Exploring The Ɇ‌CO coin in an Urban Multi-Stakeholder Network

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Master's Thesis
MSc. MADE
August, 2020

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Acknowledgements

I enjoyed this thesis. I met fascinating people, I learned a lot, and grew as a person. What you will read below wouldn't have been possible without the unbelievable support I received from the beginning until the end:

First of all, I want to thank Next Nature Network and The ECO coin for welcoming me warmly into their office. You guys really make an effort to treat your interns well. Special thanks to Lewis Just who was always upbeat, on-point and patient with me. I wish you all the best with The ECO coin.

Many thanks to all of the interviewees, who took the time to talk to me not only about my research but also illuminated me with their ideas about monetary innovation.

Furthermore, I dearly thank my sister Pia for the beautiful cover page. I also thank Madelief Schreuder Goedheijt and Sam van Hooff for helping me translate my survey to Dutch on the shortest of notice. Thank you to Sawtooth Software for awarding me a grant with all their software packages for 4 months.

I thank both of my supervisors, Eveline van Leeuwen and Evert Meijers, for trusting me with this unconventional thesis topic, and guiding me at every step of the way. I could not have done it without you!

Lastly, I thank my parents for everything they have done for me. I count myself lucky that you helped me transition back to Vienna so seamlessly during the corona crisis.

Abstract

Community currencies can be tool for sustainable development. Research on their implementation into cities, however, is scarce, if not lacking. Motivated by the case study of *The ECO coin*, which rewards city-dwellers for sustainable, actions, this thesis aims to generate new knowledge to successfully implement a community currencies in a cities. In this, special emphasis is placed on small local independent businesses (vendors), which seek to adopt the currency as a means of payment. In a qualitative analysis derived from a literature study and semi-structured interviews, 8 currency projects in Western Europe provided key to implement a community currency successfully. Then, through a discrete choice experiment, 60 vendors in Amsterdam were surveyed to inquire which configuration of a community currency like *The ECO coin* would be both feasible for the project team to design and most likely to be adopted by vendors. The results, show that there are different designs to achieve sustainable development with community currency. Furthermore, the participation fee for a vendor is highly influential in its decision to adopt. Moreover, advertising services offered to vendors are highly-valued. Lastly, a sweet-spot in regards to the number of direct competitors for each vendor was estimated.

"Everyone can create money; the problem is to get it accepted."

— Hyman Minsky

Contents

1 Introduction

1.1 Overview

It was the year of 1971 that the architect, author, designer, and inventor Buckminster Fuller wrote: *"We are not going to be able to operate our Spaceship Earth successfully nor for much longer unless we see it as a whole spaceship and our fate as common. It has to be everybody or nobody."*. Today, in times of rising temperatures and sea levels, record-breaking wild fires, and disturbing images of plastic pollution, this call to action is as urgent as it was almost 50 years ago. This is not to say that we haven't been trying or haven't made any progress. The venerated concept of sustainable development has moved to the forefront of the political agendas of many developed and developing countries, culminating in the historical Paris Climate Agreement in 2015. On an individual level, people are becoming more cognisant of the implications of their choices and the private sector is increasingly integrating climate risks and opportunities into their long-term strategies and corporate governance frameworks [Céline Ramstein & Ettehad, 2019]. Still, we know this is not enough. If global temperatures continue to increase at the current rate, Earth's temperature will have increased by 1.5 °C over pre-industrial levels between 2030 and 2050, which is associated with increased risks to "health, livelihoods, food security, water supply, human security, and economic growth" [Masson-Delmotte & Waterfield, 2018]. While an increase of 1.5 °C will have substantial implications for our lives, it is one of the more optimistic outcomes for the coming decades. In fact, to not overshoot the 1.5 °C target, the IPCC projects that global net anthropogenic CO2 emissions must decline by about 45% from 2010 levels by 2030, reaching net zero around 2050[Masson-Delmotte & Waterfield, 2018]. To achieve this, we will have to tackle the causes of climate change from multiple angles. Fundamental transitions of the socio-technical systems are necessary to give us a chance to reduce our greenhouse gas emissions to this extent. These transitions require close collaboration between the public and private sector, but also need to take into consideration the wants and needs of the individual. This thesis concerns itself with a transition tool that promises to move us one step closer to a zero-carbon and waste-free future. As a currency that incentivises sustainable behaviour in city dwellers, *The ECO coin*[1] aims to reduce the environmental impact of individuals. Implementing a new currency in a city is no easy feat, however.

By learning from a number of currency projects in Europe, this thesis produces findings that will aid the implementation of community currencies like *The ECO coin*. Before delving into the various projects, however, we will begin by exploring the style of thinking that has caused the problems we are wrangling with today. Then, as a primer on money, we will attempt to define what money is and where it came from. This will provide the fundamentals to understand why our current money system is incompatible with sustainable development. Next, we will see how complementary currencies promise to tackle the problems that the current money system neglects and, to an extent, causes. Finally, the main case study *The ECO coin* is introduced, which will lead us to the research objective of this thesis.

1.2 Externalities

The idea of accidentally influencing one thing when trying to achieve another, is inherent to our need to act in this immensely complex world. We do our best to observe the past, postulate theories, which we implement into models in the present that help us predict and shape the future. But in in order to keep this process tractable, we tend to separate disciplines neatly. An example are the fields of economics and environmental sciences. For a long time these disciplines only shared one point of contact: to fulfil our unlimited human needs, we need to efficiently allocate resources, among which are the natural resources embedded in our planet. While we quickly grasped that the physical labour needed to extract these resources is limited, it took us a while to understand that we are not simply drawing material from an infinite reservoir. Additionally, we were confronted with the fact that our processes also

[1] The ECO coin: both a community currency and its project team. In the text, whenever it is italicised it refers the currency; when unitalicised, it refers startup that is designing and operating the currency.

create emissions, which if accumulate can be detrimental to the natural world, we are so dependent on. In the field of neo-classical economics, this has lead to the concept of an externality: a cost that a party incurs outside of a transaction. This concept has led to advances in welfare economics, which have produced market-based solutions, like subsidies and taxes, to incentivise less polluting behaviour. Economists of this school see that when not assigning a monetary value to environmental damages, the market implicitly assigns a value of zero to them. The question then becomes how to value emissions, or rather how to value the health of our natural world. To do this, ecological economists have an interesting approach, namely to expand on the notion of *land* as a factor of product by seeing it as natural capital, analogous to human capital. This lens has implications in that now the concept of the preservation of value of capital can also be applied to our environment. In this way, ecological economics emphasises the complementarity of natural and human capital in regards to production. It also renders a more holistic approach by rendering different ways to measure and control the impact of our economic activities on the ecology. In either of these perspectives money plays a central role.

1.3 Money

Next to thousands of other complementary currencies, *The ECO coin* attempts to capture values that are neglected by fiat money[2]. To understand how complementary currencies justify their existence we should ask ourselves why we have money in the first place. Where did it come from? Which forms did it take? And most importantly, what is money?

1.3.1 The Functions of Money - What is Money?

In most textbooks on economics, money is defined not by what it is, but what it can do:

- unit of account - *Money to keep track of what is owed between two actors.*
- medium of exchange - *Money to expresses qualitative difference between goods and services in quantitative terms.*
- store of value - *Money with the promise its value will remain (more or less) stable in the long-term.*

Some scholars have argued that these three functions are not equally important. For example, Peacock [2014] notes that *store of value* is not at all unique to money and should therefore not be seen as a sufficient condition to define money. The *unit of account* function, however, is thought to be the "primary concept of a Theory of Money"Keynes [1930]. This is in line with the alternative narrative of money, which we will cover in the next section. Gesell - who is venerated in the field of complementary currencies for his thoughts on interest-free money - believes that money should be nothing more than *medium of exchange*. In principal, this corresponds with the perspective of other scholars who do away with this functional definition all together[Bell, 2001][Young, 1999][Mehrling, 2010]. They emphasise that we should rather "recognise money for just what it is, namely, a *means of payment*"[Young, 1999]. Unlike Gesell, however, these scholars are not fundamentally opposed to credit (unit of account), but rather see it as a type of money within a hierarchy[Mehrling, 2012].

We can already see from this short, and by no means exhaustive, overview, that there is a lot of controversy around the definition of money. We might be better off not to try to choose one *correct* definition, but rather keep in mind all of these perspectives when moving forward. Perhaps the way money is believed to have emerged can contribute to this pluralistic view of it.

1.3.2 Histories of Money - Where did it come from?

As it stands, the jury is out on the exact origins of money. There are competing theories that attribute the rise of money to different origins. These include trade-related origins,

[2] *Fiat* derives from Latin, meaning *let it be done*. In the context of fiat money, it refers to a currency that is state-issued and has no intrinsic value. Rather, its value is upheld by a sovereign nation-state.

sacred or religious origins, and state or social origins. Scholars have divided these into *orthodox*, pertaining the to trade-related origins, and *alternative*, encompassing the rest[Seyfang, 2000][Peacock, 2014]. While it should be noted that there are scholars, like Silvio Gesell, who believed in the orthodox explanation of money [Peacock, 2014] and at the same time challenged fiat currencies, this division helps show how some currencies are prone to neglect environmental and social issues in their operations.

The orthodox perspective is the one included in most economics textbooks (e.g. Lipsey & Harbury [1992]). Also known as the *commodity-exchange theory*, it sees money as the lubricant of the economy. The fundamental law of production is that joint production brings greater output than individual production [von Mises, 1949]. This naturally leads to a division of labor, in which people tend to specialise on certain tasks in society. As a result exchange is necessary. This view stresses the inconvenience of a barter economy, as exchanges would only take place if each trading partner has a direct personal need for the good he receives in the exchange. This is known as the *double coincidence of wants* [Jevons, 1875], and even when fulfilled, goods can be too bulky and cannot be subdivided to be of real use [Hülsmann, 2007]. This is where money does its trick: it quantifies qualitative differences of goods and services. In other words, it serves as a *medium of exchange* that reduces the transaction costs of trade. Commodities with characteristics such as portability, durability, divisibility and intrinsic value were sought after when selecting a currency. Examples are cattle, oxen, furs, shells and eventually metals - with ever more favourable characteristics. This train of thought, starting at reducing transaction costs and ending at the introduction of coins is known as the *catallactic theory* [Lau & Smithin, 2002], and has moulded both recent history and economic thought.
In terms of history, private entities began to create their own coins in a process called *coinage*. Simply put, they placed a stamp on pieces of metal, which ensured its value in weight. This gave rise to some large banking families such as the Medicis, Fuggers, and later the Rothschilds [van Dixhoorn, 2013]. In the academic field of economics, this story is seen as a *logical sequence* of improvement [Davies, 2010]; a transformation away from primitive socially and culturally *embedded* economies to modern *disembedded* economies [Polanyi, 2001]. The environment, be it social or biological, is separated from commercial activity; the environment as an *externality*.

Of course this approach does not come without its critique. Many scholars have pointed out the lack of anthropological evidence that there had been a long period of barter before money was finally "invented" [Humphrey, 1985][Peacock, 2013][Young, 1999]. Instead these writers adopt one of many *alternative* narratives. While these views are diverse in nature, they are, as Zelizer [1994] notes, tied together by a belief that "money is attached to a variety of social relations rather than to individuals". Emphasis is put on the public nature of money as a *unit of account*. May it have evolved from interpersonal social relations, sacred rituals or formalised and centralised institutions, this stands in direct opposition to the cornerstone of the *orthodox* view; it opposes the idea that money is a result of a hyper-rational individual striving to minimise transaction costs and thus deciding between competing forms of currencies.

Let us examine this approach through a heuristic, which will allow us to contextualise complementary currencies like *The ECO coin* at a later stage. This is the heuristic of *debt*.[3] In this light, money developed out of the need to settle debts that occur by social ceremonies like weddings or disputes between families[Graeber, 2012]. Once villages grew into cities, a formal ruling class would act as a middleman to settle these debts. As Wray [2010] puts it: "Wergild fines were paid directly to victims and their families, and were socially established and levied by public assemblies. These fines were gradually converted to payments made to an authority.". Here we can already see how money that emerged out of social relations would transform into state-issued money as we know it today. As egalitarian societies moved towards a stratified

[3]Debt and credit are two sides of the same coin. Today, it is not uncommon to hear someone blame the *credit-based economy* for economic crises. It is, however, not the general concept of debt that is so lethal to an economy, but the way it is executed and managed. Fractional reserve lending has created a situation in which private banks with strong financial interests create the majority of the money, only to be bailed out by nations when their debtors default.

society, the ruling class would replace most fees by taxes[Wray, 2010]. Taxes could thus be seen as a debt we owe, whatever the reason may be, to a central authority. As we will discuss later, collecting taxes in a certain currency positively reinforces the need to earn that currency.

In summary, we have brushed over the two main approaches to explain the rise of money. The *orthodox* view of money stresses individual agency and rationality, sees money as a direct result of a specialised society, and explains the proliferation of coins as a medium of exchange. The other, sees money as a tool to settle debts, rearranging social relations. It also sets the stage for state-issued currencies and the modern tax system. As it is often the case, it is not either or, but a combination of the two explanations that seems most plausible. A medium of exchange based currency could have unfolded in one location, while socially motivated unit of account might have been used in another.

1.3.3 The Mainstream Money System and Sustainability

As we saw above, it is common to contextualise money as a neutral exchange tool. Taking this perspective focusses heavily on economic productivity rendering anything outside of it as an externality. This is neat, but can be problematic when trying to detect the shortcomings of our mainstream monetary system in regards to sustainability. As Lietaer et al. [2012] claims in his fascinating book *Sustainability and Money: The Missing Link*, there are five major ways[4] the monetary system as we have it today stands contrary to the notion of sustainability[5]:

1. **The pro-cyclical character of the money creation process which amplifies both the upturns and downturns of the business cycle**:
   In times of an economic boom, banks are eager to issue credit (create money). In the words of Perry Mehrling, professor at the Pardee School of Global Studies at Boston University, "credit starts to look a lot like money". Since banks provide or withhold funding to the same sectors or countries at the same time, they amplify the business cycle towards boom or bust. This causes corporations to be longing for equipment and qualified staff during the boom period, then suddenly sitting on excess equipment and over-staffed during the downturn.
2. **The systematic encouragement of short-term thinking because the interest feature of the money system programs *rational* investors to discount the future**:
   Discounted cash flow is standard practice in any investment evaluation. Because bank-debt money carries interest, the discounting of all future costs or incomes inevitably tends to lead to short-term thinking.
3. **Compulsory growth due to the mechanism of compound interest**:
   The process of compound interest requires exponential growth from the economy. This is problematic as exponential growth is, by definition, unsustainable in a finite world.
4. **Concentration of wealth**:
   When a central bank bails out corporations and banks in a crisis, the newly printed money is, to a large extent, first spent by wealthy individuals who purchase goods at the current (lower) prices. As the extra money is spent and enters circulation prices have to adjust upwards(inflation). Once the issued money reaches less wealthy individuals, prices are already adjusted[6]
5. **A devaluation of social capital**:
   Money tends to promote selfish and non-collaborative behaviours. These behaviours are not compatible with long-term sustainability.

[4] A complete description of each of these points would be superfluous for this introduction. I can highly recommend the book by Lietaer et al. [2012] where each point is elaborated on. Furthermore, I recommend the master's thesis by van Dixhoorn [2013], where these assertions are quantitively investigated.

[5] See Section 1.6 for definition

[6] This is generally referred to as the *Cantillon Effect* after Cantillon [2010].

Any of these issues alone would be reason enough to question the viability of our mainstream monetary system. Together, however, these five issues motivate us to look towards other types of money that are more compatible with our true nature.

1.3.4 Contextualising Complementary Currencies

One of the reasons the aforementioned critiques are so problematic is because the mainstream monetary system holds a monopoly on the money that is issued. To use an agricultural metaphor, fiat money is a mono crop. Subordinating the mainstream monetary system into a *monetary socio-technical system*, which next to fiat money also features a wide range of other currencies, which aim to achieve distinct objectives, could enhance economic, social and environmental sustainability. As we will see by many examples in this thesis, the enhancement of social and environmental sustainability is currency-specific and not system-dependent. In other words, it is hard to argue that the environment or society will benefit by simply offering people more types of currency archetypes to choose from. We would need to define the objectives and designs of those monies before making a judgement about their efficacy on in regards to society and environment. For economic sustainability, however, a case can be made on a systems level. Let us look at this here.

Economic Sustainability

Figure 1, below, depicts a system's resilience to an external shock as it moves from a diverse and interconnected one to a specialised and streamlined one. When a system is too diverse and interconnected it becomes inefficient and may be too slow to evolve to deal with the challenges of perturbation. However, if efficiency becomes the sole focus of the system, so that processes become linear, specialised and streamlined, it is inflexible and equally unable to sustain itself in the face of a shock.

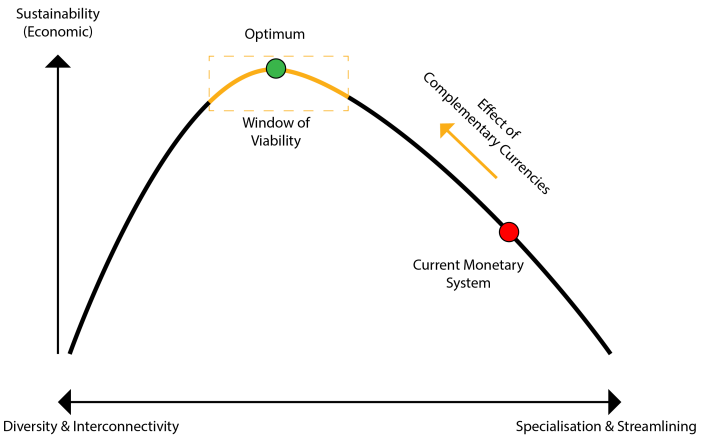

Figure 1: Sustainability of Ecosystems (adapted from [Lietaer et al., 2012])

Natural systems - ecosystems - operate in a *window of viability* where the balance of diversity and specialisation has been found[Lietaer et al., 2010]. However, many of the systems humans have created are efficiency-driven and neglect diversity and interconnectivity. For example:

> Hundreds of years of intensive management of the forests of Europe gradually have replaced native ecosystems with single-age, single-species plantations, often of nonnative trees. These forests are designed to yield wood and pulp at a high rate indefinitely. However, without multiple species interacting with each other and drawing and returning varying combinations of nutrients from the soil, these forests have lost their resilience. They seem to be especially vulnerable to a new form of insult: industrial air pollution[Meadows, 2008].

Similarly, the dominance of the mainstream monetary system is propelling the monetary socio-technical system towards a highly efficient but vulnerable state. Complementary currencies remind us that the fiat money could merely be a subsystem of the monetary ecosystem. At the same time, they attempt to establish themselves as sustainability-focussed subsystems to return the monetary ecosystem to a more diverse state that also gives people the chance to incorporate environmental and social values into their transactional motives.

1.4 The Problem Statement

One of the complementary currencies attempting to shift the monetary ecosystem towards the window of viability is *The ECO coin*. The main idea of the currency is that the faults of the mainstream monetary system could be ameliorated by explicitly valuing the mitigated CO2 emissions of individuals. Engaging with large corporations, who strive to reduce their own emissions and improve their public image, the currency has run several trials. We will examine these trials here. The project will, furthermore, serve as the main case study of this thesis, motivating us to look to other currency projects to make its aspired implementation into Amsterdam a reality.

1.4.1 Introducing The ECO coin

The ECO coin is a complementary currency that aims to incentivise sustainable actions of its users. In its simplest form, people are rewarded with ECO coins whenever they perform sustainable actions, and are then able to redeem these for real goods and services. Up until now, *The ECO coin* has found application in corporate and municipal environments and even the Amsterdam-based DGTL festival[dgt][eco].

One of these applications was at L'Oréal in 2016, which aimed to challenge the employees at their headquarters in the Netherlands to become more sustainable and save the company money. This was achieved by using *The ECO coin* to incentivise staff to carpool and take the train instead of using company cars, eating meat-free meals, being more energy-efficient by switching off machines and lights when not in use and using water bottles in place of plastic cups. They were rewarded with fair trade coffee in their canteen, spa treatments, obsolete L'Oréal products, and the top earners received a day off work. After a trial of one month, The ECO coin was able to engage 75% of the staff of 300, mitigated 8.000 kg of CO2 and saved an estimated 3.000€ for the company.

Another project was carried out with the municipality of Amsterdam, which also incentivised employees in one office buildings to perform sustainable actions. By rewarding actions such as taking the stairs instead of the elevator and meat-free lunches in the cafeteria, The ECO coin was able to mitigate a total 9.783kg of CO2 in one month[7]. Since the municipality was impressed with the extent the startup was able to engage municipal workers, there are now conversions about expanding the pilot to other municipal offices or even initiate Urban Living Labs in select parts of Amsterdam[8].

1.4.2 The ECO coin's Ambition & Vendor Adoption

As the initiation of urban living labs already suggests, The ECO coin's ambition is to introduce its currency into the urban environment of Amsterdam, to eventually scale up to become a global digital currency[eco]. Although in their white-paper more focus lies on technical details - such as the verifications of actions, the blockchain technology on which the governance structure should be based, and the backing of currency units with trees - the currency project team also intends to involve vendors to give people in Amsterdam more spending options[Just & van Mensvoort, 2018]. Indeed, the majority of community currencies use vendors, either as their sole outlet or combining them with larger organisations(see

[7]This is equivalent to the average annual per capita emissions in the Netherlands[wor].

[8]Recorded through my personal notes from a meeting with the *Gemeente Amsterdam* at the Green Office the 10.1.2020

Section 4.1). Besides giving users attractive spending options, they do this to strengthen the local economy by earmarking money to be used exclusively for products which keep the money in the local vicinity for a longer period of time. In the literature of regional economic development this falls under the banner of the *local multiplier effect*[Domański & Gwosdz, 2010]. As a result, currency projects, which promise to enhance the local multiplier effect by including vendors, are often endorsed and supported by local governments[9]. This is especially the case in cities, where the rise of large of out-of-town shopping centres have deteriorated the shopping opportunities in downtown areas, decreasing the liveability of the city, and increasing the reliance on cars to run errands. While the effectiveness of community currencies in this regard has rarely been studied, research from loyalty programmes - which may be regarded as community currencies' capitalistic cousin - shows that they can influence a town's revitalisation process, improve the attractiveness of the urban commercial network, and increase the profitability of private retailers by enhancing cross-selling dynamics[De Noni et al., 2014]. If The ECO coin would like to achieve this in Amsterdam, it might be interested to know how to design their currency so that multiple vendors are inclined to adopt it.

The above perspective treats a community currency like any other product that has to be adopted by a customer. Even though many community currencies have managed to implement in urban environments in the past, research on the adoption of complementary currencies is scarce. This is surprising because research on the adoption of technologies, ranging from mobile-internet to suitcases, is rich and well-studied. While the idea of seeing money as a technology underlies a many designs of complementary currencies, it has rarely been explicitly acknowledged to study their adoption. Exploring currencies in this light could prove valuable to practitioners and potentially explain why currency projects - even ones with ingenious designs and substantial financial support - cannot proliferate and withstand the test of time as other technologies do.

1.5 The Research Objective

The objective of this research is to generate new knowledge to successfully implement a community currency, like *The ECO coin*, in a city. In this, we will place special emphasis on small local independent businesses (vendors), as they are an essential yet often overlooked stakeholder group in community currency schemes. This objective can be decomposed into two main research questions:

RQ 1: What can The ECO coin learn from other currency projects regarding their operations, technical design, governance, and vendor adoption?

RQ 2: To what extent are vendors in Amsterdam willing to adopt a community currency like *The ECO coin*?

1.6 Terminology

Before attempting to answer these research questions, let us define the most important terms in this thesis.

Complementary currency: a currency which is designed to function alongside mainstream money to address objectives that the conventional money system can't[Bindewald et al., 2015].

Community currency: a currency which is complementary and tied to a specific, delineated community. This community could be delineated, for example, by geography (*local currencies*); business-based (mutual- credit systems); or even online platforms(digital currencies). As such, a community currency is designed to meet the needs of its people, typically on a not-for-profit basis[Bindewald et al., 2015]. This thesis will be concerning itself with this type of complementary currency as The ECO coin is striving to become one in the next year.

[9]Some examples of this are given in Section 4.1

Currency project team: a core group of people who initiate, plan, design, and implement a given (community) currency. This group also consistently works on the currency once it has been implemented. It can consist of different stakeholders, including, but not limited to, members of knowledge institutes, non-profit organisations, consultancies, *vendors* and *users*.

Multi-stakeholder environment: a geographically-bounded urban space in which people transact daily with different vendors that sell a wide variety of products and services. It, furthermore, indicates that there are multiple stakeholders involved in the (local) currency model. These stakeholders might include but are not limited to: users, vendors, management, organisations/governments, banks.

The ECO coin: both a community currency and its project team. In the text, whenever it is italicised it refers the currency; when unitalicised, it refers startup that is designing and operating the currency.

Sustainability: Is the capacity of our human society to continue indefinitely within the natural cycles of our planet[Robèrt, 2002]. In regards to community currencies, which aim to make the community they are embedded in more sustainable, the three pillars, or layers, of environmental, social and economic sustainability are useful delineations.

Units: an amount of a complementary currency. It is often used interchangeably with the currency's name (e.g. She obtained 5 ECO coins; She obtained 5 units).

User: an individual actively *obtaining* and *using* currency units. This is analogous to the term *consumer* in economics, which is a person or a group that purchases goods, products, or services primarily for personal, social, family, household and similar needs, not directly related to entrepreneurial or business activities.

Vendor: a small and independent business within the geographical area of a community currency. For the second research question this definition was sharpened by requiring the owner to work in the shop occasionally.

Vendor adoption: a vendor decides to actively participate in a complementary currency by accepting units in exchange for goods or services. This decision is circumscribed by a currency team's efforts to design and market a desirable currency.

1.7 Conceptual Framework & Structure of this Thesis

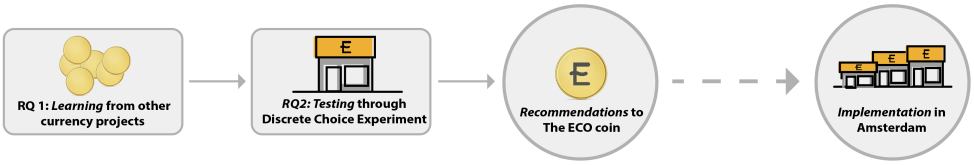

Figure 2: Conceptual Framework

The remainder of this thesis is structured by the following Sections. Firstly, Section 2, lays down the theoretical foundation for the two central themes: *community currency design* and *community currency vendor adoption*. The content of this Section is also arranged by these two themes, in that it begins with the theory on *currency design*, before moving on to theory on their *adoption* by vendors. In regards to currency design, this Section introduces two typologies which were used to select and compare different currency projects in research questions one. In regards to adoption, two prevailing frameworks for the adoption of technology are presented, which justified and helped form the discrete choice experiment for research question 2. After that, in Section 3, the methodology, which was used to answer each research question, is explained in detail. This, firstly, illuminates how the two typologies were applied to build the qualitative analysis in research questions 1. Secondly, this Section documents the components and operationalisation of the discrete choice experiment to answer research question 2. Then, in Section 4 the results of each research question are presented. The qualitative analysis culminates into a summary of key lessons in regards to *currency design* and *vendor adoption* extracted from the various currency projects. Following Figure 2 above, some of these key lessons were further investigated through the discrete choice experiment in research question two. Thus, the results of this research question present supplementary insights for practitioners that intend to fine-tune their currency so that it is likely to be adopted by vendors. Lastly, the findings of both research questions are synthesised and applied to *The ECO coin* in Section 5. This Section is dedicated to the start-up The ECO coin, in that it might help it make adjustments to their currency design to maximise the chances of vendor adoption in Amsterdam. At the end, in Section 6, I will reflect on my journey, the results, possible avenues for future research and give my thoughts on monetary innovation.

2 Theoretical Framework

This thesis can be conceptually broken up into two interrelated components that both carry with them their own strand of literature: the design of complementary currencies, and their adoption. While we will examine these components separately here, their interconnection is central to this thesis and will be elaborated on in the next Section (see Methods 3).

2.1 Theoretical Basis for Complementary Currency Design

2.1.1 Literature Review

Within the literature of complementary currencies, currency design is well-documented. Ranging from currency design proposals ([Yoshida & Kobayashi, 2018][Martignoni, 2018a]), to typologies ([Joachain & Klopfert, 2011], [Martignoni, Volu], [Blanc, 2011]) and detailed handbooks ([Bindewald et al., 2015], [Bindewald et al., 2014] [Rogers, 2014], there is a lot that can inform the design of a new currency. While the design of *The ECO coin* is not formulated from scratch in this thesis, its adaptation to a multi-stakeholder environment required the input from some of the works mentioned above. Especially the seminal book *People Powered Money* by Bindewald et al. provided instructions to the design of currencies alongside important background information of this movement. Furthermore, works by [Seyfang, 2006] and [Blanc, 2011] put ecologically-driven currencies, as is *The ECO coin*, into context of complementary currencies. Lastly, since the design of currencies is not always accompanied by academic research, there exists a body of grey literature that describes various designs.

2.1.2 Typology I: Selection of Projects

Through the first research question we seek to formulate transferrable lessons for the design and successful implementation of complementary currencies. There are, however, over 6000[10] complementary currency projects that could be examined to achieve this. Since it is unrealistic to learn from all of these currencies here, it is necessary to find criteria upon which currency projects should be chosen. These criteria could be partially informed by the characteristics of currency archetypes given by complementary currency typologies. There are a number of typologies for complementary currencies all with their idiosyncratic objective (see [Bode, 2004][Tichit et al., 2016] [Martignoni & Gmür, 2011]). A suitable typology, for the purpose of selecting similar projects, has been constructed by Blanc [2011] (see Figure 3).

[10] There have been over 6000 complementary currency projects initiated or still running according to Lietaer & Dunne [2013].

Gene-ration	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 3: Typology by Blanc [2011] - G3 and G4 currencies as selected projects in this thesis (highlighted in orange)

Blanc classifies complementary currencies into one of four quasi-chronological categories, which he calls *generations*. A generation is "characterised by a specific monetary organisation and specific relationships with the socio-economic world"[Blanc, 2011]. Although, each generation has its starting date, demarcated by an implementation of a particular currency (e.g. G1 in the 1980s, which was the dawn of *Local Exchange Trading Systems* (G1)), Blanc emphasises that the emergence of the next generation does not close the previous. In this sense, we can still see the formation of Timebanks (G2) or LETS systems (G1) today. The fourth column, "Guiding Principle", deserves special attention as it is based on *the principles of behaviour* coined by Polanyi et al. [1957]. According to Polanyi et al., there are three principles that underlie trade, namely: reciprocity, redistribution and market exchange. While, market exchange is what we naturally think of when we buy anything these days (especially in cities), reciprocity and redistribution are two socially embedded principles of trade that govern many complementary currencies[11]. More concretely, reciprocity requires a symmetrical relationship between two actors, as is, for example, the case when I do my friend a favour. Redistribution, requires movement of goods towards a centre, from which it is then distributed in a different manner, as is the case with most modern taxation systems. According to Blanc, G4 currencies often combine these principals. In fact, different stakeholders, and even different actors of one stakeholder group, might be lead by different principles. Naturally, currency design also plays a role in which principle is dominant. This aligns with Blanc's findings who states that G4 and G3 currencies - including the well-known *Regiogeld* - are also dominated by market-based exchanges. This has recently been disputed by Degens [2019], who found that in practice third generation currencies are primarily fuelled by reciprocity; hence the title of his book "Geld als Gabe" or "Money as a Gift". This discrepancy could be explained by the time these publications lie apart, or because, unlike Degens, Blanc did not have in-depth interviews of stakeholders participating in the respective currency projects[12].

For this thesis, focus lies on third and fourth generation currencies(highlighted in orange in Figure 3). This is because fourth generation currencies encompass the majority of ecologically-

[11] Note that these principles align nicely with the two narratives of money we have explored in the introduction (see section 1.3.2). Market exchange pertaining to the orthodox narrative, while reciprocity and redistribution complies with the alternative narrative.

[12] Which ever may be the case, going beyond the design of a currency on paper, by talking to people who are or have been involved is paramount. For this methods like the ones described later may be used for this purpose.

driven complementary currencies like *The ECO coin*[13], whereas third generation currencies (arguably) share principles of exchange (after Polanyi) with fourth generation currencies and have been studied extensively by other researchers.

2.1.3 Typology II: Comparing Attributes

The previous typology allows for the systematic selection of projects based on various high-level characteristics. For the analysis of the design of a currency, from which we can draw lessons(see Section 3 for a list), we need a more detailed typology. Preferably, this is a typology that explicitly lists design features and has been derived from either third or fourth generation currencies. The typology by Joachain & Klopfert [2011], which was constructed for complementary currencies that function as policy instruments for behavioural change towards environmental sustainability (G4), fulfils this purpose. This typology breaks down a currency's design in a technical manner (using Unified Modelling Language[14]) to identify key classes (in green) and attributes (in blue) in their designs(see Figure 4).

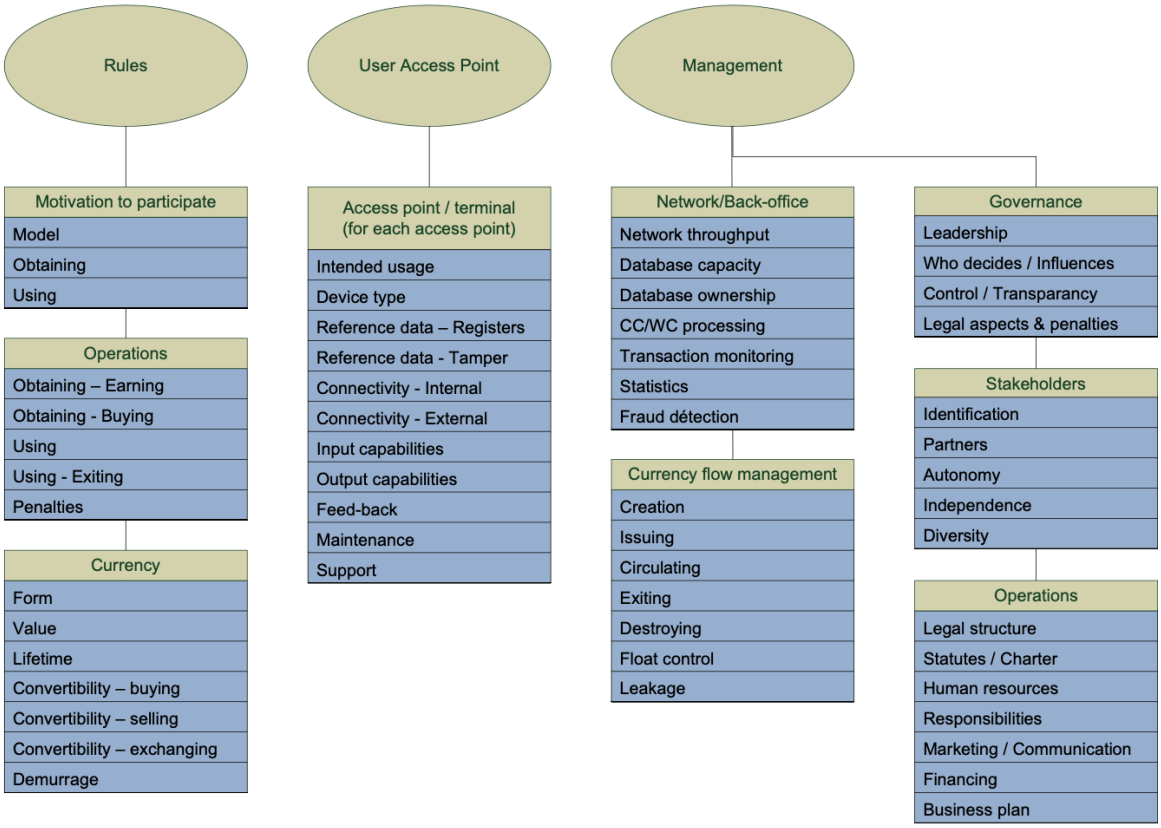

Figure 4: Hierarchical Typology by Joachain & Klopfert [2011] using Unified Modelling Language

In their paper, they emphasise that after having set the overall objective, the simple question: "Why should people decide to participate in the project?" needs to be asked. This is expressed in the first list of attributes below "Rules". They argue that ways of *obtaining* (earning) and ways of *using* (spending) currency units are central to motivating people to join. By *people* they refer to our previous definition of *users*, not *vendors*. Vendors can, conceivably, be influenced by these rules directly and indirectly, but also take notice of the other two stems "User Access Point" and "Management". In other words, some of these trees' attributes

[13] Why this is the case will become clear in Section 4.1

[14] Developed by Grady Booch, Ivar Jacobson and James Rumbaugh at Rational Software in 1994–1995, Unified Modelling Language was designed to to provide a standard way to visualise the design of a system.

can become focal motives and barriers to participate for vendors, and are, therefore, also included in the analysis of the currency projects[15].

