CCs. Whenever necessary, it is pointed out when the term complementary currencies is used in a different context. Blanc (2011) points out two dimensions in which complementary currencies are different from current money systems. "They can be either similar in their nature (thus distinct in their extent or their scope), or different (if it can be shown that crucial distinctive features make a difference in their very nature)." (Blanc, 2011). Blanc (2011) also emphasizes that "a typology should not be built in order to classify observations - as a lepidopterist does; it should be flexible enough to let space for innovation through the development of new systems" (Blanc, 2011).

Using those principles, Blanc (2011) defined three ideal-types of currency schemes depicted in 4.1. The first ideal-type are local currencies, which are described as non-national, not-for-profit currency schemes with a territorial focus (Blanc, 2011). These schemes aim to impact monetary relations within a defined geographic area, prioritizing local resilience and development (Blanc, 2011). They respect national monetary sovereignty and aim to strengthen the territory and its local authority (Blanc, 2011). The schemes involve a central controlling entity for currency generation and resource redistribution (Blanc, 2011). They may have limited consideration for community and economic factors (Blanc, 2011). Community currencies are the second type of currency (Blanc, 2011). These schemes prioritize the well-being, empowerment, autonomy, and social exchanges within a specific

Generation	Significant cases	Currency scheme types	Guiding principle	Content overview
G1	LETS, trueque, CES	Mostly community	Reciprocity first; various distance to market	Inconvertible schemes; quite small openness to external economic activities
G2	Time banks, Accorderie	Community	Reciprocity first; various distance to local governments	Inconvertible schemes with time currencies; frequent partnerships, especially with local governments
G3	Ithaca Hour, Regio, Palmas, BerkShares	Local and complementary	Market first; generally distant from local governments	Convertible schemes; local businesses are included; interest of partnerships with local governments
G4	NU, SOL	Mostly complementary	Market first, with links to governments and reciprocity	Complex schemes oriented toward consumer responsibility or / and economic activities re-orientation and other purposes; partnerships are necessary

Figure 4.2: Four CC Generations (Blanc, 2011)

community (Blanc, 2011). They can be implemented by non-profit organizations or informal groups, aiming to create social and environmental benefits for the community (Blanc, 2011). These community currencies operate based on the principle of reciprocity and can exist independently of territorial considerations, often referred to as community currencies, such as time banking schemes (Blanc, 2011). The third type are complementary currencies. These schemes are designed for economic spaces defined by actors and activities governed by market principles (Blanc, 2011). The guiding principle of this currency type is market exchange, although they can be implemented by non-profit organizations working for the general interest (Blanc, 2011). These currencies aim to influence and protect economic activities through convertibility rules, stimulate local usage, and encourage environmentally friendly practices (Blanc, 2011).

To account for the dynamic development in the field of complementary currencies, Blanc (2011) has identified four generations of complementary currencies shown in 4.2. Each of the generations uses different combinations of the three ideal-types (Blanc, 2011). This classification can be useful for classifying complementary currencies where the classification factors are known. However, for complementary currencies where these factors

are unknown, other classification systems can provide clearer guidelines for capturing information about them.

Place and Bindewald (2015) have brought forward a framework for capturing the goals and objectives for complementary currencies. This framework describes complementary currencies along the four dimensions of culture, governance, economic and social which are subdivided into the four levels meta, macro, meso and micro (Place & Bindewald, 2015). The levels contain goals with one or multiple specific objectives per goal (Place & Bindewald, 2015).

Chapter 5

Methodology

The research questions of this thesis which drive the method selection are the following:

- Who are the actors of the Leu ecosystem?
- Which factors drive the adoption of Leu for businesses and which factors hinder it?
- Which factors drive the adoption of Leu for individuals and which hinder it?
- Which problems are solved by Leu and how does it solve them?
- How can Leu be classified in the field of complementary currencies?

The research design was chosen based on these research questions. It will be further discussed in this chapter along with the practical data collection and the evaluation of the data. Mayring (2016) calls this "method control", emphasizing that a good and descriptive understanding of the subject can only be achieved when the methods of knowledge acquisition undergo constant scrutiny, despite the required openness. This standard has been frequently neglected in previous qualitative approaches (Mayring, 2016).

Following the justification for the research design in 5.1, each step of the research process is elaborated sequentially. 5.2 contains the reasoning and methodology for the definition of sub-groups in the Leu ecosystem. 5.3 describes the how the first assessment of the Leu ecosystem was carried out. In 5.4, the methodology for the expert interviews is described and 5.5 describes how the interview guidelines were constructed. From 5.6 to 5.9, the execution of the interviews are covered. Next, 5.10 covers the methodology used for the qualitative content analysis that was used to analyse the results of the interviews.

In addition to this methodology section, the transparency, quality and reproducibility of the research are ensured through the project documentation. The project documentation consists of all the related documents and the MAXQDA-files of the project.

5.1 Research design

Answering the research questions for this thesis will be done by conducting qualitative research. Qualitative research instead of quantitative research is used for the following reasons: The research done for this thesis is exploratory in two ways. There has been no research conducted on the actors of Leu itself, and because Leu is unique in its feature set, no research has been conducted about the actors of a complementary currency with the specific characteristics of Leu. For such a scenario, where the outcome is flexible, based on "openness", one of the thirteen pillars that Mayring (2016) has defined for qualitative thinking, a qualitative approach is recommended. This research design will open the path for further quantitative research to be done in the future by creating a knowledge base, that future research can be based on. For this reason, a open, qualitative mixed-methods approach involving a ethnographic analysis of the Leu key signing cycles, also called gatherings, where Leu is created and distributed and semistructured expert interviews with participants of the the Leu ecosystem has been chosen.

5.2 Definition of sub-groups

In order to choose the appropriate methodology for this thesis, it is necessary to understand the ecosystem of Leu. Leu is a currency that is theoretically open to anyone but only has a small group of active users (Encointer Association, 2023b). Combined with the small time window, that a gathering takes place in and the pseudonymous nature of the currency itself warrants a pre-screening of the community in order to gain a better understanding of where there are touchpoints with the actors.

This pre-screening was conducted based on the Encointer white paper and the official website of Leu (Brenzikofer, 2020; Encointer Association, n.d.-c). The participant observation and interviews were used to confirm the categories that were defined here. The Leu community can be subdivided into three categories: (1) People that attend Leu gatherings; (2) business owners that accept Leu as a form of payment for their goods and services and (3) The Encointer association that develops and runs the infrastructure that Leu is running

on and the think tank Dezentrum, that is tasked with business development for Leu. Those three groups all have an unique perspective on their respective touch points with the Leu ecosystem.

5.3 Participant observation

In a first step, an assessment of the first of the three identified sub-communities of Leu is made. The ethnography aims to gather a first understanding of the Leu ecosystem through the lens of a person that attends the Leu gatherings. As a main target of ethnographic research is taking the perspective of people which allows the researcher to learn about aspects of their lives, this research method is applied to achieve an understanding of the ecosystem (O'Reilly, 2012). A passive observation of a Leu gathering is not possible. Leu gatherings take place at a pre-defined time in a specific place that the participants are assigned to (Brenzikofer, 2020). This creates a in-group that is hard or even impossible to observe from an outside perspective. Therefore, the researcher needs to be involved in the group to gather meaningful results. This process is called participant observation (Bachmann, 2009; O'Reilly, 2012). For this research, the participants are not informed about intentions of the researcher and it is not revealed, that the researcher is at the gathering in the role of a researcher. This secrecy has been criticized because of ethics concerns but participant observation is still a popular method in the ethnographic field (Spittler, 2001).

The ethnographic research follows the research process described by O'Reilly (2012). O'Reilly (2012) splits the process of participating and observing into four factors. In a first step, the researcher needs to gain access to the community that he or she wants to observe (O'Reilly, 2012). As the researcher grows into their role, they might become used to certain things that are not obvious to somebody that is not involved in the community (O'Reilly, 2012). Therefore, when first starting out, noticing and noting down the details that the researcher will eventually become used to later on is essential (O'Reilly, 2012). Later in the process, the researcher will get more and more accommodated to the group setting and notice the rules and norms of the group (O'Reilly, 2012).

The third factor described by O'Reilly (2012) involves learning the language of the group. Leu-users may have their own ways of communicating certain aspects of the currency and its usage. The language could be especially complex because of the blockchain-technology that Leu is based on and the lack of familiarity of the built-in demurrage and

the distribution of Leu as a universal basic income. In a fourth step, O'Reilly (2012) describes the act of participating and observing itself as a key part of ethnographic work. The researcher takes the perspective of the people that are observed (O'Reilly, 2012). In practice, this can be done by attending the Leu-gatherings and using Leu as a currency. All of the observations gathered are then written down (O'Reilly, 2012). O'Reilly (2012) recommends tailoring the degree of detail of the notes to the project. Considering the short duration of the meetings, the notes should cover the observations as detailed as possible.

Four Leu gatherings were visited for this part of the research. The observations were captured in a description of the respective gatherings. To contextualize the gatherings, the descriptions also contain the time of arrival and departure of the researcher as well as the amount of participants that have registered for the gathering and the amount of people that actually showed up to it. The descriptions of the four gatherings are then summarized in a descriptive text in 6.1.

5.4 Expert interviews

After having gathered insights on the organic behavior of the people that are attending the Leu-gatherings, the next step of information-gathering is conducted by interviewing members of the Leu-community. While the ethnographic process is focused on the attendants of the LEU-gatherings, the interviews cover all three sub-groups of Leu identified in 5.2. Because of the exploratory nature of the research, a spoken method of inquiry is chosen. Hussy et al. (2013) recommend the spoken interview over a written interview when the interviewer expects longer, more detailed answers and wants to be able to react to the answers of the interviewee. While anonymous written interviews can lead to less social pressure on the interviewee and thus have the potential to generate more truthful answers, the lack of flexibility leads to the spoken interview to be better suited for this thesis (Hussy et al., 2013). In addition to the three groups mentioned in 5.2, a interview was conducted with an expert in the field of complementary currencies. This interview was conducted to help contextualize the results of interviews conducted prior. The results of this interview were not coded using the category system defined in 5.10 because they were not conducted with the interview guidelines defined in 5.5. The guideline for this interview is instead based on the results of the prior interviews. The results of this interview are presented in a summarized fashion and then used in 7 to add insights to the sections.

According to Denzin and Lincoln (2018), interviews could be conducted face-to-face, on the phone or over the internet. Online-interviews offer an increased flexibility because there is no need for geographical proximity of the interviewer and the interviewee. In order to reach as many interview participants as possible, this communication channel was chosen. The research question of this thesis is explorative. For such a case, Denzin and Lincoln (2018) suggest to conduct the interviews in a semistructured fashion. Semistructured interviews are not defined by hard boundaries. Brinkmann (2020) suggests, that interviews can not always strictly be separated between structured, semistructured and unstructured but instead that they exist on a spectrum. The three categories serve as guidelines for the interview preparation and execution (Brinkmann, 2020).

A semistructured interview is set up in a way that the interviewee can answer questions in an open manner (Brinkmann, 2020). In order to keep the interview on topic, the interviewer asks leading questions but leaves space for the interviewee to answer them openly (Brinkmann, 2020). The questions should not be structured in a manner that allows the interviewee to answer them with a simple yes or no (Brinkmann, 2020). Instead, they should focus on engaging the interviewee to speak their mind and produce a conversation (Brinkmann, 2020). This lets the interviewee describe their view on the topics that are discussed (Brinkmann, 2020). One of the challenges with semi-structured interviews is coming up with spontaneous follow-up questions that take the research goal and the previous answers of the interviewee in mind (Denzin & Lincoln, 2018). The interviews are recorded using screen capture and transcribed later on.

5.5 Construction of the interview guidelines

The interview guidelines are structured using the principle "as open as possible, as structured as necessary" (Helfferich, 2022). They are used as a tool that supports the researcher in the interview situation itself (Bogner et al., 2014). Further, they help to structure the field of research (Bogner et al., 2014). The interview guidelines were constructed with the three principles brought forward by Helfferich (2022) in mind. Helfferich (2022) recommends to start the interview with open questions that allow the interviewee to speak their mind as freely as possible. This is followed by questions that cover aspects which were not sufficiently covered by the literature (Helfferich, 2022). In a third step, the interviewer asks structured questions that guide the interviewee.

In order to account for the three sub-groups of interviewees and their different touch points with Leu, the interview guideline are adjusted for each of the three groups. However, the three interview guidelines follow the same base structure. They are structured along the dimensions that have been defined by Place and Bindewald (2015).

The prototype impact assessment matrix identifies the dimensions culture, governance, economic, social and environment as goals and objectives for complementary currency systems (Place & Bindewald, 2015). The interviews start with the interviewer asking the participants for demographic information about them. After that, the interviewer starts asking open questions regarding the motivation of participating in the Leu ecosystem and Leu itself and than narrowing down the questions to clarify further details. Because the five dimensions are interlinked, the questions are not structured in blocks that cover each dimension, rather they are structured in a manner that fits the interaction of the respective sub-group with Leu.

