# Accommodating unwilling allies: Creation of a mutual credit system

Master thesis

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# Abstract

Mutual credit systems (MCSs), a type of complementary currency, are thought to have a countercyclical function by providing additional credit in times of recession. Past research has also focused on trust and social values as the basis for MCSs. Actor-network theory, which refrains from making a priori assumptions about the role of either economic or social factors, is used to offer a more detailed account of the creation of a mutual credit system. This study follows the Dam Foundation in Rotterdam pursuing to turn the statement 'Dam provides an additional source of credit' into reality. Due to the unsuccessful enrollment of account holders, Dam cannot practice its credit function and is substituted to 'Dam provides a professional and personal network of entrepreneurs with a similar value system'. This study shows how the enrollment of certain actors can lead to substitutions to the program, and how the meaning of a phenomenon is ultimately dependent on the actors using it, rather than on the initial statement. This study furthermore shows that shared social values are needed to create the system, at least in the absence of any direct economic benefits. Trust, the belief that others will positively contribute to the system based on past experiences of their reliability, tends to be mentioned as a crucial requirement for the development of the system, but not as something currently present.



# Key words

Mutual credit system; community currency; alternative currency; WIR; Dam; actor-network theory; translation; trust

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# 1. Introduction

## *1.1. Introduction*

Complementary Currency Systems (CCS) are accounting systems created outside of the banking sector, intended to promote exchanges of goods and services within a certain trading network, usually a geographical area (Fare & Ould Ahmed, 2017). These systems are created to complement, not to replace, the official currency, and are often intended to stimulate the local economy, especially in tough economic times. There are many different types of CCS, that differ in their goals, set-up, and participants.

In many cases, an exchange rate is set up between the local and the national currency. Its value is based on its role as medium of exchange, and usually does not accrue interest (Dini & Kioupkiolis, 2014). A different type of CCS is the mutual credit system, in which a physical circulating currency does not actually exist. The 'currency' or credit comes into existence when two firms or individuals start trading, and the seller is credited while the buyer is debited on their account. The WIR-Bank (or Wirtschaftsring) in Switzerland is the oldest and largest example of a centralized credit system without any circulating currency, founded in 1934 (Stodder, 2009; Studer, 1998). The WIR 'club' currently has around 60,000 participants and a trade volume of about 1.5 billion CHF (Vallet, 2016). Another example is the Sardex in Sardinia, founded in 2010 (Dini et al., 2016).

## *1.2. Research problem and methodology*

Such systems are thought to bring economic benefit to the participating businesses and the economy as a whole by means of their countercyclical function: their ability to provide credit at times of economic crisis (Stodder, 2009). The system is arguably based on and creates relationships of trust (Vallet, 2016; Sartori & Dini, 2016). However, considering its economic impact and the fact that the motivation for joining the system is usually economic (Sartori & Dini, 2016), it can be questioned whether, and to what extent, trust actually plays a role. This is further questioned as the definition of trust remains elusive.

The only two case studies available on the mutual credit system deal with WIR (Vallet, 2016) and Sardex in Sardinia (Sartori & Dini, 2016). It remains to be seen whether their results can be generalized to other contexts. In the Netherlands, the system exists as well, albeit on a

somewhat smaller scale. One of these is Dam, centered around Rotterdam, which was founded in 2013 and currently has about 500 account holders.

This thesis examines Dam using actor-network theory (ANT). This approach, which is more a method than a theory, studies how a certain reality in the social or technical world is constructed. It can offer new insights into the way in which a mutual credit system is constructed, as it does not make any assumptions beforehand about the existence of social forces such as 'values' and 'trust'. Rather, it follows the actors in their own world-building activities and their attempts to turn certain statements into reality.

The research question is the following: *How and to what extent is the statement 'Dam provides an additional source of credit' turned into reality?*

The fieldwork consisted of interviewing two members of the core team, attending a Dam meeting and interacting with account holders, and studying the Foundation's annual reports and additional information available on their website.