2.2 Theoretical Basis for the Adoption of Technology

The literature on the adoption of technology is vast. Combining real-life observations with disciplines, such as psychology, network analysis, game theory and sociology, this field has produced a multitude of models to explain adoption processes(see [Venkatesh & Bala, 2008] [Kim et al., 2007] [Rogers, 2003]). As we take the stance that money is a social technology, it is reasonable to examine two of these frameworks here: *the Multi-Level Perspective on Socio-technical Transitions* and *Rational Choice Theory*. The former helps to contextualise what The ECO coin is trying to achieve in the greater scheme of the monetary socio-technical system. Complementary currencies are posited as niche innovations that, when adopted widely could transform the socio-technical regime that is fiat money. The latter theory, zooms back in on the vendor, assuming rationality in its choices, thereby inferring its proclivity to adopt a currency that maximises its utility. Before we dive into these theories, however, let us briefly review the research that has been done on the adoption of complementary currencies.

2.2.1 Literature Review

Research on the adoption of complementary currencies, which is the second component of this thesis, is scarce, if not lacking when it comes to examining the motives and barriers regarding vendors. The reason why vendor adoption is often overlooked is that in some currency projects vendors do not play a central role. Naturally, in these projects more attention is paid to other stakeholders. For example, some scholars have explicitly studied the adoption of complementary currencies by users[Pett et al., 2001][Kurita et al., 2014][Carmen Smith, 2016], while other publications have dealt with the role of governments and financing frameworks during implementation [Blanc & Fare, 2013][Schroeder, 2015]. There are, as of writing, three studies that explicitly study adoption from a vendor's perspective. The first is a book by Degens [2019], in which he presents comprehensive study of a complementary currency model known as *Regiogeld*. In the book, the adoption of three currencies are examined by visiting the local vicinity of each and interviewing vendors that have decided to join or not join. From this, Degens was able to deduct the differentiation of a vendor's operational and ideological motives and barriers to join a currency project. The second publication on this matter is an article by de Carrillo et al. [2018], who identified the prominent barriers of virtual, social complementary currency systems. By categorising the barriers of adoption into technological, environmental, managerial and emotional they were able to provide a practical overview of the barriers faced by a wide range of stakeholders (including vendors)[16]. Yet, neither of these publications concerns itself with a complementary currency within the same *generation* (in accordance with the typology by Blanc [2011]) as *The ECO coin*. There is one example in which the implementation of a fourth generation currency is studied [Lydwien A. Batterink, 2017]. This is the case of the *Do it Together! (DiT)*, for which researchers were actively involved in overcoming barriers of stakeholders. Using *action research* (see Section 6.1), they identified technological vendor barriers akin to [de Carrillo et al., 2018].

Lastly, there is a small number of papers that have studied complementary currencies through the lens of existing adoption models. While not plenty in numbers, papers like the one of Dietrich et al. [2015] and Seyfang & Longhurst [2016] are valuable practical contributions to the alternative view of money, which we have earlier examined. In other words, by applying

[15] Exactly which ones will be subject of Section 3.

[16] They did, however, only focus on the barriers and not the motives. But as Degens [2019] highlights in his book, it is often the motivational factors, that carry the most weight when a vendor decides whether to join. Thus, the overview by de Carrillo et al. [2018] might, at first glance, seem too narrow to analyse adoption; this holds until we realise that barriers and motives are two sides of the same coin. It can be argued, for example, that the absence of barriers is in itself a motive and the absence of motives is in itself a barrier. While it is much more comfortable to cleanly separate the two, this convolution is a recurring theme of my thesis. One and the same aspect of a currency design might express itself as a barrier or a motive depending on its execution and the stakeholder in question.

these frameworks, they implicitly recognise money as a technology, which through its use shapes the way we live.

2.2.2 Multi-Level Perspective on Socio-technical Transitions

The ECO coin and other complementary currencies are part of a movement, a *transition* of the monetary system. The monetary system is a *socio-technical system* because it is comprised of both technical infrastructure (i.e. ATMs and payment terminals) and social institutions (i.e. banks and financial markets). These two elements co-evolved over time, in that the technology evokes certain behaviour which is socially reinforced and facilitated by these institutions. A *transition* of such a system, is a long-term process involving multiple actors, which involves the development of new technologies and their use in societal application domains[Grin & Schot, 2010]. In recent years, this view has found use in the field of *sustainability transitions*, to understand how we might "unlock" our current systems from the unsustainable trajectories they are on[Smith et al., 2010]. One of the emerging frameworks that has been helpful to understand such change is the *multi-level perspective (MLP)*. This framework has three components(see Figure 5)[Geels & Schot, 2007]: the socio-technical regime, the socio-technical landscape, and niche innovations. While the socio-technical regime is the current socio-technical system, the landscape denotes factors which lie outside of the control of any actor of the system. A good example of this are external shocks such as wars, the subprime mortgage crisis of 2008 or the currently unfolding economic crisis due to Covid-19. Compared to these developments, niche innovations, operate on a minuscule scale. They are non-mainstream projects that innovate alternative technology and practices[17].

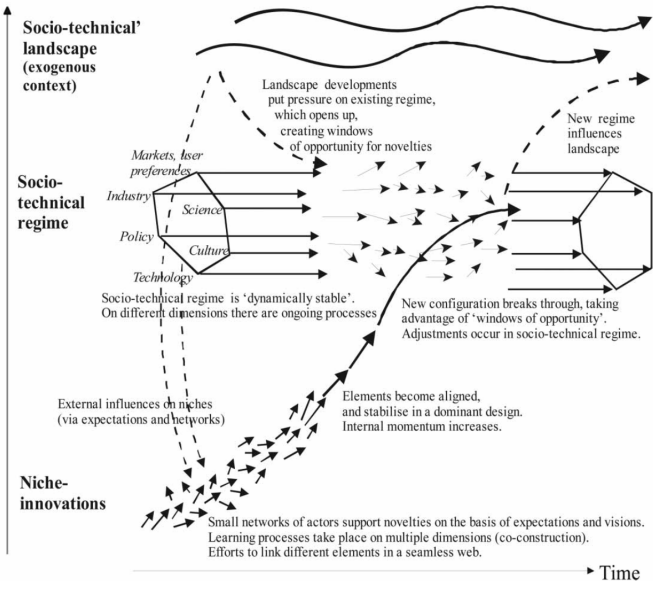

Figure 5: Multi-level perspective on socio-technical transitions by Schot & Geels [2008]

Now, how do these pieces fit together? Following Figure 5, above, the argument goes as follows: The socio-technical regime is innately rigid, which means that it will stay put until there is both sufficient pressure building up from the landscape and suitable niche innovations to replace or transform it.

While there have been instances in which complementary currencies replaced national currencies[18], more often than not, complementary currencies develop inside of a niche. However, as

[17] The Living Lab method, which was planned as one of the main methods of this thesis, is one way to open up and manage these niche innovations.

[18] In the early 2000s provincial governments in Argentina issued "cuasi-currencies", which, at the time, amounted to as much as one third of the national money supply[Gómez, 2015].

Seyfang & Longhurst [2016] point out, they are better contextualised as *Grassroot Innovations (GI)*, which unlike typical niche innovations that are market-based and profit-seeking, emerge from civil society and are driven by ideological commitment. This aligns with the findings of Dietrich et al. [2015], who have suggested that to study user adoption of social innovations like complementary currencies, conventional (utilitarian) adoption models should be extended with non-operational factors[19] (emotional, motivational, and symbolic).

2.2.3 Rational Choice Theory

For a niche or Grassroot Innovation project to eventually transpire into the socio-technical regime, its benefit over the reigning socio-technical regime has to be convincing to most, if not all, stakeholders. Conceivably, to reach an adequate size to the draw attention of regime actors, these benefits need to be clear long before it starts to concretely challenge the status-quo. This is definitely the case for complementary currencies. For local businesses - which have to compete not only among themselves but also with franchises, chains and e-commerce - making rational business decisions is paramount. Following this line of thought, the success of a project like *The ECO coin* is dependent on its ability to convince rational actors to join its network. For this reason we will equate the *willingness to adopt* to the *utility* of a currency[20]. Theoretically, this argument follows a theory called methodological individualism, which states that: "The elementary unit of social life is the individual human action. To explain social institutions and social change is to show how they arise as the result of the action and interaction of individuals"[Elster, 1989]. From this *Exchange Theory* [Homans, 2017], *Rational Choice Theory*[Scott, 2000], which is one of the main psychological assumptions of discrete choice experiments, was able to emerge[21]. Rational choice theory states that individuals conjecture the outcomes of alternative courses of action and calculate which would be best for them. Individuals are rational in that they will choose the alternative that is likely to give them the greatest satisfaction[Heath & Heath, 1976].

2.3 Linking Theory to the Research Questions

With the key theoretical concepts outlined, let us conclude this Section by briefly assigning them to the two research questions.

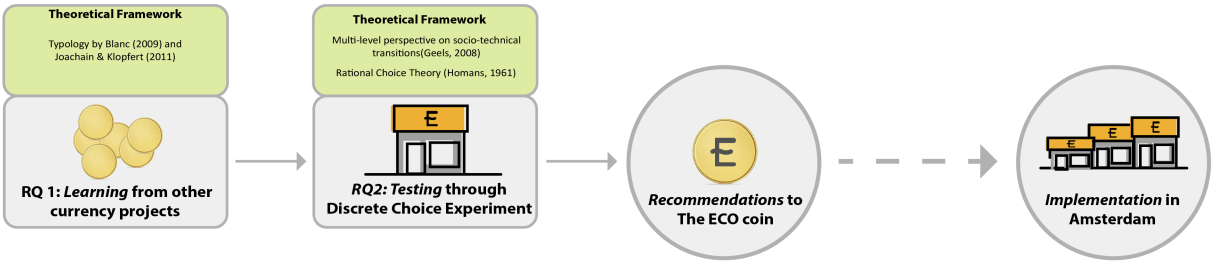

Figure 6: Conceptual Framework with research question connected to presented theory

[19] This thesis, nevertheless, uses a utilitarian method to study adoption. The reason for this is stated in the next Section (see Section 3).

[20] See Section 6 for limitations of this assumption.

[21] At this point, I must admit that in light of what has been argued thus far, presenting this theory, and its subsequent application through the DCE (see Methodology), is hypocritical: I wrote in Section 1.4 that money seen from a purely rationalistic point of view (the orthodox narrative) is prone to neglect social and environmental issues. Yet here, I claim that the vendor adoption of a currency can be studied through exactly this lens. I don't know how to remedy this, other than to note that this way of looking at adoption is incomplete and other methods as described in section 6.1.3 should ideally be supplemented. Due to an unfortunate series of events these methods could not be carried out here, but should be used in the future to understand fully how vendors can be convinced to join.

As depicted above (see Figure 6), in the first research question the design of various currency projects is analysed through the lens of the two typologies that we have examined. The first typology by Blanc [2011] allowed for the selection of projects which were to be analysed. The second typology by Joachain & Klopfert [2011] allowed us to systematically highlight key attributes of each of those projects.

In the second research question the *multi-level perspective on socio-technical transitions* is used to contextualise community currencies as socio-technical niche projects and sheds light on the importance of understanding adoption behaviour of different stakeholders, such as vendors. As this research seeks to understand adoption behaviour of vendors though a discrete choice experiment, the main underlying assumption of utility maximisation is lastly outlined through *rational choice theory*.

3 Methodology

The findings of this thesis were derived from three methods: (i) *studying of the literature*, (ii) *semi-structured interviews*, and (iii) *a discrete choice experiment*. This chapter describes and justifies these methods. Although they all have their precedent in literature, a number of adjustments were made to tailor them to this research. Where and when due, these decisions are brought to attention. As for the structure of this chapter, the three methods are introduced and described per research question. This decision was made due to the conceptual complexity of research question one. In other words, research question one needs to be dissected before it becomes clear how the methods ((i)*a literature study*, (ii)*semi-structured interviews*) were used. The second research question only draws from one method: (iii)*a discrete choice experiment*. As this method is a quantitative method that takes the form of an online survey, its design and procedure deserve special attention in this chapter.

3.1 RQ 1: Semi-Structured Interviews & Literature Study

> *RQ1: What can The ECO coin learn from other currency projects regarding their operations, technical design, governance, and vendor adoption?*

3.1.1 Overview

Data to answer the first research question was collected in the form of *semi-structured interviews* and *a literature study*. This data was then used two produce one cohesive set of lessons, drawn from multiple qualitative analyses of various currency projects. Each qualitative analysis consists of two parts: The first part describes the *currency's design*, whereas the second part focuses on the *vendor adoption* of the given currency. While the two main theoretical components of this thesis, namely a community currency's design and adoption have been presented separately in the previous chapter (see Chapter 2), their interconnection is central to the methodological approach of this thesis, and specifically this research question. On the one hand, the adoption of a currency relies on its design. If a currency's design is not attractive to the majority of the stakeholders, it is likely that it will not be adopted. On the other hand, since the design of a currency should ideally not be rigid, it can be influenced and changed according to research done during its implementation, which includes the adoption of various stakeholders. However, if it is rigid and was not adapted to the wishes and needs of stakeholders at the time, it is still meaningful to study it to produce lessons for other currencies in the future.

Before delving into the methods of this research question, it is important to clarify what exactly is asked. Figure 7 conceptually summarises this processes, showing how the different aspects of the research question incorporate into the qualitative analysis.

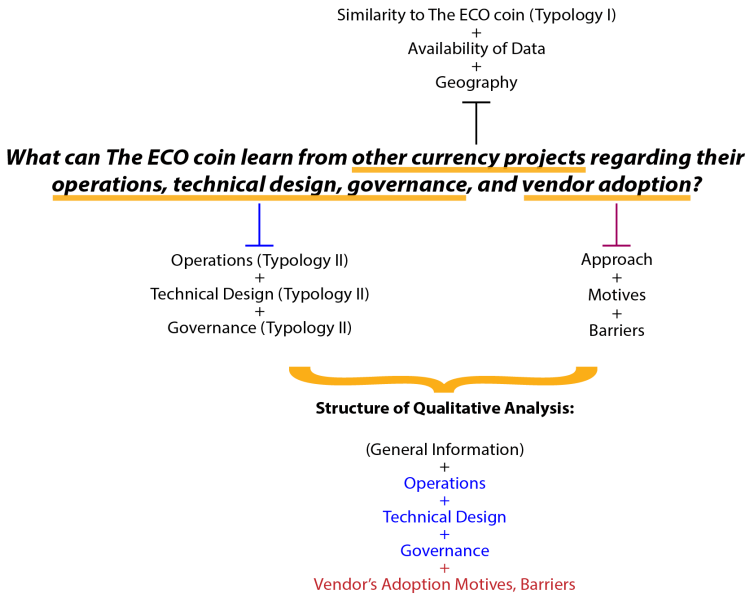

Figure 7: Overview of the Conceptual Approach for RQ1

What follows is a detailed description of the figure above. After that, the methods will fall into place.

Other Currencies

Firstly, *other currencies* refers to the currency projects which have been chosen based on three factors: similarity to *The ECO coin* (given by Typology I; see Figure 3) the availability of information and geography(relative to Amsterdam):

Currency Name	Location	Generation
Torekes	Ghent, Belgium	G4
LimbU/E-Portmonnee	Limburg, Belgium	G4
NU-Spaarpas	Rotterdam, The Netherlands	G4
Chiemgauer	Bavaria, Germany	G3
Stroud Pound	Stroud, UK	G3
Brixton Pound	London, UK	G3
Bristol Pound	Bristol, UK	G3
Val'heureux	Liége, Belgium	G3

Figure 8: Overview of Analysed Currencies

This list of projects, seen in Figure 8, was not set in stone from the start, but iteratively evolved throughout the data collection process[22]. Resulting directly from *Typology I* (outlined

[22]While talking to actors of one currency, I was often referred to actors of another. For example, this happened when talking to someone of the *LimbU*, who told me about the *Val'heureux*.

in Chapter 2), fourth (G4) and third (G3) generation currencies were chosen. There are in total 4 G4 and 5 G3 projects. Despite having one less example, more attention was paid to G4 currencies. The reason there are more G3 currencies, is that some were used to explain concepts rather than to draw direct lessons. Furthermore, the availability of data limited the choice of projects. Some currency projects did not involve researchers to document their implementation and did not produce any reports. Where possible, this information was filled with interviews(see next section). Lastly, when looking at the list of currencies above, it becomes apparent that all currencies were implemented into one of four countries in the north-west of Europe: *United Kingdom, The Netherlands, Belgium, Germany.* This was a deliberate choice in attempt to minimise the bias resulting from differing cultures. In other words, since *The ECO coin* intends to implement in Amsterdam, projects that were adopted by stakeholders that have a similar mentality and culture to the Dutch were chosen.

Operations, Technical Design & Governance (Community Currency Design)

Operations, *Governance*, *Currency* (here referred to as *Technical Design*) are classes[23] of Typology II. They refer to specific design attributes of a currency. In other words, it is here that the second typology is used to systematically analyse the design of the currency projects. In practice, this guides the structure of the qualitative analysis of each currency project. After general information on the currency this first part of the descriptive analysis was written in adherence to the following structure:

Community Currency Design

- General Information: Founding Location and Date, currency values/objectives, size, *Circulation*
- Operations: Ways to *obtain* and *use* units
- Technical Design: *Form, Value, Lifetime, Device Type*, *Converting*, *Demurrage*, Participation Fee
- Governance: *Partners* (Stakeholders)

The italicised terms, above, present select attributes of *Typology II*, as shown below in Figure 9.

[23] In Unified Modelling Language (UML), classes are objects that contain attributes. Whenever attributes take on a specific value, an instance of a class is created.

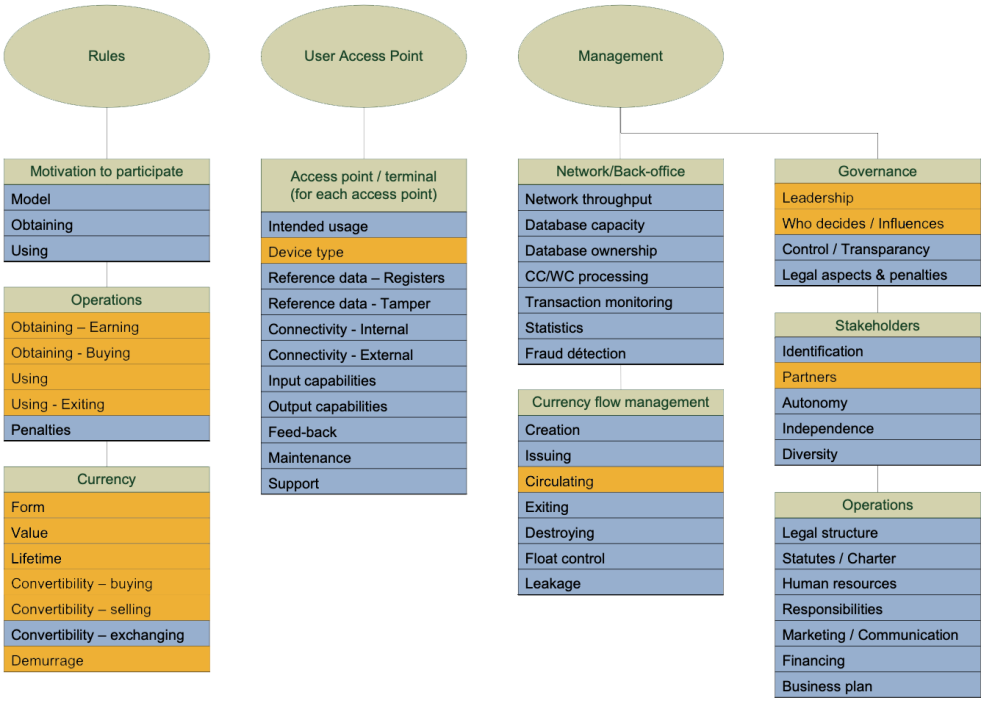

Figure 9: Hierarchical Typology by Joachain & Klopfert [2011] using Unified Modelling Language with Highlighted Attributes for Analysis

Vendor Adoption

Vendor adoption, the process of onboarding local businesses to a community currency project, is the last part of the first research question. The rationale is that if a currency project team is able to approach the right kind of vendors with a desirable value proposition, which is substantiated by their currency design, chances of adoption will be maximised. Therefore, the goal of this part was to inquire the motives and barriers of vendors of various projects to join. Notably, this most commonly had to do with specific design, but also includes the project team's general approach to the onboarding process. Therefore, there was no typology to guide this part. Instead, the results relied on an interview guide (see next section), and a literature on community currencies and loyalty programmes. For specific examples of currencies, in terms of the structure of the qualitative analysis indicated above, the *vendor adoption* segment was always placed last. In this way, the qualitative analysis of each currency takes the following structure:

Community Currency Design

- General Information: Founding Location and Date, currency values/objectives, size, *Circulation*
- Operations: Ways to *obtain* and *use* units
- Technical Design: *Form, Value, Lifetime, Device Type*, *Converting*, *Demurrage*, Participation Fee
- Governance: *Partners* (Stakeholders)

Adoption

- Vendor Adoption: approach, reactions/response, motives/barriers, value proposition and vendor selection

After having examined each of the aforementioned currencies, loyalty programmes were studied. The structure of this part is different from the one outlined above, as no specific

example of a loyalty programme will be examined. While, [Blanc, 2011] who devised *Typology I* clearly states that purely profit-seeking currencies should be not be considered complementary currencies, neglecting them for this study, however, would be a mistake because they offer valuable insights.[24]. Therefore, the aim of this last part of research question 1, was to produce knowledge that would help community currencies approach vendors smartly. On the one hand, this consists of presenting vendors with a desirable *value proposition*[25]. On the other hand, this means that the right type of vendors should be approached in the first place. As we will see later, many currencies have compliance with their core values as the only selection criteria for vendors. An outside view, given by the research on loyalty programmes suggests, however, that there should be additional criteria when selecting vendors. In this sense, vendor adoption would not only depend a specific currency design, but also on how and which type of vendor is approached. As stated before, to maximise vendor adoption a currency project team should approach the right kind of vendors and present a desirable value proposition, backed by their currency design[26].

3.1.2 Methods

(i) Literature Study

Each currency project had basic information available online. This information took the form of academic papers, official websites, news articles, and consultancy reports. For all third generation currencies, except *Le Val'heureux*, these sources painted a thorough picture of the respective design and adoption. The implementational of fourth generation currencies, however, is generally not as well-documented as it is the case for third generation currencies. This is why additional information had to be collected (see below).

(ii) Semi-Structured Interviews

As the focus lies on fourth generation currencies, the majority of data to answer the first research question was collected during semi-structured interviews. Since the design of most of these currencies is available online, the goal of the interviews was to collect information on the implementation phase. Specifically, experience with the recruitment of vendors was of interest. After being asked to quickly describe the currency project and their role in it, the interviewees recalled how the project team had approached vendors, which reactions they received when doing so, and the common motives and barriers for vendors to join the project. The semi-structured interviewing method proved useful, because it allowed for follow-up questions, which, in some cases provided essential additional information.

Figure 10, below, shows which semi-structured interviews were conducted[27].

[24] Henk van Arkel, a complementary currency expert whom I interviewed, suggested explicitly that *The ECO coin* should learn from loyalty programmes.

[25] A value proposition "will state the measurable value or tangible customer benefits that a product or service will provide to its customers and will illustrate the return on the investment or other tangible positive outcomes of choosing a particular service provider over its competitors." [Camlek, 2010].

[26] There are two additional reasons why loyalty programmes should be taken seriously by complementary currency researchers. Firstly, many vendors are more familiar with loyalty programmes than with complementary currencies. This matters because, when disregarding the differences in values, commercial loyalty programmes are strikingly similar to many complementary currencies from a vendors' perspective. Therefore, vendors might have preformed opinions on loyalty programmes, which can act as prejudice when asked to adopt a community currency. Depending on their preformed notion, this might either motivate to, or deter from adopting a given currency for the wrong reasons. Secondly, because of loyalty programmes' prolific application to increase profits for vendors, they are a well-studied field. So, while ideally avoiding the direct comparison, a currency team will find many of the insights produced by scholars of this field immensely useful.

[27] The full transcripts can be found in Appendix I.

Name	Currency	Function	Held on	Interview Code
Edgar Kampers	NU-Spaarpas	Co-founder	22.02.2020	INT1
Igor Byttebier	Torekes and LimbU	Co-founder	09.04.2020	INT2
Sofie Claeyssens	Torekes	Project Team	09.04.2020	INT3
Tom Dutry	Torekes	Project Team	28.04.2020	INT4
Wim van de Putte	LimbU	Co-founder	14.04.2020	INT5
Hugo Wanner	LimbU	Consultant	29.04.2020	INT6
Nicolas Franka	Val'heureux	Co-founder	12.05.2020	INT7

Figure 10: Overview of Semi-structured Interviews

3.2 RQ 2: Discrete Choice Experiment

3.2.1 Overview

To what extent are vendors in Amsterdam willing to adopt The ECO coin?

The last part of this thesis, contributed to to the understanding of money as a social technology by conducting a *discrete choice experiment* to evaluate the utility of different aspects of *The ECO coin* for vendors in a multi-stakeholder environment like Amsterdam. This is a common method in market research, transportation economics, and product design. While it has never been used to inform the design of a complementary currency, it has been used to design commercial loyalty programmes (e.g. [Meyer-Waarden, 2015]).

A DCE is a quantitative method for eliciting preferences of individuals by asking them to choose between hypothetical scenarios, goods or services [Mangham et al., 2008]. Each of these hypothetical *alternatives* possesses attributes that would be relevant for the consumer when confronted with the product in the real market. In the experiment, each attribute can take on a range of values or categories, which are called *attribute levels*. By presenting the participant with different combinations of these attribute levels, in what is called a *choice set*, this method allows for detailed data on the structure of consumer preferences [Ben-Akiva et al., 2019]. The method carries with it some stark assumptions, which were described in the previous chapter(see Chapter 3). In the remainder of this section, I will illustrate how I designed a DCE to test certain attributes of *The ECO coin*. Since this is the most elaborate section of this chapter, an outline of its structure is helpful: It begins by introducing, describing, and justifying the *attributes* which were tested in the experiment. After that, *sampling and recruiting* of participants is described in detail. Then, the way subjects were familiarised with the project before participating is outlined. After that, the survey design is explained. Lastly, we will take a look how the resulting data from the experiment was analysed.

3.2.2 Attributes

To collect useful and reliable data, the attributes must be carefully selected to effectively mimic the information environment that the user will face in the real market [Ben-Akiva et al., 2019]. More specifically, this means that the attributes can be barriers and motives for a shop to adopt, as long as *The ECO coin* is in some way able to respond to the outcome in the future. For example, the attribute *Increased Profit* undoubtedly would be a driver for a vendor to adopt; However a certain level of profit cannot be influenced or guaranteed by the ECO coin upon offering their service. What can be influenced by The ECO coin, are factors that would most likely lead to increased profit, such as advertising the shop brand or access to an already existing user base. Conversely, intricate design elements of the currency, however influential they might be, cannot be blatantly translated into attributes, because they could be misinterpreted by the vendor. In fact, being able to make the participant familiar with the attributes is a key to elicit their true preferences [Ben-Akiva et al., 2019]. Based on these

considerations, and the results of the first, the following attributes were included (ordered by importance according to Lewis Just):

- Participation Fee
- Current User Base
- Advertising Provided
- Number of Direct Competitors
- Integration Into Current Point-of-Sale System

Attribute levels, are the range of values that each attribute can take on. In general, they should cover a wide range of values to reduce the standard errors of parameters. Furthermore, whenever possible, they should be spaced equidistantly to ensure orthogonality between attributes.

Below, I present a brief rationale[28] for the inclusion of these specific attributes, as well as their respective research question, hypothesis and attribute levels. These are then summarised in a table at the end of this section.

Participation Fee

The ECO coin is highly interested how much vendors in Amsterdam are willing to pay for their product. In conversation with the company, it was decided to propose a monthly participation fee to the vendors in the DCE to find out:

RQ: To what extent does the monthly participation fee influence the vendors' utility of a community currency like *The ECO coin*?

H1: An increase in monthly participation fee for the vendors of a community currency like *The ECO coin* decreases in utility for vendors, but not in the low range.

The attribute levels are different amounts of a monthly participation fee, which a vendor would have to pay to stay in the network. The values {*(0€), (10€), (20€), (30€)*} were chosen, making four equidistant levels. These values were chosen based on values heard from other currencies (see Section 4.1) and benchmark services like a *Dropbox business account*[dro]. It was also necessary to include the free option, because some currencies decide not to charge vendors at all.

[28] For more information see RQ1&2

Current User Base

This attribute is a proxy for the expected profit from joining *The ECO coin* vendor network in Amsterdam.[29] In theory, a larger user base will bring a vendor, which is accepting *The ECO coin*, more customers and more revenue. Therefore, if there were no barriers of adoption at all, even a relatively small user base should lead to wide-spread adoption. As there are barriers, however, it is interesting to see how large the user base could be offset by these. Furthermore, there might be groups of vendors that place less emphasis on the size of the user base. In this way, even though the user base is not strictly a mutable parameter in the currency's design, The ECO coin would like to know which vendors to approach with which product at which size of the network.

RQ: To what extent does the existing amount of users influence the vendors' utility of a community currency like *The ECO coin*?

H2: An increase in the amount of users in the network of a community currency like *The ECO coin* increases its utility to vendors.

Here, the attribute levels are the varying number of users already in the network. The values {*(500 users), (1500 users), (2500 users), (3500 users)*}, making four levels with a spacing of 1000 users. An underlying assumption of this level distribution is that the early phase of a currency is studied. This also means, however, that this attribute might have a very different influence once the network of users grows to a significant proportion Amsterdam's citizens. Findings should therefore not be extrapolated.

Advertising Provided

Affiliation with *The ECO coin* conveys a positive stance in regards to environmental and social values to the public. For The ECO coin it is of great interest, how much value vendors place on an active advertisement campaign to remind potential and current customers of their support of and participation in *The ECO coin*:

RQ: To what extent does the type of advertising provided influence the vendors' utility of a community currency like *The ECO coin*?

H3: An increase in advertising activity provided by a currency like *The ECO coin* increases its utility to vendors.

Here, the attribute levels are the varying services of advertising provided by the ECO coin. The underlying assumption is that this will be included free of charge and equal for all vendors. Both of these assumptions might be violated in the actual implementation, but asking for the attribute in this general way, is useful to get an impression of the importance of advertising. The values: {*(No advertising), (Vendor logo on website and app), (Vendor logo on website and app and making a promotional video),(Vendor logo on website and app, making a promotional video and sending monthly reminders to users*}, were chosen, making four levels with a progressive build-up. To achieve ordinality in these levels, they are not mutually exclusive, but based on the intensity of advertising services. In this sense, it would be assumed that a four-point ordinal scale stands behind these attribute levels. Nevertheless, participants were asked to rank these before the experiment.

Number of Direct Competitors in Network

This attribute arose directly from literature on loyalty programs, which shows that the number of competitors within a multi-vendor loyalty programme is a significant factor influencing adoption[Leenheer & Bijmolt, 2008][Mägi, 2003][Sharp & Sharp, 1997](also see Section 4.1.3).

RQ: To what extent does the number of direct competitors influence the vendors' utility of a community currency like *The ECO coin*?

[29] Unlike the other four attributes, the size of the user base is not something The ECO coin can simply decide on. If successful, as more vendors will adopt, more users could be attracted as they see more opportunities to spend *ECO coins*. Conversely, vendors could be more inclined to adopt if they hear that a lot of people in the city are using it. That means that the size of the user base can be both a motivating factor for and a result of vendor adoption.

H4: An increasing number of direct competitors to vendors in a currency like *The ECO coin* will increase its utility to vendors.

Here, the attribute levels are the number of direct competitors already present within the ECO coin vendor network. The underlying assumption is that this number will be modulated by the ECO coin. The levels: {*(0 competitors), (2 competitors), (4 competitors),(6 competitors)*}, were chosen, making 4 levels with a spacing of 2 competing vendors. This distribution is based on the average current amount of competitors within Amsterdam, which was estimated using the database.

Integration Into Current Point-of-Sale System

This attribute represents the technological barrier of adopting *The ECO coin*. From the analysis done in the first research question it became clear that technological changes can act as a major barrier of adoption. Some currencies have managed to collaborate with banks, making a seamless integration into a vendor's POS-system possible. To find out how important this is for vendors in Amsterdam this attribute was included:

RQ: To what extent does the integration into the current point-of-sale system influence the vendors' utility of a community currency like *The ECO coin*?

H5: If a currency is integrated into the point-of-sale system of vendors, its utility to vendors will increase.

Here, the attribute levels denote whether the vendor would need additional technology to accept *The ECO coin*. Thus, the levels: *(Additional terminal needed)*, *(no additional terminal needed)*, were chosen, making 2 levels.

Summary

In Figure 11, below, a summary of the chosen attributes and attribute levels is shown.

Attributes	Level 1	Level 2	Level 3	Level 4
Participation Fee	0,00 €	10,00 €	20,00 €	30,00 €
Current User Base	500 Users	1500 Users	2500 Users	3500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app and making a promotional video	Vendor logo on website and app, making a promotional video and sending monthly reminders to users
Number of Direct Competitors	0 Competitors	2 Competitors	4 Competitors	6 Competitors
Integration into current POS-System	Integrated (No new hardware/software needed)	Not Integrated (new hardware/software needed)	-	-

Figure 11: Attributes and Attribute Levels

We have now looked at the rationale for including each of the 5 attributes in the discrete choice experiment. Furthermore, we have posited a hypothesis in regards to how each attribute would influence the willingness of vendors to adopt a community currency like *The ECO coin*.

3.2.3 Sampling, Recruitment & Background Information

From the population of local independent businesses in Amsterdam, a sample of 350 vendors was drawn by use of a database from the *Keurmerk "De Goede Zaak Amsterdam"*. This organisation certifies local independent businesses in Amsterdam and announced the survey in their monthly newsletter one month before it was sent out. In this way, the organisation gave shops, which were not interested in taking part, the opportunity to be removed from the database before receiving the request to fill out the survey.

After inspecting the database, it became clear that there is a wide variety of local businesses represented in the label. Research by Leenheer & Bijmolt [2008] shows that adoption of loyalty programs is highly influenced by sector type and firm characteristics. Given the stark similarities between community currencies like *The ECO coin* and loyalty programmes, it is reasonable to inquire about the vendors' characteristics before the experiment. This was achieved through a questionnaire comprised of 8 questions leading up to the experiment. The respondents were asked to report on whether the owner works in the store, numbers of employees at the point of sale, number of daily customers, prior experience with community currencies, prior experience with loyalty programmes and ecological aspirations.