The first interviews are carried out with members of the Encointer association, who invented and developed Encointer and Leu, and members of the think tank Dezentrum, who have been contracted to work on Leu. These interviews are located on the less-structured side of semistructured interviews. The interviews with members of Encointer and Dezentrum have multiple goals. First, the interviews aim to gather information about interviewees themselves. This includes the form of their involvement with Leu and what motivates them to work on Leu. Second, the interviewees are asked about Leu as a currency. These questions aim to clarify their opinion on what impact Leu can have and which factors contribute to the achievement of this impact. Last, the interviewees are asked about the adoption of Leu by private persons and businesses.

The results of the first interviews are then used to further structure the interviews that are carried out with attendants of the Leu-meetups and business-owners that accept Leu. As there is no contact list, the meetup-attendants are invited to participate in an interview at the key signing cycles and Leu lunches. A further way of contacting meetup-participants is social media. The Encointer foundation runs a twitter profile and other social media accounts where contact could be established if the physical meetings do not yield enough participants to reach a theoretical saturation. The businesses that accept Leu are listed on the Leu website and their contact details can be gathered by a web search.

The interviews with business owners and private individuals are carried out in tandem with

each other. This will allow the interviewer to adapt the interview guideline if needed. This approach is chosen because the Leu users are customers of the businesses that accept Leu. This dynamic might bring forward new information that is relevant for the interviews for the respective other target group. The interviews for both groups start with gathering information about the interviewees and an exploration of the factors that motivate the interviewees to be a part of the Leu ecosystem. The business owners are then asked whether they consider their adoption of Leu a success. Further, they are asked about the impact of Leu on their business and their customer base. Because Leu is intended to be used in a circular manner, the interviewees will be questioned, whether they are able to spend the Leu that they are earning and what they are spending it on. All the interviews therefore follow the same base structure but are adapted to the category that the respective interviewee belongs to.

5.6 Pretest

Before conducting the first interview, a pretest has been conducted. A pretest can help the interviewer to get comfortable in the interview situation by going through the entire interview process (Bogner et al., 2014). More importantly, the pretest was conducted to validate that the interview guidelines are consistent and that there are no unclear questions in the guidelines.

The pretest was conducted with a person that has attended a Leu meetup before but was not involved with Leu beyond that. In contrast to the actual interviews, the pretest was done offline because the interview partner was in the vicinity. The interviewer has conducted online interviews before, which is why no emphasis was put on rehearsing the technicalities of a Microsoft Teams interview. The pretest has brought forward an issue with a question asking the user about the specific aspects of Leu. The interviewee was unaware of the specific features of Leu and it became clear, that the interview guidelines needed to be amended with further information. Other than this clarification, no further issues with the interview guidelines have been identified by the pretest.

5.7 Sampling

The sampling of potential interview partners was done based on the three sub-groups that have been identified before. The first group, individuals, that participate in the Leu gatherings, presented a challenge when it came to identifying and contacting individuals that belong to this group. This challenge can be attributed to the anonymity that Leu grants to its users. A list of attendants of past and future gatherings is not available. While all Leu transactions are recorded on a public ledger, all wallets are pseudonymous. Further, there is no function built into the Encointer wallet, that would allow a user to contact the pseudonymous accounts. The possibilities of identifying and contacting the members of this sub-group were therefore limited. Under these circumstances, the only way of contacting the participants was at the Leu gatherings which only take place every ten days. Because the allocation to the gatherings are randomized, there is no guarantee, that each gathering yields new potential interview partners. Considering those factors, all participants that were encountered at gatherings were considered potential interview partners.

The second group of interview partners, businesses that accept Leu as a form of payment for their goods and services, was comparatively easy to narrow down. In theory, anyone can start accepting Leu as a form of payment without needing any registration or permission. This is due to the blockchain-based nature of Leu. Compared to individuals participating in Leu gatherings however, there is a public list available. When businesses accept Leu, a representative of the business can send a request to be listed on the official website of Leu. On the 30.1.2023, there were nine businesses listed on the website. All of these businesses are considered potential interview partners.

The third group of interview partners are members of the Encointer association and Dezentrum. According to their website, the Encointer association has no further engagements than working on Encointer as a product and Leu as a specific iteration of this product. Therefore, any member could be a potential interview partner, preferably Alain Brenzikofer, as he wrote the white paper for Encointer. Dezentrum is a think tank with a multitude of projects. The relevant parties that are working on Leu were identified by contacting a member of Dezentrum.

For the interview with an expert in the field of complementary currencies, Dr. Jens Martignoni was chosen as the interview partner. This choice was made because of his extensive background knowledge with complementary currencies (Huber & Martignoni, 2013;

Martignoni, 2012, 2015, 2018, 2022). Further, Martignoni already knew about Leu which further cements his status as an expert on the topic.

5.8 Contacting the interview partners

After completing the sampling process, the process of contacting the potential interview partners defined in the sampling started. Over a time frame of four months, the potential interview partners were contacted. The institutions involved in the development of Leu (Encointer and Dezentrum) were able to quickly provide access to the relevant parties. One interview partner involved with Encointer and two interview partners of Dezentrum that are involved with Leu agreed to an interview.

The process of contacting potential interview partners at Leu gatherings proved rather difficult. Besides the reluctance of many attendants of the gatherings to participate in an interview, the interviewer was assigned repeatedly to meetups with a similar crowd of participants and to meetups where multiple participants did not show up. The efforts resulted in 13 individual contacts that agreed to an interview of which six actually appeared to the interview.

The businesses that accept Leu were also reluctant to agree to interviews. All businesses on the Leu website were contacted. Of the nine contacted businesses, five responded, one more after a reminder was sent out. Of those six businesses, two business owners could be won for an interview.

5.9 Transcription

In order to bring the interviews in a format that can be analyzed by a QDA tool, they first need to be transcribed (Kuckartz, 2010). Kuckartz (2010) defines the process of transcribing as the conversion of verbal communication to a written document. For this thesis, all the interviews were recorded in Microsoft Teams. The video files are then used to create the transcripts. When transcribing the interviews, the researcher has to make sure, that the interview is transcribed in a format that can be processed by the specific QDA software that they are using (Kuckartz, 2010). The QDA software chosen for this research is MAXQDA. MAXQDA accepts a broad range of file formats, which makes

transcribing intuitive. The interviews were transcribed using timestamps for each segment spoken by either the interviewer or the interviewee.

Kuckartz (Kuckartz, 2010) has identified four different ways that an interview can be transcribed: Recollection based evaluation, protocol based evaluation, tape based evaluation and transcript based evaluation. Recollection based evaluation is mostly used in journalism and not suited for scientific research (Kuckartz, 2010). Protocol based and tape based analysis could both be used in this context but in order to preserve the most details, a transcript based analysis has been chosen for this thesis. The interviews are represented in a complete form. However, small corrections have been made to account for the repetition of words and incomplete sentence fragments that are corrected in the next sentence. Because multiple gathering participants have asked for an anonymization of their interviews, all the interviews with gathering participants have been anonymized.

5.10 Qualitative content analysis

After the interviews have been conducted and transcribed, they are analyzed using qualitative content analysis as described by Mayring (Mayring & Fenzl, 2019). Qualitative content analysis is commonly used for the analysis of expert interviews (Bogner et al., 2014). Mayring and Fenzl (2019) propose an analytical process that is based on categories. In this context, categories are a short summary of aspects that the researcher wants to analyze (Mayring & Fenzl, 2019). By strictly defining the analyzed aspects as well as the rules for analyzing them, this methodology enables a systematic analysis that is intersubjectively verifiable (Mayring & Fenzl, 2019). Qualitative content analysis can be split into two categories. When a pre-defined set of categories is used, the analysis is referred to as deductive (Mayring & Fenzl, 2019). This methodology is recommended for established fields of research where categories have already been defined (Hussy et al., 2013). Research that is explorative can make use of an inductive methodology, where categories are defined by working with the gathered material (Hussy et al., 2013).

When choosing between deductive and inductive category selection for this thesis, the choice was made to use a mixed approach of deductive and inductive category selection. This choice was made because of multiple factors. First and foremost, the research on the adoption of complementary currencies is sparse. While there are quantitative measures

for measuring the impact of complementary currencies, no analytical framework or category system for probing adoption in a qualitative manner has been found in the literature analysis (Place & Bindewald, 2015). Additionally, because of the novel attributes of Leu as a currency, the research on the adoption is exploratory. Both of those factors lead to the conclusion, that while initial categories can be derived from the interview questions that are based on the research of Place and Bindewald (2015), the exploratory nature of the research warrants to follow up the deductive category selection with an inductive category selection.

This mixed methods approach to category building is an established approach in the field of qualitative content analysis (Kuckartz, 2016). Kuckartz (2016) recommends to first apply deductive category application. The categories used for this are not based on the data itself but rather deducted from the theory or the research question itself (Kuckartz, 2016). This category system acts as a search grid for the material, helping the researcher to construct a first rough outline of the content (Kuckartz, 2016). After having concluded the deductive category application to the material, inductive category building is used to build sub-categories for the categories that have been used for the deductive category application (Kuckartz, 2016).

The qualitative content analysis has been conducted using the QDA software MAXQDA. The analysis itself has been split into multiple steps according to the flow chart for inductive category building and deductive category application as shown by Mayring and Fenzl (2019). The process is outlined in figure 5.1.

Step one to three in the process can be cut short. The first step has already been conducted in 5, where the research question has been defined and justified by the theory laid out in 2. The second step of selecting and characterizing the material has already been conducted, as all the material used in this qualitative content analysis consists of interviews that have been conducted by the researcher specifically for this purpose. The same goes for the third step in the process. Mayring and Fenzl (2019) suggest to specify the socio-cultural background of the text, the producers of the text as well as the impact of the text and the target group of the text. The interview setting has been outlined in 5.4, 5.5, 5.7, 5.8 and 5.9.

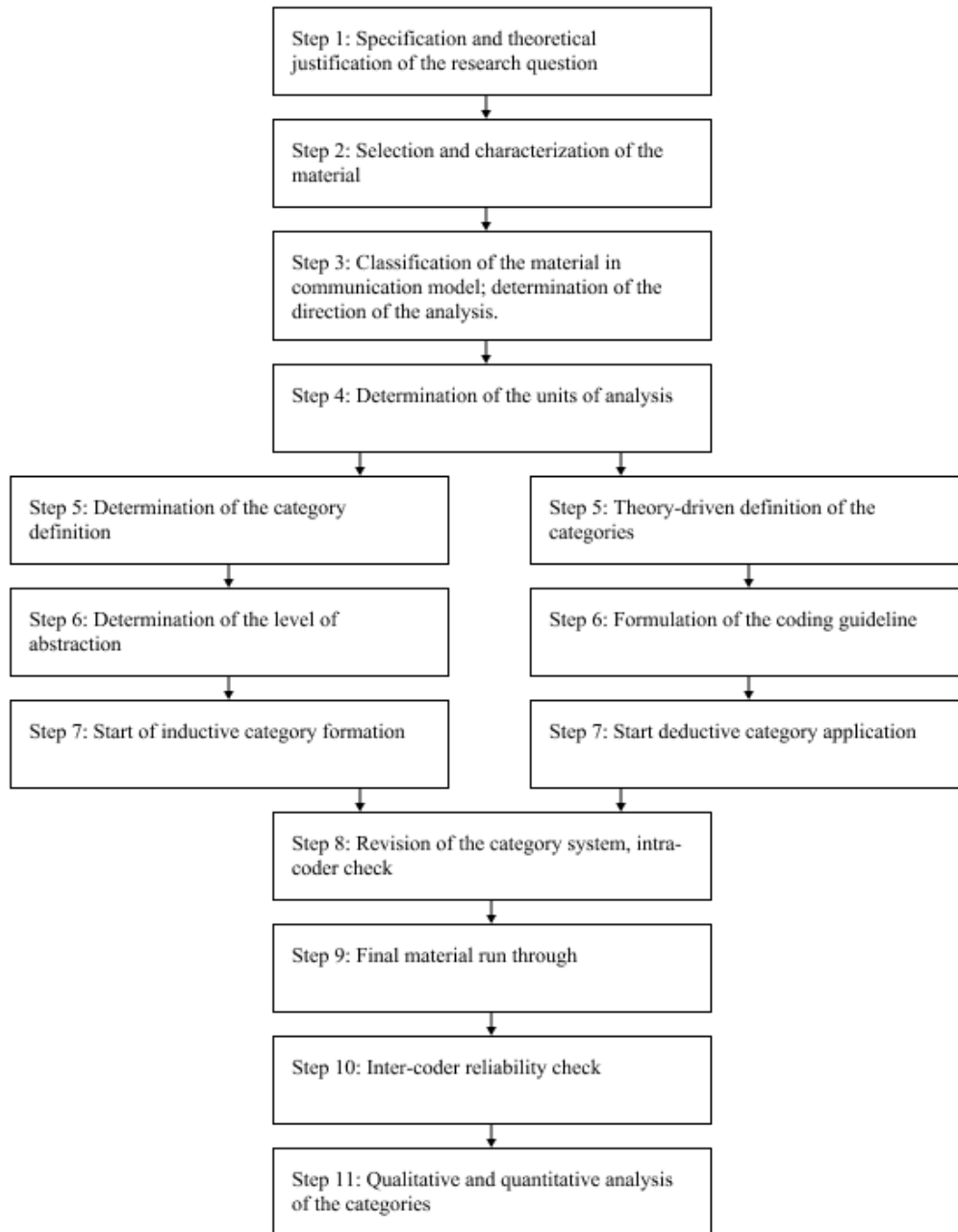


Figure 5.1: Flow chart for inductive category building and deductive category application. cf. (Mayring & Fenzl, 2019).