### *1.3. Findings*

Out of the actors to be enrolled – software, volunteers, and account holders – it proved to be most difficult for the Dam Foundation to enroll entrepreneurs as account holders. This is mainly due to the fact that Dam can only be attractive as an additional source of credit once there are enough account holders that spend and accept Dam. A certain threshold of the number of account holders has to be passed before it becomes useful and attracts more account holders to the system. Currently, the statement 'Dam provides an additional source of credit' has not become reality. Instead, entrepreneurs are currently joining the system as they know and trust the people already taking part, and see it as a way to be part of a professional network of people who hold similar values, in this case related to community, sustainability, poverty alleviation in the Rotterdam area, and innovation: 'Dam provides a professional network of entrepreneurs with a similar value system'. The Dam story demonstrates how the actors associated with the program can produce substitutions to its meaning. It furthermore shows that, at least as the economic benefits are not yet clearly visible, trust and shared social values are necessary for the system's existence. Trust in this case can be defined as the confidence that other members will positively contribute to the system, a confidence that is based on the existing relationship and past experiences with these members.

### *1.4. Thesis structure*

This thesis is structured as follows. The next chapter deals with the existing literature on mutual credit systems. Chapter three introduces actor-network theory, contrasting the approaches already used on the topic. The fourth chapter deals with the methodology following from the actor-network theory approach, and chapter five includes the case study that tells the story of Dam from an ANT perspective. Chapter six discusses and chapter seven concludes.

# 2. Literature review

## *2.1. Introduction*

The current chapter deals with the literature on mutual credit systems. So far, the subject has only been studied by a handful of researchers. Studer (1998), Stodder (2009) and Stodder and Lietaer (2012) focus on the macroeconomic impact of the WIR Bank, while Vallet (2016) and Sartori and Dini (2016) approach the creation and maintenance of mutual credit systems from a social constructivist point of view, thereby highlighting the importance of social relations and trust. Both angles on the mutual credit system are discussed below. The scarcity of the literature allows me to discuss the individual papers in relative detail.

## *2.2. The mutual credit system: macroeconomic impact*

Within a mutual credit system, the 'currency' or credit comes into existence when two firms or individuals start trading, and the seller is credited while the buyer is debited on their account. The WIR Economic Circle, founded in 1934, is the largest and oldest still functioning system that resembles a mutual credit system. Firms and households within the network hold accounts with the WIR-Bank in terms of WIR-credits and debits. Practically all kinds of goods and services are exchanged and offerings are posted in publications and online. Prices are in WIR-credit, with one WIR-credit valued at one Swiss Franc (CHF), although this is done for ease of comparison and WIR-credits cannot be redeemed for CHF. Nowadays, there are over 70,000 participants and a trade volume of around 1.5 billion CHF (Stodder, 2009).

Modelled on the WIR, Sardex is an electronic mutual credit system aimed at B2B interactions in Sardinia. Sardex had around 3000 members in 2015, most of which SMEs and a few larger firms, and its trade volume was 51m Euro, just short of 0.2% of Sardinia's GDP (Dini et al., 2016). It was created in 2010 in response to the economic crisis. It is inspired by the WIR, but its system of accounting is simpler and does not involve a bank: credits and debts resulting from all transactions are simply recorded electronically, where a sale means the seller is credited the amount the buyer is debited (Dini & Kioupkiolis, 2014).

Indeed, the WIR system differs from simpler barter clubs or mutual credit systems like Sardex. The main difference is that negative balances in mutual credit systems are obligations

towards the community, whereas within the WIR system, these are loans with the WIR Bank, granted against collateral (Studer, 1998). As they are loans from the bank, positive balances can be much higher, and the risk is carried by the bank itself rather than by the community, while the Bank's internal collateral functions as a safeguard. Interest is charged over longer-term loans.

As loans in WIR have a lower interest rates than loans from conventional banks, Studer (1998) estimates that the total savings on interest were 36 million francs in 1997. However, the main advantage of WIR is its ability to increase sales and profits. Studer estimates total turnover in WIR to be at about 5.2 billion francs for 1997. This could be additional turnover created by the WIR system, but could equally be a substitution for turnover in Swiss francs, or substitute imports for local purchases or acquisitions from large firms for purchases from smaller businesses. Although it is impossible to determine the precise sources of WIR turnover, Studer assumes that all four possibilities contribute to it. He states that even if genuine enhanced turnover is rather small, additional profits are still substantial.