In DCEs an estimate of the number of respondents should be known before designing the experiment. This estimate influences the number of attributes and attribute levels included in the experiment. There are a number of ways of attaining the minimum number of respondents. One is to evaluate the *S-efficiency* of a survey design, as can be done in software like *Ngene* [Cho]. For this priors are necessary, however. Since there were no priors at hand for this experiment, the required number was estimated using two rules of thumb by Orme [1998] and Tang et al. [2006]:

$$n_2 > 500\frac{c}{MT}(= 84) \tag{1}$$

where:

$M(= 3)$...number of full profile alternatives per task
$T(= 8)$ ...number of choice tasks
$c(= 4)$ ...maximum number of levels per attribute

$$n_2 > HLI\frac{d.f.}{t(1-c)a}(= 72) \tag{2}$$

where:

$HLI(= 200)$...Homogeneity/Logical Consistence Index
$d.f.(= 5)$ ...degrees of freedom - Number of Attributes
t ...(= richness of information - based on a table depending on attribute level count
$c(= 0.3)$ ...percentage of None answers (No-join)
$a(= 2.5)$ ...number of choice tasks

The variable a was determined by use of a table provided in the paper of Tang et al. [2006]. Furthermore, several assumptions were made for this rule-of-thumb, which if made differently would have influenced the required number of respondents significantly[30][31]

The final minimum sample size was chosen as given by:

$$n_{\min} = max(n_1, n_2)(= 84) \tag{3}$$

Initially, justified by the preselection of the *Keurmark* organisation, a response rate of 30% (of 350 contacted local shops) was assumed. This would have meant that 105 vendors would fill out the survey. Solving the second inequality above for the number of attributes, a maximum of 5 attributes could be included in the experiment[32]. Based on the rules of thumb, in a DCE with 5 attributes, the error margin stays acceptable for more than 83 respondents.

All the businesses in the database (excluding the ones that said they did not want to participate which amounted to 350) were contacted by e-mail with a short description and a link to the online survey. In the description, they were informed that their answers would stay anonymous, confidential (not shared with The ECO coin) and would be non-binding.

[30] Tang mention in their paper that a homogeneous group of Practical MDs would warrant an HLI value of 100. This is the minimum on their scale, which means maximum rationality and homogeneity in the sample. The index can range from 100 to 400. My educated guess was that the vendor sample was not as rational and homogenous as a group of MDs, but also not as heterogenous and irrational as individuals with random professions, making it 200.

[31] As it turned out c was chosen conservatively. With a value of 0.25, which was the real percentage vendors selected *no-join*, the sample size would have only needed to be 63.

[32] Since there were initially more attributes planned, this resulted in some of their omission.

Furthermore, respondents were informed that the survey would take no longer than 15 minutes; this turned out to be accurate as the average time to complete was 12 minutes.

In the two weeks after sending the initial e-mail, all of the 350 businesses were called by phone and sent a reminder e-mail that simultaneously thanked those that had completed the survey and asked those that hadn't to kindly do so. After this, 216 had opened the survey. Of these, 72 completed the survey, 12 of which were disqualified because the owner did not work in the shop(see 1.6). This resulted in respondent group size of 60 vendors[33].

3.2.4 Familiarisation & Subject Training

In many aspects, *The ECO coin* is a product unlike any other that vendors have come into contact with[34] . While they might have their own loyalty programs, *The ECO coin* would bring with it new features, a large network, and the added value of being able to position as an environmentally sustainable business. If not reconciled by sufficient information beforehand, this lack of familiarity has implications for the reliability of the respondents answers in this DCE. In other words, respondents should be informed on the idea behind the service and the meaning of each of the attributes[35]. In order to elicit their true preferences, this information needs to be detailed yet not overwhelmingly complex. In this experiment, to convey the basic idea of *The ECO coin*, an existing video clip[36]) was provided. The attributes were explained by the use of texts slides before the survey, and in case a participant wanted to revisit them, they were constantly visible during the experiment at the bottom of the page.

3.2.5 Experiment & Survey Design

The experiment was designed with *Sawtooth Software Discover*[37]. This is a user-friendly online platform that specialises in Choice-Based-Conjoint surveys(analogous to discrete choice experiments). In following the recommendation of *De Goede Zaak*, the survey was conducted in Dutch. Respondents were reminded at multiple times that their answers are anonymous, non-binding and will not not used for any other purpose than to improve *The ECO coin* product. Respondents were also debriefed and given the opportunity to give feedback via e-mail.

Before the experiment started, each respondent was asked to rate the attributes, resulting in a priori (prior) monotonicity constraints within the attribute levels. As stated above, in a DCE it is important not to overwhelm the participant with too many questions, which is why not all the attributes were asked to be rated. In other words, the attributes that logically follow an ordinal distribution (from desirable to undesirable), were not asked to be rated by the participants. Specifically, this was for the attributes: *participation fee* and the *current user base*. The attribute levels of *integration into POS-system*, *number of direct competitors* and *type of advertising provided*, however, were seen as ambiguous and were thus rated by the participants before arriving at the choice sets. After this prior rating, choice sets were created on the fly and thus custom for each respondent to satisfy multiple simultaneous goals: one-way level balance within attributes, two-way level balance between attributes, target degree of level overlap, and avoiding dominated concepts. To estimate utilities of attributes and levels, maximum likelihood estimation via individual-level logit, subject to monotonicity constraints, with *Bayesian smoothing* toward population parameters via empirical Bayes was used [SawtoothSoftware, 2018]. In the experiment, there were 8 choice sets to complete. Each choice set featured three full profile alternatives and a *no-join* option. This *no-join* option was explicitly explained to the respondents. It was stated that they should opt for it, if none of the other alternatives presented would make them consider joining.

[33] Unfortunately this lies below the desired minimum respondents.

[34] This was confirmed by prior questions.

[35] As I describe in Section 6.1, I have also developed a currency game experiment as a method. Although I was not able to conduct this, this game might be an ideal way to familiarise subjects for future discrete choice experiments. Therefore, I suggest that the game be played with future stakeholders of *The ECO coin*, before conducting a survey, Living Lab or pilot.

[36] `https://player.vimeo.com/video/263871227?dnt=1&app_id=122963`

[37] `https://www.sawtoothsoftware.com`

3.2.6 Pilot

Before sending out the survey to the vendors, 2 pilots with vendors outside of the sample were conducted. This was done by calling the respective vendor while they would fill out the survey. In this way, it was possible to gather live feedback on the clarity of instructions, definitions and the overall layout of the survey. After these phone calls, the survey was updated accordingly.

3.2.7 Data Analysis

The data collected in this experiment was analysed with the built-in CBC Analysis tool by *Sawtooth Discover* and consisted of two stages. Firstly, utilities scores within attributes and relative importance scores between attributes were calculated. These two measures guided the second step, which was the construction of bundles of configurations for a market simulation. This market simulation provided the basis for the subsequent interpretation of the data. Let us now examine the methods behind these two stages of analysis.

Utility Scores and Relative Importances

The utility score of an attribute level denotes how much it was preferred by the participants. As a utility score pertains to an attribute level within an attribute, the higher it is the more it is preferred in relation to the other levels in that attribute. In this analysis these scores are calculated for each respondent and each level of the attributes using a statistical estimation approach called *Empirical Bayes*[**?**][38]. Since utility scores are scaled within attributes, they should only be compared within attributes, not between attributes. For example, a level's utility score of 40 in one attribute does not mean that it will carry the same weight as score of 40 in another attribute. In this experiment utilities were normalised, which means that they all add up to 0 [Orme, 2010].

From these utility scores, relative importances could be calculated, which express what difference each attribute makes in the total utility of a product. This difference is calculated from the range in the attribute's utility scores. Here, percentages from relative ranges, obtaining a set of attribute importance values that add to 100 percent, were calculated. While importances depend on each other in the sense that they add up to 100%, they also depend on the particular attribute levels chosen for the study. For example, with a narrower range of prices, price would have been less important[Orme, 2010]. This should be kept in mind when trying to extrapolate the hierarchy of attributes while using different attribute levels.

Below is an example of how relative attribute importances are calculated from given utility scores(note that this example is not from the experiment):

[38]For more information on the *Emperical Bayes* algorithm see SawtoothSoftware [2018].

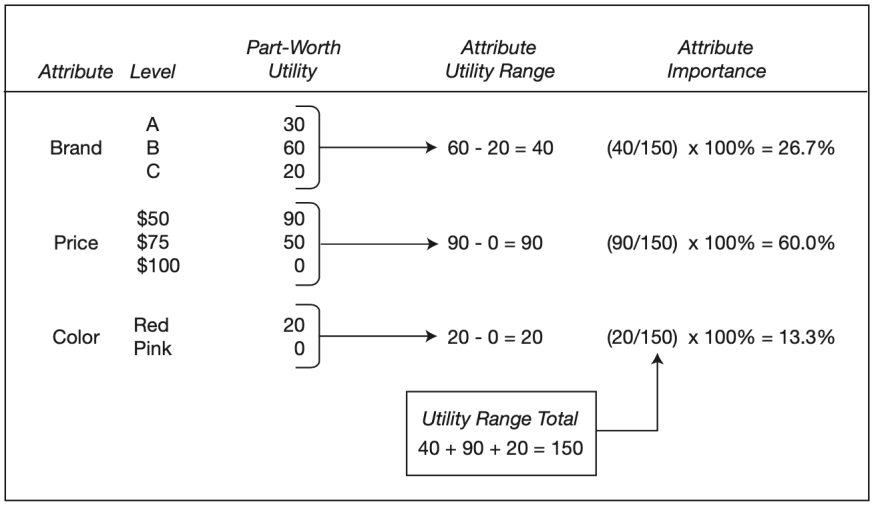

Figure 12: Relative Importances Calculations from a DCE with 3 attributes

Market Simulations

The relative importances and utility scores indicated how much attributes and attribute levels would contribute to the total utility of *The ECO coin*. However, these scores are susceptible to misinterpretation, as utility scores of attribute levels cannot be compared across attributes. Furthermore, they do not allow us to see which bundle of products[39] would be effective in capturing the vendor market in Amsterdam. To remedy this, *market simulations* were performed to present the data in a more understandable format. This method allows products to be introduced within a simulated market, which reports the percentage of respondents projected to choose each product[SawtoothSoftware, 2018]. In the simulation each product takes the form of a specific configuration of attribute levels of *The ECO coin*. As in the experiment itself, the market simulation included three configurations, and a *no-join* option to "choose" from. Market simulations were created with the integrated market simulator in *Discover Sawtooth*. This tool calculates shares of preference by the use of the *Randomized First Choice* algorithm by Orme & Baker [2000]. Rather than using the utilities as point estimates of preference, this algorithm recognises that there is some degree of error around these points. Therefore, the *Randomized First Choice* model adds unique random error (variability) to the utilities and then computes shares of preference. The model also incorporates a correction for product similarity due to correlated sums of errors among products defined on many of the same attributes[sa2].

In order to yield the most benefit from these market simulations, a framework for their construction is useful. In the following paragraphs one such framework is outlined. It consists of two metrics to measure a bundle's *viability* in the vendor market, two criteria to select meaningful configurations, and two realistic situations to which the metric and criteria are applied.

Beginning with the metrics, the *viability* of a bundle of configurations is described by two values. The first value is the sum of the shares of preference of each configuration (1- *no-join*). The rationale behind examining this number is that it allows to see how the configurations can compete against the *no-join* option[40]. The second value, expresses the ratio of the share of preference of the least desirable bundle and the sum of shares of preference. This is important because a currency team might want to know whether it is necessary to offer three different

[39] A bundle of products (interchangeable with bundle of configurations) refers to a set of different versions of a community currency in a DCE. This is assuming that the currency project team intends to cater to the needs of various vendor groups by offering three configurations of their currency.

[40] The ECO coin would not be surprised if 90% of vendors would decline when launching. However, they expect a network effect, in that this could converge to 50% as the network grows

versions, rather than just two or one. Whereas the sum of shares of preference is used in every analysis, the latter metric is only applied to the overall vendor group because the analysis would otherwise become artificially granular given the number of respondents.

Next, a set of criteria to filter meaningful configurations for each scenario is necessary. The following two criteria were defined and adhered to in the selection of the configurations:

- **Feasibility:** *The configurations and their surrounding bundles are feasible both in terms of what a currency project team can control and offer to vendors.*

  While there are 512 unique configurations of *The ECO coin* from the DCE (4×4×4×4×2; given by the product of number of attribute levels), not all are worth simulating. Moreover, it is more valuable to simulate imperfect but *feasible* configurations that are in line with what the company can achieve at any given stage. Considerations of *feasibility* are directed both at any given configuration and its surrounding bundle.
  Firstly, regarding the *feasibility* of a single configuration, it should be noted that among the five attributes, a currency project team is able to control four attributes directly. Specifically, all attributes except *size of current user base* are design elements that can be operationalised, depending on the capabilities and preferences of the project team. For example, the attribute *participation fee* may take on 0€ per month, giving vendors the opportunity to join for free. However, this decision would have to take into account the need to finance operations, and the development of features to users and vendors (i.e. advertising services)[41]. Therefore, when formulating configurations, mutable attributes, like *advertising provided* and *number of competing vendors*, were adjusted inversely proportional to the attribute *participation fee*.
  Secondly, in regards to the *feasibility* of a bundle, it is important to note that the levels of certain attributes between configurations of a bundle have to remain identical. For example, it would make little sense to include three configurations with differing levels in the attribute *Integrated into current POS*. Either the currency has managed to integrate it or not. Similarly this goes for the attribute *current user base* as it would be impossible to control the user count visiting a given vendor.
- **Meaningful differences between configurations:** *In an attempt to inquire about the trade-offs between attributes, attribute levels are varied sufficiently to produce meaningful differences between configurations inside of a given bundle.*

  It would be possible for a bundle of configurations to encompass three identical configurations, which are matched against the *no-join* option. However, a setup as such would not reveal any information on tradeoffs between attributes. Therefore, it is important that the any one configuration differs in at least one attribute to its counterparts.

Lastly, the metrics and criteria were applied to two realistic situations.

- **Trial Phase:** *A currency project team is implementing their currency in an urban environment and initiates a one year trial phase. It offers three differently-priced (participation fee) products to the vendors, each with a different type of advertising provided(see Figure 13. Since the currency is still unknown and has few partnerships (i.e. banks) one of these products is free and none can be integrated into the point-of-sale of a given given. Over the first year, the user and vendor network grows proportionately, with each vendor gaining 2 more competitors for every 1000 users who join the network. The currency network eventually reaches 3500 users, with each vendor having 6 competitors who are also accepting the currency.*

[41] This is confirmed by the utility scores and relative importances.

	Free (0€), no ads	Paid (10€), logo on website and app	Paid (20€), logo on website and app and promotional video
Participation Fee	0€/month	10€/month	20€/month
Current User Base	500 Users	500 Users	500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	0 Competitors	0 Competitors	0 Competitors
Integration into current POS	Not integrated	Not integrated	Not integrated

Figure 13: Bundle of Configurations for a Launch of a Trial Phase

Essentially, this series of simulations is viewing a community currency on an imaginary growth trajectory. It uses various *feasible* and *meaningfully different* bundles of configurations to study the interaction of the two attributes, namely *current user base* and *number of competitors*, regarding the bundle's *viability*. Explicitly, the following sub-research question was asked:

1. To what extent does the *viability* of a *feasible* bundle of configurations change for the overall vendor group when the currency's user base and number of competing vendors grow proportionally?
2. Which are the vendor groups for which such a bundle is notably more or less *viable* compared to the overall group?

– **Official Phase:** *After a successful trial phase, the currency project team has managed to keep the user base stable at 3500, has made several partnerships (among them a bank, which allows for seamless integration into the POS-system of vendors) and wants to transition into an official phase in which none of the products are free anymore. They plan to have each include a type of advertising service for the vendors. Like in the trial phase, the extent of this service depends on the participation fee. The currency project team is also in the process of revising particular vendors of the trial phase, removing those who do not no longer comply with their currency charter. This process allows them to place a limit on the number of competitors for newly joining vendors. Practically, a measure like this would entail that a joining vendor may write down a certain vendor which they do not want to join*[42]*. Below, in Figure 14, a feasible and meaningfully different bundle of configurations for this situation is shown:*

	Product A: Paid (10€), no ads	**Product B:** Paid (20€), logo on website and app	**Product C:** Paid (30€), logo on website and app and promotional video
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Not Integrated	Not Integrated	Not Integrated

Figure 14: Bundle of Configurations for an Official Phase

[42] Whether this could really be enforced like this is hard to say. This makes the vendor network exclusive, limiting *using* options for users. This, as some of my interviewees have pointed out, detract from a community currency being viewed as *real money*, which might thwart its growth.

This situation is using various *feasible* and *meaningfully different* configurations to study effects of four attributes, namely ,*participation fee integration into current POS*, *type of advertising provided*, and *number of competitors*on the bundle's *viability*. These attributes are varied successively, initially connecting to the last bundle of configuration of the *trial phase*. Put simply, the products are changed in a step-by-step manner to see how the introduction of a specific attribute level changes the overall viability of the bundle. This process is outlined by the following sub-research questions:

1. Compared to the final bundle in the *trial phase*, how does the *viability* of a *feasible* bundle of configurations change when all products are non-free?
2. To what extent does the *viability* of this bundle change for the overall vendor group when all products are fully integrated into the point-of-sale system of vendors?
3. To what extent does the *viability* of this bundle change for the overall vendor group when all products include a type of advertisement service, whose extent depends on the participation fee?
4. To what extent does the *viability* of this bundle change for the overall vendor group when a limit on the number of competing vendors is enforced inversely proportional to the *participation fee*?

In sum, *market simulations* helped to investigate the interactions between utility scores, and produced additional insights concerning the trade-offs of various attributes concerning vendor adoption. These insights were quantified by a *viability* metric, guided by two criteria, and structured by two realistic situations; namely an imaginary growth trajectory of a community currency in a *trial phase*, and a stagnant network in an *official phase*.

3.3 Linking Methods to Research Questions

With the methods used in this thesis outlined in this chapter and the key theoretical concepts explained in the previous, let us update and conclude the conceptual framework here:

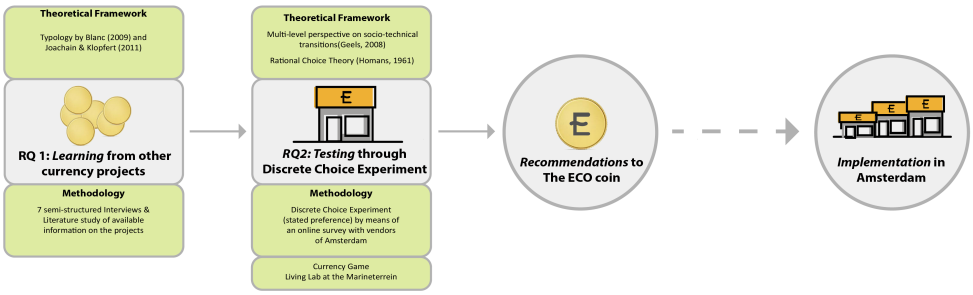

Figure 15: Complete Conceptual Framework

As we see above, the first research question makes use of a literature study and semi-structured interviews. The results of this research questions inspired the selection of attributes for the discrete choice experiment, which was used in the second research question. In other words, the second research question builds on the first and offers complementary insights to produce *Recommendations* for The ECO coin. This is all motivated by the eventual implementation of *The ECO coin* in Amsterdam. With this, we are ready to dive into the results of this thesis.

4 Results

4.1 RQ 1: Lessons from Other Community Currencies

If *The ECO coin* should be adapted to a multi-stakeholder environment successfully, it is reasonable to learn from similar projects, which have tried or managed to do so. Below are 8 community currency projects that provide valuable lessons. First, we will introduce the general currency flow model of fourth generation currencies and examine 3 examples that fall in this category. As *The ECO coin* could be regarded as a fourth generation currency, these lessons are especially transferrable. Next, we will explore the concept of a third generation currency and look at 4 examples, which also provide valuable insights. Lastly, we will study loyalty schemes, which are strictly speaking not complementary currencies (going by the typology of Blanc [2011]), but will guide us on which type of vendors should be approached. At the end of this section, the results will be summarised and synthesised to produce *Key Lessons*, which are the starting point for the second research question.

4.1.1 Fourth Generation Currencies - Reward-based Schemes

As Blanc [2011] states in his typology, one of the main qualities of fourth generation currencies is that they are "multiplex projects where local governments play a major role.". The reason this is the case becomes clear when examining at Figure 16 below: An institution (in the centre) values a certain action *A* in fiat currency. Thus, it pays an amount commensurate to a specific number of actions into the currency reserve. The *currency management*[43], which oversees this reserve, is now able to issue units *CC* at a conversion rate of 1:1 to *users* that perform the bespoke actions. The users are now able approach *vendors* (in this case *vendor 1*), which accept *CC* units, and purchase goods. As an additional (and desired) step *vendor 1* can use his *CC* revenue to buy goods from *vendor 2*, who eventually converts his *CC* revenue to fiat money at the *currency reserve*.

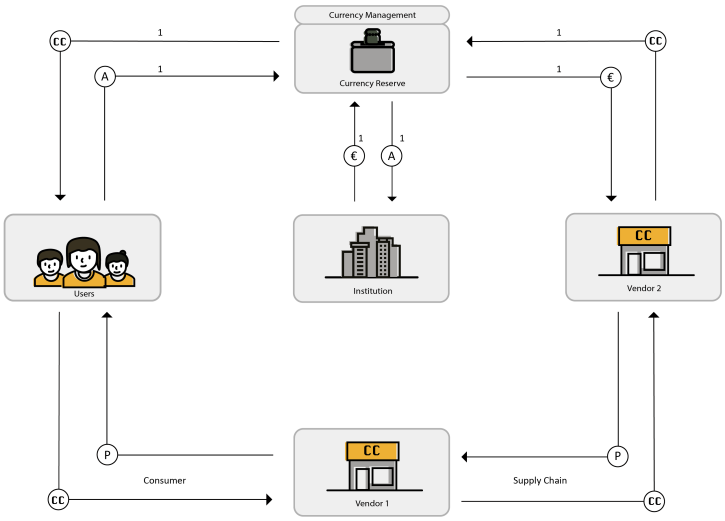

Figure 16: Simple Reward-based Currency Scheme (G4)

We can see from this simple example that the Euro value of a certain behaviour, like separating waste or local gardening, has been made explicit by a local institution. In a sense, this resembles a negative *Pigouvian*[44] tax, or *subsidy* to the individual. Let us now look at

[43] Depending on the governance structure this currency can be managed by various actors. Most of the time however, it is the currency project team who manages the currency.

[44] A Pigouvian tax after Pigou who in his seminal book *The economics of welfare* described a per-unit tax set equal to the external damage caused by an activity, such as a tax per ton of pollution emitted equal to the external damage of a ton of pollution[Harris & Roach, 2017]. It is sometimes referred to as *the polluter pays* principle.

three examples, which are built upon this model.

The Torekes - Rewarding Volunteers

The *Torekes* (Belgian for Towers), is a community currency in Ghent, Belgium, which was commissioned in 2009 by the Flemish Minister for Work and Social Economy as an experiment to find forms of "appreciation" for voluntary work[Aponte, 2018]. The objective of the currency is to strengthen the community, provide residents with an extra source of income and support the local economy. This is made possible by an annual grant of 25.000€ from the municipality of Ghent, which finances the units. Therefore a maximum of 25.000 Euro-equivalent units are circulating in any given year. While the active user base has fluctuated over the last years (between 200-400), the number of participating vendors has become stable at around 35 vendors(INT3) [Aponte, 2018].

The currency *operates* by allowing any local resident to sign up with one of the 17 voluntary organisations working in the area. Each hour of work is rewarded with 25 *Torekes*, which equates to 2.5€. This represents the *obtaining* attribute of the currency. *Torekes* units can then be spent at vendors and to rent a $4m^2$ allotment, in an area called de Site, to grow food, functioning as the *using* attribute of the currency.

As for the *technical design* of the currency, it is paper-based, and only allows vendors to convert units back to Euros. In 2017, 70% of the issued *Torekes* were spent at vendors, who are able to convert these to Euros at a conversion rate of 1:1[Aponte, 2018]. Recirculation is rare as 95% of *Torekes* units are converted after the first transaction[Aponte, 2018] by vendors. The *Torekes* is governed only by the project team, which consists of members of the NGO *Samenlevingsopbouw*.
In regards to *vendor adoption*, the project team asked the vendors to contribute to the project financially after four years of operations. This was never realised, however(INT3). Today, the project team is once again looking to give more responsibilities to the vendors; be they financial or otherwise(INT3). As Sofie Claeyssens, who is active in the currency project team, notes:

> **"To achieve that [involve the vendors] I know that our presence needs to be more clear for the vendors. In other words, they need a contact person. This was especially hard during the last years, because the contact person switched 6 times."** -(INT3)

This will be part of a larger update of the *Torekes*, which also includes the introduction of an app and a digital payment system*Torekes*(INT4)(INT6). This social currency was *implemented* in 2009 in the Rabot District of Ghent, which is the poorest area in the whole province. After the Flemish minister met with Bernard Lietaer[45], she decided to run her campaign on financing a currency that would help lift people out of poverty(INT6). After that, the initiators of the *Torekes*, approached the minister and convinced her to fund to project. Besides providing people of the area with extra income, an additional objective was tackle to main street's waste problem. This was to be done by placing waste bins in front of the vendors who accepted the currency(INT4). While the waste bins were not put up due financial reasons, the currency went ahead and onboarded 6 vendors. These included 3 local grocery stores, a pharmacy, a baker, and a local café (INT2)(INT4)(INT6). The project team went up to the shopkeepers in person and told them about the projects. The reactions they received were mixed: Some were quite enthusiastic while others, who had already given up on the area, did not want to hear about it. Of the ones that wanted to join, the majority saw the potential of attracting new customers. A small minority (by judgement of the interviewees 10-20% of vendors), truly believed in the currency's objectives and values (INT2)(INT4). The ones that believed in the values also showed up to the regular meetings more frequently(INT4). These vendors were hoping to to contribute to the revitalisation of the area. As Igor Byttebier puts it:

[45]Bernard Lietaer was a Belgian financial expert involved in the design of the Euro. Arguing for monetary diversification as a means for resilience [Lietaer et al., 2012], he was a proponent of complementary currencies and helped with the design of the Torekes.

> **"The area of the *Torekes* called Rabot held one of the main shopping streets in Ghent many years ago. In that sense the shop owners hoped to make it back to the status."** - (INT2)

The project team was particularly selective as to which vendors they would allow to join. Naturally, they did not allow supermarket chains and franchises to join (INT4). However even among vendors, butchers, pizza and pita joints were excluded because they were not aligned with the currency's core values (healthy and sustainable)(INT2)(INT3)(INT4)(INT6). The vendors that were accepted into the currency are also asked to not sell tobacco or alcohol for *Torekes*. Not all of the vendors abide to this request however. As the project lead Tom Dutry said:

> **"We also have cheaters that still sell alcohol and tobacco. In the beginning we were very severe and would kick someone out after one warning. We also have shops that let people exchange *Torekes* for Euros without buying anything. This is really hard to monitor because it's physical cash but we are aware of it."**- (INT4)

In sum, the *Torekes* is a small social local currency that has been successfully operating for over 11 years. Let us highlight the key lessons learned from this project. Firstly, the project team imposes strong rules on *using* and selects vendors based on their values carefully. Secondly, since most people are used to mobile payment today, the currency team, is planning the implementation of a digital payment system, which is part of a larger update of the currency. This digital system could also thwart cheating. Thirdly, to make the currency more resilient, the project team, which has previously been governing the currency by themselves, plans to change the governance and financing structure by including vendors.

The e-Portemonnee & The LimbU - A case for including vendors

The e-Portemonnee (Dutch for E-Wallet) is an electronic savings and reward system designed to reduce household waste and support environmentally sustainable behaviour in the 44 municipalities of the East Belgian province of Limburg [Bindewald et al., 2015]. Residents *obtain* units for actions, such as switching to a green energy provider, donating goods to a local second-hand shop, or composting food waste(INT6). These credits, which can be accessed through the national ID cards, can then be *used* on sustainable services and products, such as public transport, environmentally friendly household products or educational courses. *Using* the credits with vendors is not an option however(INT5). This was one of the reasons why the *e-Portemonnee* was limited in its perception as "real money" by the inhabitants of Limburg (INT5). To change this, a team was formed to upgrade the currency in what was to be called the *LimbU*. Like before, users would *obtain* units whenever they performed specific actions. This time however, the units could have also been *used* freely at vendors(INT5). This would give people more options to spend their money, reinforcing their view of it as "real money". Thus the restrictions on *using*, like we saw in the *Torekes*, were not planned:

> **"Also do you know the Torekes? There they forbade the buying of cigarettes and alcohol. We did not do that because we wanted to LimbU to be seen as real money. And with real money you can buy whatever you want. In other words, the green and warm [values] were on the earning and not on the spending side of things."** - (INT5)

After three years of work, practically ready to implement, the *LimbU* came to a halt due to a change in the political landscape(INT2)(INT5)(INT6). The green party, which had previously guaranteed 70% of the funding, was voted out of office. As a result, the *LimbU* reverted to the *e-Portemonnee*. Like the *e-Portmonnnee*, the *technical design* of the *LimbU* was foreseen to be fully digital. Next to a payment app, users would be able to spend units with vendors on the standard terminals with an official debit card. This was seen as essential for two reasons. Firstly, because most inhabitants were older, they did not use smartphones and preferred traditional bank cards over an app(INT2). Secondly, vendors could seamlessly integrate the currency into their operations. They would not need additional hardware, as the bank cards could be used on regular terminals(INT5)(INT6). At the end of each month, the

bank would transfer unit earnings to the respective vendor's Euro account at a conversion rate of 1:1. Users, however, could not convert earned units. Furthermore, vendors would not have to pay to enter the system. The *e-Portmonnee* is governed centrally by the provincial waste company. Examining the *LimbU's* governance structure, however, we see more intricacies than in its predecessor. The planned governance structure would have let the citizens of a municipality co-create the actions that were going to be rewarded (INT5). In other words, the citizens could decide which issues were the most pressing in their neighbourhood and propose concrete actions and accompanying rewards to tackle these.

The *technical design* of the currency as well as its marketing would have been provided by the project team, whereas the actual management and governance would have been performed decentralised by the municipalities themselves. Since the project team and the managers of the *E-portmonnee* in the provincial waste company worked together, addresses and names of the citizens were available. This would have proved useful reaching out to inhabitants to ask them to contribute to the currencies governance. Furthermore, had the project come to fruition, this would have only been possible because of the wide range of partners involved. These include the currency consultancy *Muntuit* to organise the app with *De Studio*(INT6), the Belgian bank *Belfius* to reimburse the vendors and provide a chip card, the local newspaper for marketing, the local municipalities to manage the currency, the province to provide funding, the provincial waste company to provide contact details, and of course the various vendors providing a daily outlet for the currency's users.

In the three preparatory years of the *LimbU*, the project team already worked on *vendor adoption*(INT5). In the beginning, they did this by approaching the vendors individually at their venues. Later, they reached clusters of vendors through street congregations(INT2). When selecting for vendors, the project team focused on local, small businesses, which also sold sustainable products. One motive to join for many vendors was financial gain through attracting customers. The other motive was ideological commitment to the currency's values(INT5). Naturally, the latter, was more welcomed by the project team. As users would have also been able to spend units for services at venues which were embedded in the municipalities (i.e. cinema, theatre), the project team could be particular about which vendors they would accept. As Wim states:

> **"We didn't need all the shops from the beginning. Therefore, we could really make the choice, which ones support our story and which don't. In the end we wouldn't have needed to let shops join just for getting new customers."** - (INT5)

There were also businesses which declined to join, however. There were two main reasons for this. The first was a lack of ideological commitment. Secondly, some vendors refrained from joining due to additional administrative work(INT5).

To conclude, the *e-Portmonnee* and what would have been the *LimbU* is a regional complementary currency with strong ecological values. There are a number of lessons we can draw from this currency project. Firstly, typical in a fourth generation currency, the project team has enshrined the values in the actions users have to undertake to *obtain* units and the selection of vendors by the currency team. Secondly, having a wide range of *use* option for the *users*, allows the project team to bide their time when selecting for suitable vendors. Thirdly, digital payment is seen as a central feature of this currency, to both increase the chances of adoption for vendors and users. The fourth, last and most important lesson from this example is that the wide range of stakeholders in the *LimbU* would have allowed for large scale implementation and rapid growth. To the currency project team's dismay, the withdrawal of one of these stakeholders, the provincial government, lead to the cancellation of the project as a whole. This goes to show how reliant fourth generation currencies are on public partnerships.

NU-Spaarpas - Incentivising Sustainable Consumption

Let us now turn to a currency that Blanc [2011] used as the prime example of a fourth generation currency in his typology. The *NU-Spaarpas*, was piloted in 2002-2003 in Rotterdam

and rewarded environmentally-friendly consumer behaviour. At its peak, the currency had almost 1.5 million points issued and 120 active vendors in its network [van Sambeek & Kampers, 2004]. Furthermore, through an elaborate marketing campaign and novel chip card technology, they were able to attract over 10.000 users. After a year of operation there had been a change in the political landscape, which lead to the withdrawal of funding from the project (INT1). Since the project cost 2 million Euros to establish and run for the trial period, a lack of financial support from the local government lead to its discontinuance. The currency had two layers when it came to *obtaining* the units. First, like in the *LimbU* and the *Torekes*, users were rewarded for two sustainable actions: taking local transport in Rotterdam and bringing waste to convenient spots. The latter was the reason for a considerable amount of funding by the waste management company in Rotterdam. More importantly, however, the second layer of the currency would reward sustainable consumption.

The currency *operated* similarly to a supermarket loyalty card. Consumers would collect points on their card whenever they bought products at a certified vendor. Specifically, users would *obtain* one point per Euro whenever they bought a "grey" product, and 4 points per Euro whenever a product was deemed "green". Earned points could then be *used* on "green" products only[46]. At first, a product was deemed "green" whenever it had an accepted eco-label. After a while, the project team also included specific product groups such as water-based paint, second-hand items, and even convinced certain vendors to make new products (INT1). As Edgar Kampers, the project lead notes:

> **A Turkish pizza shop for example decided to make an organic pizza because we told him he would sell more of these in our currency.** - (INT1)

In regards to *technical design*, the *NU-Spaarpas* was fully digital and the value of the currency was on par with the Euro for vendor conversion. In other words, users were only able to *use* units by buying goods or services which were sold at a 1:1 conversion rate by the vendor. Furthermore, it was free to participate for both the vendors and the users. The project team of the *NU-Spaarpas* saw that the card should be distributed to all households free of charge to make entry as easy as possible. As Points [2004] state in their report: "In that way enough people start using the card and the communication costs can be used for encouraging people to use the card. Consequently businesses and vendors will be lured by widespread use of the card."

To achieve *vendor adoption*, the project team went from door to door and informed them about the benefits. Besides looking for an intrinsic motivation, and the display of "green" goods and services, vendors with high margin per sale were preferred in the early recruiting phases(INT1). Once joined, vendors had to place an invoice with project team commensurate to the points they were able to hand out to their customers. These points could be converted to Euros by the vendors at any time(INT1), although there were extensive efforts to delay or prevent this. In other words, the project team analysed and rearranged the supply chains of various vendors, so they could use their points as to run their business. A lack thereof was also one of the barriers for vendors to join, as Edgar states:

> **Some businesses are fearful to lose money, "to pay for their neighbours".** - (INT1)

Other concerns were voiced due to prior unfavourable experience with loyalty schemes and lack of integration into the point-of-sale system. Since vendors had to (partially[47]) finance the points themselves, they preferred to sell services and experiences. This means that cinemas, theatres and other service based venues were more inclined to join. This coincides with the observation of Bindewald et al. [2015] that complementary currencies can be used to utilise unused capacity.