5.10.1 Determination of the units of analysis

The units of analysis can be separated into the three categories *coding unit*, *context unit* and *evaluation unit* (Mayring & Fenzl, 2019). The coding unit describes the smallest unit of text that is allowed to be evaluated (Mayring & Fenzl, 2019). This could be a word, a sentence, a semantic unit or other dimensions of text (Mayring & Fenzl, 2019). The coding unit chosen for this analysis is a group of words that in combination form a meaningful expression.

The context unit defines which information can be added to the coding process of a single unit (Mayring & Fenzl, 2019). Depending on the definition of the context unit, this could be the sentence, that contains the unit, an answer in the interview, a paragraph of text, additional context material or the entire interview (Mayring & Fenzl, 2019). For this analysis, the entire interview was set as a context unit. This choice was made because of the interwoven nature of the interview questions. Further, the exploratory nature of the interview allowed the interviewer to come up with follow-up questions which can not be accounted for beforehand.

The third unit that needs to be defined, the evaluation unit, defines the amount of material that is being analyzed with the category system (Mayring & Fenzl, 2019). The material can range from parts of the material to the entire material and further dimension (Mayring & Fenzl, 2019). For this thesis, the range has been set to include all the interviews that have been conducted with the three groups of participants of the key signing cycles, associates of Encointer and Dezentrum as well as the businesses that accept Leu. The decision was made to evaluate all the three interview groups because while interviews have been adjusted for each target group, the core contents of the interviews are persistent.

5.10.2 Deductive category application

The steps five to seven on the right side of the the flow chart in 5.1 describe the preparation and execution of the deductive category application. As described in 5.10, the literature did not provide a clear framework that could be applied to this analysis. However, a deductive category application can be used to produce an outline of the material that can then be used to further break down the material in the process of inductive category formation.

This process resulted in the application of the following deductive categories to the material:

- *Motivation for involvement with Leu*: Categories concerning the reasons why individuals of all of the three interviewed groups are involved with Leu.
- *Leu adoption factors for businesses*: Categories concerning the reasons why Leu might be attractive for businesses to adopt and what can be done going forward to improve Leu to make it more attractive for businesses to adopt it.
- *Leu adoption factors for individuals*: Categories concerning the reasons why Leu might be attractive for individuals to adopt and what can be done going forward to improve Leu to make it more attractive for individuals to adopt it.
- *Success factors for a circular economy*: Categories concerning the build-up of a circular economy in Zurich.
- *Issues with Leu*: Categories concerning issues that individuals of all of the three interviewed groups have encountered while using Leu. This includes general grievances with Leu from a theoretical point of view but also issues that have an impact to the usability of Leu.
- *Features of Leu*: Categories concerning the features are embedded in Leu. This can be technical features that impact the way that people use Leu but also features that enable potential use cases down the line.
- *Problems addressed by Leu*: Categories concerning the use case of Leu. This can be problems that are already being addressed by Leu but also Problems which have a potential solution in the future that is enabled by Leu.

5.10.3 Inductive category building

After applying the deductive categories to the material, the categories are then broken down to more granular categories using inductive category building. The steps five to seven on the left side of the the flow chart in 5.1 describe this process. In practice, inductive categories have been developed for all seven categories defined for the deductive category application. After coding the first interview, the interview was re-coded the next day to check for intra-coder reliability. Intra-coder reliability refers to a check which evaluates whether the same coder would use the same or similar codes if he were to build categories a second time for the same material (Kuckartz, 2010). Mayring (2015) mentions that

this technique is rarely useful, this process was only done as a sanity check of the coder to mitigate big issues down the line. It was also done as a training exercise since the coder has not worked on a qualitative content analysis before. Therefore, no statistical test, such as Krippendorff's Alpha was conducted on the data, but it was used to improve the category system. This was done by adding categories that have been missing in the first run and supplement additional information to the category descriptions wherever the second coding run provided a better or more expansive description.

After completing the inductive category building, the category system was revised as Mayring and Fenzl (2019) recommend. This resulted in the combination of categories that were deemed redundant into new categories. Overall, eight categories were merged which resulted in a more streamlined category system.

5.10.4 Inter-coder reliability check

After a final material run through has been conducted, an inter-coder reliability check has been conducted. The inter-coder reliability check is used in quantitative content analysis to determine the reliability of the inductive category building (Mayring & Fenzl, 2019). Mayring and Fenzl (2019) recommend to add a second coder to the process that codes parts of the material. After the second coder has completed coding, it is checked, whether or not the codes of the first coder match with the codes of the second coder (Mayring & Fenzl, 2019). Mayring and Fenzl (2019) recommend, that the second coder starts without the codes of the first coder and builds inductive categories from scratch.

This system has been adapted to fit the needs of this thesis. Because the interviewer, who is the first coder, has been immersed in the Leu community, the language used in the interviews was very topic-specific. The second coder has not been involved with Leu before and could therefore not be expected to code the interviews without a guideline. Therefore, the choice was made to adapt the process to exchange the inductive category building that Mayring and Fenzl (2019) recommend for the second coder with a deductive category application to account for the lack of expert knowledge. By using deductive category application, the second coder was able to quickly gather an overview of the categories built by the first coder and, if needed, read the context in the category description.

The inter-coder reliability check showed a 67.92% agreement between the codes of the first and the second coder. As proposed by Mayring and Fenzl (2019), this check was

subsequently used as a basis for discussion between the first and second coder. This has led to the adjustments of the description of certain codes. Further, some codes were shifted as a result of this discussion.

5.10.5 Topic matrix

In order to have the data in a state where a qualitative and quantitative analysis is possible, the category system needed further restructuring. Kuckartz (2016) describes the structuring of the material in the two dimensions *cases* and *categories* a central component of the qualitative content analysis. For analyzing interviews, Kuckartz (2016) recommends structuring those two axes in a matrix called a topic matrix, where the interview partners are listed in the rows and the topics are listed in the columns. This approach of structuring the data is similar to a data matrix used in quantitative research (Kuckartz, 2016).

MAXQDA has a built-in function called summary grid which generates a cross table that displays the categories on one axis and the interview transcripts on the other axis. Each node in the summary grid displays the statements that an interview partner has made about a category. In a next step, the content of each node was summarized to further condense the material. Using the MAXQDA function summary table, a new topic matrix was created, a table with the same x and y axes as the summary grid that displays the summarized content in each field.

5.10.6 Case summaries

Kuckartz (2016) recommends to write a case summary as a first step after having worked through the content. A case summary is a "systematically organizing, summarizing presentation of the characteristics of this individual case" (Kuckartz, 2016). This means, that instead of summarizing the entire case, the case is summarized in a focused manner, using the research questions as a guideline (Kuckartz, 2016). Therefore, the case summary aims to highlight the central characteristics of the individual case that are related to the research questions.

5.10.7 Evaluation of the codes

In a next step, the categories are evaluated as described by Kuckartz (2016). This step evaluates what information about each category is present in the material (Kuckartz, 2016).

This methodology is mainly used to present the results in a qualitative fashion (Kuckartz, 2016). Assumptions and interpretations are allowed for this step of the research (Kuckartz, 2016). Kuckartz (2016) recommends to structure this descriptive evaluation in a sense that makes sense for the reader instead of strictly following the structure of the categories.

Chapter 6

Results

This chapter aims to give an overview of the results of the application of the qualitative methods described in 5. A summary of the participant observation is presented, followed by the case summaries of the expert interviews and the evaluation of the codes.

6.1 Participant observation

The following subsections describe the four Leu gatherings that the were visited and described for this thesis. The summary has been split into two parts. In the first part, the sequence of events of the gatherings is summarized. The second part focuses on the gathering participants and their interactions.

6.1.1 The Leu gathering process

While each of the four gatherings was a different experience, the overall process worked the same each time except for the first time. Before being able to register for a gathering, one needs to create an account using the Encointerwallet app, which can be downloaded in the app store. Next, a small amount of Leu is needed to pay for the registration. This is necessary because the registration for a meeting is an interaction with the blockchain, which costs transaction fees. This means, that one needs to establish contact with someone who already owns Leu and ask them to send a small amount.

From here, the process is the same for each gathering. There is a button on the main page of the app that allows the user to sign up for the next gathering. One day before the gathering, the Encointerwallet app sends a notification and shows how many people have

been assigned to the gathering. It also shows a map with the location of the gathering and the time at which the gathering takes place. The time is usually the same and only changes with daylight savings time.

At the start of the gathering, the participants show up and count how many people are present. They enter the number of present individuals in the app, which then shows a QR code. Now, the first participant presses a button in their app which opens the camera. While this is not a mandated process, it is the norm that the other participants then stand in a circle and hold their phones in front of them, presenting their QR codes. The person who has opened the camera then walks around the circle, scanning the QR code of each gathering participant. The first person who had their QR code scanned then also opens their camera and starts scanning in a circle. This is repeated until each participant has scanned all the QR codes of the other participants. After this step, each gathering participant presses a button in their app to submit the attestations of the other participants. This step concludes the Leu gathering.

6.1.2 Interactions at Leu gatherings

The Leu gatherings usually take place in a time span of five to ten minutes, depending on when a participant arrives. While the entire attestation process described in 6.1.1 could theoretically be conducted in less than three minutes depending on the number of participants, the meetings usually take longer, which leaves more time for interactions. In the meetings that were attended, there were three reasons why the meetings took longer. First, there were usually people who arrived early and then needed to wait for the gathering to start. Second, the groups usually waited for a few minutes after the official start of the gatherings because there were never all the registered participants present. This would allow them to join the meeting even if they were a bit late. Third, some participants encountered technical issues during the gathering. In the attended meetings, those were caused by user error.

Because the gatherings were very short, the impressions that were gathered are superficial but can still provide valuable insights. The people that attended the observed meetings were very diverse when it came to their age and background. The youngest attendant was a teenager and the oldest a retiree. Some of the elderly participants had issues with the app, but the younger participants were eager to help them. The overall atmosphere at

the gatherings could be described as very friendly and respectful. The conversations are mostly focused on Leu or small talk.

6.2 Case summaries

The following subsections contain the case summaries of the interviews that have been conducted for this thesis. The interviews are not sorted in chronological but by the group that the interviewee belongs to. Starting with associates of Encointer and Dezentrum, followed by company owners and individuals that participate in Leu gatherings.

6.2.1 Alain Brenzikofer - Encointer association

Alain Brenzikofer is the author of the Encointer white paper and a founding member of the Encointer association. The Encointer association is a association under Swiss jurisdiction based in Zurich, Switzerland (Encointer Association, [n.d.-a](#)). Their main offering is a blockchain-based platform that enables communities all over the world to create their own local currencies (Brenzikofer, [2020](#)).

His motivation to develop Encointer and Leu as a pilot project for Encointer is ideological. Brenzikofer considers the current monetary system flawed because it enables the accumulation of wealth. Encointer is his proposed solution to tackle the issues of the current monetary system. Further, it should promote discussions about the current monetary system.

He sees multiple features that distinguish Leu from other forms of currencies: Leu is open and accessible to anyone; however, because of the effort involved in creating it, he thinks that in the long term only people that are situated at the lower end of the income spectrum will be attending the meetups. The demurrage serves as a balance to the distribution of the universal basic income and combats inflation. Leu is automatically redistributed. Thus, the basic income is paid by the people that do not spend their Leu. The distribution of power is a core feature of Encointer. By being used in a localized community, Leu users can hold each other accountable. Encointer will enable a new form of democratic governance using proof-of-personhood which can enable a form of digital identity. Proof-of-personhood can also be used for different use cases such as social media.

Business adoption of Leu can be driven by economic reasoning because Leu is supposed to increase the margins of businesses that accept it. In order to increase the attractiveness of Leu, the early adopters of Leu were promised that they would be able to sell the Leu back to Encointer. For the adoption of new private users, he sees the ability to pick up on community input as an important part of the development because it helps him to feel the sentiment of the community. The number of businesses that accept Leu and the community need to grow in tandem.