When compared to turnover in CHF, WIR turnover remains small. In the six sectors covered by WIR (construction, retail, services, hotel and tourism, wholesale and production/manufacturing/crafts), the average WIR turnover in 1994 was only 0.37% of total turnover (Studer, 1998). Within the WIR circle, WIR turnover was 0.925% of total turnover. Studer furthermore estimates that, in 1997, WIR money supply amounted to just 0.46% of M1 and 0.22% of M2, and fluctuations in WIR were much smaller than M1 fluctuations, meaning that the WIR money supply and its fluctuations are insignificant when it comes to fiscal policy (Studer 1998).

The ability of the WIR bank to grant loans is its most significant advantage over barter clubs (Studer, 1998). It guarantees that WIR 'currency' keeps circulating and members remain active. Loans have to be repaid in WIR, requiring participants to build up their WIR accounts by selling goods in the currency. Every franc from a WIR loan creates two francs in WIR turnover: one franc is spent after the loan is granted, and the second is spent to build up one's WIR account for repayment of the loan (Studer, 1998). This ensures the continued sale of goods in WIR. These interest requirements, the fact that for the first 2000 CHF of sales at least 30% has to be accepted in WIR, and the WIR Bank's ability to create money, together explain the WIR's success (Studer, 1998). Simpler mutual credit systems that do not feature interest rates will be at higher risk of becoming redundant after some time.

Stodder (2009) provides another study of WIR's macroeconomic impact, based on a 'money in the production function' (MIPF) specification and 56 years' worth of data from the WIR bank. He argues that a secondary currency like the WIR can exercise a stabilizing function in the economy because of its countercyclical tendency: it provides extra spending power in times of recession. This is consistent with the role of trade credits, which are commonly used between firms. Trade credits can have a countercyclical function for small firms (Nilsen, 2002). When money is tight, the smaller firms are least likely to receive credit from banks, leaving trade credits as their best option. Likewise, the WIR provides extra credit in times of recession, which is particularly valuable for small firms.

A 'money in the production function' (MIPF) specification considers money to be an important factor in the production function, because of its macro-economic role in saving transaction costs. The MIPF specification is a useful tool to examine the use of two currencies, the primary and the secondary currency, by firms aiming to minimize costs (Stodder, 2009).

Stodder suggests two propositions, which he proves using the MIPF specification. The first is that, if firms are cost-minimizing, turnover (defined as balances times velocity) in the secondary currency will be countercyclical. If inputs purchased in the primary currency lead to output that is lower than full potential output, which happens in case of a slump, a firm aiming to minimize costs can still produce output with inputs purchased in the secondary currency. The more actual output in terms of the primary currency falls below potential output, the more inputs will be purchased in the secondary currency to compensate for this loss. Turnover in the secondary currency will increase. In case of a boom, this turnover will fall. Therefore, turnover in secondary currency is countercyclical.

Real balances in the secondary currency have the ability to self-adjust to their optimal level, allowing this currency to reach the optimum output level. This countercyclical power is due to the fact that turnover is directly related to demand via the system's automatic credit-debt balance.

For the second proposition, it is important to note that prices in the secondary currency are assumed, in general, to be higher than prices in the primary currency. In the WIR magazine, for example, prices in WIR are usually quoted higher than prices in CHF, showing that WIR are less useful than CHF. Furthermore, the differences in prices in primary and secondary currency are assumed to be determined by institutions and transactions technology, and not by

variations in the economic cycle. The higher the relative cost of the secondary currency, the more time it will take to buy and sell inputs in secondary currency compared to inputs in the primary currency. Therefore, the second proposition states that turnover in the secondary currency will be less countercyclical the higher its price compared to the primary currency.

As a corollary to the second proposition, Stodder states that a decrease in the relative marginal productivity of the secondary currency means that it will take more time for the output realized using secondary currency to fill the gap between actual and full potential output realized in the primary currency. Therefore, turnover in the secondary currency is less counter-cyclical the lower its relative marginal productivity.

Summarizing, cost-minimizing firms will choose to use secondary currency to realize outputs for which they lack primary currency. Output realized using secondary currency increases the larger the gap between potential and actual output in primary currency, and decreases when this gap closes, making turnover in the secondary currency countercyclical. However, its countercyclicality is lower the higher its relative transaction costs and the lower its productivity.