[46] This is usually referred to as a grey-for-green design

[47] Some of the points were subsidised by the local waste company because of the financial prospects of not having to stop at every single house.

In summary, the *NU-Spaarpas* was pilot that showed how a smart design, the involvement of multiple stakeholders and a dedicated project team can lead to the rapid growth of a complementary currency. Aside from highlighting the key lessons learned, let us use this example to delve deeper into reward-based schemes below:

Several important lessons can be learned from this project. For one, the key for its success was that it was one of the first CCs to work fully digitally(INT1). This was unprecedented at the time and highly effective in convincing both vendors and users to join. Secondly, to increase mass appeal and the user base as fast as possible, there was a professional marketing campaign in place. When comparing the user count the the currencies we have seen above (200-400 Torekes, and 25.000 as a projected cap for the LimbU), this marketing campaign must have been highly effective to achieve a user base of 10.000 in less than a year.

Another salient lesson we can learn from this currency is that the currency model incorporated the vendors in the backing of units (see Figure 17). In other words, each vendor paid for the points issued through its transactions. Crucially, this is only possible because the actions for *obtaining* were the purchases made in Euros and thus directly benefitted the vendor. In this light, it seems difficult to convince vendors to pay for actions, like separating waste or biking, because they are not accompanied by an immediate gain in revenue. Furthermore, for a vendor to break even, or make a direct[48] profit off of the scheme, it needed to sell as many green products as possible(in points not Euros as we will see below). This acted as a strong incentive to increase the amount of green product offered, enforcing the values of the currency through the elegant *technical design* of the currency. It also created competition between vendors in the complementary currency(see Figure 17): *vendor 1*, who had to issue 4 points when selling a 1€ green product to a *user*, loses 4 Euros in this transaction. This is because he previously had bought these points from the *currency reserve* and could convert them at any time for no extra charge. Next, the user uses these four points to purchase another 1€ green product from *vendor 2*, who converts these to 4€ at the currency reserve. *Vendor 2* gains 4€ at the expense of *vendor 1*.

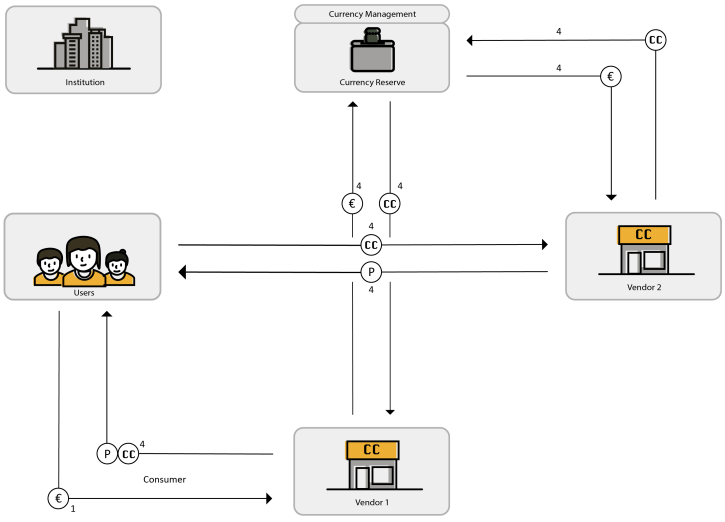

Figure 17: Fully Vendor-backed Reward-based Currency

From this example it becomes clear that it is better for a vendor to sell more green products. Even so, whether he earns or loses money also depends strongly on the user's currency of choice. For any given transaction, if a user decides to use fiat money, the vendor will lose

[48]Direct profit refers to the redeemed points earned through sales of green products. In the sense of *customer retention*, vendors could have potentially also increased their overall sales regardless of green or grey if users were inclined to buy more from them in general.

money, and if units are used, the vendor will gain money. Since the prospects of a 4€ loss at each transaction do not sound attractive, the currency team of the *NU-Spaarpas*, managed to have some of their points financed from the municipality of Rotterdam(INT1). While the exact ratio of vendor to municipality funding is not available in the literature, let us assume that any given vendor would only have to pay for every fourth point it issued(see Figure 18): Practically, this means that a vendor can buy 4 units from the *currency reserve* for 1€, which it must give away to a user in a transaction involving a 1€ green product(or four 1€ transactions of grey products). Like before the user *uses* these units to buy a 1€ green product from *vendor 2*, who converts these points to 4€ at the *currency reserve*.

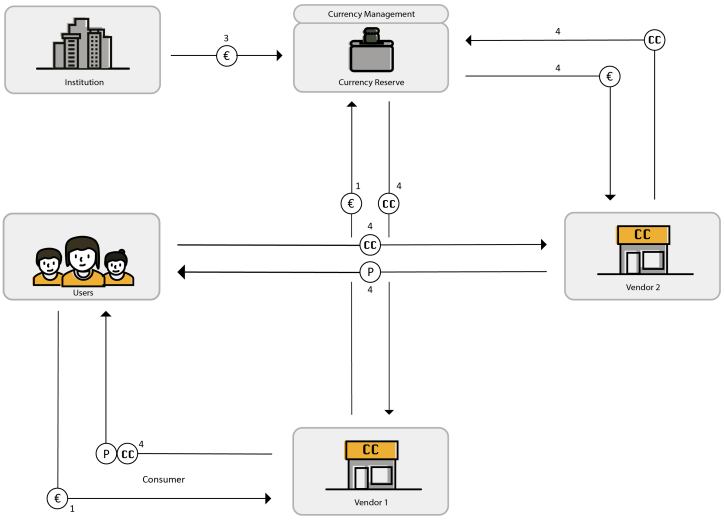

Figure 18: Partially Vendor-backed Reward-based Currency

The partially vendor-backed model in Figure 18 presents much more favourable conditions to the vendors than in the one we saw above (see Figure 17). While the reason for this is trivial, loopholes of the system should not be overlooked. In theory, a vendor could buy 4 units for 1€, and without selling any (green) products convert these units back to Euros at a conversion rate of 1:1. By cheating the vendor makes a personal gain, and undermines the goals of the currency. From it a technological standpoint it is, therefore, important to differentiate between "issued" and "idle" units. This example shows clearly how money systems are limited when they are physical rather than digital. Since the *NU-Spaarpas* was fully digital cheating this way was not an issue.

The final and most important lesson of this example is that despite the partial backing of points by vendors, the currency's continuance and success remained strongly reliant on governmental ties. This is evident by its abolishment when the municipality ceased to support it. The story of the *NU-Spaarpas* is similar to the one of the *LimbU*, in that the strong reliance on public partnership could have helped to grow the network rapidly, but also made the project volatile.

4.1.2 Third Generation Currencies - Convertible Schemes

Let us move down one generation and take a look at the most common complementary currency model: *convertible schemes*. In regards to their *technical design*, these systems are fundamentally different from the ones we have explored so far. Therefore, it is reasonable to examine the basics of such systems first, and then look at concrete examples. These examples will illustrate important concepts such as *conversion malus*, *demurrage*, *tax-driven money* and give us further examples of how sustainable values can be expressed explicitly and implicitly. In convertible schemes units are not issued through actions but require the users to convert Euros to units. The initial conversion is, therefore, performed with the intent of spending

ones money in ways which are aligned with the objectives and values of the currency. This is an important difference to fourth generation currencies, as the enactment of values is fully shifted to the *using* side. This begets the intensified need of keeping the units circulating, as long and often as possible, before they leave the system through the conversion to fiat money. To achieve this, not only users but also vendors need to find or be provided with an option to *use obtained* units. In Figure 19, below, an example of a convertible scheme, which has managed to achieve circulation, is shown.

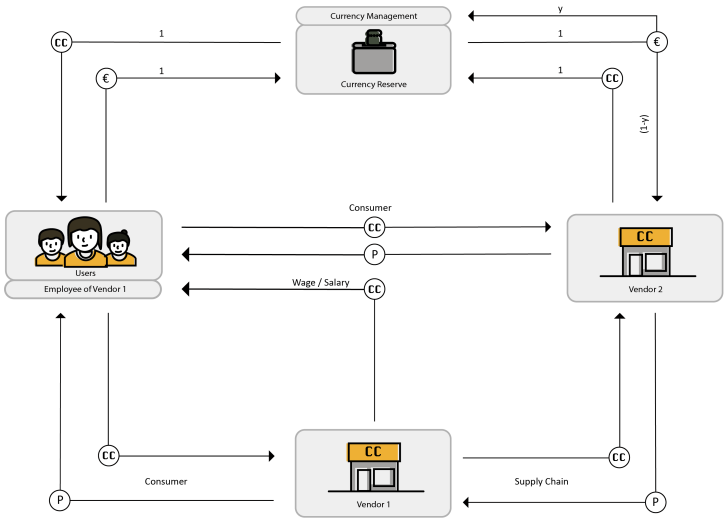

Figure 19: Convertible Scheme with Vendor Malus at Unit - Fiat Money Conversion

Starting on the top left of Figure 19, *users* pay Euros to the *currency reserve*, which gives back *units* (CC) according to a fixed conversion rate. As long as this conversion rate is fixed, the reserve always holds the exact Euro value of the money in circulation. Users with units in their pockets can use these to buy products or services from vendors. In this illustration there are two vendors, which the user can engage with. As both vendors accept the currency from users, they also agree to use the currency between each other: *vendor 2* is a supplier of *vendor 1*; they decide to transact using units.

Lastly, *vendor 1* decided to pay its employees' wages in units. They, in turn, are able to spend their units at another (or the same) vendor. The units circulate, reaffirming the meaning and values of the currency at each transaction; a circuit of commerce is created[49]. Besides not allowing for the conversion from units to Euros by users, the example also illustrates how conversion by vendors can be discouraged by imposing a malus (discounted conversion rate). Whenever a vendor decides to opt out (see top right), his conversion rate is no longer 1:1 but 1:(1-(x+y)), with x being an amount allocated to a sustainable project and y being a fee to keep operations going.

The Chiemgauer - Malus on Conversion & Demurrage

The version of a malus seen above can, for example, be found in the *Chiemgauer*, a regional convertible scheme in Bavaria, Germany. It started in 2003 and is the largest complementary currency in Germany today. In total, there are 476 vendors and 3500 users in the network. This year there are 770.000 Euro-equivalent units in circulation[chi, 2020]. It is estimated that

[49] For more on this see Zelizer [2006], who has coined the term *circuits of commerce*. These denote networks that have (1) shared economic activities carried on by means of those social relations, (2) a distinctive set of social relations among specific individuals, (3) a common accounting systems for evaluation of economic exchanges, for example special forms of monies, (4) shared meanings that people attach to their economic activities, and (5) a well-defined boundary separating members of the circuit from non-members with some control over transactions crossing the boundary. This definition is important as it makes the alternative view on money concrete.

for each unit used in a given transaction, 70% stays in circulation and 30% is converted[Thiel, 2011] back to Euros.

To a great extent, the *operations* of the currency, follows the version of the convertible scheme design we have examined in the introduction on third generation currencies. By supporting a sustainable community project with part of the malus[Gelleri, 2018], this currency has found an elegant way to weave the fee on conversion into their value system. Moreover, in the *Chiemgauer*, users are able to choose which project they want to support with their purchases. Practically, this means that when a user converts Euros to *Chiemgauer*, 3% of that amount is directly donated to a project at the users discretion. So when a vendor converts its earnings to Euros the conversion rate is reduced by these 3% and an additional 2% for operations. This makes the values of the *Chiemgauer* explicit. Users do not only support the local economy but choosing vendors that are often embedded in a local supply chain, but also directly stimulate development of the area with their purchases. This is among the reasons, the *Chiemgauer* has been called "a superior money"[Thiel, 2011]. The transparent allocation of the malus is a motive to join for users, and ameliorates the perception of a fee on converting for vendors, as they feel that money is being put to good use(conference session day one in Brussels). Additionally, the malus incentivises local businesses to spend their earned units in their supply chain or in wages. It therefore becomes both a means, in terms of strengthening the local economy, and an end in supporting social and environmental causes. Over the years, the malus has cumulated to almost 715.000 € in support for local projects. This despite many of the 476 vendors are able to spend all of their revenue in the local economy each month, thus avoiding the malus entirely[Gelleri, 2018]. This revenue can range from a couple of hundreds to multiple thousands a month of euro-equivalent units, which when higher incentives the spending rather than converting[Gelleri, 2018]. Another noteworthy feature in this currency's *operations* is its *demurrage*. A *demurrage* is defined as a built-in pre-programmed depreciation of the nominal value of a currency[Godschalk, 2012]. The idea follows the proposal of *Freigeld* by Silvio Gesell, which has inspired the introduction of a *demurrage* in many complementary currencies thereafter[50]. In its digital form, an amount is simply deducted from a user's checking account whenever units lie there for longer than 6 months. In the physical money system of the *Chiemgauer*, this is realised through stamps that have to be bought every 6 months to keep notes valid [Gelleri, 2018]. The money collected from these deductions is further used for the currency's operation.

As for the *technical design* of the *Chiemgauer*, there are physical and digital units[chi, 2020]. Using the currency is free for users, while vendors have to pay a participation fee of 12 € a month[chi, 2020].

The currency is *governed* by an NGO called *Chiemgauer e.V.*. The NGO is lead by an executive board, which is democratically elected by all *regular members*. Anyone using the currency may become a *regular member* by paying a 30 € participation fee. The bylaws of the NGO can be amended and changed in a general assembly, in which each regular members can cast one vote. Changes are enforced upon a 3/4 majority. Beyond the democratic governance structure, the *Chiemgauer* also has multiple partners. These include 10 municipalities in Bavaria, 6 banks, and multiple task forces for sustainability. The currency team has, furthermore, managed that *Chiemgauer* checking accounts can be opened at all cooperative banks in the region.

[50] Gesell believed that the primary function of money should be the one of a *medium of exchange*. In fact, he saw other functions of money, such as the *store of value*, competing with this main function. Interestingly, *demurrage* would not only prevent hoarding but also thwart the creation of undue *surplus value*. Differently from Karl Marx, who attributed the creation of *surplus value* to production (see Schumpeter [2013]), Gesell insisted that *surplus value* is created because money is a superior commodity since it does not perish[Peacock, 2014]. In other words, the holder of money could, knowingly that the producer's goods will degrade over time, delay a transaction. With this in mind, the producer could, therefore, pay less than the commodities actual worth. As a solution, Gesell was convinced that money should systematically decrease in value the longer it remains with its holder. He writes: *"Money should . . . like commodities, rust, become mouldy and rotten".*[Gesell, 1991]

In sum, this wide net of partners is both conducive to and a result of a successful currency management from which many complementary currencies can learn from. Its currency design holds features such as the *malus on conversion* and *demurrage*, which can undoubtedly ring unorthodox to ears which are used to the narrative of full-purpose fiat money. For this reason, not all currencies have managed to integrate these features without resistance. To study this further, let us look at two currencies in which vendors felt dismay in a currency design that had these elements.

Brixton Pound & Stroud Pound - Complications of Demurrage and Malus

We have previously seen how two features of the convertible scheme currency model, namely *malus on conversion* and *demurrage*, can operationalise the values and attain the objectives of a currency. These features are not always welcomed by all stakeholders, however. Especially vendors, which we have posited as essential stakeholders of fourth and third generation currencies, sometimes have issues with the operational and financial implications of these features. In order to learn more about the complications of *malus on conversion* and *demurrage* on vendors, let us move to Great Britain, home to the *Stroud Pound* and the *Brixton Pound*.

The *Brixton Pound*, a convertible scheme initiated in Lambeth Council, London, revoked their malus after vehement backlash from vendors. Since its launch in 2009, the *Brixton Pound* has experienced a remarkable growth. In 2010 the currency had B£30.000 circulating yearly; five years later, in 2015, the currency already had an estimated B£20.000 in circulation per month[Hanbury, 2016]. Furthermore, launching with 60 vendors in 2009, growing to 180 vendors in 2010[Ryan-Collins, 2010], reaching 250 vendors in 2014[Degens, 2019], and featuring 339 vendors today, the vendor count has also been steadily increasing over the years. These vendors span all sectors and are spread out over Lambeth Council[Bri]. While the *Brixton Pound* is also a convertible scheme, today, it does not have a *demurrage* or a *malus on conversion*. While it never had a *demurrage* to begin with, it did feature a *malus* until late 2013. This malus was a result of the *The Brixton Bonus*, which was a 10% bonus on conversion for users. For example, upon conversion users would receive 11 £Brixton for 10 €. In turn, this bonus had to be balanced by a 10% malus for vendors. The idea was to attract users to the scheme, while discouraging conversion of vendors, who would instead recirculate units.

For the *technical design*, the currency started off paper-based. At this time it was the first English local currency in an urban setting[Bri]. After two years of operations, the project team added a digital *Brixton Pound*, which provided the project team with an extra source of income through a 1.5% transaction fee (incurring on the recipient). This was implemented through a pay-by-text system and was later replaced by a smartphone app. Since cash-less payments are common in the UK, the eB£ soon cast a shadow over its paper-based antecedent.

Concerning the *governance* of the *Brixton Pound*, The project team consists of a particularly diverse group of actors. It included academics from the *New Economics Foundation (NEF)*, project team members of a former[51] community currency in Brixton, and members of *Transition Town Brixton*, a committee to initiate sustainable projects in the town.

In regards to *vendor adoption*, the main motive for vendors is that they are advertised on the *Brixton Pound* website. This is done in the form of a directory with an accompanied map, an occasional blog post for specific vendors (called *Meet the Trader*), and regular posts on social media. As one of the most active vendors, the owner of a bicycle shop, notes:

> **"Its about marketing and it's not just about business, it's about long term business. So we've obviously been here about what nearly 30 years and we hope to be here for another 30 years... without sort of banging your own drum, we are sort of like a stalwart Brixton business who have been here since the riots, so it adds consistency to people's lives. So it's like, "Oh thingy might be in trouble, but there is always Brixton Cycles". Brixton cycles is there, some things are always**

[51] This was a LETS scheme (see [Blanc, 2011]) which ran under the name of *Brixton Bricks*.

> **constant and I think being involved in the B £ just reiterates our commitment to the community..."** - Excerpt from an Interview by Ryan-Collins [2010]

Some local businesses however, refrained from joining the currency at first. Up until late 2013, the major barrier for vendor adoption was the *malus on conversion*. In the words of a vendor:

> **It was just a clever marketing scheme you know. And the businesses had to pay** - Note on the 29.3.2014 by Degens [2019]

In the end, due to this backlash, the project team decided to revoke the malus (and the *Brixton Bonus*).

Moving on to our second example in England, the *Stroud Pound* was a paper-based third generation currency that aimed to strengthen local economic links in Stroud and the surrounding Five Valleys area (UK)[Cato & Suárez, 2012]. The *Stroud Pound* was initiated in 2009 and had a design almost identical to the *Chiemgauer*[52].

In the currency's second year of *operations*, 10.000 Pound Sterling-equivalent *units* were *obtained* by users. In the same year, however, 60% of these were converted back to Pound Sterling[Cato & Suárez, 2012], indicating a lack of trust and use options for vendors and users. This also foreshadowed the gradual decline in use over the years and its eventual discontinuation in 2013[Degens, 2019].

The currency was officially *governed* by the *Stroud Pound Co-operative Limited*, which would allow users, vendors and organisations to vote on the rules of the currency. To join this cooperative, applicants would have to pay a one-time fee of 5 £ . Despite its democratic structure, governance proved to not be democratic after all, since many members were not aware of their right to vote[Degens, 2019]. The *Stroud Pound* also lacked political and institutional ties, as the Council Stroud had concurrently initiated the *Stroud District Local Loyalty Card*. This loyalty card was seen as too similar to the *Stroud Pound*, to be supporting it. Furthermore the vendors were displeased in regards to *demurrage* and *malus*. Among the lack of democratic governance and partnerships, this contributed to the discontinuation of the *Stroud Pound*[Cato & Suárez, 2012]. Let us examine how these barriers to *vendor adoption* hampered the growth of the currency in more detail below.

In regards to the *malus on conversion*, the *Stroud Pound* project team faced similar criticism to the *Brixton Pound*. Cato & Suárez note that for vendors, a 5% malus, which was initially enforced, loomed unjust. This is why the project team reduced the malus to 3%. This, however, meant that no funds could be drawn from the malus to run operations, making the project team reliant on the one time participation fee of vendors. Even then, however, the currency scheme was under critique, at one point inspiring a counter-movement in form of a local voucher-scheme between a group of businesses. This voucher scheme included discounts, ranging from 10-20%, which were far higher than the malus of the *Stroud Pound*. This is why the project team saw it is an internal objective to *educate* users and vendors on the intricacies of the money system. Next to a lack of understanding of the money system, however, a lack of local supplies for vendors was found to make the malus an unattractive feature of the currency. This was the case even though over half of the local businesses were buying some of their products from other local businesses[Cato & Suárez, 2012].

Demurrage was another factor that deterred vendors from joining or staying in the currency network[Degens, 2019]. To recapitulate: *Demurrage* is the built-in pre- programmed depreciation of the nominal value of a currency. In the paper-based currency, that was the *Stroud Pound*, this was administered through stamps which were stuck on the backside of a note every 6 months. From a vendor's perspective, this meant that each time someone paid with

[52] In fact, it was modelled after the *Chiemgauer* with the help of Christian Gelleri the founder of the *Chiemgauer*[Degens, 2019][Cato & Suárez, 2012].

Stroud Pounds, it would be necessary to check each note for completeness of stamps. This extra task was cumbersome for some vendors, as former vendor Nic describes:

> **"That's the problem that we found because they had a demurrage... People forgot about it... and my staff were busy... there is a queue and we don't look and see and work out the day so is it six months from that day so you know, and then you had to get these stamps... so we ended up with most of our notes out of date".** - Excerpt from an Interview by Degens [2019]

If Nic had not been able to make a deal with the project team, he would have lost 10% of his *Stroud Pound* earnings when converting to Euros (5% demurrage + 5% malus)[Degens, 2019]. Miles, another ex-vendor in the *Stroud Pound*, sees the concept of demurrage as as something that is preventing the currency from being "real money":

> **"What was also a problem within the scheme that I wasn't very good with, is the fact that Stroud Pound devalues the longer you hold it. You know I don't mind holding 50 quid upstairs for 6 months. But if it's going to lose money then..."** - Excerpt from an Interview by Degens [2019]

This is confirmed by Cato & Suárez [2012], who after a year of the *Stroud Pound's* operations observed that *demurrage* is unpopular in part due to a general *misunderstanding of money*. Clare Mahdiyone, a co-founder of the *Stroud Pound*, also corroborates this:

> **"People didn't like that [demurrage]. And particularly businesses don't like it. So what we found was that people [users] were quite keen to use it but we found it hard to get the businesses to sign up to it."** - Excerpt from an Interview by Degens [2019]

Motivated by the feedback of vendors, co-founder Bernard, intends not to include a *demurrage*, should the currency ever be relaunched[Degens, 2019]. Instead, he would give the notes an expiration date[53].

To conclude, we learned by these two examples how malus and demurrage can influence vendor adoption. In the case of the *Brixton Pound*, which is still operating today, we saw that in order to please all stakeholders, the malus had to be removed from the currency design. In the case of the *Stroud Pound*, which ceases to exist today, we saw how these features can act as barriers for adoption for vendors and ultimately contribute to a currency's failure. It would be a mistake, however, to attribute the failure of the *Stroud Pound* solely to these two features. After all, the same currency model is still thriving in Bavaria. It is apparent that unorthodox features, like demurrage and malus, only become a problem when users and more often vendors do not have enough options to use their currency as is hoped for. In other words, a currency will be trusted more when there are sure outlets (aside from converting). In the next example, let us study the surest outlet of all: *taxes*.

The Bristol Pound - More Use Cases for Units

In 2012 the launch of the Bristol Pound attracted significant media attention, as Bristol became the first city in the UK to launch its own currency and gain the support of the local council[Bendell & Greco, 2013]. Its objective was to create a more resilient and sustainable independent business sector in Bristol, and in turn, a fairer and more inclusive local economy[Sealy, 2019]. Like other convertible schemes, it aimed to reach this objective by encouraging the circulation of money through the local economy. The currency had over 570 vendors and 1500 individual members[Marshall & O'Neill, 2018], operating regionally in Bristol and the surrounding Avon Area. It was the largest local currency of the UK as according to the Bristol Pound CEO, in the year of 2015, £1 million had been issued in £Bs, with more than £B700,000 in circulation[br3]. By late 2017, 5 million £B have been spent (since its launch), which raised doubt whether the currency truly had an impact on the local economy[br2][Marshall & O'Neill, 2018]. In early 2020, the local newspaper reported that the

[53] Although he did not know yet whether a note should become worthless beyond the expiration date

reach of the currency had been substantially declining since 2018. Most recently, the project team announced to be transitioning to the so-called *Brixton Pay* platform, of which details are still unknown[br1][54].

The *technical design* for the *Bristol Pound*, featured both a paper-based and an electronic payment option (pay by text), facilitated by a local financial institution(see below). Historically, participation of vendors and users was free. Furthermore, the currency had no demurrage or malus, imposing no additional costs on vendors. As a result the currency's operations were dependent on grants[Sealy, 2019]. The aforementioned transition to *Bristol Pay* has consequences for the *lifetime* of the paper-based Bristol Pounds, as they will only remain in circulation until their expiry date of September 30th 2021. During this time, no new members (vendors and users) may join the network.

The currency was *governed* by the non-profit *Bristol Pound Community Interest Company* and the *Bristol Credit Union*, which is a non-profit co-operative offering financial services (e.g. loans) to locals of Bristol. As mentioned above, the currency enjoyed substantial political support since its launch in 2012. This materialised in the city accepting the Council tax[55] (from users) and business rates (from vendors). The Bristol City Council, and other organisations in the city, would then offer their employees the option to take part of their salaries in Bristol Pounds. A striking example of this was when George Ferguson, former mayor of Bristol, accepted his entire salary (£51.000) in Bristol Pounds to endorse the currency[ma1][ma2].

Regarding *vendor adoption*, a recent study by Sealy [2019] studied the kinds of services and features vendors in Bristol value and would find attractive as part of a paid membership package that the £B might provide. It showed that should the *Bristol Pound* want to introduce a participation fee for vendors, it would have to radically improve their services in regards to promotions, technological infrastructure and networkingSealy [2019]. Furthermore, the findings indicate that ideological discourse without a clear value proposition risks alienating vendors.

In sum, the *Bristol Pound*, which operated regionally and enjoyed substantial political support, was the largest complementary currency of the UK. The currency gave users and vendors a sure outlet for their units by means of paying taxes(see Figure 20). Proponents of a number of economic and monetary theories[56], argue that the need of paying of taxes in a currency gives that currency its legitimacy[Chohan, 2020]. While paying taxes with £B is not mandatory, it does provide a sure outlet for excess units. Ryan-Collins et al. [2012], who studied the *Brixton Pound*, expresses hope that the Council's acceptance of the £B for the payment of business rates will serve to encourage small businesses to join the scheme by providing an outlet for excess £B. Below is an illustration of the currency model of a currency like the *Bristol Pound* (despite not having a malus, i.e. y = 0 %).

[54]For more information you may subscribe to the newsletter on the official *Bristol Pound* website

[55]The Council Tax is an annual fee residents of the UK have to pay to their local council. The cost is set by the council and goes towards funding local services like waste management and libraries.

[56]This includes the *Chartalist school of monetary theory.* as well as *Modern Monetary Theory*

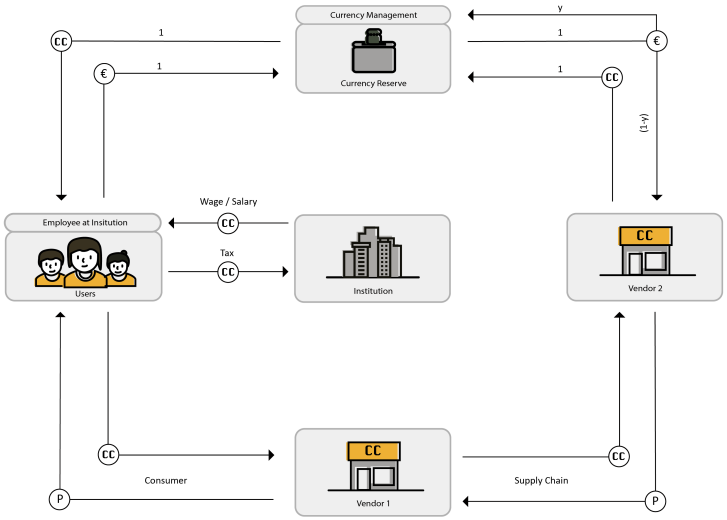

Figure 20: Convertible Scheme with Vendor Malus at Unit - Fiat Money Conversion and Local Government Partnership

In Figure 20, above, users and vendors of the *Bristol Pound* have the option of *using* units to pay a tax to the local municipality (*institution*). As a result, the local municipality can *use* these units to pay wages and salaries to its employees.

There are two important interrelated lessons we can draw from this currency:

Firstly, political support can act as strong stimulant for adoption of both users and vendors. This is due to increased trust that one can *use* units at any time.
The second lesson is that as political support decreased, the currency declined. As we saw in previous fourth generation currencies, an over-reliance on government support can make a currency unstable. While the *Bristol Pound* was a convertible scheme, which meant that units were not financed externally, taxes as an outlet for units resulted in complacency and diminished the need to foster a strong value proposition. Especially in the case of vendors the option to use units on taxes could have prevented the localisation of supply chains [Dittmer, 2013].

Le Val'heureux - A Citizen Currency

Coming back full circle, the last currency we will study is the *Val'heureux* based in Belgium's French-speaking Wallonia. Launched in 2014, the convertible scheme aims to foster a strong local economy and fair working conditions. While the exact amount of circulating units are unknown, the official website states that: "Compared with the size of the regional economy, there are still few Vs in circulation."[val]. In May 2019, Le Val'heureux had more than 290 partners, which operate in 71 towns and villages, spanning over 6 different regions around Liège. As indication for the user count, the currency's Facebook page has over 3000 "likes".

The currency's *technical design* foresees a participation fee. This covers the currency project team's operation. Since it is a convertible scheme it is not reliant on any further external funding, making it fully self-sufficient(INT7). Whereas in the past, vendors had to pay 25 € per year and it was free for users, the recent introduction of a digital payment system also brought with it a small user fee of around 5 € a year(INT7).

In regards to *governance*, contributing users and vendors receive one voting share to elect a board of directors in the NGO *le Val'heureux*. This board is allowed to change and amend the currency charter. These bylaws, among other things, define what is expected of vendors that intend to join(INT7):

- The vendor should not abuse short-term contracts to make economic gains.
- The decision-making power should be with the vendor, in that the vendor owner works there or is a local.
- The vendor sells mostly local products and is not reliant on foreign suppliers.
- The vendor offers good working conditions to its employees.

In Spring 2019, the mayor of Liège, submitted a motion to support the development of the *Val'heureux* to the vote of the municipal council. From this, new partnerships have emerged, such as the collaboration with the energy office, the tourist office, the Liège trade and various other structures for organising events. Furthermore, the currency works in close collaboration with the NGO *Financité*, which stimulates and supports collective initiatives in responsible and united finance. In other words, the *Val'heureux* has both partnerships with institutions and knowledge platforms.

Concerning the *vendor adoption* process, of all the currencies we have investigated, this currency is the most particular about the selection of vendors. Some vendors, like local grocery stores, are highly welcomed, while others, like franchises or even small vendors that only work with large wholesales, are disqualified immediately. As project team member Nicolas Franka notes:

> **"Franchises, on the other hand, are no-gos. They are fundamentally not compatible with a local economy because a part of the turnover will always leave the area."**

However, certain vendors land in the "grey zone" and are asked to make some changes in their operations before allowed to join. Examples are local grocery vendors that mostly source locally but also sell good from multi-national corporations. As Nicolas reports:

> **"You wouldn't believe how much it hurts businesses to not have coca cola. So we usually have the deal that you can have coca cola on the very bottom shelf but not on the top. The top shelf will have to have all the local products."**

In the past, the project team trusted the vendors to give truthful information about suppliers and products on display. It was, therefore, not necessary to visit and inspect the vendors. As the vendor network grew, however, they began to visit vendors to validate the information they provided. If a vendor does not enact the charter, which it had signed upon joining, the currency team provides support to improve its operations. For example, if a vendor does not source locally, the currency team would make a list of suppliers which the vendor could switch to. As this may take some time, the project team also uses this process to delay the conversion from units to Euros until the issue has been ameliorated(INT7). In other words, the vendor either spends its unit earnings in the network, or improves its operations to be able to convert.

To conclude, the *Val'heureux* in Belgium is a growing social currency that is financially self-sufficient. It does, however, foster strong ties to knowledge and governmental institutions. The major lesson from this currency is that a *malus on conversion* is not always necessary to incentivise recirculation and reinforce the currency's values. Rather, this can be achieved through delaying the conversion process itself while asking the vendor to ameliorate its operations. Justified by a consensual charter, this measure is an elegant way to avoid additional costs on the vendor.

4.1.3 Loyalty Programmes

Somewhat distant from the currencies we have looked at up until now are commercial loyalty programmes. Even so, complementary currencies can learn from them to approach the right kind of vendors with a sound value proposition for their project. Before further investigating this, however, let us briefly define loyalty programmes and highlight the relevant design types.

A loyalty programme can be defined as an integrated system of marketing actions that aims to make member customers more profitable by enhancing their loyalty[Leenheer, 2004]. This is worthwhile because it is less expensive to retain customers than to acquire new ones[Reichheld & Sasser, 1990]. There are various design types of loyalty programmes, generally differing in their reward mechanisms (customer tiers or frequency rewards) and number of partners(single vendor or multiple vendors). For the sake of comparability with complementary currencies, we will focus on loyalty programmes which allow users to *obtain* reward *units* (i.e bonus points) whenever they purchase a product or service from a vendor.

Value Proposition

To understand how complementary currencies could enhance their value proposition to vendors, let us take a look at *coalition loyalty programmes*. Differently from single-vendor loyalty programmes, these loyalty programmes feature multiple partners at which units can be *obtained* and *used*, which makes them very comparable to complementary currencies. Usually, they are managed externally by specialised operators, while costs are shared by participating vendors[Bijmolt et al., 2010]. For participating vendors they offer strategic advantages to networking, the spillover effects of partner's images, and cross-selling opportunities [Varadarajan, 1986][Lemon & Wangenheim, 2009]. Indeed, rather than performing the aforementioned function of customer retention, these loyalty programmes have been found to help businesses expand their markets and attract new customers[Rese et al., 2013][Kopalle & Neslin, 2003]. In other words, vendors are presented with a cost effective way to tap into a new pool of customers by being associated with other vendors. Additionally, a vendor might conjecture whether initiating its proprietary loyalty programme or joining an existing one, is more likely for its customers to use it. As coalition programmes present more diverse reward options and feature a single card, which can lead to the patronising of participating vendors, they are deemed to be more attractive customers[Lara & De Madariaga, 2007] [Berman, 2006]. Next to enhancing a vendor's image with the currency-specific values, these are among the arguments complementary currencies should use when approaching vendors.

Suitable Vendors

The benefits of loyalty programmes are not equal for all vendors, as these can vary widely in their size, customer orientation, technological proficiency and sector. In their research, [Leenheer & Bijmolt, 2008] studied the influence of various retail vendor and sector characteristics on vendor's loyalty programme adoption. Let us highlight some of the key findings of this study and connect it to some of the findings of the previous part.