To enable a successful local circular ecosystem, he wants to have as many types of businesses as possible to accept Leu. Businesses that already accept Leu are incentivized to onboard other businesses in their value chain to create new ways of spending their earned Leu. The reliance on a circular economy that does not exist yet could lead to a waste of effort of businesses that participate in the Leu ecosystem.

6.2.2 Malik El Bay - Dezentrum

Malik El Bay works at Dezentrum, which has a mandate to do business development for Leu. Dezentrum is a Swiss-based think tank that aims to promote "a digital transformation that serves society" (Dezentrum, n.d.). Besides the mandate, his motivation to be involved with Leu is ideological. He believes, that Leu could enable a distribution of the benefits of digitization to the community. Further, he thinks that Leu can educate people about the concept of a universal basic income.

One of the core features of Leu is in his view that Leu is open to anyone to participate and highly accessible. He also sees benefits in the decentralized nature of the blockchain as it allows the community to set the rules of the system. The localized distribution of the currency enables a universal basic income that is adjusted to the local purchasing power. Because it is distributed locally, Leu helps to support local businesses and the local economy. It could be environmentally friendly because it promotes local consumption. The demurrage redistributes money to the places where it is needed.

He thinks that early adopters of Leu can profit from reputation gain. Because Leu is a permissionless system, anyone is free to start and stop accepting Leu whenever they want, which gives businesses flexibility. Beyond those factors, he sees education on currencies in general and the pros and cons of Leu specifically as an essential part of onboarding businesses. To drive adoption from individuals, he prioritizes a strong community which

will lead to a natural growth in the user base.

He thinks that there needs to be a big range of local businesses that accept Leu for goods and services. A circular ecosystem needs to exist that allows businesses to spend their Leu.

6.2.3 Gesa Feldhausen - Dezentrum

Gesa Feldhausen also works at Dezentrum and is involved in the business development of Leu. Her main driver for her involvement with Leu, besides the mandate, is her believe in creating added value for the community. Businesses can act as an enabler to integrate people with low income into society. She also sees her involvement as a good opportunity to learn about blockchain and community building.

Leu is supposed to enable equality of opportunity. In her view, Leu is open to everyone, which needs to stay this way and the Encointer project is planned to be handed to the community in the future. It is therefore important to prevent the formation of bubbles. The blockchain enables a transparent monetary system. Leu leads to discussions about the financial system and alternative solutions such as the concept of universal basic income. This is especially interesting in Zurich because of its role as a financial capital. The demurrage combats inflation and the accumulation of wealth.

When it comes to adoption factors for businesses, she thinks that a business directory could help to promote the businesses. The Leu app is supposed to be updated with a list of businesses that accept Leu. Besides the directory, she aims to use Leu as a way of connecting local businesses. Additionally, she sees education about currencies as an important aspect that helps to clear up uncertainties. Businesses can freely choose to accept or not accept Leu and define their own rules for payments which can help to lower barriers of entry.

She states that communication and education of the community are essential factors for the adoption by individuals. She also wants to attract users from like-minded communities to Leu. The ability to pick up on community input is important. This way, the user experience can be optimized. Community building is also important, in her opinion. When the community consists of people who are interested in Leu, it can grow through word of mouth marketing. They are organizing events to support community building.

In her opinion, it is important that circular supply chains get established. In the meantime, Leu could be bought back by the local economy association to give businesses a way to bring their Leu back into circulation. Another way for them to bring Leu back into circulation is to pay out Leu as a part of the salary payments. Involving the city could help to increase the adoption of Leu.

6.2.4 Philipp Probst - Spheres GmbH

Philipp Probst is a restaurateur and co-owner of Spheres GmbH. "Spheres is a bar and bookstore with a stage for cultural events and an event space for rent, RAUM68" (Spheres, n.d.). His participation in the Leu ecosystem is mainly motivated by ideological factors. More specifically, he is interested in testing the concept in Zurich for use in poorer regions of the world later on.

The adoption of Leu has been a marketing success for Spheres, but it was not his primary motivation for accepting it. Even though Leu has attracted new customers to his business, most of the customers that pay with Leu are existing customers. The inclusion in the processes of the business has been comparatively easy. Payments with Leu do not disturb the business, which is important to him. Despite the popularity of Spheres with Leu users, Leu did not increase the revenue noticeably and constitutes only a small percentage of the total revenue. He is unable to spend the Leu that Spheres generates because of a lack of businesses in his supply chain that accept it. Because his business started accumulating Leu, they switched from accepting Leu for all products to drinks only.

Expanding the area in which Leu operates to the entire city would help with adoption and make circularity easier to achieve. Leu could be bought back by the local economy association to temporarily make it easier for him to bring Leu back into circulation. He considered paying Leu as a part of the wages, but not all employees are interested in Leu; therefore, he considers it unfair and now offers Leu at a discounted rate to employees instead.

6.2.5 Andrew Katumba - Isule Coffee

Andrew Katumba is co-owner of Isule Coffee. The main line of business of Isule Coffee is the coffee trade (Isule Coffee, n.d.). In 2023, they have opened a popup café in Zurich

where they accept Leu as a form of payment (Tan, 2023). He is involved with Leu because he thinks that the monetary system needs to change to account for lost jobs due to automation and to price in externalities.

He sees potential in the inclusive nature of Leu, enabling individuals with a lower income to participate in everyday life, but most of the customers that use Leu to pay at his business are in the high income segment.

Leu is for him also a marketing tool for his company and has a maximal budget that he wants to spend on it. In order to improve the positioning, he suggests implementing a business directory directly into the app. Further, there should be a standalone app for Leu for branding purposes. The marketing appears to be working, as most people who pay with Leu at his business are new customers. Leu accounts for only a small percentage of the total revenues of his company. He sees it as a protection mechanism for the supply chain of local businesses. His business has limited the acceptance of Leu to drinks only. Currently, he does not know how to spend the Leu that his company has earned. He thinks there needs to be a big push for communication and education in the Leu ecosystem for businesses and individuals.

He would like to spend Leu on local products that are relevant for his business but currently there are no opportunities for him to spend the Leu that his business earns. He also thinks that certain clusters need to form to enable circular supply chains.

6.2.6 Gathering participant 1

The first gathering participant (GP1) that was interviewed is a 49 year old woman. She works as a chemist and has been involved with Leu for about half a year. Her main motivation to be involved with Leu is that she is a single mom and happy about the additional income. She also likes meeting people and having interesting conversations with them. Additionally, she thinks the aspect of using a new currency is interesting.

Leu does not require technical knowledge to use. She compares it to a banking app when it comes to accessibility. She likes that Leu is a local currency and supports local businesses in her day to day life. In her past gatherings, she has noticed that people from all age groups visit the Leu gatherings except for children and teenagers.

Leu has motivated her to visit new businesses that she would otherwise not have visited

before because they are expensive and not close by. When it comes to spending her Leu, she is sometimes reluctant to do so because she is unaware of how Leu works in detail and what the businesses that accept Leu can do with it.

She would accept Leu as part of her wage if she could do her everyday shopping with it; however, there are not enough businesses that accept Leu. At the moment, there are no offers for things that she would buy in everyday life. She would like to attend more Leu lunches, but they are a big time commitment.

6.2.7 Gathering participant 2

The second gathering participant (GP2) that was interviewed is a 30 year old man. He works as a community manager. The interview was planned to be conducted with only one person but the interviewee showed up with an additional man, so the interview was adapted to fit the setting. The second person has used Leu before, but stopped using it in the meantime. The interviewer decided to include him in the interview to get the opportunity to talk to an individual that stopped using Leu, as getting access to such a person would have otherwise been difficult because there exists no register of individuals that use Leu. The second perspective of the second interview participant is covered in 6.2.8. This person is motivated mainly by ideology to be involved with Leu. Initially, he thought that Leu would be used to defraud people, but changed his mind later on. He has been participating at Leu meetups for 30 days. At the gatherings, he noticed that there were a lot of people present that had a lower income, while mostly privileged people participated at the Leu lunch.

He thinks that with a strong regional focus, Leu could enable a partial decoupling from the global economy. This could in turn be good for the climate. Further, he has seen that Leu can enable individuals to participate in social life who were previously priced out. The demurrage is seen as rather negative because it forces individuals that own Leu to quickly consume something with it because they would otherwise lose their money. It also makes it hard to save up for a bigger purchase.

The interviewee seemed rather distrustful and would like more open communication about the financing of Leu. He believes that Leu is promoted by elderly people with word of mouth advertising to other elderly people because he noticed a lot of elderly people at the gatherings.

He feels that businesses have no opportunities to spend their Leu but thinks that they could pay it to their employees if there were more businesses that accepted Leu.

6.2.8 Gathering participant 3

The second gathering participant (GP3) that was interviewed is a 34 year old man. He works as an IT specialist. About a year ago he participated in Leu gatherings but then stopped shortly after. He was mainly motivated by ideology to participate. The circular economy interested him but he saw that there was no circularity in the system and he thought that it was mainly an instrument for privileged people to enrich themselves.

The interviewee thinks that Leu could strengthen and support the local economy. He sees the economic factors as the main feature of Leu.

The reason why he stopped going to gatherings is that he did not want to participate in the system as long as there is no circularity and the businesses do not have a way of spending their Leu. This is also why he never spent any of the Leu that he received at the gatherings that he attended. However, when the gathering participant covered in 6.2.7 told him that there were less privileged people at the meetings that he attended, he was motivated to give it another try.

6.2.9 Gathering participant 4

The fourth gathering participant (GP4) that was interviewed is a 34 year old man. He works as a IT specialist in the finance sector. He has been participating in Leu gatherings for about a year. His main motivation is ideological. He thinks that the monetary system needs to change to account for lost jobs due to automation and sees Leu as a step in the right direction.

He thinks that buying local is important but mostly shops at big grocers because of the price difference. At the gatherings that he attended, the attendants were very diverse. He thinks that this is enabled by the blockchain. As a decentralized currency, Leu is accessible to anyone and allows for anonymous participation. A further advantage of the blockchain is transparency. He also sees advantages in the way that Leu is created. Proof-of-personhood can enable a form of digital identity which could lead to new use cases.

He thinks that Leu is continually moving more towards a community focus. If a business accepts Leu, he is more likely to give them a try. He mostly spent Leu at one business. He was already frequenting the business, but since the business accepts Leu, he visits it more often. However, he is unaware how Leu can be spent by the businesses that accept it which leaves him reluctant to spend it. He thinks that businesses do not have a way to spend their Leu, if there is no circular economy.

The downsides that he mentions with Leu are that at the moment, there are no offers for things that he would buy in everyday life and that the gatherings do not take place at a time that is suitable for working people. The demurrage of Leu is not noticeable to him and does not incentivize him to spend his Leu.

6.2.10 Gathering participant 5

The fifth gathering participant (GP5) that was interviewed is a 28 year old woman. She works as a journalist. She attended her first Leu gathering four months prior to the interview. Her main motivation at the beginning was monetary. She went to the gathering to collect free money, but in the meantime has changed her opinion and is now more motivated by ideology. She likes the fact that Leu wants to establish a value-based monetary system. She is not interested in participating in the social aspects of Leu.

Even though she is aware that Leu is open to anyone, she noticed that the gatherings that she attended consisted mostly of young upper-class people. She sees a big advantage in the fact that Leu can help support the local economy because she supports local businesses outside of Leu. The blockchain-based nature of Leu made her skeptical. She also did not know whether Leu was a currency for people in need at first and if she was profiting of something that is not meant for her.

She accidentally tried to spend Leu at a branch of a business that does not accept it in this location. This made her realize that at the moment, there are no offers for things that she would buy in everyday life. She does not like to spend Leu if things are only partially payable in Leu. Additionally she thinks that this would make Leu useless for lower-income individuals.

She heard that the system is too small and that popular businesses do not have a way to spend their Leu. She dislikes that Leu is forcing the users to consume more things that they

would not have bought otherwise. Especially because Leu can not be spent on everyday expenses.

6.2.11 Gathering participant 6

The sixth gathering participant (GP6) that was interviewed is a 43 year old man. He works for a consulting company in the financial sector. He has been participating in gatherings since about half a year. He likes meeting new people at the gatherings that are not part of his bubble. He also wants to actively connect to people beyond the gatherings. He also sees collecting Leu as a form of gamification, but he would like Leu to be integrated more in his day to day life.

The participants that he encountered at the gatherings were very diverse. He states that Leu could help support the local businesses, which he thinks is a positive factor because he supports local businesses in his day to day life. He also states that it is positive that the demurrage combats inflation and the accumulation of wealth. Further, he states that the blockchain enables a trustless monetary system and that a comparable security could only be offered by the state.