Stodder assumes the secondary currency's turnover (in the short run) to be 1) inversely correlated with GDP; 2) inversely correlated with the Swiss broad money supply M2; and 3) directly correlated with the number of unemployed. In order to test the correlations, Stodder uses WIR bank data from 1948 to 2003 on the number of accounts, turnover and credit.

Proof for correlations between WIR turnover and both GDP and the number of unemployed is weak. However, the results for the correlation between WIR and Swiss M2 are interesting. In 1973, the WIR bank prohibited 'discounting' of WIR, the sale of WIR for CHF at highly discounted rates. This measure 'decoupled' WIR and M2: while before 1973, WIR and M2 were closely correlated, this tie was weakened afterwards. The coefficients on M2 are both more significant and greater in absolute value before than after 1973: there was a more positive relationship between M2 and WIR in the long run and a more negative relationship in the short run, compared to post-1973. After 1973, a decrease (increase) in M2 was no longer as strongly associated with an increase (decrease) in WIR in the short run as before. This provides evidence for the theory that the counter-cyclical function of a secondary currency is stronger the lower its transaction costs. The increased transaction costs of WIR due to the prohibition of discounting weakened its countercyclical power. Stodder therefore concludes

that WIR has been able to play a countercyclical role in the short run, especially when transaction costs were low.

A similar countercyclical role of a secondary currency was found by Colacelli and Blackburn (2009). Using a Kiyotaki and Wright model, which allows for the study of equilibrium conditions with several currencies, they study the conditions under which a secondary currency is accepted. Colacelli and Blackburn show that the emergence of Argentinian localized secondary currencies (créditos) in 2002-2003 was strongly related to shortages in the supply of the national currency, and its rate of acceptance furthermore depended on the secondary currency's transaction costs relative to the peso and its relative effectiveness vis-à-vis individual trading. Real income gains from the créditos were substantial: those using it had an extra monthly income of more than 15% of the average monthly income in Argentina, which equaled a 0.6% increase in GDP.

In a follow-up study to Stodder (2009), Stodder and Lietaer (2012) have at their disposal a new disaggregated data set with which they can separate balances and velocity. Using this, they argue that the countercyclical tendency of the WIR, or its ability to create extra spending in times of recession, for larger firms comes about through increased balances, while for smaller firms, extra spending arises from increased velocity. The way in which balances of larger firms increase while those of smaller firms decline, is similar to how large firms have more accounts receivable and are extending trade credit, while small firms are on the receiving end of trade credits (Petersen and Rajan, 1997).

### *2.3. The mutual credit system: trust and social values*

A social constructivist perspective may explain how a mutual credit system comes about. From this view, mutual credit systems can be seen as socially constructed, whereby social interactions create the relationships, beliefs and practices that shape the credit system, and the system in turn determines the direction of social interaction (Dini & Kioupkiolis, 2014). Such studies have been conducted by Vallet (2016), who studies the WIR, and Sartori & Dini (2016), who look into Sardex, a B2B mutual credit system in Sardinia, Italy. Both base their theoretical framework on an economic sociology perspective, which introduces concepts such as relational networks, cultural factors, and the existence of different market structures in different contexts, and which enables them to conduct qualitative studies into the meanings of actors' actions (Vallet, 2016). Vallet draws on WIR bank documents and interviews with

several prominent bankers and users, while Sartori & Dini (2016) make use of in-depth interviews with Sardex' founders and members.

Economic sociology investigates the form and meaning of money itself (Sartori & Dini, 2016). Within economic sociology, there are two perspectives of money. The first is 'money changes values', in which money is a given instrument, often seen as having a corrupting influence on values, promoting destruction and commodification. The second perspective is 'values change money', which regards money as emerging from social values. This also implies that a variety of social relationships can lead to an equal variety of money types (Sartori & Dini, 2016). The WIR money as a unit of account represents a certain kind of society based on specific social and spatial values, as can be seen in the way goods are valued (Vallet, 2016). Vallet states that participants' decisions for joining and using the WIR network are often based on social values such as exchange that is not just economic, but also based on sustainability or connection with the locality, for example. According to Sartori and Dini, Sardex emerges out of both economic and social values and contributes to both perspectives on money. The 'money changes values' view stresses the importance of Sardex' economic benefits for its sustainability, while the 'values change money' perspective points at the social values that underpin its creation (Sartori & Dini, 2016).