Firstly, Leenheer & Bijmolt found that assortment homogeneity within the sector of a given vendor considerably stimulated loyalty program adoption. When multiple vendors feature similar (or the same) products, a given vendor has more to gain from a loyalty programme. However, the same holds for its competitors, which is why it has been shown that as more competitors join the programme it becomes less attractive to do so for new vendors[Mägi, 2003]. This is one of the main reasons *coalition loyalty programmes* focus on complementary, and not competing vendors. In fact, [Sharp & Sharp, 1997] find no network effects between competing partners in coalition loyalty programmes. This coincides with findings of Degens [2019], who found that vendors in one of his complementary currency case studies were unhappy with a growing network because it reduced their perceived exclusivity. Crucially, for community currencies, this stands in conflict with the desire to build a large network to offer a large amount of *use* options to vendors and users.

Secondly, size of a vendor is a determining factor of its willingness to adopt new innovation[Frambach et al., 1998][Wierenga & Ophuis, 1997]. Incidentally, loyalty programmes have been found to be more profitable for big vendors, which already enjoy an established competitive edge[Sharp & Sharp, 1997]. Nevertheless, small vendors are not less inclined in adopting loyalty programmes[Leenheer & Bijmolt, 2008]. In other words, in hopes of generating more sales, small vendors might adopt, only to find out later that it has not made them more profitable. This dissonance between expectation and outcome can be problematic to the system as it has been shown that service failure of one vendor negatively impacts the user's perceived value the whole program [Schumann et al., 2014]. For complementary currencies, these findings are relevant in terms of longevity. We already saw in the example

of the *Brixton Pound* that the majority of revenue is made by only a few vendors in the network. Paired with innate costs like a participation fee, *demurrage* or a *malus*, this could lead to vendors exiting the network, which might make their customers doubt its integrity; creating a self-fulfilling prophecy that could lead to the decline of a currency. This is one of the main reasons currency project teams should be diligent to only approach vendors which they believe can truly benefit financially from adopting.

Thirdly, a retail vendor's technological skills were found to influence its adoption of loyalty programmes[Leenheer & Bijmolt, 2008]. In their study, this was the case because vendors were asked to adopt a self-managed loyalty programmes, in which vendors themselves have to analyse customer data. As, complementary currencies usually delegate this task to the project team, the transferability of this finding is questionable. It does, however, point to the general fact that vendors can be reluctant to make changes in their operations. In this sense, in loyalty programmes, vendors which do not have the capabilities of analysing data might not acquire this skill (through hiring or learning) just to be able to adopt a loyalty programme. For complementary currencies, we already saw how essential electronic payment systems are deemed to onboard vendors and users(see for example *LimbU*, *NU-Spaarpas*, *Brixton Pound*). In the *Nu-Spaarpas*, for example, the key to success was to introduce chip-card, which would seamlessly integrate into vendor's point-of-sale system. Moreover, in the *Brixton Pound*, we saw how upon the introduction of the e£B, the physical notes became obsolete.

The three findings by [Leenheer & Bijmolt, 2008], which we have looked at above, could act as additional criteria for selecting vendors in order to maximise not only adoption but also long-term success of a given complementary currency project.

4.1.4 Summary of Key Lessons

To answer the first research question, we have examined the design and implementation of 8 community currencies and have extracted additional insights from loyalty programmes. Let us now recapitulate the key lessons learned. These build the foundation for the recommendations towards a community currency like *The ECO coin*, which seeks to implement into an urban environment. The delineation between *currency design* and *vendor adoption*, as well as the general order of the descriptive analysis (see section 3.1) will guide the structure of this summary. The lessons that are marked by an asterisk below, were further investigated by means of the DCE, of which the results are presented in the next section.

Currency Design

1. Operations
   - Fourth generation currencies enact values on the *obtaining* and the *using* side.
   - Fourth generation currencies require strong institutional alliances, which when broken may lead to the discontinuance of the currency.
   - Fourth generation currencies present policy instruments in form of a negative Pigouvian tax to institutions.
   - Third generation currencies (convertible schemes) enact values on the *using* side.
   - Third generation currencies often have the strengthening of the local economy as their main objective. This is usually achieved by creating incentives to spend units, rather than convert them.
2. Technical Design
   - Third and fourth generation currencies often peg their units to the fiat currency in the area(e.g. Euro-equivalent units).
   - In recent years, most third and fourth generation currencies have seen it as essential to include an electronic payment option. In some currencies, a simple pay-by-text sufficed, while others opted to build an app.
   - Demurrage, mostly seen in third generation currencies, can be a way to finance operations by pre-programming a nominal deprecation of the given currency.
   - Demurrage is more easily implemented in an electronic than in paper-based currencies, as the latter require additional stamps keep notes valid.

- Malus on conversion, mostly seen in third generation currencies, can be a way to finance operations. The amount deducted can be partially used to fund local projects. This can overtly portray the values of a currency to users, vendors and other partners.

3. Governance
   - In line with the wish to make the monetary system more inclusive, many community currencies aim for a democratic governance structure.
   - Despite having set up a democratic governance structure, some community currencies fail to engage members and thus, in practice, are not governed democratically.
   - Practically, democratic governance is commonly carried out through general assemblies, by which all voting members gather in a room and are able to propose changes to the currency's bylaws.
   - Some third and fourth generation currencies are governed by indirect democracy, in that voting members elect a board of directors, which makes the decisions.

Vendor Adoption

1. Approach:
   - Most community currencies approach vendors in person by visiting their venues[57]. This speaks to the personal nature of most vendors.
2. Adoption Barriers
   - The barriers of adoption of a community currency can generally be of operational (economic) and ideological (value-alignment) nature.
   - A community currency's adoption by vendors can be hampered by features that impose additional financial costs on vendors (malus, demurrage and a participation fee)*.
   - A community currency's adoption by vendors can be hampered by features that impose additional tasks (paper-based demurrage and accounting).
   - Lack of integration into the vendor's point-of-sale system can act as a major operational barrier*.
   - Generally, paper-based community currencies have more operational barriers than electronic community currencies, as they are less integrated in the point-of-sale system and require additional accounting.
   - Should a vendor not already offer electronic payment methods, paper-based currencies might be preferred as it requires fewer changes in that vendor's operations.
   - Community currencies often promote values of economic, environmental and social sustainability, which when not shared by vendors could act as ideological barriers for adoption(further investigated in the next section).
   - Prior (unfavourable) experience with loyalty schemes can be a barrier for adoption as community currencies may overlap with these in their value propositions.
   - There is indication that too many competing vendors in a given network could be a barrier for adoption for a new vendor*.
   - A lack of motives to adopt can be a barrier for adoption*.
3. Adoption Motives
   - The motives of adoption of a community currency can be of operational (economic) and ideological (value-alignment) nature.
   - A community currency's adoption by vendors can be motivated by prospects of direct financial gain by attracting new customers (akin to multi-vendor loyalty programmes).
   - A community currency's adoption by vendors can be motivated by prospects of indirect financial gain through business branding and positioning, stimulating customer retention (akin to single-vendor loyalty programmes).

[57] In my survey, I also experienced that calling the vendors personally yielder a far greater response rate than reaching out over e-mail.

- Whether the financial gain is direct or indirect, community currency project teams will commonly advertise for vendors on the currency's website. This service might be considered as an operational motive for vendors to join*.
- A community currency's adoption by vendors can be motivated by shared values and goals for that community(ideological motive). These values and goals are often related to environmental, social, and economic issues in the area or of the planet as a whole.
- After a while, once the community currency network has grown and the value proposition has been proven, vendors may become more likely to join*.
- Ideological motives may not be sufficient to keep a vendor inside a community currency's vendor network for long. In other words, operational benefits, like the ones mentioned above, may need to be present to ensure enduring and active vendor members.

4. Value Proposition & Vendor Selection
   - To increase the adoption rate, a community currency project team might consider not only selecting vendors based on values (i.e. sustainability) but also take into consideration firm characteristics such as size, technological proficiency, and the type of vendors which are already present in the network*.
   - If a community currency project team is specific in their value proposition towards vendors, it might increase chances of adoption.
   - Vendors seem to prefer to have a clear contact person at the community currency project team.

4.2 RQ 2: Willingness of Vendors to Adopt *The ECO coin*

Prior to the experiment several questions concerning general information were asked. Based on the answers to some of these questions, it was possible to construct meaningful groups of vendors[58]. For example, one question asked for the average number of daily customers. Based on the answers of this question, the respondents were grouped into 4 groups delineated by quantiles (see Figure 21).

Daily Customers (mean = 45)		Number of Staff at POS		Sustainability is Important		Experience with Loyalty Programmes	
(0-15]	27 %	One	47 %	Yes	73 %	No	77 %
(15-30]	25 %	Two	23 %	No	15 %	Yes	20 %
(30-76]	23 %	Three or more	30 %	I don't know	12 %	I don't know	3 %
(76-100]	25 %						

Figure 21: Descriptive Statistics of the Respondents

Likewise, groups based on *Number of Staff at POS*, *sustainability is important for our shop*, and *prior experience with loyalty programmes* were constructed to facilitate a more differentiated analysis(see Figure 21). We will use these groups later to detect peculiarities in preferences among these groups[59]. Lastly, while it was not used to build groups, the survey revealed that all but one vendor in the respondent group had experience with community currencies. This suggests that The ECO coin would the be first community currency to work with wide-scale local independent businesses in Amsterdam.

[58] Not all preliminary questions proved useful in creating groups. For example, a differentiating on *prior experience with complementary currencies*, would have been unreasonable, as there was only one vendor that did.

[59] Unfortunately, the number of vendors per group tends to smaller than we would have ideally hoped for. As a result, whenever a result is presented by these differentiated vendor types, it should be kept in mind that the 95% confidence intervals are quite large; sometimes even larger than the actual differences between the groups. Whenever possible, the range of these confidence intervals is shown by grey brackets.

4.2.1 Analysis: Attribute Utilities and Relative Importances

In this section, we'll analyse the results of the DCE by attribute and attribute level. As explained in more detail in section 3, relative importances are calculated from the utility scores of the respective attribute levels. In this part, we will go the other direction, by examining the relative importances of attributes before delving into the utilities of their respective levels.

Let us start by comparing attributes by their relative importance for the overall vendor group and respondent groups based on the aforementioned characteristics (see Figure 21). As can be seen below in Figure 22, the attribute *participation fee* carries the largest importance among the five attributes (36%). Second and third place is taken by *current users base* and *type of advertising provided*, with 22 % and 17% respectively. The *requirement to install new technology* and the *number of direct competitors* was deemed least important by the surveyed vendors (12% and 14%).

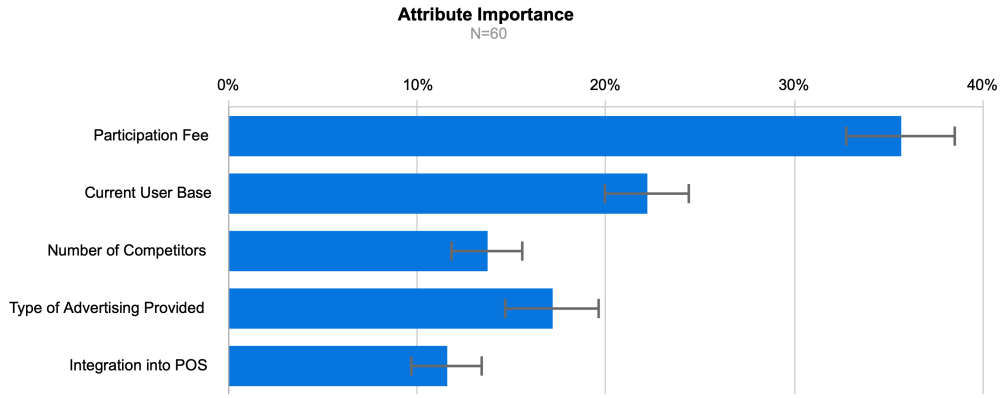

Figure 22: Relative Importance of Attribute of the Overall Vendor Group

Based on the question: *how many employees work at the point of sale at one time?*, only small differences in attribute importances emerged between the three groups (see Figure 24). Perhaps the most notable difference among these was that vendors with three or more employees at the point-of-sale placed more importance on *number of competitors* than the other two groups(16% versus 13%). Furthermore, the data indicates that vendors with more than one employee at the point-of-sale place more importance on the *current user base* than single-person shops(22% and 25% versus 20%). Lastly, the attribute *type of advertising provided* was deemed least important by vendors with more than 3 employees at point-of-sale(15% vs 17% and 18%). However, caution is due when interpreting these differences, as they are overshadowed by their respective 95% confidence intervals. In other words, a larger sample size would be needed to make these claims more reliable.

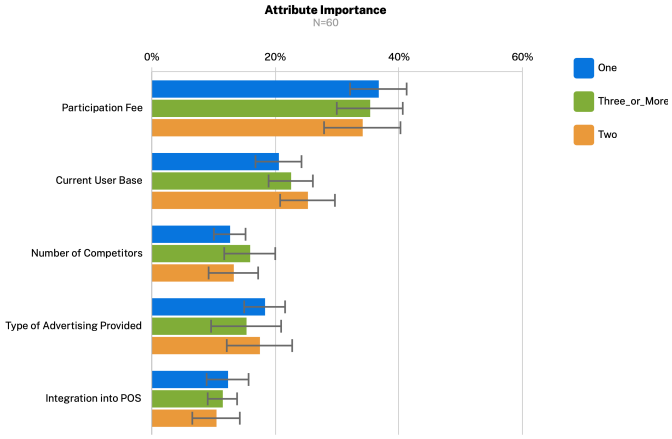

Figure 23: Relative Importance of Attribute by Number of Employees at Point-of-Sale

When differentiating based on the answers to *how many daily customers do you have?* also only small differences in attribute importances emerged between the four groups (see Figure 24). Perhaps the most notable difference among these was that vendors with 76 or more daily customers placed most importance on *number of competitors* (17% versus 12%, 15%, 11%) but least importance on *participation fee*(33%). Furthermore, the data indicates that vendors with 15 to 30 daily customers place the most importance on the *participation fee* (39% versus 33%, 37% and 33%). Lastly, the attribute *type of advertising provided* was deemed most important by vendors with fewer than 16 daily customers(20% vs 16%, 18%, 15%). Again, caution is due when interpreting these differences, as they are significantly overshadowed by their respective 95% confidence intervals.

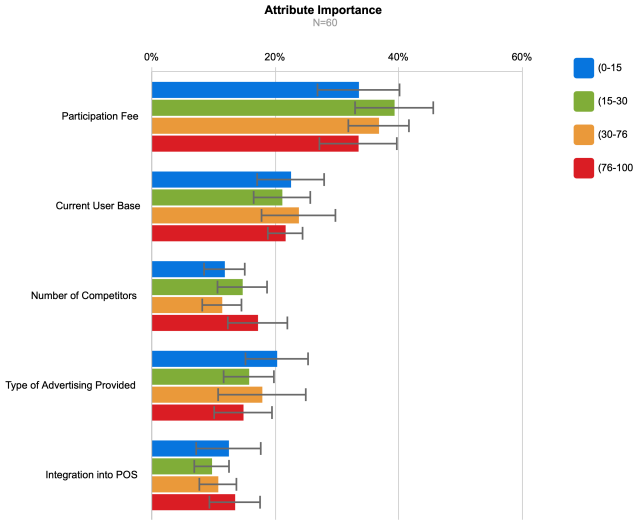

Figure 24: Relative Importance of Attribute by Number of Daily Customers

As is depicted in Figure 25, Vendors that indicated that *sustainability* is important for them viewed the attribute *participation fee* as less important than vendors who said it was not or did not know (35% versus 41% and 43%). Nevertheless, it remains the dominant attribute for this group. Interestingly, this same group of vendors also put considerable emphasis on the *type of advertising provided*(19% versus 15% and 16%). It should be kept in mind, however, that the number of vendors in groups "No" and "I don't know" is smaller than in group "Yes". This results in a much wider 95% confidence interval for these two groups.

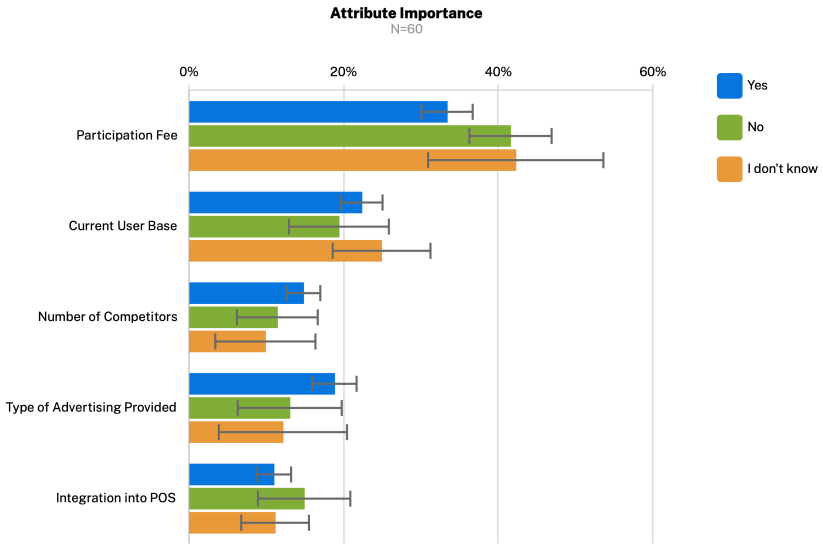

Figure 25: Relative Importance of Attribute by Sustainability Values

Lastly, differentiating the vendor group based on prior experience with loyalty programmes, the following difference in attributes importances emerged:

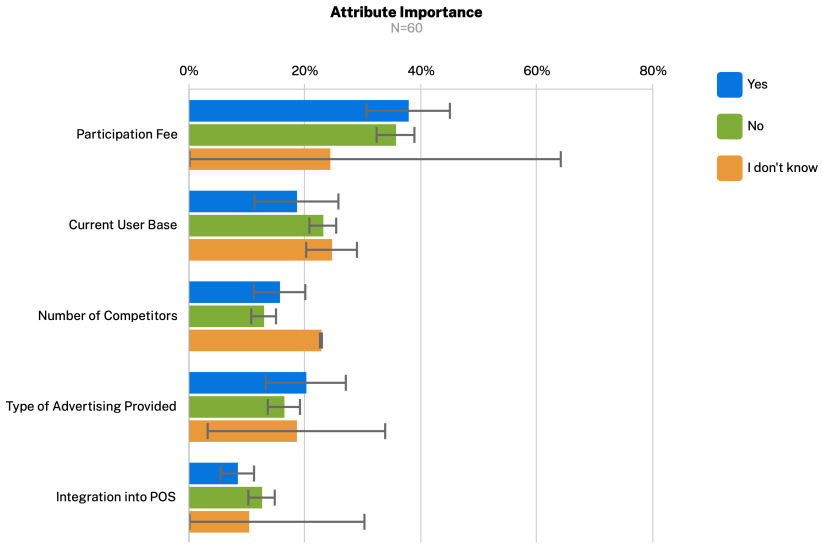

Figure 26: Relative Importance of Attribute by Prior Experience with Loyalty Programmes

As is shown Figure 26, vendors that had prior experience with loyalty programmes viewed the attribute *participation fee* as slightly more important than those who did not or did not know(38% versus 36%). Furthermore, this group also found the *number of direct competitors*, *type of advertising provided* as more important than the other two groups.

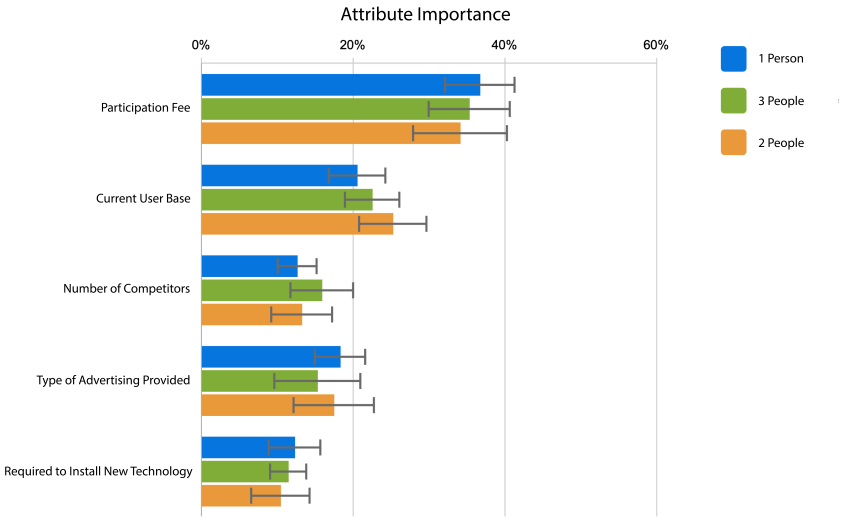

Figure 27: Relative Importance of Attribute by number of employees at point-of-sale

In sum, this first analysis revealed that *participation fee* is the most important attribute, both for the entire vendor group and differentiated vendor groups. Although *type of advertising provided* and *current user base* are generally more important to vendors than *number of competitors* and *integration into POS*, this ranking seems to be different for some vendor groups. For example, results indicated that vendors with the highest transaction frequency find the *number of competitors* more important than *type of advertising provided*. For these types of claims to be deemed reliable, however, the DCE should be repeated with a larger sample.

Let us now move on to the utility scores of the attributes we have just examined. In a way, this analysis will zoom in on the attributes by illuminating which levels were particularly desired and which ones were not. In section 3, a hypothesis on the effect of each attribute on the utility was given. With the results below, these hypotheses are put to the test.

Attribute 1: *Participation Fee*

Hypothesis: An increase in monthly participation fee for the vendors of a community currency like The ECO coin decreases in utility for vendors, but not in the low range.

As can be seen in Figure 28, a monthly participation of 0 €, or a free service, would give *The ECO coin* the most utility. This is substantially higher than at 10 € per month, which is second most desired[60]. The attribute levels with higher participation fees than 10 € per month are least desired, with 30 € per month having the largest absolute (dis)utility out of all the attribute levels.

[60] This does not mean that the ideal price is the weighted average between 10 and 20 € a month, since other attributes are not taken into account here.

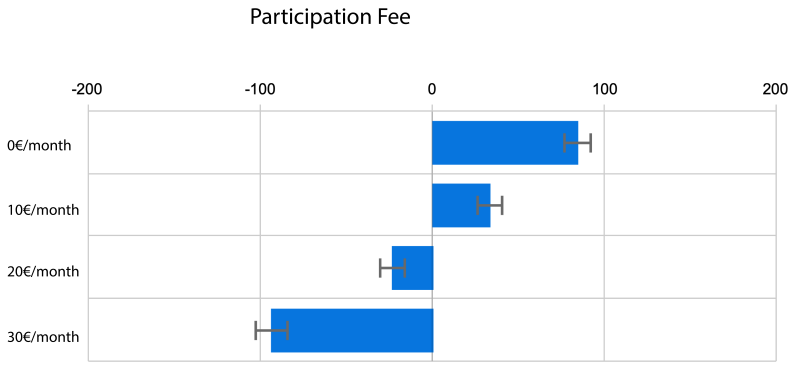

Figure 28: Utility Scores of Participation Fee Levels

From these results the hypothesis regarding the participation fee is partially correct. While it was confirmed that the utility decreases with an increase in participation fee, this decrease was also also substantial in the low range. In other words, the first increment from *0€ per month* to *10€ per month* already yielded a significant decrease in utility.

Attribute 2: *Current User Base*

Hypothesis: An increase in the amount of users in the network of a community currency like The ECO coin increases its utility to vendors.

As can be seen in Figure 29, a current user base of 500, would give a currency like *The ECO coin* the least utility. This is considerably lower than a user count of 1500. The attribute levels with larger user bases than 1500 are most desired, with 3500 users having the second largest absolute utility out of all the attribute levels.

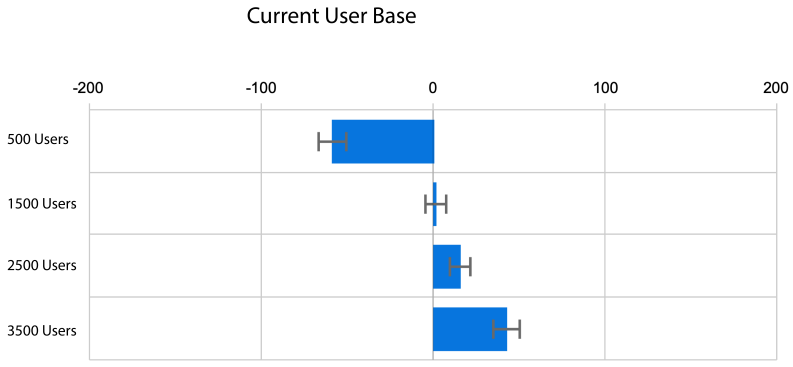

Figure 29: Utility Scores of User Base Levels

As we found that the utility of a currency like *The ECO coin* increases with the growth of the *current user base*, the hypothesis, stated above, is supported.

Attribute 3: *Type of Advertising*

Hypothesis: An increase in advertising activity provided by a currency like The ECO coin increases its utility to vendors.

From Figure 31 we see a currency like *The ECO coin* would gain the least utility to a given vendor should it not offer any advertising service at all. The other three attribute levels,

denoting a types of advertising (each one also including the former), were similarly rated, with the most elaborate one (also including notifications to users) desired the most.

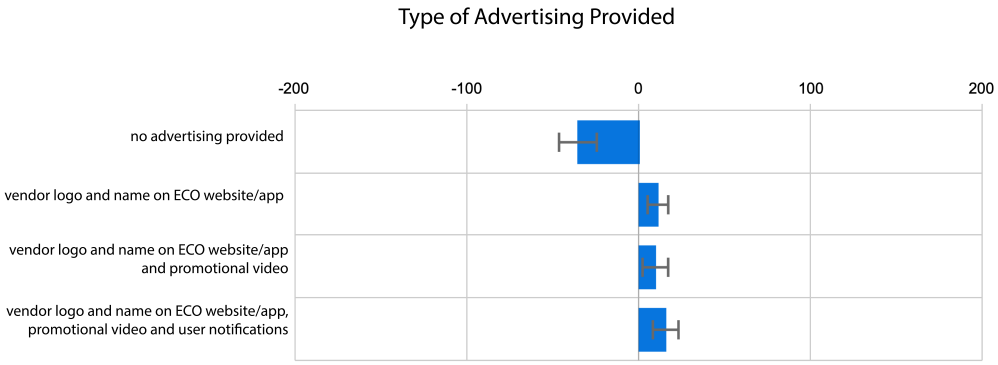

Figure 30: Utility Scores of Type of Advertising Levels

These results support the hypothesis stated above, as the results indicate that more elaborate advertising services increases the utility to vendors.

Attribute 4: *Number of Competitors*

Hypothesis: An increasing number of direct competitors to vendors in a currency like The ECO coin will increase its utility to vendors.

As we see in Figure 31, a currency like the *The ECO coin* would gain the most utility to a given vendor had it two direct (to that vendor) competitors already in the network. Conversely, would the network already hold 6 directly competing vendors, it would bring the least utility to the vendor. Direct competitor counts of 0 and 4 are similar in their utility[61].

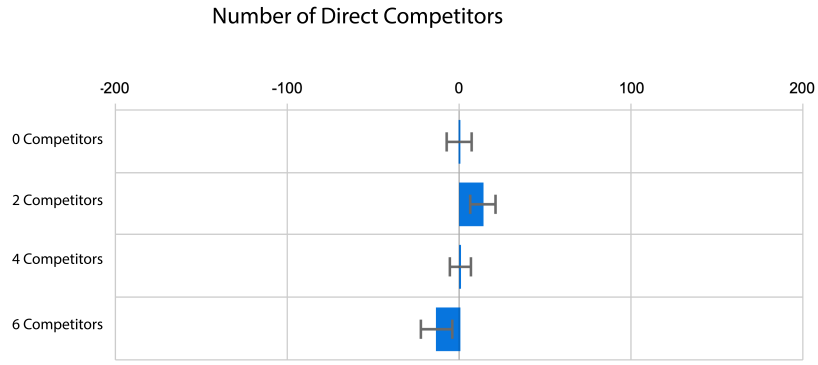

Figure 31: Utility Scores of Number of Competitors Levels

The hypothesis that utility would simply rise with the number of direct competitors was faulty. While this is the case for the increment of *0 competitors* to *2 competitors*, beyond that, the two variables seem to have an inverse relationship. In other words, as the number of direct competitors becomes too large, a shop is less likely to want to adopt a community currency like *The ECO coin*.

[61] The fact that they have 0 utility here, does not mean that they are neutral. This is because they have been normalised for this representation and do in fact have a *raw utility score* in the rest of this analysis.

Attribute 5: *Required to Install new Technology*

Hypothesis: If a currency is integrated into the point-of-sale system of vendors, its utility to vendors will increase.

As Figure 32 shows, the utility of a community currency like *The ECO coin*, is indeed increased when users are able to pay with units on regular bank card terminals. Therefore, the hypothesis from above is supported by these results.

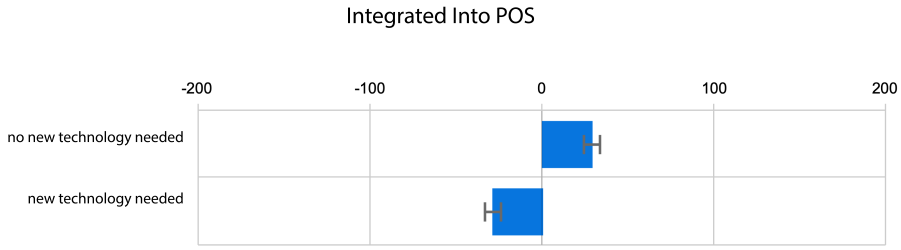

Figure 32: Utility Scores of Type of Advertising Levels

4.2.2 Interpretation: Market Simulation

We have now analysed the data by attributes and attribute levels. While this gave a general indication of what was deemed important by vendors, it is still difficult to interpret which bundle of configurations of a currency like *The ECO coin* would be both feasible for the project team to offer and viable enough for a large share of vendors to adopt. Furthermore, we would like to know how vendors trade off between attributes and their levels when presented with different versions. Practically, this means that we will simulate markets in which a group of vendors would choose between different configurations of a currency like the *The ECO coin* and the *no-join* option. In other words, the setup of these simulations takes the same form as the actual discrete choice experiment. Instead of presenting individual vendors with automatically produced configurations, however, we can choose the configurations that a fictitious but representative vendor group will be confronted with.

The remainder of this section is structured by the two situations, after which the configurations in the market simulation were modelled[62]. First we will recapitulate each situation, state the accompanying research questions, and present the configurations. Then we will examine the results to these research questions.

Trial Phase

Setting: A currency like *The ECO coin* decides to initiate a trial phase to test their products with the vendors and users in Amsterdam. Over the first year, the user and vendor network grows proportionately, with each vendor gaining 2 more competitors for every 1000 users who join the network. The currency network eventually reaches 3500 users, with each vendor having 6 competitors who are also accepting the currency.

The bundles shown in Figure 33 are *feasible* for this situation and also incorporate *meaningful differences* between attribute levels to elicit the trade-offs between them.

[62]For a more detailed description of the selection process of these configurations see section 3.2.

	Free (0€), no ads	Paid (10€), logo on website and app	Paid (20€), logo on website and app and promotional video
Participation Fee	0€/month	10€/month	20€/month
Current User Base	500 Users	500 Users	500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	0 Competitors	0 Competitors	0 Competitors
Integration into current POS	Not integrated	Not integrated	Not integrated

Figure 33: Bundle of Configurations for a Trial Phase with 500 Users and 0 Competitors per Vendor

1. To what extent does the viability of a feasible bundle of configurations change for the overall vendor group when the currency's user base and number of competing vendors grow proportionally?

Based on the *randomized first choice* algorithm, Figure 34 shows the share of preferences for the bundle of configurations presented in Figure 33:

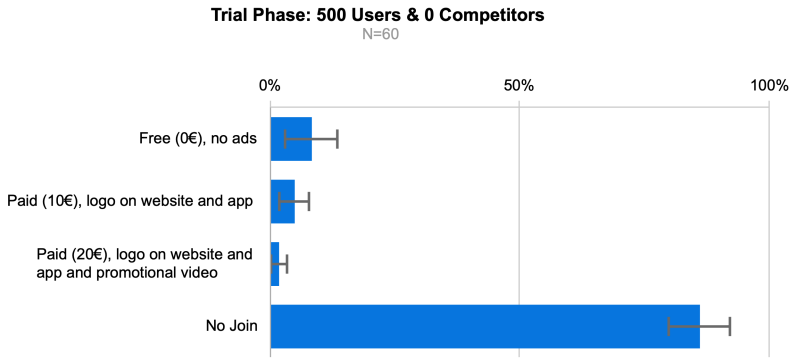

Figure 34: Shares T1

We see that the great majority of vendors in the simulation opted for the *no-join* option (86%), leaving 14% to be split up among the three products. Of these products, the free version was the most desirable (8%), with the version that cost 10 € per month coming in second (5%), and the one for 20 € per month scoring lowest, capturing a mere 1% of the market.

As our is aim is to learn how the shares of preference evolve when the currency network grows let us repeat these simulations for increments of 2 competitors and 1000 users. Figure 35, below, shows the process of plotting each configuration's share of preference at each increment in user base and number of competitors.
Interestingly, the edge that the product *Free (0€), no ads* had over the product *Paid (10€), logo on website and app* in the beginning, already ceases to exist after the first increment. From then on, this difference increases and reaches a 4% difference at a network size of *3500 users* and *6 competitors*.

In regards to the bundle's viability throughout this trajectory, we see in Figure 36 that there is a sharp increase in the sum of shares of preference (first metric of *viability*; see section 3) within the first increment, plateauing at 37% market share within the second, to then increase moderately to 40% in the last stage of the *trial phase*. Moreover, when looking at the second metric for *viability*(see section 3), the prevalence of the least desirable bundle

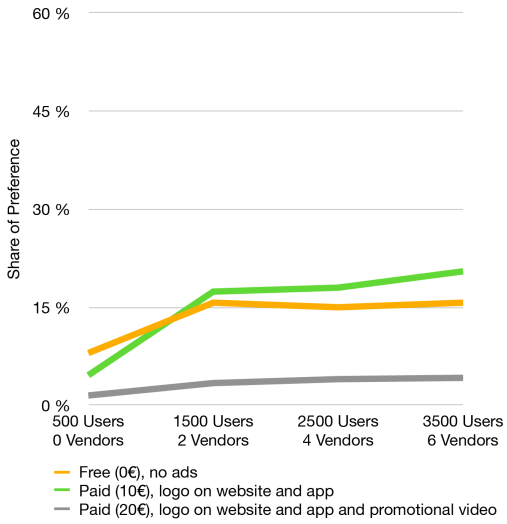

Figure 35: Shares of Preference as the Network Grows

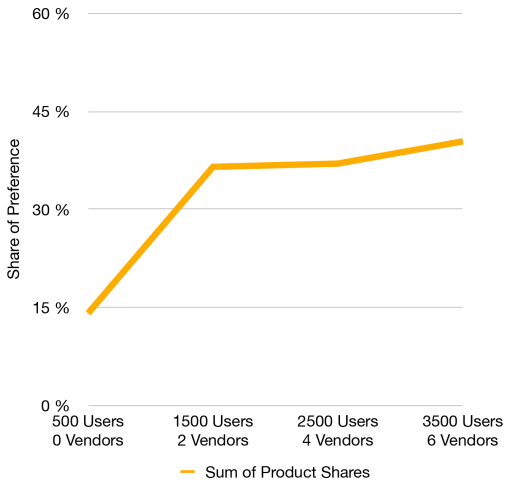

Figure 36: Sum of Shares of Preference

Paid (10€), logo on website and app and promotional video steadily increases over the three increments. As we see in Figure 37, this share increases to a lesser extent than the other two configurations by the first and third increments. In the second increment, however, the share of the least desirable bundle increases more. This is because the product *Free (0€), no ads* even decreases in its market share in that increment.