He sees the potential of Leu as a marketing instrument for businesses. Leu has motivated him to try new businesses because he sees it as lower risk if he does not have to spend fiat currency. He feels that the area in which the meetups take place should be expanded to the entire city. This could help with adoption. The meeting locations should also be easier to access with public transport or they should be at more central locations.

Giving Leu as a coupon to employees is a good idea; however, at the moment, there are no offers for things that he would buy in everyday life and he states that the Leu ecosystem needs to grow to a point, where businesses can spend their Leu. At the moment, there are not enough businesses involved, which could lead to a downward spiral. He is afraid that if Leu is not successful, businesses will lose money. He thinks that Leu incentivizes consumption because the money is perceived as free. The demurrage may also incentivize spending money, as hyperinflation would.

6.2.12 Gathering participant 7

The sixth gathering participant (GP7) that was interviewed is a 25 year old woman. She is currently studying. Her first Leu gathering took place a week before the interview. She

was motivated primarily by monetary aspects but also thinks that Leu has the potential to have a positive impact. She also sees participating in Leu gatherings as an opportunity to learn about complementary currencies.

The crowd at the gathering that she attended was very diverse, with the exception that there were no very young people. She says that the localized focus enables Leu to capture value in Zurich. She would like to buy local but can not afford it. Therefore, she likes that Leu can help to support the local economy. Leu has prompted her to think more about the nature of money.

She is unaware of how Leu can be spent by the businesses that accept it, which leaves her reluctant to spend it. She says that an active community could make Leu attractive for potential users. Therefore, she thinks it would make sense to communicate community events through the app.

On the negative side, she mentioned that there are not enough places where businesses can spend their Leu. Leu also incentivizes additional consumption of things. She bought items with Leu that she would not have bought if she did not have Leu.

6.3 Motivation for involvement with Leu

The following subsections cover the factors that motivate the interviewees to participate in the Leu ecosystem.

6.3.1 Ideology

Ideology is at least a part of the motivation to participate in the Leu ecosystem for most of the interviewees. Only two of the twelve interview partners mentioned nothing about their ideological alignment with Leu. Two of the interviewees were skeptical at first but then realized that they were ideologically aligned with the values of Leu. On the other hand, GP3 stopped using Leu when he realized that there was no ideological alignment. Philipp Probst mentioned that he sees Leu as a test environment for the Encounter model. His ideology was mainly focused on bringing benefits to people in poorer countries.

Achieving benefits for the community

Two of the twelve participants mentioned they are interested in Leu because helps to achieve benefits for the community. One participant, Malik El Bay, specifically mentioned the possibilities that the benefits of new technologies should be leveraged for the benefit of society.

Improving the monetary system

Four of the participants mentioned that the monetary system needs to change and see Leu as a solution for this. Half of them see a necessary change because of the automation of the economy, which will lead to a decrease in jobs. The other half sees a need for reform because the current system does not represent their values.

6.3.2 Social interactions

Two of the twelve interview participants mentioned that they are motivated to participate in Leu-related activities because they are able to meet new people. One of those two participants, GP6, even left the impression that the social interactions were his main motivator for participating in the gatherings. On the other hand, one participant stated that she is not interested at all in the social aspects of Leu.

6.3.3 Monetary gains

Four participants brought forward that the monetary gains that they can get by attending Leu gatherings are a relevant motivator for them. Two of the participants, a single mother and a student, seemed like the money made a relevant difference to them.

6.3.4 Self-education

Three of the participants are motivated because they see their participation as a learning opportunity. Two of them want to learn more about currencies and one of them about blockchain and community building.

6.4 Leu adoption factors for businesses

The following subsections cover adoption factors for businesses. They describe, which factors need to be present in practice to make it attractive for businesses to start accepting Leu.

6.4.1 Marketing

Six of twelve people mentioned that accepting Leu can be an effective marketing tool for businesses. One business owner that accepts Leu has been surprised by the marketing that was generated. The other interviewed business owner sees the acceptance of Leu as a form of marketing expense, which he has a fixed budget for.

6.4.2 Business directory

Three people mentioned that it would be helpful to have a better overview of which businesses accept Leu. One interviewee recalled that she once went to a branch of a store that does not accept Leu. A business owner would want his business to be featured on the *Encointer* app as a form of marketing. A member of *Dezentrum* has mentioned that an update for the app is being worked on that lists the businesses that accept Leu.

6.4.3 Customer acquisition

Five of the interviewees have stated that they have become new customers at businesses or have started frequenting businesses more because they accept Leu. The two business owners have had very different experiences since they started accepting Leu. One of them stated that the customers that pay with Leu are mostly new customers, while the other business mostly gets Leu payments from existing customers. The owner of the second business thinks that this might be because his business has already had a very local crowd before. One of the Leu users says that he is more motivated to give businesses a try if he can pay with Leu instead of Swiss francs because he feels that he has less to lose.

6.4.4 Flexibility

One business owners stated that it is essential to him that Leu integrates properly into his workflows and does not disturb the daily business. Six interviewees have noted that businesses are free to choose whether or not they accept Leu. The two interviewees involved with *Dezentrum* have mentioned this as a factor that lowers the barrier of entry for businesses. Philipp Probst mentioned that they had to restrict the products that can be paid with Leu because they currently do not have a way to bring the Leu back into the system. The business of Andrew Katumba, which only recently started to accept Leu, seems to

have implemented this learning from the start. Partial acceptance of Leu has been criticized by GP5, especially when Leu can be used like a coupon code, because it reduces its usefulness to people who are in the lower income segment.

6.4.5 Increased revenues

While Malik El Bay speculates that businesses will see an increase in revenues when they accept Leu, the two business owners reported that Leu only makes up a very small amount of their turnover. It has to be said that one of the businesses only started accepting Leu recently. Also, while the other business owner stated that Leu only contributes a small portion to their turnover, it was enough to restrict their acceptance of Leu as mentioned in 6.4.4.

6.4.6 Local business network

Two participants mentioned the importance of a local business network that can be established by the businesses that accept Leu. Gesa Feldhusen sees the benefit of connecting businesses in facilitating a platform for the exchange of ideas. Andrew Katumba sees benefits of the connection in the resilience that a local supply chain can provide to a business.

6.4.7 Communication and education

Both Dezentrum employees mentioned that education and communication is an essential part of the onboarding process for businesses. Both emphasized the importance of general education about the monetary system and how money works.

6.5 Leu adoption factors for individuals

The following subsections cover adoption factors for individuals. Similar to 6.4, this section describes which factors need to be present to make it attractive for individuals to start using Leu.

6.5.1 Communication and education

Similar to the adoption criteria for businesses, communication and education also were mentioned when it comes to business development for individuals. Half of the interview

participants mentioned that communication and education could be useful. Four of the interviewees mentioned that they felt reluctant to spend their Leu. This is because they do not know if businesses that accept Leu are able to use it. If it was communicated to them that the businesses are in favor of accepting Leu, it would make it easier to spend Leu.

6.5.2 Community building

All three individuals that work on Leu agree that a strong community is important for the success of Leu. Gesa Feldhusen and Malik El Bay both agree that a strong community will organically lead to the growth of the user base. The observations of GP2 seem to confirm this theory. He thinks that elderly people promote Leu through word of mouth marketing. GP7 also thinks that an active community could make Leu attractive for potential users. Alain Brenzikofer also agrees that a strong community is important and empathizes that the growth of the community and the businesses need to be balanced with each other.

6.5.3 Collaboration with other communities

To further build the Leu community, Gesa Feldhusen mentions that they want to explore collaborations with other communities in Zurich. BG3 mentioned that he first heard about Leu at one of the communities mentioned by Gesa Feldhusen.

6.5.4 Reacting to community input

Three people mentioned the symbiotic relationship between the community of Leu users and the developers of Leu. Gesa Feldhusen and Alain Brenzikofer mentioned that the ability to pick up on community input is important for the further development of Leu. This way, the user experience can be optimized. GP4 mentions the importance of feedback from the user side and thinks that it is important that the community gives feedback to improve Leu.

6.6 Succes factors for a circular economy

The following subsections cover factors that have the potential to enable a local circular economy using Leu as a currency.

6.6.1 Local circular ecosystem

Five of the participants highlighted the importance of a local circular ecosystem that needs to be in place. This is specifically important to the businesses in the ecosystem as they need ways to bring Leu back into circulation. Andrew Katumba mentioned that the formation of topical clusters could help start a circular economy.

6.6.2 Involving the city

Gesa Feldhusen mentioned the possibility of involving the city of Zurich in the ecosystem. This could be done either by means of cultural promotion or by enabling individuals to pay for utility bills or public transport using Leu.

6.6.3 Expansion of acceptance area

Two of the interviewees mentioned that the acceptance area, which is limited to two districts of Zurich at the moment, should be expanded. Philipp Probst thinks that expanding the acceptance area to the entire city would help with adoption and make circularity easier. This sentiment was mirrored by GP6.

6.6.4 Buyback program

The possibility of having a buyback program in place, which could assist businesses in bringing their Leu back into circulation was mentioned by three interview participants. Both Philipp Probst and Gesa Feldhusen mentioned the newly formed local economy association as a potential buyer of Leu. Further, Alain Brenzikofer mentioned that the early adopters of Leu were promised that they would be able to sell the Leu back if they were unable to spend it.

6.6.5 Leu as salary

Four interviewees mentioned that businesses that accept Leu could use it to pay parts of the salaries of their employees. Philipp Probst ruled out this option for his business because not all of his employees are equally interested in Leu, which would make it unfair. Employees of his company can purchase Leu at a discounted rate. Four individuals mentioned that they would not be opposed to receiving Leu as part of her salary but only if

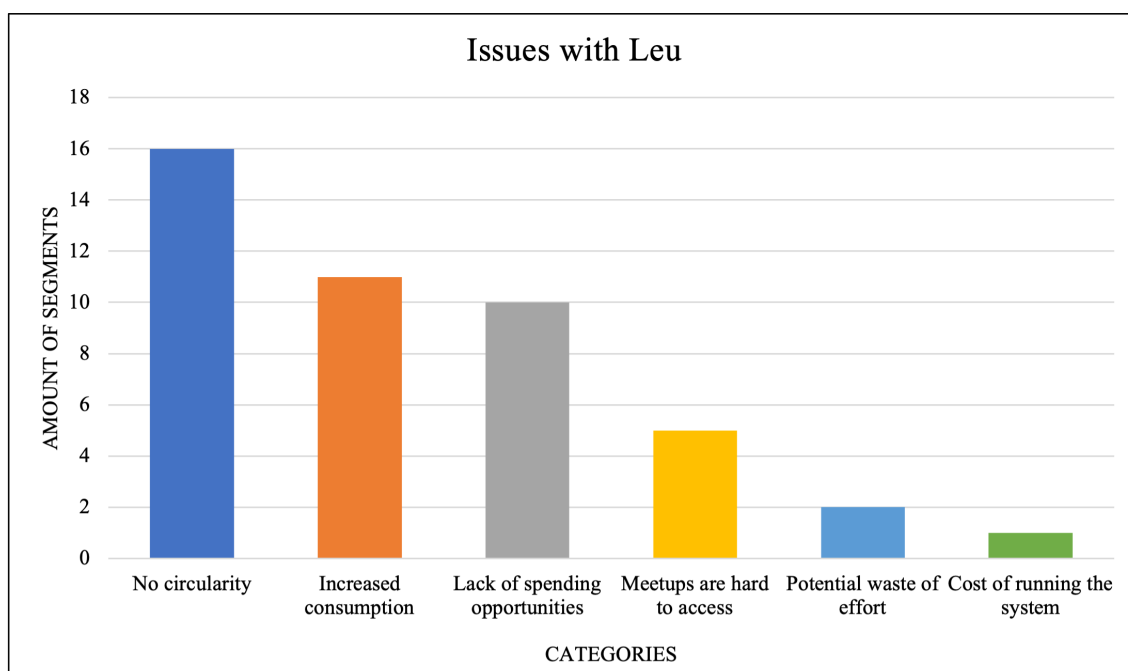


Figure 6.1: Amount of segments per issue with Leu. Own figure.

businesses started accepting Leu that sell goods and services which she consumes in her everyday life. This is a sentiment which is further discussed in 6.7.1.

6.7 Issues with Leu

The following subsections cover current issues that users have with Leu as well as future issues that could be caused by Leu. The graphic 6.1 shows the amount of segments that were assigned per category of issues with Leu. It shows that the most mentioned issue that the interviewees pointed out was a lack of circularity in the Leu ecosystem, with sixteen segments that were coded with this category. The second most coded issue is the increased consumption that Leu causes and the third most pointed out issue is the lack of spending opportunities for Leu.

6.7.1 Lack of spending opportunities

A majority of the individuals that participate in the Leu gatherings mentioned that there is a lack of businesses where they can spend their Leu. Four of the five individuals that raised this concern, and specified that they would like to be able to spend Leu in businesses that sell products and services that they need in their everyday lives. The current offerings

could be considered luxury products as they are mostly in a high price bracket compared to competing offers.