Values therefore play an important role for both Sartori & Dini and Vallet, mainly because they create trust. In Sartori & Dini, social relations, trust and social capital are used almost interchangeably. Social capital is defined as both generalized trust and a network of useful and productive relationships. Trust is said to be closely connected to social capital. It emerges from actors' beliefs about the extent to which others will use the money system, and is therefore specific to the community values and expectations of reciprocity. Trust is viewed as crucially important for creating a smooth trading environment among businesses: it is needed to get a network started and subsequently works to smoothen transactions (Sartori & Dini, 2016).

Vallet (2016) stresses two central aspects of the WIR system. First, the 'horizontal' perspective, which entails the use of the money by participants. The constant circulation of money, or what Vallet calls its 'death', and subsequent renewal, its 'birth', is what allows the WIR to function. Constant circulation is what makes it useful for current members and attractive for prospective members. As new participants join, new relationships are created, further strengthening the network. The network becomes a club good based on non-rivalry

and excludability, thereby again attracting new members and increasing circulation (Vallet, 2016).

This crucial circulation, according to Vallet, depends on supporting social values and trust within the community. Trust can be observed when companies turn to the WIR system first when crisis hits, and is shown when firms' indebtedness to others within the system increases. The required trust in the money comes in three forms: "methodical (between the users of money); ethical (referring to shared values inside a community); and hierarchical (between the users and institutions that hold money)" (Vallet, 2016, p. 485).

The latter corresponds to the second, 'vertical', perspective, which entails the banker's relationship with the participants and the confidence shared between the banker and the participants. Vallet argues that the culture (beliefs, values, attitudes) within a community shapes the economic and cultural structure of the money, which again gives rise to a certain 'attitude'. 'Attitude' is defined as 'a process of individual consciousness which determines the real or possible activity of the individual in the social world' (Thomas & Znaniecki, 1918, p. 221 as quoted in Vallet, 2016, pp. 488-489). The 'attitude' of the banker, especially, defines the moral and social meaning of monetary transactions, and in this case stresses the importance of social values next to the logic of the market. The bank creates the conditions for money to exist within the community by creating credit-debit ties when strong relationships between the members have not yet formed. The attitude based on moral and social values creates trust within the community which encourages sharing and subsequently the circulation of money (Vallet, 2016).

### *2.4. Conclusion*

Concluding, a mutual credit system like the WIR provides a source of extra credit in times of recession and thereby has a countercyclical function. The added advantage of the WIR Bank is its ability to grant loans against interest, which gives extra incentives for loan-takers to keep circulating the WIR currency, keeping it alive. Both Vallet and Sartori & Dini mention the economic benefits of a mutual credit system. Sartori & Dini remark that the most important reason for joining Sardex is its economic benefits. Firms join searching for new clients and trading partners. New participants are also recruited by existing members who understand that the usefulness of the network grows exponentially as new members join. Money circulation is stimulated by the lack of interest. Despite the economic benefits, however, Vallet and Sartori

& Dini argue that the circulation of the currency depends in large part on shared values among the participants and between participants and the banker in case of the WIR, which creates trust between banker and participants, and among participants themselves. Trust among the members ensures that they keep sharing the money, allowing it to circulate (Vallet, 2016). While both authors refer to the function of trust and its relation to other concepts, they fail to give a clear definition. This may be problematic for knowledge advancement (Castaldo et al., 2010).

# 3. Actor-network theory

## *3.1. Introduction*

On the one hand, a mutual credit system creates economic benefits for participating companies. On the other, however, it is argued that the crucial forces keeping the system together are shared social values and trust, of which the definition is not precisely clear. This raises the question as to what actually builds and maintains the system and how it is created. An approach that might be particularly valuable in this case, and which has not been used before, is actor-network theory.

Actor-network theory (ANT) was conceived of in the 1980s by Bruno Latour, Michel Callon and John Law, and has set itself the ambitious task of redefining the entire social science (Latour, 2005). ANT is not so much a theory as it is a method of studying how society, its ordering and power relations, is made and continues to be reconfigured constantly. The aspects of society studied may include anything, from the construction of knowledge (Latour, 1987), to governments, organizations, institutions, innovations, the family, devices and agents. ANT does not believe in society as a given ready to be invoked as an explanation for certain phenomena, but instead tries to find out how society itself has come about through the construction of networks. Rather than about defined entities, it is a theory about circulations (Latour, 1999).