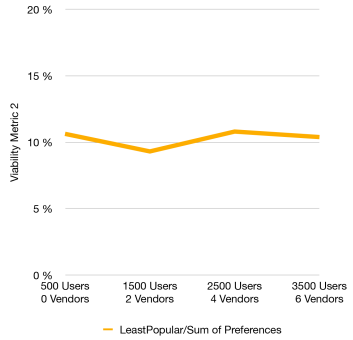

Figure 37: Proportion of the Share of Preference of the Least Desirable Product to the Sum of Shares

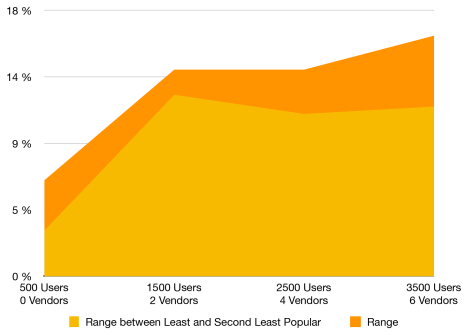

Figure 38: Range between the most and the least preferred product(orange) and the range of shares between the second most and least product(yellow)

Another way to understand this is shown in Figure 38. The graph shows the range of shares between the most and the least preferred product(orange) and the range of shares between the second most and least product(yellow). We see that after the first increment it is highly inefficient for a currency project team to offer the third product, as the discrepancy between the shares of the least and the second most preferred product becomes highest in absolute terms. With the following two increments this discrepancy decreases again in an absolute sense, but increases in relative size, because the other two configurations' shares increase further. As a result it is questionable whether a currency project team would want to introduce the product at all, since it struggles to capture an efficient market share. Of course, if the product, which is marginal in share of preference, is not laborious to develop and maintain, a currency team might still like to offer it. In our bundle of configurations,

however, the difference lies in an added service of advertising by creating a promotional video for the vendor. This is time-consuming and might not be worth it for a prospective share of 4% of the entire market and 10% of the vendors that choose to adopt(4% / 40%; market share divided by sum of product shares, see Figure 37).

2. Which are the vendor groups for which such a bundle is notably more or less viable compared to the overall group?

To find out which of the vendor groups in Figure 21 behave differently than the overall vendor group, the same analysis can be performed. We will commence by first examining the groups based on *number of employees at point-of-sale* and *number of daily customers*. With the idea that vendors with more customers have more employees, we will take these and infer the influence *vendor size* has on the willingness to adopt a certain product.

Below, Figure 39 shows how the shares of preference of vendors that have one employee at the point-of-sale evolve as the user base and number of competitors increase. We see that the product *Free (0€), no ads* is preferred over the other two paid products by most of these vendors throughout the whole growth trajectory. Despite having an average difference of 9% to the product *Paid (10€), logo on website and app*, these take a similar shape in that they increase sharply after the first increment, plateau after the second and rise again moderately at 3500 users and 6 competing vendors.

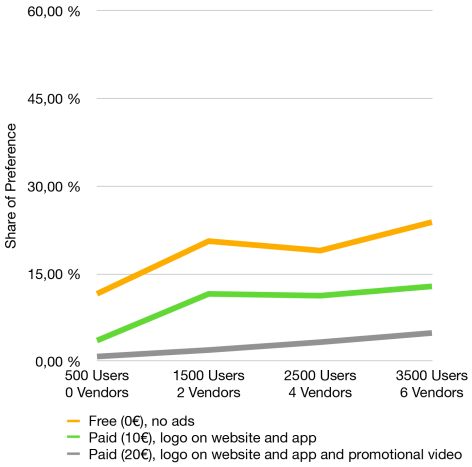

Figure 39: Shares of Preference for Vendors with 1 Employee at POS

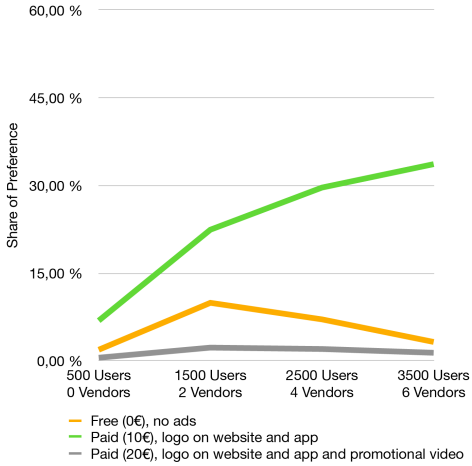

Figure 40: Shares of Preference for Vendors with 2 Employees at POS

A different story can be told about vendors that have more than one employee at the point-of-sale. Shown by Figure 40 above and Figure 41 below, these vendors tend to prefer the product *Paid (10€), logo on website and app* over the free one(in orange). This difference becomes noticeably pronounced in vendors which have two employees at the point-of-sale, as the free product nearly coincides with the least desired, most expensive product *Paid (20€), logo on website and app and promotional video* after the last increment.

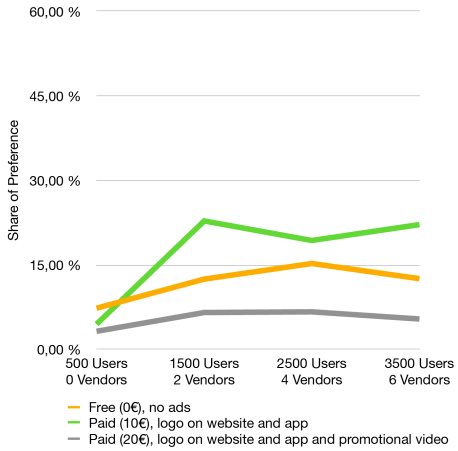

Figure 41: Shares of Preference for Vendors with 3 or more Employees at POS

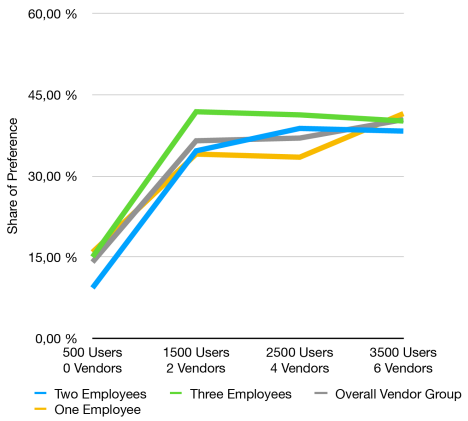

Figure 42: Sum of Shares of Preference

Regarding Figure 42, the viability of this bundle, measured by the sum of shares of preference, peaks earliest for vendors with 3 or more employees at the point-of-sale at 42%. The other two vendor groups trail along, differing moderately after the second increment, and eventually coincide with the vendors with 3 or more employees at the point-of-sale at around 40%. Like for the overall vendor group, the product *Paid (20€), logo on website and app and promotional video* stays marginal for all vendor groups at a maximum of 5%. Lastly, compared to the overall vendor group (in grey), these vendor groups not not differ significantly.

Moving to our second size characteristic we can differentiate the vendor group by their number of daily customers. In Figure 43 we see that most vendors that have 0-15 daily customers are inclined to adopt the product *Free (0€), no ads*. This difference is especially prominent after the first increment, where the share of preference between *Free (0€), no ads* and *Paid (10€), logo on website and app* differs by almost 10% of the market share.

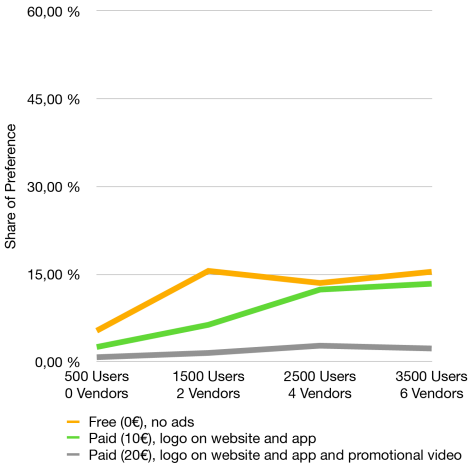

Figure 43: Shares of Preference for Vendors with 0-15 Daily Customers

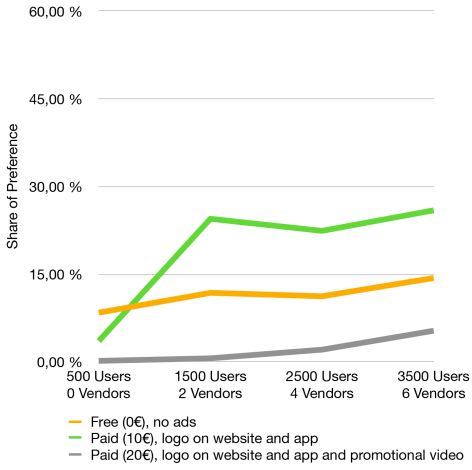

Figure 44: Shares of Preference for Vendors with 16-30 Daily Customers

Like for the groups based on *number of employees at point-of-sale*, a distinct story can be told about vendors that have in between 16 and 76 daily customers. Shown by Figure 44 above and Figure 45 these vendors tend to prefer the product *Paid (10€), logo on website and app* over the free one(orange). This difference becomes noticeably stark after the first increment. Interestingly, most vendors with 30-76 customers also show a slight interest in the product

Paid (20€), logo on website and app and promotional video, peaking at 7% of the market.

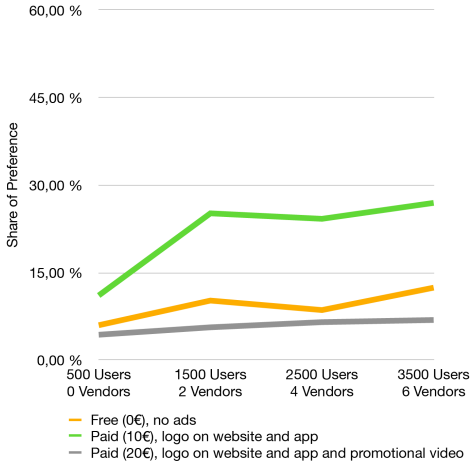

Figure 45: Shares of Preference for Vendors with 31-76 Daily Customers

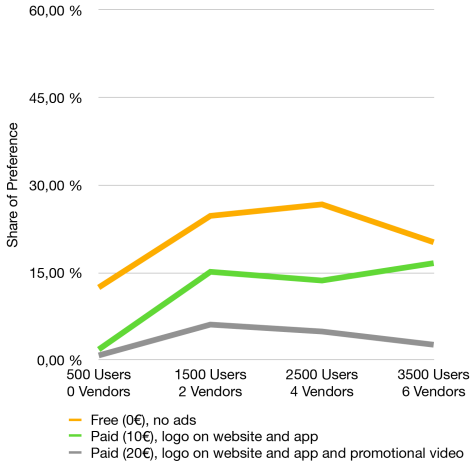

Figure 46: Shares of Preference for Vendors with 77-100 Daily Customers

In the vendor group with the most daily customers(76-100), the hierarchy of products reverses again and looks similar to the vendor group with 0-15 daily customers, in that the product *Free (0€), no ads* is preferred by the most vendors throughout the growth trajectory.

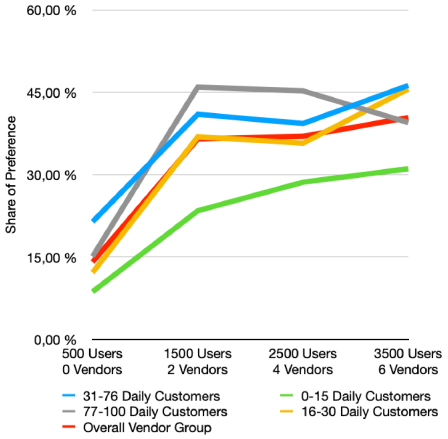

Figure 47: Sum of Shares of Preference

Regarding Figure 47, the viability of this bundle measured by the sum of preferences, is similar for all vendor groups except the one with 0-15 daily customers: On the growth trajectory, this vendor group starts with the aggregate preference to adopt (8%), and peaks at only 31%. Compared to the other three groups, in which 40% or more vendors would adopt one of the three products, this is low. In fact, it also lies well below the overall vendor group(in red), which to great extent aligns with vendors who have between 16-100 daily customers.

Next, let us analyse and interpret the data based based on whether or not vendors find sustainability important for their business[63]. By comparing Figure 48 and Figure 49, we find that of the vendors who deem sustainability an important value for their business, more vendors preferred the product *Paid (10€), logo on website and app* than the vendors who did not value sustainability highly. In this latter group the free product *Free (0€), no ads*

[63]Respondents also had the option of saying they *did not know*; however only one respondent made use of this. As a result, this respondent was neglected in this analysis

was preferred over the product *Paid (10€), logo on website and app* by an average margin of 10% across all four scenarios.

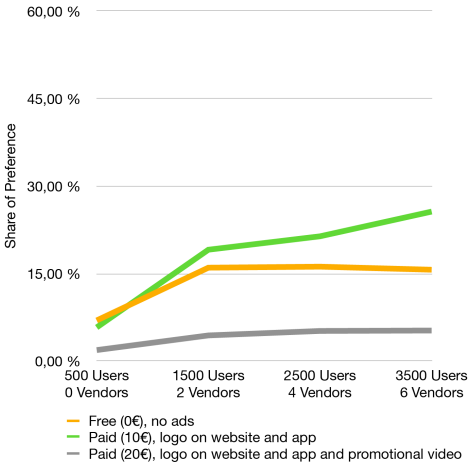

Figure 48: Shares of Preference for Vendors who deem sustainability important

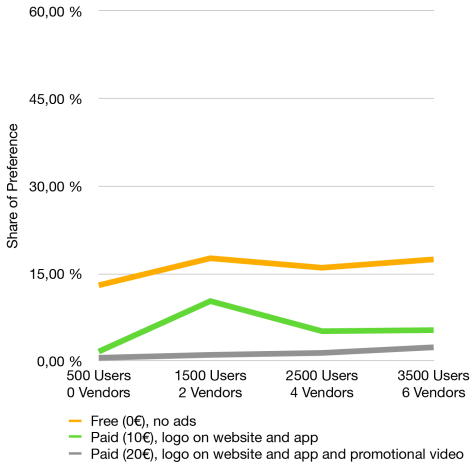

Figure 49: Shares of Preference for Vendors who do not deem sustainability important

In regards to this bundle's viability, the sum of shares of preference, shown in Figure 50 take significantly different shapes for the two vendor groups. The aggregate share of preference of the vendors who deem sustainability important increases steadily over the growth trajectory, whereas the aggregate share of the other group surprisingly declines after the first increment. Furthermore, it finishes an astonishing 21% lower than the one of vendors sustainability-motivated vendors. When compared to the overall vendor group(in grey), the aggregate share of preference of vendors that do not deem sustainability important also greatly differ.

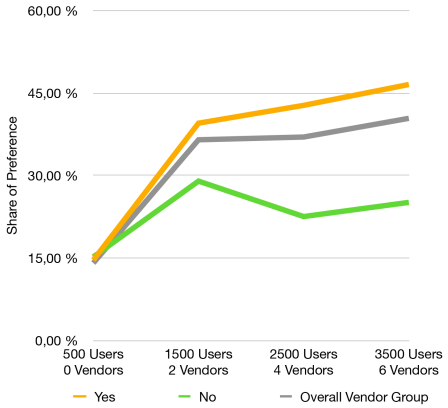

Figure 50: Sum of Shares of Preference

As the last analysis of this *trial phase*, let us investigate the shares of preference differentiated by vendors who have had and have not had experience with loyalty programmes. Again, strong differences are visible between these two groups: Looking at Figure 51, which displays the group that are experienced with loyalty programmes, we see that the product *Free (0€), no ads* captures the largest share of preference from the very beginning. This share stays almost constant over the growth trajectory. The share of product *Paid (10€), logo on website and app* increases 14% after the first increment, slightly decreases after the second increment, coincides with the most prevalent product after the third increase in user base and competitors. Contrarily, more vendors of the group without experience with loyalty programmes, preferred the product *Paid (10€), logo on website and app* over the free one.

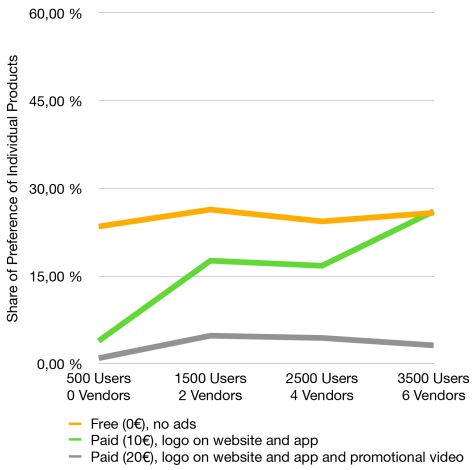

Figure 51: Shares of Preference of the Configurations for Vendors have had Experience with Loyalty Programmes

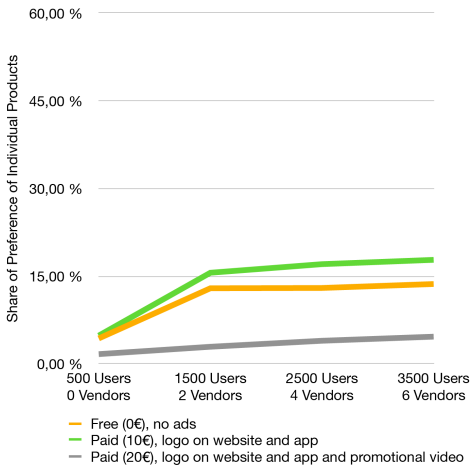

Figure 52: Shares of Preference of the Configurations for Vendors who have not had Experience with Loyalty Programmes

In regards to this bundle's viability, the sum of shares of preference, shown in Figure 53 take similar shapes for the two vendor groups. Despite the downward slope in the second increment for the curve of vendors with experience in loyalty programmes, there is a strong upward trend in both curves. The curve of the vendor group without experience of loyalty programmes is, however, with an average difference of 16% consistently below the curve of the other. This indicates that vendors with experience with loyalty programmes are more inclined to adopt a currency like *The ECO coin*. Interestingly, when we compare the aggregate share of preference of this group to all aggregate shares of preference, including the ones of other differentiated groups(given by Figure 21), it is the highest of this analysis(55%). This is also the case when compared to the curve of the overall vendor group(in grey).

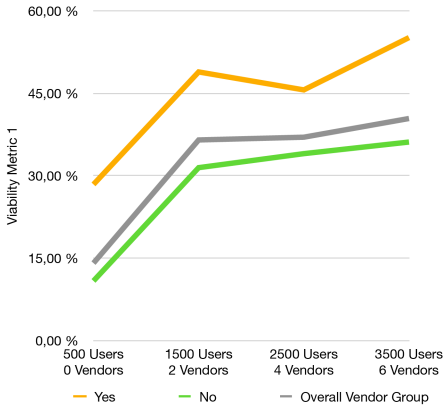

Figure 53: Sum of Shares of Preference

Let us now interpret the results of this second sub-research question of the *Trial Phase*.

Starting with the two vendor size characteristics *number of employees at point-of-sale* and *number of daily customers*, we found that product *Paid (10€), logo on website and app* is preferred most often by vendors that have more than one employee at the point-of-sale or more than 15 daily customers. For small vendors, however, the free product without advertising was most often desired. This makes intuitive sense, as larger businesses would more likely have the financial means of paying the proposed fee. Furthermore, these results are also supported by research done in the field of loyalty programmes, where it has been

found that larger businesses have more to gain from joining similar schemes[Leenheer & Bijmolt, 2008]. Moreover, differentiating by both of these characteristics showed that only the smaller vendors significantly underperform the aggregate market shares of the overall vendor group.

As for the vendor groups constructed around valuing sustainability, we found that vendors that value sustainability more often prefer the product *Paid (10€), logo on website and app* over its free counter-part. Furthermore, the aggregate share of preference of this group outperformed the one of its counterpart significantly, and also superseded the overall vendor group. This confirms that a community currency project team like The ECO coin could benefit from approaching those vendors who are aligned with their core values, as they would have more success with charging for their service and enjoy a higher adoption rate.

The last vendor characteristic, namely a vendor's prior experience with loyalty programmes, also proved to be a strong indicator of which product vendors would prefer and the *viability* of the various products of a community currency like *The ECO coin*. More specifically, most of the vendors with prior experience were interested in the product *Paid (10€), logo on website and app*. This product's market share, also stayed relatively constant over the growth trajectory, which turned out to be an anomaly for the most desired product in this analysis. This might be the case because these vendors know from experience that being in a loyalty programme is only effective when there are not too many competitors[64]. As a result, the increased utility from an increase in current users is negated by the simultaneous increase in competing vendors, making the curve appear almost constant. Moreover, the aggregate share of preferences for the vendors experienced with loyalty programmes superseded the vendors that didn't, those of all other differentiations, and the one of the overall vendor group[65].

To conclude this sub-research question, we saw that the size of the *current user base* and the number of *competing vendors* work in opposite directions when it comes to utility of a community currency like *The ECO coin*. For most vendor groups, the attribute currency user base weighs more, so that despite a growing number of competitors the sum of product shares rises when the user base increases. As we saw in the vendor group which was experienced with loyalty programmes, there seem to be exceptions to this interaction. Furthermore, almost regardless of size, the product *Paid (20€), logo on website and app and promotional video* could not capture a noteworthy market share. This calls into question the decision to offer three different products. As noticed in the previous sub-research question, which examined the entire vendor group, a third product might be offered if it does not require much additional work to develop and maintain. In our bundle of configurations, however, the difference lies in an added service of advertising by creating a promotional videos for the vendor, which are definitely time-consuming to create. As there seem to be certain vendor groups that show a much higher proclivity to join, it might therefore be advisable to spend more time and effort on recruiting the right kind of vendors instead of offering a plethora of product tiers.

Official Phase

Setting: After a successful *trial phase*, the currency project team has managed to keep the user base stable at 3500, has made several partnerships (among them a bank, which allows for seamless integration into the point-of-sale system of vendors) and wants to transition into an *official phase*. In this official phase, none of the products are free anymore. Furthermore, a type of advertising service for the vendors is included with each of the products. Lastly, to potentially increase the adoption rate the currency project team intends to place a limit on the number of competitors any given vendor has in the currency network.

[64] The analysis of attribute importance by this characteristic also confirms this.

[65] As a closing remark of this sub-research question, all of these results and interpretations should be enjoyed with caution. This is because the 95% confidence intervals are, to a great extent, wide and often overlapping when the respondent group is split up by these characteristics; more on this in section 3

Let us quantify the viability of this narrative by answering a number of chronologically structured sub-research question[66]. In regards to the order of these questions, it is important to note that a question will always build upon the previous, in that the bundle of products, which is analysed in one question will be the reference point for the next. In this way, changes in the viability based on the various attribute levels become especially tractable.

1. Compared to the final bundle in the trial phase, how does the viability of a feasible bundle of configurations change when all products are non-free?

Since the *feasible* bundle of configurations, referred to above, directly adjuncts to the *trial phase*, let us view them side-by-side below:

	Product A: Free (10€), no ads	**Product B:** Paid (20€), logo on website and app	**Product C:** Paid (30€), logo on website and app and promotional video
Participation Fee	0€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Not Integrated	Not Integrated	Not Integrated

Figure 54: Last Bundle in the *Trial Phase*

	Product A: Paid (10€), no ads	**Product B:** Paid (20€), logo on website and app	**Product C:** Paid (30€), logo on website and app and promotional video
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Not Integrated	Not Integrated	Not Integrated

Figure 55: Bundle "All Paid"

We see that the levels of all but one attribute remain the same: *participation fee*. The official version of the currency now charges all its vendors a monthly participation fee, which is commensurate to the type of advertising provided. Below, in Figure 54, the shares of preferences of the similar products in these two bundles are compared.

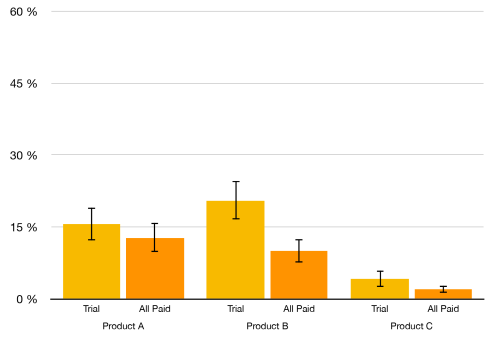

Figure 56: Shares of Preference

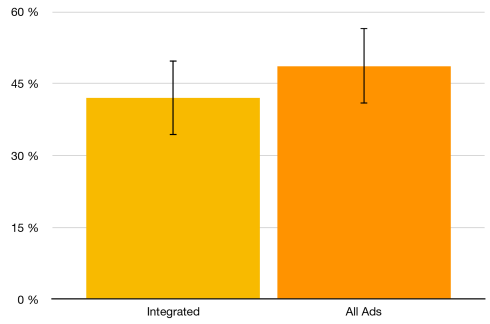

Figure 57: Sum of Shares of Preference

In Figure 57, we notice that across all products, the official version *all paid* manages to capture less of the vendor market than its predecessor from the trial phase. The difference is especially pronounced in *Product B*, where the price increase of 10€ caused a 11% drop in share of preference. Examining Figure 55, we see these differences translate into the overall viability of the new bundle, in that the new bundle, which offers the same service but costs more, is adopted by 16% fewer vendors.

2. To what extent does the viability of this bundle change for the overall vendor group when all products are fully integrated into the point-of-sale system of vendors?

Since this dramatic drop in preference, the currency project team is thrilled to allow users to pay in units with their bank cards. As it is indicated by the difference between the two

[66] A compact and complete list can be found in section 3.

bundles in Figure 58 and Figure 59, this means that the currency is now fully integrated into the point-of-sale system of the vendors.

	Product A: Paid (10€), no ads	**Product B:** Paid (20€), logo on website and app	**Product C:** Paid (30€), logo on website and app and promotional video
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Not Integrated	Not Integrated	Not Integrated

Figure 58: Bundle "All Paid"

	Product A: Paid (10€), no ads	**Product B:** Paid (20€), logo on website and app	**Product C:** Paid (30€), logo on website and app and promotional video
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Integrated	Integrated	Integrated

Figure 59: Bundle "Integrated"

Based on the *randomized first choice* algorithm, Figure 60 depicts the differences between shares of preference between the unintegrated and the integrated bundle.

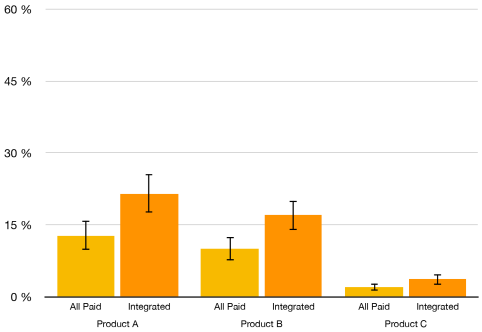

Figure 60: Shares of Preference

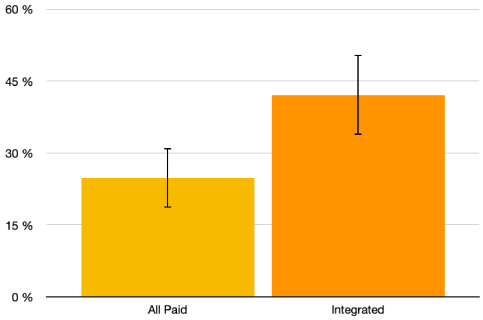

Figure 61: Sum of Shares of Preference

Unsurprisingly, the act of integrating the payments into the vendors' point-of-sale system increases the share of preference for all products. As we see in Figure 61 this also reflects in the sum of shares, in that they are now 18% higher than its unintegrated counter-part. Notably this bundle also beats the trial version's bundle which still included a free product by 2%.

3. To what extent does the viability of this bundle change for the overall vendor group when all products include a type of advertisement service, whose extent depends on the participation fee?

In the previous bundle, which is shown again in Figure 62, *Product A* still did not provide vendors with an advertising service. This changes in our next bundle, which increases the level of advertising offered by each product(see Figure 63).

	Product A: Paid (10€), no ads	**Product B:** Paid (20€), logo on website and app	**Product C:** Paid (30€), logo on website and app and promotional video
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	No advertising	Vendor logo on website and app	Vendor logo on website and app, making a promotional video
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Integrated	Integrated	Integrated

Figure 62: Bundle "Integrated"

	Product A: Paid (10€), logo on website and app	**Product B:** Paid (20€), logo on website and app and promotional video	**Product C:** Paid (30€), logo on website and app, promotional video, and reminders
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	Vendor logo on website and app	Vendor logo on website and app, promotional video	Vendor logo on website and app, making a promotional video, reminders for Users
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Integrated	Integrated	Integrated

Figure 63: Bundle "All Ads"

Comparing the two bundles side-by-side, Figure 64 illustrates interesting differences in the shares of preference on a product level. Particularly *Product A*, is now more prevalent (by 15%) than its unadvertised predecessor. This product is now so popular that it seemingly steals shares from *Product B* and *Product C*, which are now preferred less than the comparable products of previous bundle. Nevertheless, as we extract from Figure 65, the new bundle is able to capture 7% more of the market than its predecessor.

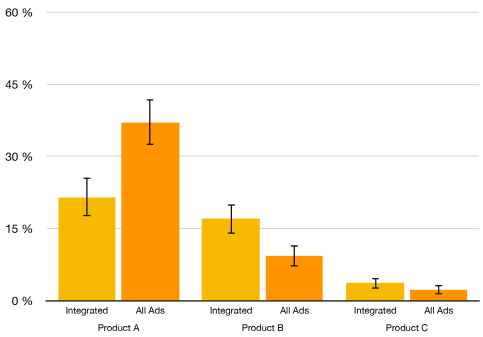

Figure 64: Shares of Preference

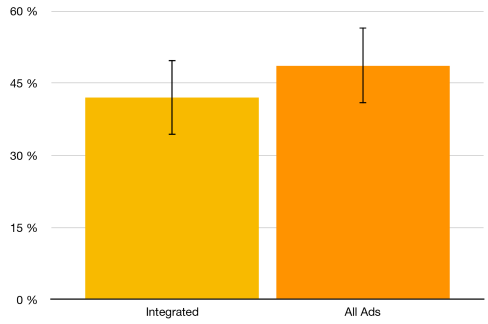

Figure 65: Sum of Shares of Preference

4. To what extent does the viability this bundle change for the overall vendor group when a limit on the number of competing vendors is enforced inversely proportional to the participation fee?

Operating the currency for over a year, the community currency project team is revising their selection of vendors. This allows them to give new vendors the option to prevent their competitors from joining the network after they do. The bundle that offers this service is presented in Figure 66. Essentially, the more a vendor is willing to pay in *participation fee*, the fewer competitors he will have to share his users with.

	Product A: Paid (10€), logo on website and app	**Product B:** Paid (20€), logo on website and app and promotional video	**Product C:** Paid (30€), logo on website and app, promotional video, and reminders
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	Vendor logo on website and app	Vendor logo on website and app, promotional video	Vendor logo on website and app, making a promotional video, reminders for Users
Number of Competitors	6 Competitors	6 Competitors	6 Competitors
Integration into current POS	Integrated	Integrated	Integrated

Figure 66: Bundle "All Ads

	Product A: Paid (10€), logo on website and app	**Product B:** Paid (20€), logo on website and app and promotional video	**Product C:** Paid (30€), logo on website and app, promotional video, and reminders
Participation Fee	10€/month	20€/month	30€/month
Current User Base	3500 Users	3500 Users	3500 Users
Type of Advertising Provided	Vendor logo on website and app	Vendor logo on website and app, promotional video	Vendor logo on website and app, making a promotional video, reminders for Users
Number of Competitors	6 Competitors	4 Competitors	2 Competitors
Integration into current POS	Integrated	Integrated	Integrated

Figure 67: Bundle "Competitors"

Figure 68 shows this feature's effect on the shares of preference of each of the products. Whereas *Product B* and *Product C* gain significant market shares compared to their unrestricted counter-parts (7% and 5%), *Product A*, which is the cheapest version, slightly declines by 3%. Still, the bundle with this feature could be adopted by 57% of the vendors, which is 8% more than before.

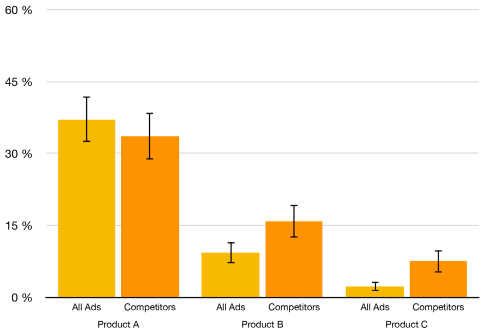

Figure 68: Shares of Preference

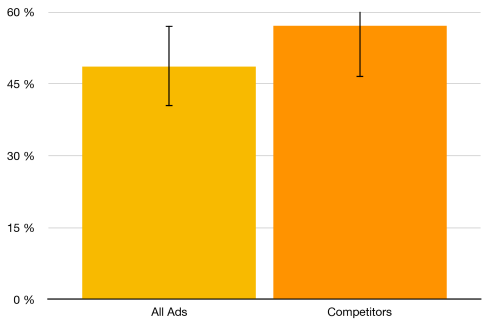

Figure 69: Sum of Shares of Preference

In sum, all changes, except the first, had a positive influence on the bundle's viability. We see this in Figure 70, which shows how the subsequent changes to the products influenced the sum of shares of preferences. The initial drop, due to the introduction of a participation fee on all products, could be circumvented, however. As shown in Figure 71, if all products were non-free but also integrated into the point-of-sale system of the vendors, the viability would increase slightly right from the start. Not all changes to the products increased the bundle's viability equally, though. The introduction of a limit on competitors yielded the greatest increase of all changes. With 57%, it also captures the highest market share of all the bundles examined thus far. The initial suspicion by The ECO coin that the vendors rejecting to join the network could drop from 90% to 50% is therefore supported by these results.

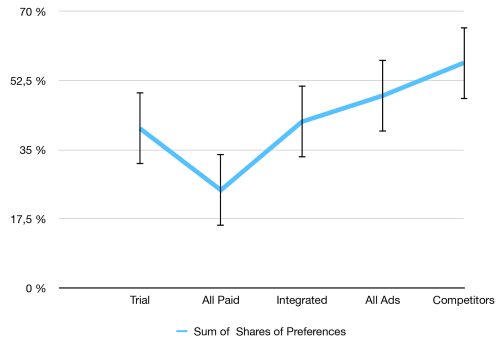

Figure 70: Sum of Shares of Preference

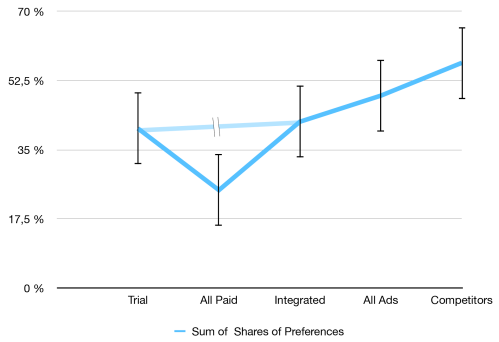

Figure 71: Bridging the Dip

4.2.3 Summary of DCE Findings

In order to answer the second research question, we have examined the results of a discrete choice experiment, in which 60 vendors in Amsterdam were asked to choose between different products of a currency like *The ECO coin*. Let us now recapitulate the key findings, by summarising them in a bullet-point format[67]. Together with the key lessons from the previous research question, these findings allow for recommendations in regards to the implementation of ecologically-driven community currencies in the conclusion of this thesis.