6.7.2 No circularity

A common downside of Leu that interviewees point out is that there have been no circular value chains established yet in the Leu ecosystem. Alain Brenzikofer points out that businesses get incentivized to onboard new businesses in their value chain when they do not have ways to bring Leu back into circulation. The two business owners confirmed that they currently have no way to spend their Leu. This fact has also been noticed by five of the individuals that participate in Leu gatherings.

6.7.3 Meetups are hard to access

Two gathering attendants mentioned that the Leu gatherings are hard to access for people who work a full-time job. For GP4 it is the timing of the gatherings that is inconvenient while for GP6, both the time as well as the locations of the gatherings were problematic. He wishes that they would take place in a more central, easier to access location. Alain Brenzikofer mentioned that the gatherings could lead to traffic jams if Leu becomes successful.

6.7.4 Potential waste of effort

Alain Brenzikofer mentioned that a potential downside of Leu could be that businesses wasted their resources if Leu does not become a successful ecosystem. This sentiment was mirrored by GP6, who was worried that the owner of a business that accepts Leu could go bankrupt if they are not able to use their Leu in a meaningful manner.

6.7.5 Increased consumption

Malik El Bay and Alain Brenzikofer both mention that Leu increases the disposable income of lower income households, which can lead them to consume more locally. Four of the Leu gathering attendees mentioned the increase in consumption as a negative aspect of Leu. Three of them mentioned that they feel pressured by the demurrage to spend their Leu on products that they would have otherwise not bought. An additional gathering attendant also mentioned that Leu incentivizes her to consume more without specifically

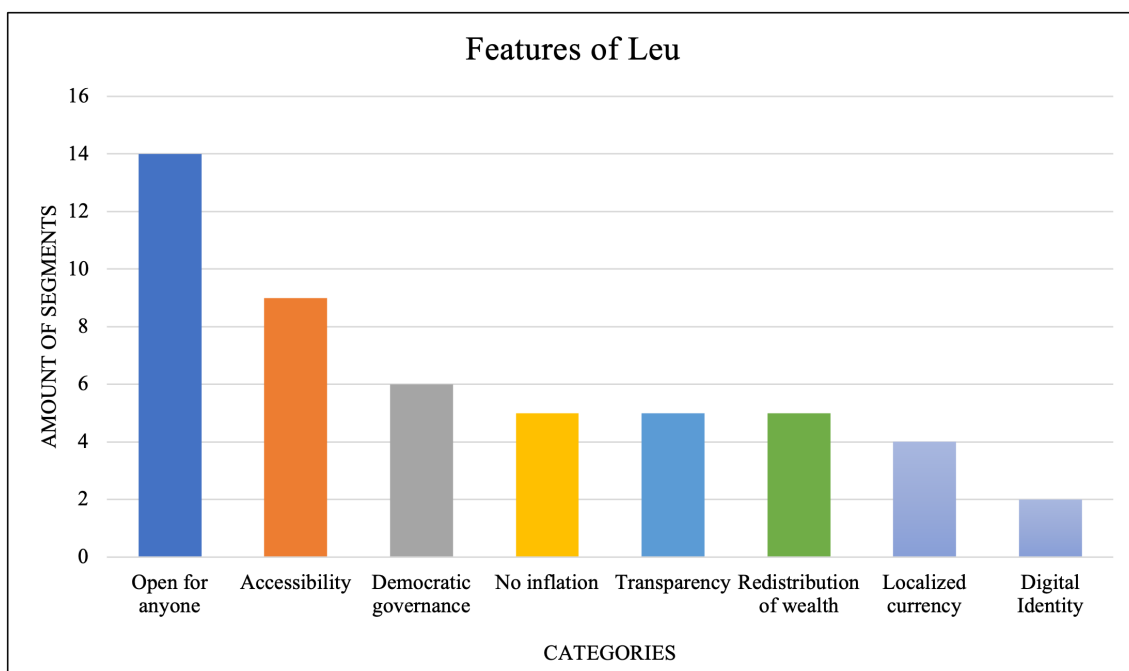


Figure 6.2: Amount of segments per feature of Leu. Own figure.

mentioning the demurrage. GP4 was the only interviewee that said that he does not feel pressured to consume by the demurrage.

6.8 Features of Leu

The following subsections cover the feature set of Leu and why participants believe that certain features are important for Leu. The graphic 6.2 shows the amount of segments that were assigned per category of features of Leu. It shows that the three main features of Leu that the interviewees pointed out were that Leu is open for anyone to use. This feature was coded in sixteen segments. The second and third most features with nine and six segments respectively coded with their categories were the accesibility of Leu and the democratic governance.

6.8.1 Open for anyone

The openness of Leu was an important topic to eleven of the twelve interview participants. The fact that Leu is open for anyone to use has been noticed by five of the gathering participants. They have pointed out that the attendants of the gatherings that they attended

were very diverse. Two of the gathering participants have pointed out that they have noticed mostly people who belong to the upper income segment at their gatherings. Andrew Katumba also noticed that his customers that pay with Leu mostly belong to the upper income segment.

6.8.2 Digital Identity

Alain Brenzikofer and GP4 pointed out that the proof-of-personhood technology of Encointer can be used for use cases beyond currencies. Both pointed out the potential for its use in issuing a unique digital identity.

6.8.3 No inflation

Three of the interview participants have mentioned the fact that the demurrage of Leu prevents inflation as a positive feature of Leu.

6.8.4 Democratic governance

All three individuals that work on Leu have mentioned that Encointer will enable a new form of democratic governance and that the distribution of power is a core feature of Encointer. Gesa Feldhusen also pointed out that the Encointer project is planned to be handed to the community in the future. No member of the other groups mentioned the democratic governance aspect of Leu.

6.8.5 Transparency

Four of the interview participants mentioned that the transparent nature of Leu is an advantage. Three of them mainly attribute the transparency to the blockchain technology behind Leu. Alain Brenzikofer mentioned that the fact that Leu is a local currency makes it transparent and the users of Leu observable, which enables mutual control.

6.8.6 Localized currency

The fact that Leu is a localized currency was important for three of the interviewees. Malik El Bay sees benefits in the ability to distribute a universal basic income that is adjusted to the purchasing power of the location where it is distributed. The other two interview

participants saw the advantage in a potential decoupling from the global economy and local value capture.

6.8.7 Redistribution of wealth

All three interview participants that work on Leu mentioned the fact that Leu enables the redistribution of money using demurrage. This fact was not mentioned by any of the interview participants who were not working on Leu.

6.8.8 Accessibility

Five of the interviewees mentioned the accessibility of Leu as a positive feature. Two of the interview participants attribute this accessibility to the blockchain technology and all three individuals that work on Leu agree that an anonymous participation in the ecosystem should be possible. GP1 mentions that she has no technical knowledge but has no issues using the Leu app. She compares it to using a banking app.

6.9 Problems addressed by Leu

The following subsections describe the problems that can be solved by Leu according to the interview participants.

6.9.1 Supporting local businesses

Eight people mention that Leu can help to support local businesses. Out of the six attendants of Leu key signing cycles that mentioned this aspect, five are of the opinion that shopping locally is important. Of those five, three shop local products in their day to day life. The other two individuals mention that they would like to shop locally but that they do not do it because of the high cost of local products.

6.9.2 Sustainability

While Malik El Bay and Alain Brenzikofer both mention that Leu has the potential to promote sustainability, both of them did not seem to see this as a major selling point of Leu.

6.9.3 Reducing Inequality

Alain Brenzikofer says that Leu should reduce the inequality in Zurich. GP2 also thinks that Leu can enable individuals to participate in social life who were priced out before.

6.9.4 Education about the monetary system

All three individuals that work on Leu mention it as a strength of Leu, that it leads to discussions about the financial system and alternative solutions such as the concept of universal basic income. Gesa Feldhusen mentions, that this is especially interesting in Zurich because of its role as a financial capital. Alain Brenzikofer mentions that the Leu lunches were launched to encourage such discussions. GP7 says that Leu has prompted her to think about the nature of money.

6.10 Expert interview summary

Jens Martignoni sees the main advantage of complementary currencies that operate at the scale of Leu in the education they can provide to the public about complementary currencies and the current monetary system. If complementary currencies were to become successful on a global scale, they could contribute to creating a more sustainable economy. Further, they could enable a more just distribution of resources. While he sees the advantages of blockchain, demurrage and proof-of-personhood that are used for Leu, he also mentions the weak points of the current Leu ecosystem. His main critique is that the system currently lacks an effort component. This means that Leu is distributed without requiring the gathering participants to give anything in exchange. This causes the businesses that accept Leu to finance the consumption of the gathering participants. He states that some of the basic income can be financed by the businesses if they see their acceptance of Leu as goodwill or as advertising; however, a financial system can only bear a few percentage points of this.

He stresses the importance of a strong circular economy. A circle can only be established if there is demand for Leu. Possible solutions for establishing demand include the ownership of a property which can be rented out or be used to produce electricity. By charging Leu for those services, demand for Leu would be created. He calls this a driving circle which could be used as a basis for other circles that can attach to it. A driving circle could also be established by selling products that can exclusively be bought using Leu.

Further criteria for the future success of Leu are also mentioned. Leu needs to establish a community of active users who use Leu not only because of ideology but because they can use it in their day to day lives. This means that there needs to be a sufficiently large number of businesses accept Leu for their goods and services. In the long term, the financing of the Leu system also needs to be secured. The costs of the system could otherwise bring it down.

Chapter 7

Discussion

The results that are showcased in chapter 6 are used in this chapter to answer the research questions. Section 7.1 covers the actor analysis of the Leu ecosystem. The drivers and blockers of the adoption of Leu are covered in the next two sections. Adoption for businesses is covered in 7.2 and adoption for individuals is covered in 7.3. Section 7.4 describes how the use case of Leu and its characteristics are used in practice. The classification of Leu is covered in 7.5.

7.1 The Leu ecosystem

Research question 1: *Who are the actors of the Leu ecosystem?*

The data gathered for this thesis does not enable a representative statement to be made, but it does enable an exploratory overview of the current participants of the Leu ecosystem. As described in 5.2, the Leu ecosystem can be divided into three groups of actors: Individuals that use Leu, businesses that accept Leu and organizations that work on Leu.

The group of individuals that participate in the Leu gatherings can be considered diverse both in terms of age as well as background, which has been confirmed by both the participant observation and the interviews. While the author of the Encointer white paper believes that the gatherings will be frequented only by individuals who need the additional income, currently most of the participants in the gatherings are motivated by ideology. Interestingly, the community aspect of Leu can also lead people who are not dependent on extra income to frequent Leu gatherings.

The participating businesses are also driven at least in part by ideology. Purely economical factors do currently not seem to entice businesses to accept Leu. Development of Leu is driven by the Encointer association and the Dezentrum association, Encointer is mainly focused on the development of the technology while Dezentrum focuses on the business development.

7.2 Business adoption

Research question 2: *Which factors drive the adoption of Leu for businesses and which factors hinder it?*

Marketing

Leu can be a marketing tool for businesses that adopt it. The acceptance of Leu has led to new customers visiting the businesses that do so. The marketing possibilities could be expanded by including the business directory that is currently on the Leu website into the app and allowing businesses to advertise there. The results show, that at least one business owner would like to change the app from a general-purpose app for all Encointer currencies to a Leu-specific app because it could improve the brand power of Leu.

Circularity

The results indicate that Leu currently only marginally increases the revenue of businesses that accept it. Despite that, some businesses have limited their acceptance of Leu. The results indicate that this limitation has been caused by the inability of the businesses to spend their Leu in a meaningful manner. The lack of other businesses in their supply chain means that they are amassing Leu which constantly loses value due to the demurrage. This fact has been noticed by individuals who attend the Leu gatherings, which makes them reluctant to spend Leu because they feel bad for the businesses. This lack of circularity makes Leu unattractive for a business that wants to increase its revenue. A possible solution for this problem could be the creation of demand for Leu by selling rights, for example the rent for a house, for Leu. This method would provide a core circular ecosystem that ensures a steady demand for Leu. Another way of creating demand for Leu could be the sale of products that can exclusively be bought with Leu. Businesses that accept Leu could pay a part of their employees salaries with Leu instead of spending it in a B2B fashion. The results suggest that this option is not attractive for employees as long as they can not

spend Leu on everyday products and services. Further, the expansion of the area that Leu operates in could make it easier for businesses to pay other businesses in their value chain with Leu for their products and services.

Ease of use

An additional adoption factor is a seamless integration into the business processes. The results indicate that especially the payment process needs to work without disrupting the existing processes. Business owners also want to have no commitments with Leu. The ability to start and stop accepting Leu whenever it fits into their plans and the ability to change the acceptance rules makes it less risky for them to start accepting Leu.