Crucially, ANT focuses on the role of technology, or materials, within the creation of networks. Technology cannot be explained by society as society is not the explanation of anything, rather, technology makes society possible. The key innovation that ANT has introduced, is the symmetry between humans and non-humans, meaning that both people and things can 'act', produce effects in a similar way and have a role in the composition of society (Callon, 2001). In fact, it is technology that stabilizes social relationships (Latour, 1991). For example, a doctor-patient relationship is only possible thanks to the doctor's equipment, without which he would not be able to diagnose his patient and the patient in turn would not seek his help. The doctor would not be a doctor and the patient would not be a patient.

Just like there is symmetry between humans and non-humans, there is no inherent distinction between macro-actors such as institutions and organizations and micro-actors like individuals (Callon & Latour, 1981). These are made up of the same stuff, their difference in size only originating from the extent of the networks in which they are involved. Actors become bigger

as they succeed in building more durable networks around themselves. ANT follows the negotiations and modifications between humans and non-humans in their efforts to constitute networks, whereby it should be kept in mind that even networks that seem stable are always provisional and can be reconfigured.

The remainder of this chapter consists of diving deeper into the way in which (social) realities are created according to actor-network theory, which is divided into three main topics: black boxes, macro-actors, and the process of translation. In the next chapter, I continue with the method and mindset needed to conduct a study using ANT, before coming back to the case at hand.

### *3.2. Black boxes*

ANT focuses on the process of the making of science, society and technology, rather than taking any innovations, artifacts, definitions or societal order for granted. In other words, ANT is interested in the instances when a black box has not yet formed (Latour, 1987). The term black box originates from cybernetics, where a black box is drawn in place of mechanisms or commands that have become too complex. The only things one needs to know about a black box are its input and output (Latour, 1987). In the context of ANT, a black box is any mode of thought, institution, innovation or object about which there is no longer any controversy, at least for the time being (Callon & Latour, 1981). One is no longer interested in its history, its constituent parts, or the decisions and uncertainties arising during the production process. Take the example of a car. During its production process, it consists of many different materials, decisions and people, but once it is finished, the only thing that matters is that it functions as a car. It is only when it breaks down that the black box opens again and one becomes aware of all the parts constituting it. One could also think of a regime, take for instance the Soviet Union (Law, 1992), as an example of a black box: it had been taken for granted for decades, and only when it all came falling apart, did the relationships, uncertainties and decisions underlying it become visible.

ANT researchers are not interested in the finished product, but instead arrive before the black box is closed and the controversy is still in full swing, or, alternatively, when the black box has burst open (Latour, 1987).

What does the production process of a black box look like? It starts with an actor deliberately building on a program, or an idea. For this to become reality, he needs others (both human beings and materials) to associate themselves with this program, whereby the views of these so-called actants will have to be 'translated', or put in line with those of the actor and be stabilized in this way. An actant simply is something or someone with the ability to act and be acted upon (Czarniawska & Hernes, 2005). As more actions are attributed to the actant, it gets more active and acquires a more stable character. Actants become actors when, by building networks of associated actants, their programs are more successful than anti-programs (Czarniawska & Hernes, 2005). An actor is 'any element which bends space around itself, makes other elements dependent upon itself and translates their will into a language of its own.' (Callon & Latour, 1981, p. 286). Some actors are better than others at translating others' wills into their own and creating black boxes. These can be called macro-actors (Callon & Latour, 1981).

### *3.3. Macro-actors*

According to ANT, there are no inherent differences between actors, hence there cannot be a distinction between macro-actors such as institutions and organizations, and micro-actors like individuals (Callon & Latour, 1981). Yet, not all actors are equal: despite the lack of inherent differences, there are clear differences in size. Seeing an actor as a network may be helpful (Callon & Latour, 1981). Each actor is also a network of heterogeneous materials (both human and non-human) – hence the term actor-network. Although the actors (networks) themselves are shaped similarly, one may stretch over several provinces or even countries while the other is hardly connected to anything. For example, although there are no inherent differences between a king and a peasant, the king is linked to the entire country, both in terms of the citizens and the resources to which he has access, while the peasant's network remains mostly local (Callon & Latour, 1981). The number of connections a place has with other places, or the number of networks to which it is connected, give it its power and 'size' – thereby making it a macro-actor.