- The amount of a monthly participation fee looms as a strong factor as to whether a community currency will be adopted by a vendor.
- The amount of a monthly participation fee looms as a strong factor as to whether a community currency will be adopted by a vendor.
- This seems to be especially true for vendors that are small or are not particularly sustainability-driven.
- Vendors, which have only one employee at the point-of-sale or less than 15 daily customers might be less interested in joining.
- Increasing the level of advertising seems to increase the viability of the community currency.
- The majority of adopters in some vendor groups seems to prefer to pay a participation fee as long as they receive additional advertising services.
- While, offering two different products of the community currency to vendors might be an effective way to capture a larger market share, introducing a third product was not deemed viable.
- The non-viability of a third product might be particularly considered when it strongly different from the other two and is laborious to develop and maintain.
- As the community currency network of vendors and users grows proportionately, the viability generally increases; although vendors with experience in loyalty programmes seem to be exempt from this, as they place more value on having fewer competitors in the network.
- All other attributes being equal, integrating payments into the point-of-sale system of vendors, can more than offset an average 10 € increase of the participation fee in all products.
- Placing a limit on the number of competing vendors might be an effective mechanisms to increase the viability of a community currency in the short term.

[67] The tone of this summary is deliberately non normative, as the sample size was too limited to express declarative statements on specific vendor groups

5 Conclusion

5.1 Synthesis of the Research Questions

The ECO coin's ambition is to introduce its currency into the urban environment of Amsterdam, and eventually become a global digital currency[eco]. As it stands there are many intricacies which need to be worked out, before this ambition can become a reality. While many of these components were not subject of this thesis, let us now synthesise and apply the findings to those that were. In this way, this thesis can hopefully make a valuable contribution to the currencies successful implementation into the city of Amsterdam. We will begin by examining the financing of units and operations, which are both prerequisites for a successful implementation. After that, we will bring together the barriers and motives of adoption, which go beyond these two financial components.

5.1.1 Financing Units - Public and Private Actors and Vendors

If the *The ECO coin* would operate in an urban environment it would be remarkably similar to the fourth generation currencies we have studied in Section 4.1. This is due to its reward structure, which requires large amounts of fiat money to back units for vendor conversion. In other words, since the essence of *The ECO coin* is that users are rewarded for sustainable actions, the value of these actions needs to be accounted for before they can be issued. In the case of the *Torekes*, this was entirely achieved by an annual fund from the municipality of Ghent. This however, places a strict limit on the amount of available actions, which in turn limits the growth of the currency's user base. A possible solution would be to introduce a hybrid model, in which vendors also finance some of the units. We witnessed this currency model in the *NU-Spaarpas*, which borrowed aspects of multi-vendor loyalty schemes, in that vendors would reward users with units when they bought something. Therefore, the actions became vendor-specific purchases. While in *The ECO coin* users are rewarded for buying sustainable products, like meat-free lunches and recyclable items, at least as many actions are not consumption-related. For these actions the connection and benefit to the vendor becomes particularly obscure. Put simply, it is presumably difficult to ask a café in Amsterdam to pay for the kilometres a user cycled today. As a result, it is foreseeable that the relative share of actions, which is financed by vendors will remain marginal in *The ECO coin*. This means that *The ECO coin* will need to find other financiers for their units. These financiers could take the form of governmental actors, like in the *Torekes*, or corporations, which do not sell anything directly to users. For the former, the currency's value proposition would be that it is a policy instrument, steering citizens towards more sustainable lifestyles. For the latter, the reduction or offsetting of CO2, and the positive public image through direct association are most likely to be the main arguments. Which of these actors to include, whether it is possible to combine private and, and how to manage these actors when the currency seeks to expand into another city, are still open questions. Regardless of the answers to these questions, however, it is clear that the reliance on one actor is a double-edged sword. On the one hand, a strong partnership that leads to substantial financial support can lead to a currency's rapid proliferation. We saw this in the *NU-Spaarpas*, which with strong financial support from the municipality, in less than a year was able to attract of 100 vendors and 10.000 users. On the other hand, a reliance makes the currency fragile, and prone to be discontinued when there is a shift in political landscape. The example of the *LimbU* was a prime example of this, as a sudden withdrawal of funds completely decimated three years of preparatory work. Therefore, *The ECO coin* would be well-served to keep in mind the risk of only having one source of financing for their units, even if the municipality of Amsterdam decides to use their project as a policy instrument.

5.1.2 Financing Operations Through the Currency Model

One of the most important factors in a currency's continued success is its ability to sustain its operations from a financial viewpoint. In the case of a digital currency like *The ECO coin*, this includes but is not limited to paying for staff members, like app developers, paying office rent and hosting events for stakeholders. In this thesis we have examined three ways the currency

project team could attempt to internalise these costs into the currency model: *demurrage*, *malus on conversion*, and a *monthly participation fee for vendors*. Let us recapitulate each of these mechanisms and conjecture if they would be suitable for *The ECO coin*.

In regards to *demurrage*, which is the built-in pre-programmed depreciation of the nominal value of a currency, *The ECO coin* indeed has something interesting planned. Their idea involves backing each unit by a tree, which should be achieved by rewarding tree owners to register trees or the planting of new trees[Just & van Mensvoort, 2018]. Since trees do not live forever, but The ECO coin intends to always have all units in circulation backed, the value of units in circulation need to decay at the same rate as the average tree does. While exactly how and where these trees should be planted, registered and monitored is still unclear, this indicates the project team's affinity for the concept of *demurrage*[68]. So, is it, based on the findings of this thesis, advisable for The ECO coin to incorporate a demurrage? As we studied multiple community currencies which incorporated a *demurrage* in Section 4.1, we learned that vendors and users may be ambivalent towards this feature. In the case of the *Chiemgauer*, it is entirely accepted and even venerated as a progressive monetary mechanism to increase the velocity. Especially after the introduction of the digital version of the currency, it faded into the background and become seamless in operations. However, stakeholders of the *Bristol Pound*, a currency modelled after the *Chiemgauer*, met the depreciation of units with strong aversion, which eventually contributed to the currency's decline. What is more, in an insightful piece titled "Does demurrage matter for complementary currencies?", Godschalk [2012] concludes that a "theory behind the implementation of demurrage within a durable CC without the evidence of an economic crisis is lacking". He, furthermore, states that the level of the demurrage-rate of the local issued depreciated money seems to be not crucial for the usage, turnover and velocity. The ECO coin's idea of a demurrage is elegant since it uses a monetary mechanism to remind its users of the sustainable assets behind the currency. Furthermore, as it is fully digital, many of the operational problems of demurrage present in paper-based currencies would also be alleviated. However, for this feature to make sense, the backing of units with trees needs to be worked on. If, in the early phases, units are fully financed by an organisation like the municipality, waiting for enough trees to be registered could delay the implementation. Besides this, it remains unclear what would happen to registered trees when vendors decide to convert units to fiat money. Lastly, The ECO coin should not expect that the currency's velocity would increase due to this feature; at least not in the early phases.

While at the moment nothing of the sort is planned, *malus on conversion* for vendors is another mechanism The ECO coin could use to finance their operations. The idea of this feature is that vendors are charged when converting units to fiat currency so they would rather use them in the community currency network. As we saw in Section 4.1, *malus on conversion* can be used to elegantly support projects that are aligned with the values of a given currency. However in some cases, it can also become problematic, especially when vendors do not have enough options to use their units. For The ECO coin this means that it could consider implementing this feature, but would need to be diligent to provide vendors with sufficient spending opportunities. For this, many currencies, such as the *NU-Spaarpas*, have made an effort to localise and connect supply chain of their vendors and recommend that employees of vendors be partially paid with units. This might be especially hard in the early phases, which is why it might be a considered to implement the *malus on conversion* only at an adequate size of the currency's network. If done correctly, however, it could present a stable source of income for the currency project team.

The third and final examined mechanism to finance operations of the currency project team is a *participation fee*. While, in theory, users might also be charged for partaking in a community currency, we have focussed on a participation fee for vendors in this thesis. In the examples we have studied in Section 4.1, we saw that sometimes vendors are asked to either pay a one-time fee upon joining, a yearly participation fee or no fee at all. Interestingly, The ECO coin is interested in charging vendors monthly for their service, which is why a monthly

[68] In the first meeting I asked Lewis Just about this idea and he, in fact, referred me to the famous case of Wörgl, in which demurrage was initially tried with great success.

participation fee was investigated in more detail through a discrete choice experiment in Section 4.2. From the results it seems that there would be certain vendors who are ready to pay a monthly fee of 10 € (120 € a year), given that advertising services are included and adequately dedicated. In the experiment, a higher participation fee than these 10 € per month was widely unpopular even when advertising services were subsequently improved. This might only hold for the case that a 10 € version of a currency is also available (like in the experiment). Still, a participation fee of 120 € a year is high compared to the fees of the studied community currencies in Section 4.1, which ranged from 5-20 Euros a year. As a result, to successfully finance their operations, The ECO coin might consider introducing a lower monthly participation fee than 10 €, and also implementing a *demurrage* and / or *malus on conversion*.

5.1.3 Adoption Barriers & Motives Beyond the Currency Model

The additional costs on vendors (*participation fee, malus, demurrage*) we have just discussed, can present barriers for vendors to join a given currency. There are, however, also other factors which influence adoption beyond these financial considerations. At the end of Section 4.1, we noted that there seem to be operational and ideological motives and barriers for a vendor to join.

Starting with the latter - the ideological factors - we saw how most currencies require businesses to embody values which are aligned with the currency's own values and objectives. As a result, many currencies decide to only allow vendors (local, small, independent) to join and preemptively discard larger organisation, like franchises. Some currencies, like the *Val'heureux* and the *Torekes*, even go beyond this by checking which kind of products are sold by these vendors. While this selection can be a barrier to allow a vendor to join, it also possible that a vendor does not want to join because he is not in agreement with the objectives of the currency. On the flip-side, we saw in Section 4.1 and 4.2 that when a vendor agrees with and stands for the values of the currency, she is much more likely to join. Joining due to ideological conviction was also found to be an indicator of participating in governance activities, like joining the general assembly. However, ideological motives alone were not found to be sufficient for a vendor to join, or remain in the currency network.

Rather, certain operational benefits would need to be apparent to the vendor. One of the major operational benefits in most currencies is additional advertisement for the vendor. As we saw in Section 4.1, it is common practice to list vendors on the currency website. In this regard, the *Val'heureux* is a neat example, in that it presents all its vendors on an interactive map online. Other currencies decide to take advertising one step further by also writing blog posts about specific vendors, which they then share over their social media pages. The findings in Section 4.2 also confirmed that there is strong interest in advertising services by vendors, which suggests that *The ECO coin* should devise elaborate plans to advertise vendors adequately.

The number of users and vendors in the currency network also present operational factors for prospective vendors to consider. Given that advertising is prolific, a vendor will gain access to a new network of customers upon accepting a units as a means of payment. In other words, the more users a currency has, the more a vendor might be inclined to adopt. This was supported by the DCE in Section 4.2, where the viability of *The ECO coin* almost exclusively rose together with an increase in users. As users become more inclined to adopt, it is natural that with an increase in users, the number of vendors will also increase. This can bring about both operational motives and barriers for a vendor's adoption. On the one hand, a greater vendor network means that it is easier to localise the supply chain of any given vendor. This is essential if a vendor would like to use units in the network, instead of converting them to fiat money(especially when a *malus on conversion* is present). On the other hand, vendors might discourage a growing number of vendors, as they do not want to share their newly gained customer pool with too many competitors. This effect was indeed recorded in Section 4.2, where the number of competitors acted as a balancing feedback loop for the gained utility through an increase in users. In the same experiment, we also found that placing a limit on the number of competitors for each vendor could substantially increase *The ECO coin's* viability. This, however artificially limits the currency's size, in that when all vendor sectors are represented in the network, its size will remain stagnant.

The currency's integration into the point-of-sale system of vendors can also be an operational factor in vendor adoption. We learned in Section 4.1 that nowadays many currencies are investing heavily into a digital means of payment. Although digital payment infrastructure is necessary for integration at the vendor's point of sale, it is not sufficient. It would for example be conceivable that a currency project team would develop a smartphone app, with which users can pay vendors directly from phone to phone. While this already alleviates many of the troubles of a paper-based community currency (i.e. admission of demurrage, second bookkeeping logs), it is not integrated yet. Full integration is achieved when users pay at the bankcard terminals already present at the vendor's point-of-sale. From the point of a vendor, this makes the adoption of the currency nearly seamless. If *The ECO coin* wants to achieve this it would need to partner involvement of a bank, which decides to dedicate an official bank card. The results in Section 4.2, indicate that this would be a worthwhile partnership, especially when charging vendors in form of a participation fee.

5.2 Concluding Remarks

The ECO coin has multiple challenges ahead of itself before it can reliably convince vendors in Amsterdam to adopt their product. This thesis studied a selection of these challenges, which were identified through an in depth literature study of 8 other community currencies in Western Europe. Among other things, this literature study revealed that vendors might be drawn and repulsed by specific features of the currency design, as well as ideological alignment with the startup. Then, in a discrete choice experiment with 60 real vendors in Amsterdam, some of the key lessons from the literature study were investigated. The data of this experiment enabled the simulation of two realistic situation. Among many things, these simulations demonstrated the importance of setting the planned monthly participation at the right level and also indicated that there are ways to offset this fee. All in all, with much work, *The ECO coin* can become a frontrunner of a fourth generation currency and perhaps even transcend this status. The key to achieve this will be to test, revise, and scale their original ideas, through test beds like Urban Living Labs and other related research. Hopefully the research presented here will be acknowledged as one of these related project and will prove valuable to the startup and other aspiring community currency project teams in the near future.

6 Reflection

For the last Section of my thesis, I see it fit to reflect the thesis process, the methods used and the results which emerged. Furthermore, I will reflect on my decision to focus on small independent businesses and suggest further avenues for research. Lastly, I'd like to reflect how my view of monetary innovation has changed over the last 8 months, and offer my take on carbon pricing[69].

6.1 Reflection on the Process & Methodology

6.1.1 Interviews & Literature Study

Having been completely new to the field of community currencies before starting this thesis, I found that studying 8 other community currencies proved to be an exhilarating and insightful experience. I began doing so in late November, when I visited an international conference on community currencies in Brussels. There I was able to connect to many experts, among which were founders of the *Chiemgauer*, which was one of my selected examples. Furthermore, I accrued the foundational knowledge that would later help me in my interviewing process. In this regard I look back on my first article on the topic with a smirk[70]. Although I already knew back then that my thesis would focus on the vendor adoption of the *The ECO coin*, admittedly I was not knowledgeable enough in the field to construct an effective framework for vendor adoption. To do this, I needed to dig deep into the literature, where, among other material, I found the book of Degens [2019] incredibly illuminating. I developed the interview guide based on my impression that for most currencies information on their design was abundant, but lacking in regards to their implementation. I would later understand why: Community currencies are primarily grass root initiatives, only attracting the attention of academics and media, once a certain size has been reached. As a result, the implementation phase, of which vendor adoption is a part, mostly goes unnoticed and undocumented. Unfortunately, I had already conducted several interviews before this stage, which meant that I gathered data without a well-thought out interview guide. As my knowledge on qualitative methods grew, I later decided to exclude these interviews. Nevertheless, I still learned from these experiences, especially because community currency experts enjoy talking about the greater picture of alternative finance.

However, the semi-structured interviews I conducted after I had constructed my definitive interview guide went incredibly well. Because I consistently researched a currency and the interviewee before an interview, I knew which questions would be most apt and also was able to ask relevant follow-up questions during the interview. Noticeably, the majority of interviewees were particularly friendly as they offered that I may reach out to them after the interview to ask further questions. This proved to be helpful, as I made use of this several times.

Once I completed the data collection phase, I was ready to document and compare the results; or so I thought: my supervisors pointed out that a clear framework for the descriptive analysis was lacking. I understood what they meant and began dissecting one of the major typologies for complementary currencies. By selecting only the attributes which seemed relevant for my research, the framework eventually took shape. In retrospect, I should have done this before even beginning the interview process. It might have allowed for an even better interview guide and a more straight-forward literature study, saving me a lot of time. Perhaps, however, in this way, I was able to comprehend the typology more effectively, taking less time to develop the framework for comparison. Which ever may the case, this kind of iterative work was a common theme of my thesis experience.

6.1.2 Discrete Choice Experiment

With the onset of the corona virus in Amsterdam, it became clear that the Living Lab and the currency game (see below in Section 6.1.3), would not be able to take place in the timeframe

[69] Since what follows is entirely my opinion and experience, I will, unlike the previous parts in this thesis, write it in first person.

[70] `https://www.ecocoin.com/blog-posts/more-money-less-problems`

of my thesis. As a result, I decided to move back to my hometown Vienna, 3 months earlier than I had initially planned. This meant that I needed to find a methodological approach that would allow me to work remotely and collect similar data to a Living Lab. Having been part of a Living Lab before, I knew that it is a highly realistic research context, which is not easily replicated it in an online context. After consultation with my thesis supervisors, we decided to test certain attributes of an ecologically-driven community currency in a discrete choice experiment. Never having performed this type of quantitive method, I immediately audited a course on stated preference methods at TU Delft. This course focussed on transport modes, but was nevertheless highly informative, equipping me with the basic know-how to construct my own experiment.

The first activity was to define the attributes and attribute levels, which were of interest. I did this in close collaboration with The ECO coin and also discussed each one in detail with my supervisors. The number of attributes was limited by the expected number of respondents. This is why some attributes, which I also deemed highly important, had to be removed. These included, *malus on conversion* and *governance responsibilities*, which were much-talked about themes in Section 4.1. The main reason we ranked the importance of these attributes lower than the five which were included, was that they are quite difficult to explain in the context of a survey. I think that the risk of going more in depth with the explanation of the context could have been taken if the sample size had been larger.

Next, I had to design the survey, which I did with software from *Sawtooth Software*, for which I eventually received a grant from the company. Unfortunately, I waited until I was ready to build the survey, and only then applied for the grant. As its processing took around 2 weeks, my progress was forestalled. Once I had the software, I immediately built the survey. As the sample consisted of 350 vendors in Amsterdam, I decided to do this in Dutch to increase the response rate. For this, I luckily had a lot of help, without which there would have been even more grammatical errors.

Retrospectively, there are some things I would have done differently when designing the survey. One of the shortcomings of my survey design was that it was not able to properly capture the sector types. Though I asked participants to tick the sector that applied to them, the majority opted for *other*. I should have studied the sample in more detail before to make adequate sector categories. Another option would have been to let respondents fill in which sector they consider their business to belong to, and then post-process their answers into categories. Either one of these, would have allowed for a better analysis later on. Another aspect that I would do differently next time, is that the survey might have appeared as a sales pitch to vendors. Despite repeatedly mentioning that the survey is non-binding, anonymous and none of the data would be shared with the startup, the mere fact that The ECO coin was explicitly used repulsed some vendors in the sample. In fact, I received multiple emails in which vendors expressed their dismay in being "sold" a product. Since I partnered with the label *De Goede Zaak*, I feel a bit embarrassed that I may have tainted their reputation. However, in my view, using The ECO coin also yielded benefits. In regards to the methodology which attempts to recreate a realistic choice scenario, it was advantageous to use a real company, that had, among other things, a short introductory video readily available. In this way, the context of the survey was more easily created by using the logo, video and rationale of The ECO coin. Next time, I would not use the company's name and logo but still show the video as an example of a currency, so respondents can better imagine the setting.

Once the survey was ready and tested, I began with the recruitment of respondents. This process turned out to be extremely laborious, as I spent almost three weeks, writing emails and calling with vendors in Amsterdam. I definitely should have checked with my mobile service provider, as the fee of calling from Austria to the Netherlands turned out to be several hundreds of Euros. Still, all in all, I enjoyed it, because with every new respondent my efforts felt justified. Furthermore, I was able to gather some soft feedback from curious vendors over the phone. Some vendors were quite enthusiastic and asked me to put them into contact with the company.

The last challenge was to analyse and visualise the results of the experiment. While I have extensive experience with data analysis, stated preference data turned out to be quite idiosyncratic, which is why I was happy to use the inbuilt analysis tool from *Sawtooth Software*. The results turned out to be somewhat relevant, as I describe in Section 6.2.1.

To make a long story only a little bit longer, I am ambivalent about having used this method. On the one hand, I had much higher expectations with the Living Lab and currency game and was a bit disappointed that the number of respondents for the experiment fell short of what I had hoped for. On the other hand, I truly believe that this method was the best choice given the circumstances and I am certain that I learned a lot from applying it.

6.1.3 Benchwarmers

> *In sports, a benchwarmer is a player who does not get selected to play; a substitute.*
> - Merriam Webster Dictionary

While it is somewhat unusual to discuss methods that were not actually used, I will outline two here, because they took up considerable amounts of time to develop. Unfortunately, the corona crisis (and other events) made it impossible to use them in the given time period. Nevertheless, I see them being used in the future[71].

The Living Lab Method

A Living Lab is a "user-centered, open innovation ecosystems based on a systematic user co-creation approach in public–private–people partnerships, integrating research and innovation processes in real life communities and settings" [Eno]. Ecocoin has conducted several Living Labs in the past, each with a specific learning goal in mind. In this upcoming Living Lab, the company's main goal is to implement their currency in an urban setting, and thereby move one step closer to full scale implementation in Amsterdam. In my time at the company the Living Lab was postponed twice. After the first proposal[72], the official Living Lab program at the Marineterrein discounted the option of funding the project. This lead the company to look for outside funds. During this time, I developed the currency game (see below) as an alternative way to learn about user preferences. In early March, the Bureau Marineterrein and the Amsterdam Economic Board approached us again and offered to contribute to the funding of the Living Lab given that we would specifically tackle to waste goals of the area. I, thereafter, commenced my work on the Living Lab planning, adjusting it to fit the waste-specific goals of the Marineterrein (see Figure 72).

[71] The decision to share them here was also welcomed and encouraged by both of my thesis supervisors.
[72] In the appendix

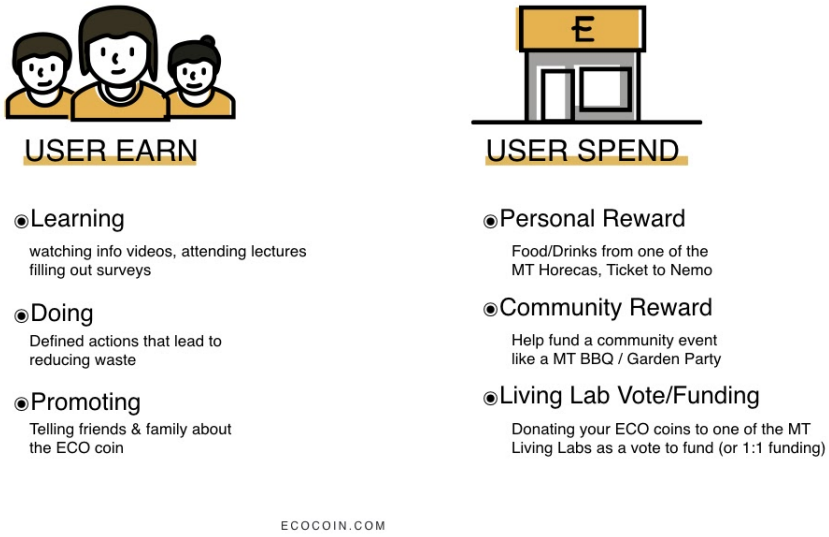

Figure 72: The Co-created Living Lab Concept for the Marineterrein, Amsterdam

One of the key ideas of this project would have been the use of *The ECO coin* as a currency to fund the cite-specific Living Labs of other start-ups or companies. In this way, people working at the Marineterrein could fund Living Labs with their earned *ECO coins*, making them feel more connected to the area by learning about the various projects happening on the grounds. Unfortunately, this approved and supported version of our Living Lab was cancelled upon the arrival of the coronavirus in Amsterdam.

Serious Game for Currencies - A Variation of the Public Goods Game

Currency games fall under the broader category of simulation games, also known as "serious games". Originally developed for military purposes, simulation games have recently found successful application in fields like urban planning and economics [Tóth, 2015] [Wanner, 2014]. Likewise, scholars in the field of complementary currencies have increasingly used games to teach people how to use their currency, as well as refine the currency model [Yoshida & Kobayashi, 2018][rol][Martignoni, 2018b].

I initially developed *The ECO coin currency game* in response to answers found to the first research question (literature review & expert interviews) as well as the hiatus of the aforementioned living lab. Firstly, the results of my first research question showed that economic and operational considerations of vendors are major barrier of the ECO coin's implementation. This made it important to find the boundaries of economic viability. Secondly, the Living Lab, in which I planned to find ways to overcome the barriers, was postponed due to a lack of funding. This initially prevented me from studying the workings of the ECO coin in a real-life urban context. Therefore, I developed a currency game[73] to learn specifically about the economic workings of the ECO coin economy. These findings could later be used to develop the currency model that is presented in the results of research question 1.

While this currency game can be considered a method, it is also an outcome of my thesis because it can be used for educational and co-creative purposes by The ECO coin in the future. It can be run as a cost-efficient way to introduced people to the workings of *The ECO coin* economy. Additionally, through feedback, in the shape of surveys and discussions after the game, players are able to co-create the currency design. When played with future

[73] I am happy to provide all the materials, instructions and methodology of the game by email.

stakeholders (i.e. vendors in Amsterdam), this in and of itself can also be a means to overcome barriers. For example, a discrete choice experiment usually requires a form a subject training, which this game could efficiently provide.

6.2 Reflection on the Results

6.2.1 Research Question 1

The findings of the interviews and literature study coalesced in a descriptive analysis. I wrote this descriptive analysis with three main goals in mind. Firstly, I wanted to give readers a pleasant introduction to the field of community currencies. As a result, I attempted to lay out the aim and background of various currencies as plainly as possible. Secondly, I intended to convey key currency design concepts by describing the currency models of various examples of currency projects. These examples were varied enough to illicit key differences between concepts, yet strung together by a clear and acknowledged typology. Thirdly, I aimed to draw key lessons for community currency researchers and practitioners like The ECO coin, which may help them to design a viable currency that is likely to be adopted by vendors.

Although I believe I met all of these goals, I should highlight that, compared to the 6000 currency projects which have existed, only a small number of projects was analysed. As a result, the transferability of the key lessons is limited to currencies that are similar[74] to *The ECO coin* and were implemented in the UK, Germany, Belgium, or The Netherlands. The consideration of geography might be especially relevant for the parts on vendor adoption, in which culture plays a pivotal role. In fact, already in my selection of projects differing success with certain currency features like demurrage and malus on conversion could be noticed. I suspect that these differences would increase if currencies operating in drastically different geographies and cultures, such as South America or Africa, are studied.

Furthermore, I believe that the transference of lessons from third generation currencies to fourth generation currencies should also be carried out carefully. Looking back, it seems to me that, at least from static perspective, these two currency types are highly similar when to comes to vendors. However, when studied over time, the strongly differing roles of users between these two types has to be taken into account when studying how vendors perceive a currency. This is because users and vendors are in constant interplay, and are dependent on each other. Concretely, in one direction, the way users perceive, think about, and use a given currency, is likely to affect the growth of the user base and thus on a vendor's experience with the currency. As a result, despite being able to implement the same features for vendors in both types, the differing value propositions for users, which were mostly neglected in this thesis, might also be seen as a key factor for vendor adoption.

Lastly, I am aware that the *governance* of community currencies received the least attention of all studied attributes. This is because I initially thought that I would find more about it in the literature. Knowing better now, I should have incorporated questions about governance into my interview guide.

6.2.2 Research Question 2

As I discussed above, several methods were planned to study the vendors' willingness to adopt a currency like *The ECO coin*. In the end, a discrete choice experiment was the method of choice to do so. The main assumption of discrete choice experiments is that the data reflects rational choices of the participants. In my experiment, several complications with this assumption might be noted.

The sample consisted of small independent businesses, which, as many of my interviewees reaffirmed, base their decisions both on operational and ideological considerations. From my experience with talking to vendors, I also noticed that they first and foremost want to make

[74] See Section 3 for definition of similarity.

ends meet, but since the owners almost exclusively worked at the location, personal values and normative judgements shine through in their decisions. I see this as especially problematic for my experiment, not only because ideological factors could mean that participants (those that did take part) would indeed not choose as they did in the experiment, but because I know that many vendors in the sample refrained from taking part because they were simply *not interested* in the matter. In other words, the data is definitely skewed towards a group that is generally open towards the ideas presented. This means that the true adoption rate *might* generally be lower than found. Might, because I because I also don't know how well a survey format is able to convey the ideas and value proposition of a currency like *The ECO coin*. Around a third of the vendors which started to fill out the survey stopped before reaching the choice scenarios. It is hard to say if this decision to quit the survey was due to its lengthy nature or due to its content. As it is so often the case, it is probably a combination. Nevertheless, in real-life the situation in which a vendor is approached by a currency team is very different than a survey. I believe that explaining the concepts verbally, in person, and answering idiosyncratic questions of vendors, is likely to capture the attention of vendors, even if they do not have the patience or interest to take part in a survey which tries to inquire the same.

For those that did decide to fill out the whole survey (participate in the experiment), I, furthermore, have to question whether the feeling of being in a real choice scenario was adequate. Especially when confronted with something which a respondent has no experience with, the real consequences of choosing one alternative over the other might not be easily imaginable. This was the case for my experiment as almost none of the surveyed vendors had experience with community currencies. This meant that the short introductory video and text description of *The ECO coin*'s attributes would have needed to supply them with enough information to make realistic choices. When I think about the way a vendor would inquire about a currency in real life, which might involve talking to the currency team and users, it seems that the information could have been meagre. In a participant this lack of information might activate preconceived opinions, perhaps motivated by attitude towards sustainability, loyalty programmes, and the problems of the monetary socio-technical system. Fortunately, questions about these attitudes were asked before the experiment and the data indeed reveals the effect of these tendencies.

It is an acknowledged limitation of discrete choice experiments that if the number of person specific observations captured in a survey is too low, the statistically reliable parameter estimates suffer substantially. Given the wide confidence intervals of the relative importances based on differentiated vendor groups, the number of respondents was too low in my experiment. This is why, as I have also emphasised in the results section, the results for specific vendor groups should be used and interpreted with caution. In my view, many of these results make sense, but as the confidence intervals strongly overlap cannot be deemed reliable. For example, the indication that vendors who deem sustainability important, seem to adopt the currency more than those who do not, is plausible but cannot be reliably stated from my research. For the undifferentiated vendor group(all respondents), however, the results are reliable and I think will be useful for community currency project teams like The ECO coin. Nevertheless, I could have benefited from increasing my sample size. For this I should have supplemented the 350 vendors from *De Goede Zaak* with additional vendors.

6.3 The Focus on Vendors & Further Research

Already in my first meeting with The ECO coin, the startup's interest in vendors was apparent. At the time, we had not defined what is meant by vendors. As, for good reasons, many other currencies strive include small independent businesses, however, I decided to define vendors in this way. This decision was recently questioned in a recent academic conference by the *Society for the Advancement of Socio-Economics*, where I presented my findings. Jerome Blanc, a community currency researcher whose typology I used, asked me whether The ECO coin really needs to focus on these small independent businesses. He asked me if The ECO coin would not be better off by instead focussing on larger corporations to simply finance sustainable actions of city-dwellers. As I sat with this comment, I re-evaluated

my decision process. At first I was totally inexperienced with community currencies and thought The ECO coin was an anomaly. Then I found out that there were indeed numerous currencies already implemented. In academic fashion, I connected The ECO coin directly to these other currency projects, transferring the importance of including small independent businesses. I am still convinced that vendors are important for *The ECO coin*, but as I found through my research, additional external funding is essential for it to function. I think this is where new avenues of research open up: How can The ECO coin convince corporations to finance their units? Like I showed for the example of the *Torekes* and the *e-Portmonnee*, community currencies have a strong value proposition for local governments, in that they offer policy instruments to stimulate sustainable behaviour. However, what would be the value proposition for corporations? Avenues of carbon budgets, carbon offsets could be explored, which, in light of the Paris Climate Agreement, are becoming more realistic in the near future. Furthermore, as vendors are important to create sufficient use options for users: How does the inclusion of corporations affect the willingness to adopt the community currency by small independent businesses? These two groups are polarised, as corporations are often thought to take away customers from local businesses. If and how a currency that has to goal to save our planet, might bridge this divide is fruitful ground for further research.

6.4 Monetary Innovation

6.4.1 The Monetary System and Covid-19

I wrote this thesis during the onset of covid-19 in the West, which unleashed an epic crash of the US stock market in late March 2020. Miraculously, however, today in mid August, the stock market has almost fully recovered with some companies, like Apple and Amazon, reaching an all time high in value[rec]. The absurdity of this becomes apparent when looking at measures like the yearly unemployment rate, which in the case of the US has tripled compared to 2019. How can it be possible that shareholders continue to profit, while millions of people are losing their jobs? The first thing that comes to mind is that many of the now soaring companies simply have products that are especially valuable in a world where social distancing has become the norm. In other words, we would expect that a company like Amazon would profit when no physical stores are open anymore. While this is surely a factor, the real reason for the strong dissonance between real-world events and the financial sector is a type of monetary policy called *quantitate easing*. Through this policy, central banks expand their balance sheets by printing money to issue loans directly to the banking sector, corporations and recently also the public sector. In fact the S&P 500, which is one of the major indices for the performance of the stock market and includes companies like Apple and Amazon, declined strongly until the Federal Reserve announced on the 23rd of March that they would be stepping in. To put into perspective to what extent quantitative easing was used for corona, the Federal Reserve issued 3 trillion USD in a mere 3 months, which is just as much as was issued in the 8 years after the 2008 financial crisis[bal]. But as odd and extreme as this may sound, I believe it is important that instead of viewing quantitative easing as an intervention from the outside, we see it as an integral part of the monetary socio-technical system we live in. Only then, we might relinquish blame on events like a pandemic, and think how we might transition to a more sustainable an resilient monetary system.

6.4.2 The role of Complementary Currencies

In the spirit of Winston Churchill, who when working to form the United Nations famously said "Never let a good crisis go to waste", I would argue that the unfolding crisis offers opportunities for complementary currencies to shift the monetary socio-technical system to a more sustainable state (see Section 1.3.4). Here, I intentionally say *complementary* and not just *community* currencies, because I believe that *cryptocurrencies* should be taken seriously in this transition. I don't want to understate this: I predict the development of blockchain technology, which is the backbone of cryptocurrencies, to be one of the major socio-technical disruptions of our age. Looking back, I see the general trend of decentralisation. With the introduction of democracy, power became decentralised. With the introduction of the internet

knowledge became decentralised. And with the introduction of blockchain technology, money is becoming decentralised.
This is not to say that cryptocurrencies as we have them today are perfect. In fact, I would even argue that many should not be considered currencies at all. They are used for speculation not for commerce. But, in my opinion (and all of this is my opinion), what counts is that we can glean the possibility of living in a world where the rules of the game are more consistent, transparent, and benefit the majority of people using it and perhaps even our planet[75].

Community currencies, which are substantially different from these cryptocurrencies, may also benefit from the current circumstances. After all, community currencies have often been used in the past to remedy the shortcomings of the dominant monetary system in times of crises[Peacock, 2014]. However, from my experience over the course of this thesis I remain skeptical if they can indeed move our monetary socio-technical system into the window of viability in the long run. They may gain in prevalence during crises, but due to their short-lived, scattered and heterogenous nature I do not see them as a true challenger of the mainstream monetary system. This is not to say that they cannot exert impact. I did see that community currencies, some of which I studied, make a difference in peoples' lives and can contribute to a more sustainable future. If only temporarily and with great effort, they can offer people an escape from the colossal and tyrannical machine that is the mainstream monetary system.