Communication

The fact that Leu is a new form of currency makes open communication between the developers and businesses important. The results show that there are uncertainties on the side of the business owners. The uncertainties range from the functionality of Leu and how they can access their funds to the overall direction of Leu. A non-technical manual for businesses could proactively prevent uncertainties.

7.3 Individual adoption

Research question 3: *Which factors drive the adoption of Leu for individuals and which hinder it?*

Openness

Leu can be used by anyone with a smartphone. This is enabled by the permissionless blockchain technology that is used to run Leu. The low barriers of entry for new users can be an important factor in the adoption of Leu by individuals. Because a new user needs a small amount of Leu, they need to establish contact with a current Leu owner. The results suggest that Leu has managed to keep the barrier of entry low, which has helped to attract individuals, as demonstrated by the diversity of people at the Leu gatherings.

Acceptance

According to the results, one of the main blockers for the adoption of Leu is the lack of

spending opportunities. Many of the interviewees have pointed out that they would like to be able to spend Leu on products that they buy in their everyday life. If they could spend it for their groceries or their rent, the attractiveness of Leu to individuals would increase.

Accessibility of gatherings

The results show that the Leu gatherings are not convenient for people who have a full time job. This is both because they take place in areas that are not necessarily easy to access with public transport and because the time at which they take place is not convenient.

Communication

The most common way that individuals hear about Leu is through word of mouth marketing as indicated by the results. This suggests that active community building and communication are key factors if new users are to be reached. The results also suggest that communication about the way that Leu works and about its financing could be improved to alleviate uncertainties in the user base about the origins of the money that they receive. Further, many users indicated that they are hesitant to spend their Leu because they feel like they are getting free products from the businesses that accept it and that they are hurting the business by paying with Leu.

7.4 Advantages of Leu

Research question 4: *Which problems are solved by Leu and how does it solve them?*

Purchase-power adjusted universal basic income

By using the proof-of-personhood mechanism for currency creation, Leu ensures that it can only be created and used in a certain area. This mechanism can prevent people from receiving basic income that is adjusted to Swiss purchasing power from abroad, where purchasing power might be lower. According to the results, this can lead to more value being captured in Zurich.

Enabling local consumption

The results show that local consumption is important to the user base of Leu. Local consumption can be expensive. The results show that the high prices for local products hinder

individuals who would like to support local businesses from doing so. As a currency that can only be used locally, Leu enables those people to buy local products that they would not have otherwise.

Redistribution of wealth

The demurrage that is built into Leu combats accumulation of wealth and encourages circularity. The results indicate that the redistribution of wealth and the prevention of inflation is seen as positive by the community. The results suggest that the demurrage is also seen in a negative light. The fact that it encourages consumption has been pointed out as a negative aspect. Users feel pressured to purchase products that they would not have bought otherwise because they are aware that they will lose purchasing power if they do not spend their Leu.

Unique digital identity

The proof-of-personhood mechanism opens up use cases for Leu beyond the currency aspect of it. The necessity to appear in person at a gathering to earn reputation means that the mechanism can verify that a real human is behind a blockchain address.

7.5 Classification of Leu

Research question 5: *How can Leu be classified in the field of complementary currencies?*

Based on the results, Leu can not be classified as a first or second generation scheme in the *generations of schemes* classification model by Blanc (2011). This is because Leu has a clear focus on the economic space, which is not in focus for first and second generation schemes. Further, it is not a time-based currency, which is one of the key differentiators of first-and second-generation schemes. Additionally, Leu has clear territorial aspects that are also not present in first-and second-generation schemes. With a mostly complementary focus, the fourth generation of schemes also does not fit the characteristics of Leu. In addition, Leu has no ties to the government, which would also not lead to its classification as a fourth generation scheme.

Leu is therefore most closely related to the third generation schemes. Both the local and the complementary scheme types fit the characteristics of Leu as depicted in 7.1. However, two of the descriptors of third generation schemes do not apply to Leu. First, Leu is not

<input checked="" type="checkbox"/>	Obvious economic purpose
<input checked="" type="checkbox"/>	Territorial ambition
<input checked="" type="checkbox"/>	Implemented by non-profit organizations
<input checked="" type="checkbox"/>	Implemented around a non-profit
<input checked="" type="checkbox"/>	Fixed rate to the national currency
<input checked="" type="checkbox"/>	Backed by national currency
<input checked="" type="checkbox"/>	Inflows are possible
<input checked="" type="checkbox"/>	Outflows are impossible
<input checked="" type="checkbox"/>	Useable in the current economic sphere
<input checked="" type="checkbox"/>	Re-localize daily consumption expenses
<input checked="" type="checkbox"/>	Inclusion of small local enterprises and shops
<input type="checkbox"/>	Distributed as a universal basic income

Figure 7.1: Features of Leu compared to the third generation schema definition. Own figure.

backed by any national currency reserves. Second, because Leu is only created during key signing cycles, it is not possible for additional money to flow into the system. In addition, the fact that Leu is distributed in the form of a universal basic income implies that it could be attributed to the community currency scheme type.

With all three currency scheme types present, Leu could be considered outside of the definitions of all four generations defined by Blanc (2011). Leu could add an additional generation to the four existing ones and define a new category of generation schemes.

Chapter 8

Conclusion and recommendations

The qualitative content analysis of the eleven expert interviews has shown that Leu has the potential to reach a broader audience in Zurich. The characteristics of Leu make it easily accessible to anyone who is interested. Being built on a blockchain could help Leu mitigate potential trust issues that could become a factor for any currency that is not endorsed by the authorities. In theory, the feature set of Leu, with its distribution mechanism as a universal basic income and the built-in demurrage that controls inflation and reduces the possibilities for capital accumulation, could enable Leu to include marginalized individuals in the local community. By being designed for strictly local usage, Leu can capture value locally and prevent the outflow of basic income that could not be prevented by a national currency.

Despite the novel and well thought-out approach to many long-standing problems with currencies, Leu also has multiple design problems that may cause it to fail if they are not addressed. The problems stem from multiple design decisions of Leu being in conflict with each other. Leu is not backed by a state currency which means that value is created from nothing when Leu is distributed at gatherings. The total value is capped by the demurrage, which means that the amount of Leu in circulation can not grow indefinitely. This limits the economic impact that Leu can have; however, there is no incentive to acquire Leu if aside from attending the key signing cycles and getting it for free since the demurrage makes it objectively a worse currency to hold compared to Swiss Francs.

The results show that the lack of circularity is a big threat to the Leu ecosystem. The system currently lacks a mechanism that creates demand for Leu. Businesses that accept Leu can not bring it back into circulation, which leads to them amassing Leu, which loses value over time because of the demurrage. This means that the businesses are, in essence,

gifting their products and services to the customers that pay with Leu. Customer-facing businesses could see this as marketing, but the lack of circularity makes it unattractive for businesses further down the value chain to accept Leu from customer-facing businesses. The difficulty of spending Leu further down the value chain is increased by the fact that Leu is currently only used in two districts of Zurich, which limits the number of potential businesses.

This has led businesses to restrict their acceptance of Leu, which in turn makes them less attractive for individuals who want to spend their Leu. Spending opportunities, especially for products that people would buy without Leu, are already limited by the small number of participating stores. This limits the opportunity for businesses to pay Leu to their employees as a part of their salary because it is not attractive to use for them, which in turn makes it less attractive for businesses to accept Leu.

Further research could be done to assess whether it is possible to stop this self-reinforcing downward spiral. The results of this thesis indicate that the setup of a closed circle based on the sale of rights, for example a property that is owned by Leu or a third party that supports Leu is and rented out, could introduce a constant demand for Leu into the system. Modeling a system to test this hypothesis could help build the next iteration of Leu. It would also be interesting to explore the legal setup that would be required to run such a system. The classification of Leu in 7.5 suggests that Leu belongs to a new generation of complementary currency schemes. Further research could be done to verify this claim and identify whether other complementary currencies exist that would also fit into the same scheme.

Appendix A

Project documentation

The project documentation has been anonymized wherever the the interviewees did not give their permission for the publication of their name. It contains all the documents that were used in the research process. The project documentation provides transparency for the entire research process. It covers the data collection processes, specifically the participant observation and the expert interviews. The process of data transformation is also presented in a transparent manner by sharing the MAXQDA project file.

The contents of the project documentation are:

1. The descriptions of the participant observation
2. The interview guidelines
3. The transcripts of the interviews
4. The MAXQDA-project file which contains
 - (a) The code definitions
 - (b) The coded interviews
 - (c) The summary-table
5. The sources for calculations and graphics used in the thesis

Bibliography

- Bachmann, G. (2009). Teilnehmende Beobachtung. In S. Kühl, P. Strodtholz, & A. Taffertshofer (Eds.), *Handbuch Methoden der Organisationsforschung: Quantitative und Qualitative Methoden* (pp. 248–271). VS Verlag für Sozialwissenschaften. Retrieved June 8, 2023, from https://doi.org/10.1007/978-3-531-91570-8_13
- Balaguer Rasillo, X. (2021). Alternative economies, digital innovation and commoning in grassroots organisations: Analysing degrowth currencies in the Spanish region of Catalonia. *Environmental Policy and Governance*, 31(3), 175–185. <https://doi.org/10.1002/eet.1910>
- Barone, G., & Mocetti, S. (2016). Inequality and Trust: New Evidence from Panel Data. *Economic Inquiry*, 54(2), 794–809. <https://doi.org/10.1111/ecin.12309>
- Blanc, J. (2011). Classifying ‘CCs’: Community, Complementary and Local Currencies. *International Journal of Community Currency Research*, 15, 4–10. <https://doi.org/10.15133/IJCCR.2011.013>
- Bogner, A., Littig, B., & Menz, W. (2014). *Interviews mit Experten: Eine praxisorientierte Einführung*. Springer Fachmedien. Retrieved June 8, 2023, from <https://link.springer.com/10.1007/978-3-531-19416-5>
- Brenzikofer, A. (2020). Encounter – Local Community Cryptocurrencies with Universal Basic Income. <https://doi.org/10.48550/arXiv.1912.12141>
- Brinkmann, S. (2020). Unstructured and Semistructured Interviewing. In P. Leavy (Ed.), *The Oxford Handbook of Qualitative Research*. Oxford University Press. Retrieved February 1, 2023, from <https://doi.org/10.1093/oxfordhb/9780190847388.013.22>
- Bundesamt für Sozialversicherungen BSV. (2022). Eidgenössische Volksinitiative «Für ein bedingungsloses Grundeinkommen» - Volksabstimmung vom 5. Juni 2016. Retrieved February 6, 2023, from <https://www.bsv.admin.ch/bsv/de/home/sozialpolitische-themen/soziale-absicherung/revenu-de-base-inconditionnel.html>

- Burdges, J., Cevallos, A., Czaban, P., Habermeier, R., Hosseini, S., Lama, F., Alper, H. K., Luo, X., Shirazi, F., Stewart, A., & Wood, G. (2020). Overview of Polkadot and its Design Considerations. <https://doi.org/10.48550/arXiv.2005.13456>
- Chancel, L., Piketty, T., Saez, E., & Zucman, G. (2022). *World Inequality Report 2022* (tech. rep.). World Inequality Lab.
- Davies, G. (2010). *History of Money*. University of Wales Press.
- De La Rosa, J., & Stodder, J. (2015). On Velocity in several Complementary Currencies. *International Journal of Community Currency Research*, 19(500), 114–127. Retrieved June 9, 2023, from <https://repub.eur.nl/pub/78670>
- Denzin, N. K., & Lincoln, Y. S. (Eds.). (2018). *The SAGE handbook of qualitative research* (Fifth edition). SAGE.
- Dezentrum. (n.d.). A digital transformation that serves society. Retrieved June 11, 2023, from <https://www.dezentrum.ch/en/>
- Douceur, J. (2002). The Sybil Attack. Retrieved June 9, 2023, from <https://www.microsoft.com/en-us/research/publication/the-sybil-attack/>
- Encounter Association. (2021). Encounter application for a common good parachain slot. Retrieved June 9, 2023, from <https://kusama.polkassembly.io/post/610>
- Encounter Association. (2022). Encounter Lease2 Treasury Proposal. Retrieved June 10, 2023, from https://docs.google.com/document/d/173FnUyaemsHD9wnGMipZWnanO23yZUVhco55RxBXKBw/edit?usp=embed_facebook
- Encounter Association. (2023a). Encounter - Charting the development of Encounter's longest established community currency. Retrieved June 9, 2023, from <https://encounter.org/charting-the-development-of-encounters-longest-established-community-currency/>
- Encounter Association. (2023b). Encounter Explorer. Retrieved January 29, 2023, from <https://explorer.encounter.org/>
- Encounter Association. (n.d.-a). Encounter - About us. Retrieved January 30, 2023, from <https://encounter.org/about/>
- Encounter Association. (n.d.-b). Here you can pay with Leu. Retrieved January 30, 2023, from <https://leu.zuerich/bazaar/>
- Encounter Association. (n.d.-c). LEU – Die neue Währung für Zürich. Retrieved June 8, 2023, from <https://leu.zuerich/>
- Fare, M., & Ahmed, P. O. (2017). Complementary Currency Systems and their Ability to Support Economic and Social Changes. *Development and Change*, 48(5), 847–872. <https://doi.org/10.1111/dech.12322>

- Gerstle, G. (2022). Review | Thomas Piketty's optimistic blueprint for easing global inequality. *Washington Post*. Retrieved January 22, 2023, from <https://www.washingtonpost.com/outlook/2022/06/17/thomas-piketys-optimistic-blueprint-easing-global-inequality/>
- Gesell, S. (1949). *Die Natürliche Wirtschaftsordnung* (9th ed.). Rudolf Zitzmann Verlag. Retrieved January 23, 2023, from <https://kreuzgang.org/pdf/silvio-gesell.die-natuerliche-wirtschaftsordnung.pdf>
- Gómez, G. (2012). Governance and sustainability of the Argentine Complementary Currency Systems. *International Journal of Community Currency Research (special issue)*, 16, 80–89. Retrieved January 30, 2023, from <https://repub.eur.nl/pub/37269>
- Goodwin, N., Harris, J. M., Nelson, J. A., Rajkarnikar, P. J., Roach, B., & Torras, M. (2019). *Macroeconomics in Context* (3rd ed.). Routledge. <https://doi.org/10.4324/9780203713075>
- Guicciardi, P. (2022). *Scalability of Encointer - a Proof-Of-Personhood Cryptocurrency* (Master's thesis). ETH Zurich. Retrieved November 29, 2022, from <https://www.research-collection.ethz.ch/handle/20.500.11850/525222>
- Helfferich, C. (2022). Leitfaden- und Experteninterviews. In N. Baur & J. Blasius (Eds.), *Handbuch Methoden der empirischen Sozialforschung* (pp. 875–892). Springer Fachmedien. Retrieved June 7, 2023, from https://doi.org/10.1007/978-3-658-37985-8_55
- Hoffmann, L. (2021). *Security analysis of Proof-of-Personhood: Encointer* (Master project report). Decentralized Distributed Systems Laboratory, EPFL.
- Huber, L., & Martignoni, J. (2013). Improving Complementary Currency Interchange By A Regional Hub-Solution. *International Journal of Community Currency Research*, 17. <https://doi.org/10.15133/J.IJCCR.2013.001>
- Hussy, W., Schreier, M., & Echterhoff, G. (2013). *Forschungsmethoden in Psychologie und Sozialwissenschaften für Bachelor: Mit 54 Abbildungen und 23 Tabellen* (2., überarbeitete Auflage). Springer. <https://doi.org/10.1007/978-3-642-34362-9>
- Isule Coffee. (n.d.). Von der Farm direkt in die Tasse. Retrieved June 11, 2023, from <http://isulecoffee.ch/>
- Kelly, M. (2000). Inequality and Crime. *The Review of Economics and Statistics*, 82(4), 530–539. <https://doi.org/10.1162/003465300559028>
- Kennedy, B. P., Kawachi, I., Prothrow-Stith, D., Lochner, K., & Gupta, V. (1998). Social capital, income inequality, and firearm violent crime. *Social Science & Medicine*, 47(1), 7–17. [https://doi.org/10.1016/S0277-9536\(98\)00097-5](https://doi.org/10.1016/S0277-9536(98)00097-5)

- Krohn, M. D. (1976). Inequality, Unemployment and Crime: A Cross-National Analysis. *The Sociological Quarterly*, 17(3), 303–313. <https://doi.org/10.1111/j.1533-8525.1976.tb00984.x>
- Kuckartz, U. (2010). *Einführung in die computergestützte Analyse qualitativer Daten*. VS Verlag für Sozialwissenschaften. Retrieved June 9, 2023, from <http://link.springer.com/10.1007/978-3-531-92126-6>
- Kuckartz, U. (2016). *Qualitative Inhaltsanalyse: Methoden, Praxis, Computerunterstützung* (3., überarbeitete Auflage). Beltz Juventa.
- Lamsallak, S. (2021). *Can complementary local currencies with universal basic income reduce inequality?* (Bachelor Thesis). University of Applied Sciences and Arts Northwestern Switzerland. Zurich. https://encounter.org/wp-content/uploads/2022/01/2021_Lamsallak_Verein-Encounter_BT.pdf
- Lenis Escobar, A., Rueda López, R., Solano-Sánchez, M. Á., & García-Moreno García, M. d. I. B. (2020). The Role of Complementary Monetary System as an Instrument to Innovate the Local Financial System. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 141. <https://doi.org/10.3390/joitmc6040141>
- leu.zuerich [@leu_zuerich]. (2022). Am 03.05.2022 fand die erste Leu-Zeremonie statt, während der diese neue Zürcher #Lokalwährung geboren wurde! Retrieved June 9, 2023, from https://twitter.com/leu_zuerich/status/1526915094558429184
- Lietaer, B. (2004). Complementary Currencies in Japan Today: History, Originality and Relevance. *International Journal of Community Currency Research*, 8, 1–23.
- Lietaer, B., & Dunne, J. (2013). *Rethinking Money: How New Currencies Turn Scarcity Into Prosperity*. Berrett-Koehler Publishers.
- Lietaer, B. A. (2002). *Das Geld der Zukunft: Über die zerstörerische Wirkung unseres Geldsystems und Alternativen hierzu* (Sonderausg., 3. Aufl.). Riemann.
- Martignoni, J. (2012). A New Approach to a Typology of Complementary Currencies. *International Journal of Community Currency Research*, 16. <https://doi.org/10.15133/J.IJCCR.2012.001>
- Martignoni, J. (2015). Cooperation and Intertrade between Community Currencies. *International Journal of Community Currency Research*, 19(500), 137–151. Retrieved June 13, 2023, from <https://repub.eur.nl/pub/78672>
- Martignoni, J. (2018). *Das Geld neu erfinden: Alternative Währungen verstehen und nutzen: Grundlagen, Konzepte, Experimente, erfolgreiche Beispiele*. Versus.

- Martignoni, J. (2022). *Ansätze zur Entwicklung eines neuen Vollgenossenschaftsmodells mit integrierter Währung: Ein Vorschlag für eine wirkungsvolle Genossenschaftsform mit Beiträgen zu einer gemeinwohlorientierten Wirtschaftslehre* (1. Auflage). Nomos.
- Marx, K. (2020). *Das Kapital. 3: Der Gesamtprozess der kapitalistischen Produktion / Karl Marx*. Nikol Verlag.
- Mayring, P. (2015). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* (12., überarbeitete Auflage). Beltz.
- Mayring, P. (2016). *Einführung in die qualitative Sozialforschung: Eine Anleitung zu qualitativem Denken* (6., überarbeitete Auflage). Beltz.
- Mayring, P., & Fenzl, T. (2019). Qualitative Inhaltsanalyse. In N. Baur & J. Blasius (Eds.), *Handbuch Methoden der empirischen Sozialforschung* (pp. 633–648). Springer Fachmedien. Retrieved June 1, 2023, from https://doi.org/10.1007/978-3-658-21308-4_42
- Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System.
- Nguyen, C. T., Hoang, D. T., Nguyen, D. N., Niyato, D., Nguyen, H. T., & Dutkiewicz, E. (2019). Proof-of-Stake Consensus Mechanisms for Future Blockchain Networks: Fundamentals, Applications and Opportunities. *IEEE Access*, 7, 85727–85745. <https://doi.org/10.1109/ACCESS.2019.2925010>
- North, P., & Weber, K. (2013). The Alternative Economy at the Regional Scale?: Lessons from the Chiemgau. In H.-M. Zademach & S. Hillebrand (Eds.), *Alternative Economies and Spaces* (pp. 43–68). Transcript Verlag. Retrieved January 30, 2023, from <https://www.jstor.org/stable/j.ctv1xxt0r.6>
- Oishi, S., Kesebir, S., & Diener, E. (2011). Income Inequality and Happiness. *Psychological Science*, 22(9), 1095–1100. <https://doi.org/10.1177/0956797611417262>
- O'Reilly, K. (2012). *Ethnographic methods* (2nd ed). Routledge.
- parachains.info. (n.d.). Kusama Auctions #36-41 and Crowdloans. Retrieved June 9, 2023, from <https://parachains.info/>
- Peacock, M. S. (2014). Complementary currencies: History, theory, prospects. *Local Economy: The Journal of the Local Economy Policy Unit*, 29(6-7), 708–722. <https://doi.org/10.1177/0269094214553174>
- Petrowski, J. (2021). Common Good Parachains: An Introduction to Governance-Allocated Parachain Slots. Retrieved June 9, 2023, from <https://polkadot.network/blog/common-good-parachains-an-introduction-to-governance-allocated-parachain-slots>

- Piketty, T. (2020). *Das Kapital im 21. Jahrhundert* (I. Utz & S. Lorenzer, Trans.; 3. Auflage). C.H. Beck.
- Piketty, T. (2022). *Kapital und Ideologie* (A. Hansen, E. Heinemann, S. Lorenzer, U. Schäfer, & N. S. Dresler, Trans.; 1. Auflage in der Reihe C.H.Beck Paperback). C.H.Beck.
- Place, C., & Bindewald, L. (2015). Validating and improving the impact of complementary currency systems through impact assessment frameworks. *International Journal of Community Currency Research*, 19(500), 152–164. Retrieved January 30, 2023, from <https://ijccr.files.wordpress.com/2015/03/ijccr-2015-place-bindewald.pdf>
- Rousseau, J.-J. (2002). *Discours sur l'origine et les fondements de l'inégalité parmi les hommes*. J.-M. Tremblay. Retrieved January 19, 2023, from http://www.uqac.ca/zone30/Classiques_des_sciences_sociales/classiques/Rousseau_jj/discours_origine_inegalite/origine_inegalite.html
- Rufrancos, H., & Power, M. (2013). Income Inequality and Crime: A Review and Explanation of the Time-series Evidence. *Sociology and Criminology-Open Access*, 01(01). <https://doi.org/10.4172/2375-4435.1000103>
- Sahakian, M. (2014). Complementary currencies: What opportunities for sustainable consumption in times of crisis and beyond? *Sustainability: Science, Practice and Policy*, 10(1), 4–13. <https://doi.org/10.1080/15487733.2014.11908121>
- Schoenmakers, B. (1997). Basic Security of the ecash Payment System. *Computer Security and Industrial Cryptography: State of the Art and Evolution*, 342–356.
- Schwarz, F. (2021). *Das Experiment von Wörgl: Ein Weg aus der Wirtschaftskrise* (Neuaufgabe). Synergia.
- Seyfang, G. (2000). The Euro, the Pound and the Shell in our Pockets: Rationales for Complementary Currencies in a Global Economy. *New Political Economy*, 5(2), 227–246. <https://doi.org/10.1080/713687774>
- Seyfang, G., & Longhurst, N. (2013). Growing green money? Mapping community currencies for sustainable development. *Ecological Economics*, 86, 65–77. <https://doi.org/10.1016/j.ecolecon.2012.11.003>
- Spheres. (n.d.). Sphères – Bar, Buch & Bühne. Retrieved June 11, 2023, from <https://spheres.cc/>
- Spittler, G. (2001). Teilnehmende Beobachtung als Dichte Teilnahme. *Zeitschrift für Ethnologie*, 126(1), 1–25. Retrieved June 8, 2023, from <https://www.jstor.org/stable/25842798>

- Straubhaar, T. (2017). On the Economics of a Universal Basic Income. *Intereconomics*, 52(2), 74–80. <https://doi.org/10.1007/s10272-017-0649-8>
- Szabo, N. (2008). Unenumerated: Bit gold. Retrieved April 13, 2022, from <https://unenumerated.blogspot.com/2005/12/bit-gold.html>
- Tan, N. (2023). Happy PopUp Coffee. Retrieved June 11, 2023, from <https://isulecoffee.com/happy-popup-coffee-copy/>
- Thiel, C. (2011). Complementary Currencies in Germany. *International journal of community currency research [Special Issue]*, 17–21. <https://doi.org/10.5282/ubm/epub.13774>
- Trautman, L. J. (2016). *E-Commerce, Cyber, and Electronic Payment System Risks: Lessons from PayPal* (SSRN Scholarly Paper No. 2314119). Social Science Research Network. Rochester, NY. <https://doi.org/10.2139/ssrn.2314119>
- Web3 Foundation. (2023). Web3 Foundation Grants Program. Retrieved June 9, 2023, from <https://github.com/w3f/Grants-Program>
- WIR Bank Genossenschaft. (n.d.). Vision & Mission. Retrieved June 13, 2023, from <https://www.wir.ch/de/die-bank-wir/ueber-uns/vision-mission>