6.5 Valuing Carbon & Thoughts on the Sustainability Transition

"Be careful what you wish for, lest it come true!"
— Aesop's Fables (260 BC)

One way to change any system is to tweak its objective. We often believe the objective of a system is one thing, only to find out that the metric we chose to measure the attainment of that objective has become the new objective. The best example of this is our economic system, which, we might say, should aim to maximise human welfare. To measure human welfare, we have, by and large, adopted the metric of the *Gross Domestic Product*. We can see this any time we turn on the news and listen to politicians talk about the economy. Unfortunately, it has turned out that this metric is not truly indicative of human, let alone our planet's, welfare after all. Or as Robert F. Kennedy eloquently remarked at the University of Kansas in 1968:

> "It does not include the beauty of our poetry or the strength of our marriages, the intelligence of our public debate or the integrity of our public officials. It measures neither our wit nor our courage, neither our wisdom nor our learning, neither our compassion nor our devotion to our country, it measures everything in short, except that which makes life worthwhile."

This widespread proxy of welfare is quantified with money. The same money that is also used in the transactions that cause us so much harm. But money can be used in more meaningful markets too. For example, the European Union has capped anthropogenic CO2 emissions of certain sectors through the implementation of the ETS in 2005. This directly created a market for carbon, as businesses that need to emit more than what is allowed have to buy carbon permits from other businesses, which they did not emit. Most recently, China has also followed suit by starting their own emissions trading system, which for now only includes the power sector, amounting to a fourth of their national emissions. Other policy instruments like carbon taxes, or indirect mechanisms like a fuel tax are also on the rise around the world. As a whole, these top-down compliance markets have proven to be effective tools to incentivise the transition of industries towards clean tech solutions, like renewable energy production.

[75] It is difficult to argue that cryptocurrencies are good for the environment. At least their direct effect is quite the opposite, because they are very energy-intensive. For comparison, in 2018 Bitcoin used as much electricity as the whole country of Austria[aus].

However, covering only 22.3% of global GHG emissions[car], carbon pricing is nowhere near capturing all anthropogenic GHG emissions. But should it?

While I like the idea of carbon pricing, we should be careful not to implement mechanisms like the ETS without paying due diligence to infrastructural changes. There is definitely a social cost to carbon, but also so to changing a system too rapidly. In this sense, a study from 2009, which looked at the financial effects of a carbon tax on different income groups in the UK, found that the very richest households would gain three-and-a-half times more than the very poorest from a carbon tax[Grainger & Kolstad, 2010]. This dynamic also became apparent by the upheaval caused by increasing fuel prices in France in 2018. Governments might, therefore, see that systems of provision, like transport and power networks, are adapted at a rate to not obstruct people from meeting their daily needs. Of course climate change race against time, so we need to take bold actions. But if we cannot get people, regardless if they are living in rural or urban areas, onboard to participate in changing the systems, there is little hope. As a result, I see a socio-economic safety net for those who are most affected by the ensuing system transitions as essential.

For city-dwellers, I could see *The ECO coin*, which is also a type of carbon pricing, as one thread of this social safety net. It is an area-specific, consumer-focussed tool that can be leveraged by local governments to reduce the friction of the system transitions that stand before us. More specifically I see two major ways it could do this.

Firstly, with the help of local governments, the rewards for sustainable actions could be used offset the switching costs for consumers. This is of course only possible if it is possible to switch. For example, take a rural area, in which it is immensely infeasible for people to use public transport. There, The ECO coin would fall on deaf ears, if it tried to reward people for using public transport. A city dweller, on the other hand, might have the opportunity to use public transport in the morning, but would have to wake up 10 minutes earlier to walk to the station. In this situation a little incentive could contribute to shift his or her behaviour. The question then becomes if the majority of users would not behave sustainably even if they would receive no reward?

The second way I see The ECO coin facilitating the transition to sustainable systems of provision is that it can be an awareness-building tool. I'd like to end on the thought that what becoming a sustainable species may come down to is each and every individual's capacity for compassion. Whether in regards to other people, animals, fungi, or plants, being aware of the consequences of our daily choices and actions may shift our behaviour more than any feasible financial incentive ever could. Analogous to financial literacy, the shaping of *carbon literacy*, as a component of a common language in regards to our ecological footprint and ecological capacity, could be the key role of The ECO coin.

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7 Appendix I: Interviews

Edgar Kampers (NU-Spaarpas) - INT1

Date: 14.02.2020
Location: Amsterdam

Background Information on the Interviewee:

Edgar Kampers is a community currency expert who has worked on multiple initiatives. Among these is the NU-Spaarpas.

Interview Questions:

Introduction: Can you tell me a little bit about your work for the LimbU over the last years?

I designed NuSpaarpas, which was used in Rotterdam. Shops gave out points. One point per euro for grey (non-certified) products and 4 points per euro for green products. The points could only be spent on green products. Shops had to place an invoice with us of the points that they wanted to hand out and could exchange the points back to euros whenever they wanted. Shops specifically like to sell experiences because this was unused capacity. We motivated local leisure that way, because you know leisure is the only area of consumption that is actually growing. We had all the products on a barcode level in a database. We selected those products based on accepted eco labels. This was about 1% of all products, so we decided to add whole product groups like water-based paint, second-hand items, and even convinced certain shops to make new products. A Turkish pizza shop for example decided to make an organic pizza because we told him he would sell more of these in our currency.

1. **Which types of shops did you approach for the NU-Spaarpas?**

We found it impossible to bring everyone in a room. The key for our success was really that it was the first system that was electronic. There was a lot of talk about these systems but no one had done it electronically. Choosing the right shops and explaining the value proposition to the shops was also very key. When we chose shops, the intrinsic motivation had to be there of course. Apart from shops that sold green things, we went for shops that make a high margin per sale. They are much more open to a marketing opportunity like that. Also really important was to convince shops not to exchange it back right away. There you really have to look at the supply chain and maybe even connect them to new suppliers. A sink is really important. Create one by talking to an institutional actor. In our case we had the municipality that was in charge of the waste collection. They saved huge amounts of money with our system so they were financing some of the points.

2. **How did you approach local shops? Was it free for them to participate?**

Eventually we had 120 shops on board, so we went door to door. We simply approached their shops on foot and talked to them.

3. **What were the different reactions you received?**

Not answered

4. **Why did some shops decide to join?**

Some decided to join for profit. Others because they identified as “green”.

5. **Why did some shops not join?**

For one it will be a new type of system that is not integrated in the point of sale for the business. Some businesses are fearful of losing money, “to pay for their neighbors”'. Some have experience with or are running their own loyalty schemes. You need to really set yourself apart here. Don’t even mention the loyalty scheme, but talk about the unique marketing opportunity you are providing for them.

6. **Did you react to these reasons by making adjustments in the currency design?**

The currency wasn’t co-created, it was my brainchild, so that wasn’t a problem. So to answer your question, no, the currency was not really adapted from feedback.

7. **Research shows that motives for small shops to join a currency project can be categorised in operational (economic) motives, such as better marketing or unused capacity, and ideological motives, tied to the general ideas of monetary reform or the values of the specific currency. Did you also see this distinction when you approached the local shops?**

Not answered

Igor Byttebier (Torekes/LimbU) - INT2

Date: 09.04.2020
Location: Vienna - Limburg (ZOOM)

Background Information on the Interviewee:

Igor Byttebier is a consultant and creative strategist. He was a member of the initial Torekes working group, which included currency expert Bernard Lietaer, Hugo Wanner (Muntuit), Matthias Biensman (Bond Beter Leefmilieu), wijkregisseur Stefaan Vervaet and members of the City of Ghent. After that, he initiated the LimbU project with the province of Limburg, inhabitants 880.000. The LimbU was a community currency, which focuses on sustainability and community cohesion. Through an elaborate engagement process Igor and his colleagues were able to onboard 9 of the 44 communities, which is a population of around 250.000 people. Unfortunately, the currency was not implemented due to a change in the political landscape.

Hugo Wanner, wo I previously interviewed referred me to Nicolas and Val'heureux because it was a good example of a currency that does not rely on external subsidies and is mainly financed by local shops and its users.

Interview Questions:

Introduction: Can you tell me a little bit about your work for the Torekes and the LimbU over the last years?

Torekes:

The Torekes was actually how I got into the field of community currencies. I saw it as a great opportunity. We had 8000 people that lived in the area and about 300-500 people worked with the Torekes. As you might know the exchange was 10 Torekes for one Euro. The first year we started on quite a low budget of about 25.000 Euros.

LimbU:

To start off, there were three elements: social, local economy, and environmental sustainability. It functioned similar to the Torekes but was on a much larger scale. Essentially, it was a rediscovery of a currency for the waste management company, which was called the E-portmonee. We planned to operate locally and regionally and with 9 municipalities of Limburg, adding up to about 250.000 people. The aim was to reach around 10% of those. The currency would be issued by the municipalities themselves, and they would also set the actions for which people would get paid. I don't know if you know, but Limbu didn't go through. In the first year we carried out preparation and got together the money. In the second year we talked to the communities and banks. The banks were necessary because it was 100% euro backed. We worked with different banks like Triodos and Belfius. Then, unfortunately, the left-wing party was voted out and because they were the main advocates for our project, we lost wind and didn't get to implement it. We had an app and a chip card, because many of the people there did not use apps. Especially the old people of the communities were the target group, which is why the chip card would be essential. One of the most difficult things was to convince the councils, so the communities, and especially the people working for the communities. It was a coaching principle: you invite your inhabitants to come up with sustainable actions. Unfortunately, the community administers weren't used to that. Out of 44 municipalities, 33 signed, but only 9 of those then joined in the end. This was mainly due to the problem stated above.

1. **Which types of shops did you approach in each of the projects?**

Torekes:

We started with 3 grocery shops, a chocolate shop, an official Torekes shop and a warehouse. The warehouse was a bit problematic because it had its central office in Brussels, which made communication harder. In the beginning we managed to get around half of the potential shops, which we wanted, onboard. We actually prohibited shops that did not comply with our message. For example, we did not allow butchers in Ghent to join. Also we told a lot of shops not to sell cigarettes and alcohol for Torekes. This wasn't that problematic because most of the users of the Torekes were Muslim, so no-one bought alcohol and cigarettes.

LimbU:

You should best talk to Wim van de Putte about this. He actually did this. (See interview with Wim)

2. **How did you approach local shops? Was it free for them to participate?**

Torekes:

It was totally new, so we just went by, explained and talked. It was free for them and the money was in paper. Every week the collector collected the Torekes from the shops and transferred Euros to their bank accounts. Later on, they tried to get a fee from the shops. They were not good at selling it though so it did not go through.

LimbU:

Since it was virtual, the way to approach the shops was over a district or street congregations. In the beginning Wim went to the different shops individually, but it wasn't practical. So he went to congregations. Another thing was to approach bio farmers, which had a web shop**.** Another thing that was quite important was the cooperation with the local newspaper "Het Belang van Limburg" which made marketing much more easy. They were part of the organisation itself and there was a budget available. The whole launch was explained in the newspaper in a very detailed manner.

4. **Why did some shops decide to join?**

Torekes:

The main reason for shops to join of course was to get more clients. It was quite simple to convince them because there were almost no disadvantages, except maybe the accounting system. But since the Torekes was cash, it was in their cash system. The difficulty there was that it was very new. By nature, shop owners are quite conservative. And they count every penny. One of the most important things for some of the shops to join was to make the neighbourhood better. The area of the Torekes called *Rabot*, held one of the main shopping streets in Ghent many years ago. In that sense the shop owners hoped to make it back to the status.

5. **Why did some shops not join?**

Torekes:

Didn’t want to bother. Some shops just don’t want to change the way to operate. Especially because these small shop owners are conservative in general.

LimbU:

You should best talk to Wim van de Putte about this. He actually did this. (See interview with Wim)

6. **Did you react to these barriers by making adjustments?**

Unanswered

7. **Research shows that motives for small shops to join a currency project can be categorised in operational (economic) motives, such as better marketing or unused capacity, and ideological motives, tied to the general ideas of of monetary reform or the values of the specific currency. Did you also see this distinction when you approached the local shops?**

Unanswered

Sofie Claeyssens (Torekes) - INT3

Date: 09.04.2020
Location: Vienna - Ghent (Skype)

Background Information on the Interviewee:

Sofie is part of the local NGOs *Samenlevingsopbouw Gent*, which has been responsible for the start-up and coordination of the Torekes. The Torekes (literally “Tower”), is a community currency in Ghent, which was commissioned by the Flemish Minister for Work and Social Economy as an experiment to find forms of 'appreciation'. The way it works is that any local resident can sign up with one of the 17 voluntary organisations working in the area. Each hour of work is rewarded with 25 Torekes, which equates to 2.5€. Torekes can then be spent at vendors and to rent a 4m2 allotment, in an area called de Site, to grow food but not exchanged for Euros. In 2017, 70% of the issued Torekes were spent at vendors, who are able to exchange these for Euros. This is made possible by an annual grant of 25000 euros from the City of Ghent, which potentially funds 10000 volunteer hours. This also plays an important part in generating local confidence in the currency. The circulation of the currency is very low, as 95% of Torekes are spent right away. While the hourly wage of 2.5€ isn’t high, it does make a difference in people’s lives. While the active users base has fluctuated over the last years, the number of participating vendors has been stable (around 35 vendors).
Sofie noted before the Interview that she joined the Torekes only recently (two months before the interview). That is why her knowledge of the shops was limited and referred me to her colleague Tom Dutry, with whom I have also conducted an interview.

Interview Questions:

Introduction: Can you tell me a little bit about your work for the Torekes over the last years?

I joined the Torekes only recently. Our main goals for this year is to implement the digital version and involve the shops more in the currency’s management.

1. **Which types of shops did you approach?**

Around 30 shops in the neighbourhood are active. That is almost all of the shops present. We didn’t approach supermarket chains and butchers, because these do not fall in line with our main idea.

2. **How did you approach local shops? Was it free for them to participate?**

At the moment the shops don’t have to do anything else than selling products for Torekes. This is how it has always been. But now, we want them to do more. We want them to either contribute financially or take on another responsibilities in the currency’s management. To achieve that I know that, our presence needs to be more clear for the shops. In other words they need a contact person. This was especially hard during the last years, because the contact person switched 6 times.

3. **What were the different reactions you received?**

Generally the shops are very glad to participate. They participate because they can earn more.
In general, shops are happy that they are a little group. They are worried that if there are more participating shops, they would need to split the profit.

4. **Why did some shops decide to join?**

Unanswered

5. **Why did some shops not join?**

Unanswered

6. **Did you react to these barriers by making adjustments?**

Unanswered

7. **Research shows that motives for small shops to join a currency project can be categorised in operational (economic) motives, such as better marketing or unused capacity, and ideological motives, tied to the general ideas of of monetary reform or the values of the specific currency. Did you also see this distinction when you approached the local shops?**

Unanswered

Tom Dutry (Torekes) - INT4

Date: 28.04.2020
Location: Vienna - Ghent (ZOOM)

Background Information on the Interviewee:

Tom is a leading figure in the currency project team.

Interview Questions:

Introduction: Can you tell me a little bit about your work on community currencies over the last years?

The goal was to have the main street with a lot of shops, with bakeries and a few larger shops, like restaurants. Especially Igor was very interested in getting the shops on board because of a lot of problems you could see in the mainstreet. If we can manage to get the mainstreet on board we can solve those problems.

1. **Which types of shops did you approach for the various projects you worked on?**

First we had little groceries, then one chocolatier and pralines shop. We also had a pharmacy, one bakery.
We were also approached by little restaurants that only sell pita and pizza. Since we wanted to only have healthy things we had to decline. Same with butchers. They wanted to join but they weren't allowed because they didn't fit the way we looked at the project. I must say that most users aren't happy with this exclusivity, but we find it necessary.

So I would say we started with five to six shops in the first couple of months.

***[Follow-up question]**: Did you ever let a shop join because it changed the way it operates or the goods it sells?*

We didn't have the case that a shop changed the way they operate and then we let them join.

***[Follow-up question]**: Did you ever kick a shop out?*

No, we but we had to warn a couple. But one shop owner said after 2 times that he will quit himself.

2. **How did you approach local shops? Was it free for them to participate?**

Answered by Igor

3. **What were the different reactions you received?**

In the beginning it was that new that no one knew what to expect. It just seemed like monopoly money. Nobody expected it would go that fast. In the first months we only had 5.000 Torekes revenue but after 10 months we had 20.000 torekes. So after a short while most of the Torekes went to the grocery shops.

***[Follow-up question]:** How about competition between shops?*

But I don't know if the competition is important.

A lot of people go to the Lidl or Aldi because they are cheaper, but they aren't local. So we did not let them join. A lot of people asked us why we don't have the Torekes in the Lidl and Aldi, so we tell them that it doesn't circulate in the community if we do.

We also have cheaters that sell alcohol and tobacco still. In the beginning we were very severe and would kick someone out after one warning. We also have shops that let people exchange Torekes for Euros without buying anything. This is really hard to monitor because of its physical cash but we are aware of it. .

4. **Why did some shops decide to join?**

More customers. I think they saw the potential of the local currency. In the beginning we only had two shops who believed in the system: the baker and the pharmacy. Every year we have a meeting and show the shopkeepers exactly how many Torekes were in circulation. The baker was also one of the few shopkeepers who would go to the meetings. The others said they don't have time. The pharmacy believed in the system because she said that the Torekes is a gamechanger for many of the people in the neighborhood because they could suddenly afford medication.
If I had to guess, 90% of the shopkeepers just wanted more customers.

5. **Why did some shops not join?**

It was extremely new. They didn't know Igor, because he didn't live in the city. They just listen to someone they know. Some shops with typical belgian shop owners were also angry because the street had lost its importance over the years. They didn't have much hope left. If we would start again today, I don't know if it would work. For a shopkeeper, if it's a success he will join.

6. **Did you react to these reasons by making adjustments in the currency design?**

In the very beginning we saw that a big problem was littering. People were dropping garbage on the street. We wanted to buy trash cans in the Torekes project and hang them up outside of the shops. Those would have been very visible with the Torekes logo on them. But we didn't manage because it was too expensive. We didn't have the money to buy 50 to 100 of these cans. And a lot of shop owners back then didn't believe in the system yet. Back then, 10 years ago local currencies were very new. Some shop owners said that if we have trash cans outside the shops it will even increase the problem of littering rather than solve it. Also who will empty these cans, who will pay? We had a lot of energy go into this system, because this would be an eye catcher, especially Igor put a lot of energy in it. Luckily, Igor had a lot of talks with the shopkeepers and a few shops still wanted to join not as a solution for the littering but just for the currency.

7. **Research shows that motives for small shops to join a currency project can be categorised in operational (economic) motives, such as better marketing or unused capacity, and ideological motives, tied to the general ideas of monetary reform or the values of the specific currency. Did you also see this distinction when you approached the local shops?**

Already answered.

Wim (LimbU) - INT5

Date: 14.04.2020
Location: Vienna - Ham Kwaadmechelen, Flanders, Belgium (Skype)

Background Information on the Interviewee:

Wim van de Putte was one of the leading figures in designing and setting up the LimbU. Over his three years at LimbU, he was, amongst other things, responsible for the engagement of the small local shops in Limburg. He did this by sitting down with numerous shops and specifically asked them about their expectations, wants and needs in regards to a community currency like the LimbU.

Interview Questions:

Introduction: Can you tell me a little bit about your work for the LimbU over the last years?

We wanted to introduce a digital currency with a conversion rate of 1 Euro = 1 LimbU. The target was to create real value for the currency and to be able to pay easily in shops. For us, clarity towards shop owners was crucial. They needed to be sure the coin was “money”. The currency would be associated with the values green and warm. So citizens could only earn the LimbU by participating in green and warm actions foreseen by the local government. This way, if you can pay with LimbU, you are a “nice” citizen, who did something good for society.
We also urged shops to give a little bit of an extra to people who paid in LimbU (i.e. 50gr extra chocolats extra if you buy 500gr). We said that we would only promote those shops who actually did this and since we had the local newspaper as a key partner this was a powerful incentive for the shops. Also do you know the Torekes? There they forbade the buying of cigarettes and alcohol. We didn’t do that because we wanted to LimbU to be seen as real money. And with real money you can buy whatever you want. In other words, the green and warm was on the earning and not on the spending side of things.
As you said, it was the resurrection of the e-portemonnee with the important difference that with the e-portemonnee the shops were not included. In the end, it took us a lot of time but if you want to create a real digital currency you need to talk to a bank to get a license. Unfortunately, we wasted a year on trying to convince a Greek bank called Triodos. This cost us, because when there was a change in the political landscape our funding was withdrawn before we could implement and prove our concept. Some politicians said: “Why should we reward people for separating waste? That’s normal right?” So we never got it running.

1. **Which types of shops did you approach for the LimbU?**

Given the fact LimbU was a “green” and “warm” coin, we contacted shops that were local, sustainable and small. We talked to grocery shops, local restaurants and also clothing stores with Belgian designers. But it’s important that you know that people could not only spend their LimbU at these shops. They could also get cultural rewards, like theatre tickets and pay for a library subscription. These would also have been embedded in the municipalities, which was an advantage. So in short, we really could make use of over-capacity to give people value. That also meant that we didn't need all the shops from the beginning. Therefore, we could really make the choice, which ones support our story and which don’t. In the end we wouldn’t have needed to let shops join just for getting new customers.

[Follow-up question]: Would you have accepted competing shops into the LimbU?

Sure, why not? I mean, the idea was never to work with exclusivity in the shops. So everyone who supported the story could join. Of course, we also didn’t want too many shops. Otherwise the available money would have to spread too much over the different shops, leaving a single shop with a small amount of LimbU revenue. At the same time we needed enough shops, so people would be able to spend all the available LimbU. So we would have found a balance there.

2. **How did you approach local shops? Was it free for them to participate?**

Just cold prospecting and storytelling. It was necessary to convince them by creating enthusiasm for the project and for that you need a story. No, being a shop in the LimbU was not free. They would have had to pay a yearly fee of 50€ to participate. But to be honest, this was the hardest part. Especially for smaller local shops it was difficult to come up with this kind of money. But everything else was very integrated. We even had a bank card because we had an actual bank called Belfius. That meant that there was no new equipment needed at the point-of-sale and also that every month the earned LimbU would be deducted and transferred to the shop's bank account in Euro.

[Follow-up question]: Were the shops involved in the governance?

No, the shops had no governing role in the LimbU.

3. **What were the different reactions you received?**

Very positive to very reluctant. This really depended on the type of shop. Biological and ecological shops really loved our story, while real and hard entrepreneurs remained sceptical. You will always have the non-believers for such "toy coins". The idea was to start with the believers and give them an early adopter advantage on the fee. And once the LimbU was launched and would have success, the rest would follow at 100% fee.

4. **Why did some shops decide to join?**

There were two main reasons: Firstly, because they believed in the story and wanted to help to make the difference in the great scheme of things.
Secondly, because they saw it as a way to attract new customers.

5. **Why did some shops not join?**

There were also two main reasons: Firstly, because they didn't believe that an extra coin could make the difference in the great scheme of things. Secondly, because of the extra administration, even though that was very minimal as I said earlier. But we really didn't want to deal with the negativity. We thought: "They'll come back later once we are successful."

6. **Did you react to these reasons by making adjustments in the currency design?**

Not really. Our story was good for many. I met extensively with shops to find out what they wanted and it seemed to work with our concept. So the sessions were more of explaining to them what the project was about and what it could do for them.

7. **Research shows that motives for small shops to join a currency project can be categorised in operational (economic) motives, such as better marketing or unused capacity, and ideological motives, tied to the general ideas of monetary reform or the values of the specific currency. Did you also see this distinction when you approached the local shops?**

But let's be honest, they are shop owners and entrepreneurs. So, it is necessary to see a benefit in the project: "What's in it for me?".

Hugo Wanner (LimbU) - INT6

Date: 29.04.2020
Location: Vienna - Belgium (Skype)

Background Information on the Interviewee:

Hugo Wanner is a pioneer in the field of alternative finance. Formerly at FairFin, now at Muntuit, he has been active for years in innovative economic practices such as sustainable savings formulas, interest-free banking, social crowdfunding, and, of course, complementary currency systems. For example, Hugo has been involved in various local community currencies and international initiatives like the LimbU in Limburg, the Torekes in Ghent and the Troeven.

My Research:

In my research, I specifically focus on the motives and barriers of local shops in Amsterdam to adopt the ECO coin. For that I am studying other currencies that have been able to implement and onboard shops.

Interview Questions:

Introduction: Can you tell me a little bit about your work on community currencies over the last years?

I worked on an ecological currency called the *e-portemonnee* and it was run by the waste company. This was very useful because they had information like adresses, which made it easy to register people later on. It was paper based, and not for-profit. It started by encouraging people to use return (glass) bottles. That's how it started. Later, we also joined the CCIA project. After a while we found it was a bit limited because there were few use cases. That's why we wanted to broaden it by including local shops, community building. For that we made a new organisation called *LimbU*. We had very nice partners like the local newspaper. Unfortunately, we had an election and a new party that did not support. At last, it was given back to the waste collectors and now it's very limited again.

The Torekes, is a totally different story: Back in 2009, it was initiated in a deprived neighborhood of Ghent. It's a shame that people there still have hunger, while the Province of Flanders, itself, is very wealthy. As the LimbU ultimately failed because of political reasons, the origins of the Torekes also had to do with politics. This was because a Flemish minister had an interview with Bernard Lietar. So she ran her campaign on financing a currency. So one day we popped into her office and said, here we are and we have this idea. So we received the grant. At the time there was a second grant for an educational currency.

1. **Which types of shops did you approach for the various projects you worked on?**

For the Torekes, we engaged local shops, drugscore, bicycle shop, grocery shops, and one local restaurant. That restaurant was a social restaurant, which means that people working there are doing their training and are partly subsidised in their wage.

[Follow-up question]: Was that the Torekes cafe?

Yes that's the name.

2. **How did you approach local shops? Was it free for them to participate?**

We just went up to them, because it is very local. Back then that's how you did it. We still only have paper money.

[Follow-up question]: I heard from Sofie that you are working on an app for the Torekes, how is that going?

Yes, we are now making a digital app for them. There was an app developed a couple of years back but it was not used at all. Now we need a good technological partner, especially for the safety and maintenance. We like to have it in different versions. What I mean by that is: A big organisation like Limbu would have to pay for it but a small organisation like the Torekes would be free. We have a partner that is subsidised by the government. De studio is the partner and is also a member of Muntuit. We also keep in mind that we need a solution without a smartphone, so that's a card with a QR code. This is important in a poor neighborhood where a lot of people are still not onto smartphones.

[Follow-up question]: Are you thinking of building your app on a blockchain?

For our purposes a blockchain would be an overkill.

3. **What were the different reactions you received?**

I have no clear answer to that. But Tom Dutry will have answers.

4. **Why did some shops decide to join?**

Shops join when they see an advantage. But what's in it for them can be different depending on the shop. One shop is out for the branding while another just wants more customers. They say, "Ok I will use the currency so people come to me not to another shop", but of course that only works as long as not all the shops are taking part.

5. **Why did some shops not join?**

I can tell you that not just for Torekes but for all other systems: Shops are not taking part if they don't see an advantage. Some shops are strongly put off by extra bureaucracy. For us at Muntuit, we always want to create technology that is seamless as possible. That means, no new terminal of course they also don't want to pay for it.

[Follow-up question]: How can you make them pay for it?

Well the same as with the terminals when they were introduced in the first place. It was per transaction. This however incentivises to have as few transactions as possible. Shops get the positive image, but don't have to pay a lot.
The other option is the membership fee per month, or per year. This seems more at first, but really incentivises more transactions.

[Follow-up question]: Is there a currency, you know of, which functions without external subsidies?:

Yes, the brixton pound, but that is just for exchange and not reward-based.

The RES barter scheme in Belgium is another example. It is for-profit and the shop paid a membership fee. Last time I checked it was in court because of malpractice. But I think that's more because of their values, not their currency design. In my opinion they did not have a good vision and management; not the right intentions so maybe this is a bad example.

A good example is the Ambipas in Tongeren, Belgium. It is financed only by the shopkeepers. I will give you the contact details on someone who knows more about this.

Another reason why shops might not want to join is that they put the currency next to coupons. This can make a currency unattractive. In Belgium, for example, you can give employees an extra on which you don't pay taxes by use of special vouchers. These vouchers can only be spent on food and restaurants. So, in Belgium, sometimes shops see currencies as competitors to these vouchers.

6. **Did you react to these reasons by making adjustments in the currency design?**

That's the process that we are using now. The first ones [currencies] were very top down towards the shops. Even though it was co-creative with NGOs and users, the shops were just the receivers of an already finished currency design. Now we really want to make it a co-creative process by including the civil servants, citizens in an evening session. Additionally, we also organised meetings with shopkeepers, to find out what is positive and negative. We found that the engagement during the currency's operation is much higher if we include stakeholders early on.

7. **Research shows that motives for small shops to join a currency project can be categorised in operational (economic) motives, such as better marketing or unused capacity, and ideological motives, tied to the general ideas of monetary reform or the values of the specific currency. Did you also see this distinction when you approached the local shops?**

Certainly, I think that you can distinguish these two categories. Every shop has to make ends meet, but beyond that most shops are run by people and people have their own visions, beliefs, etc. That's also the way the shop is part of their life means that they also have these other values which run the shops. So for example when shopkeepers give kids some sweets its part of their value system.

There is a very interesting experiment in Le Liège called **Val'heureux**. Financité, our partner in France runs it. They have a clear charter with their values and shops can only take part in the system if they agree with the charter. In fact, they have to sign it. The control is not very strict but if a shop is not in line with these values, its customers will not be interested. The charter is not very strict either, but functions a way to go. So, if a grocery shop still sells coca cola he will not be kicked out. The customers in the shop are also in line with these values. So they in turn convince the shops to be more in line. There is also voluntary work, but there is no subsidy, so it is another good example. I will give you contact details of someone at Financité.

Nicolas Franka (Le Val'heureux) - INT7

Date: 12.05.2020
Location: Vienna - Liège (ZOOM)

Background Information on the Interviewee:

Nicolas Franka is a researcher and network manager at Financité and works on the currency Le Val'heureux.

Interview Questions:

Introduction: Can you tell me a little bit about your work on community currencies over the last years?

I work for both Financité and the complementary currency *Val'heureu*x. My main work at the *Val'heureu*x, which was started in 2012, was to set up the accounting framework from a legal perspective. I'm an economist but I really got into law because of that. Our goal was always to make a self-sustaining business model for our currency. This is made possible by a payment of 25€/year from each shop for the paper-based currency. Since a couple of days ago we also have a digital payment system. For this we also want 25€/year from each shop, but if they already pay for the paper-based it is free. In the digital version, however, we also ask the Users to pay at their discretion. It's a bit lower than for the shops, but this can range from 5-10€/year. From these memberships we can run our operating costs. How we frame it is that it is not a complementary or community currency, but a *citizen* currency; owned by the people. Legally they purchase a voting share of an NGO. Each user or shop has one vote, allowing them to select a board, which makes decisions.

[Follow-up Question]: Which kind of decisions?

Things like which shops to include, the value charter and other things.

[Follow-up Question]: Which kind of decisions?

The reserve for the currency is totally separate of course. What I mean by that is that users convert Euros to units and use these to buy products at shops. So this makes up the reserve, which we store with the Triodos bank.

[Follow-up Question]: Like the Regiogeld right?

Yes, this is actually the most common currency model out there.

The committee and the volunteers had to build up a framework to see which shops to include or not.

Some were really easy like chains aren't allowed, local aren't. But the grey zone was interesting.

We don't give points, but there are red lights. There are various levels, economic: do you try to promote local suppliers, are you products locally produced; social: not make abuse of short-term projects, **decision-making power is in the person working there**. Most importantly is a franchise, is a problem. Only work with big suppliers, you're out. Only have products from abroad you're out. Working conditions for employees and you'll be pulled off. We dont want to control but the first appraisal is based on trust. But now we are revising and being a bit more careful because it is more popular and actually attracts shops at the moment. Do you discriminate?

We had to exclude a woodcrafting retailer because he did not have autonomy. We have a grey area like mechanics for cars. Pharmacies are also in the grey area. Because of big pharma, but many say they have homeopathy, we have a special committee to assess businesses that are actually valonia wide, for all currencies. For circulation we can't accept someone who is a retailer. Its very different from Flanders because we dont have the municipality initiative, its all grassroots. Funding you can take but who gets to decide at the end of the day. You need to carve in marble through the status in regards to the DAO. You need to write down the rules of decision making. Amount-based voting is a red card. One vote, one person.

We try to create economic circuits for businesses and that should attract. We have a brewery: wheat, yeast bottle washers producers should be in the currency. That's how we target businesses. We want to get people that can't advertise like doctors etc. We want to span the consumer basket as wide as possible.

1. **Which types of shops did you approach for the various projects you worked on?**

We have a big variety in the network. Of course there are the easy one to accept and the easy ones to discard. For example, local grocery stores that sell products from local farmers we really welcome. Franchises, on the other hand, are no-gos. They are fundamentally not compatible with a local economy because a part of the turnover will always leave the area. But the more interesting cases, the ones in the grey-zone, are also there. There we have pharmacies that also claim to have a lot of p and example a big bio shop. But actually he is a slave of a whole sale.

So you see we are strict with which ones we allow to join. We actually have a special committee that makes these decisions. Over Fincancité, we expanded this committee to other currencies. In this way currencies can learn from each other. But as I said we are strict. We have a charter with a couple of main points:

1. The shops should not abuse short-term contracts to make economic gains,
2. The decision-making power should be with the shop, in that the shop owner works there or is a local
3. The shop sells mostly local products, and is not reliant on foreign suppliers
4. The working conditions of the employees should be good

We generally don't want to control, and usually trust shops when they claim something. Now though, when the Val'heureux is becoming more popular, we actually have a revision process for shops. There we go into the shops and inspect them. Our leverage point is also the conversion fee. In the beginning conversion from units to Euros was free. Now if we feel a shop doesn't comply we usually recommend them to provide a list of suppliers. We then send them back a list of suggested suppliers that are more in line with our values. This process can take a while, which can be costly for shops while they sit in their units. But essentially we are also providing a service to the shops by telling them about other suppliers.

[Follow-up Question]: Did you have to kick some shops out already?

Yes we did have to do that.

2. **How did you approach local shops? Was it free for them to participate?**

We approach shops human-based, not online. We visit, see how they run their business. Then we get back to you, to see if they took out the coca cola that we said they should. You wouldn't believe how much it really hurts businesses to not have coca cola. So we usually have the deal that you can have coca cola on the very bottom shelf but not on the top. The top has all the local product

3. **What were the different reactions you received?**

Miscomprehension, excitement, willingness to do their bits, value-based at first, now it's getting somewhat marketing based. You can sense that they are more interested in the branding than in the actual consequences. We are using the crowding out effect.

4. **Why did some shops decide to join?**

Most vendors want to join for an increase of their revenue.

5. **Why did some shops not join?**

There are multiple reasons. Scared of the legality of such a scheme, lack of liquidity when taking in units or that they simply don't see the economic impact or believe in it. Another reason is that additional work in operations is required in our currency.
To make it easier for vendors, we don't say electronic money. Rather we tell officials that it's a payment system with vouchers for the legal standpoint.

6. **Did you react to these reasons by making adjustments in the currency design?**

Yes, many times.

7. **Research shows that motives for small shops to join a currency project can be categorised in operational (economic) motives, such as better marketing or unused capacity, and ideological motives, tied to the general ideas of monetary reform or the values of the specific currency. Did you also see this distinction when you approached the local shops?**

Yes, I also see these two main factors.