Rather than speaking of the micro- and macro-level, ANT presents the notion of locality. Locality is defined by connections and framing. Interactions can only take place when they are framed, otherwise they make no sense. For example, the interaction between a police officer and two motorists involved in an accident is framed by non-humans such as the cars,

the road, the crossing and the traffic lights (Callon, 2001). However, total framing is impossible, which is illustrated by the term 'overflowing' (Callon, 1999). Overflowing is actively prevented by non-humans. These so-called 'boundary-objects' both constrain interactions by framing them and at the same time connect them to other places, in effect allowing overflowing to occur. This happens because the boundary-objects themselves are also connected to elsewhere (Callon, 1999). The non-humans in the policeman-motorists case connect the place of the accident to other places. They could take us to other crossings where accidents occur; one of the cars could be broken, leading us to the mechanic; the policeman connects the place of the accident to the office where the reports are written, and so forth (Callon, 2001). Within ANT, the micro-level can be seen as interactions that are framed locally, while the macro-level should be replaced by localities that are connected (Callon, 2001). The difference between big and small (or 'macro' and 'micro') depends only on the number of relationships or networks in which an actor is involved. The social, so to speak, is flat (Latour, 2005).

Differences in size between actors, or the extent of their networks, are the result of struggles or negotiations, whereby some actors have succeeded in enrolling more actants for their program; they have 'translated' the other actants' wills to be the same as their own (Callon & Latour, 1981). Such translation, which can come about through all possible means ranging from peaceful negotiation to outright violence, enables an actor to speak on behalf of others (Callon & Latour, 1981). To become a macro-actor, translating human actors is not enough: one needs to also enlist materials. A king becomes powerful thanks, in part, to his palaces and the weaponry for his army. An actor becomes 'bigger' the more durable materials it can enlist to stabilize certain practices; in other words: the number of black boxes, or accepted 'truths' it can form (Callon & Latour, 1981). Macro-actors are those who succeed in fixing elements by associating and translating them: turning their wills into a single one, and thereby creating relatively stable hierarchies (Callon & Latour, 1981).

Macro-actors can be seen as the center of translation, the most powerful point to occupy within a network. Translation centers have some of the most and longest networks, having access to many resources and a lot of information. With their far-reaching networks, these centers are able to 'act at a distance' and have the means to combine elements and pieces of information to find new connections. This endows the translation center with the power to imagine various possible states of the world and the ways in which to get these about, and it is able to make other elements act so as to bring about this state of the world (Callon, 2001). The

sociotechnical network is a crucial element in enabling this action (Callon, 2001). A translation center could be an institution inhabited by humans such as a government, but it could also lie in an artifact, such as a car or a television, which benefits from a collection of actants (all connected to their own networks) made to behave in a certain way.

### *3.4. The process of translation*

Building such hierarchies between the center and the periphery starts with a statement, that an actor wants other actants to associate themselves with. A statement can be anything that is said, sent, thrown or delegated by a speaker and can therefore be anything from a word or a sentence, to an object, apparatus or institution (Latour, 1991). For instance, a scientist may make a statement about the entities under study, such as: 'the scallops in St. Brieuc Bay in Sologne, France, can anchor themselves to collectors' (Callon, 1986). This statement can be made with the help of instruments that produce inscriptions such as photos, graphs or maps through which the entities can be said to 'speak' (Latour, 1987). By enabling the elements to speak, the researcher becomes their spokesperson. The statement is created by putting inscriptions on top of each other, comparing and interpreting them, each of these steps being a translation of the inscriptions (Latour, 1987).

A statement is not only something that a researcher says about the inscriptions produced by studied entities, but can be interpreted much broader. For instance, it could also be a wish someone wants others to adhere to. Latour (1991) provides the example of a hotel manager who wishes hotel guests would leave their keys at the reception. The fate of a statement, however, depends not on the enunciator but on what others do with it (Latour, 1987). Whether the hotel manager's wishes are adhered to, depends on the decisions of the guests and not on the statement itself.

We should study both the transportation of a statement by others and the transformations that the statement undergoes (Latour, 1991). Here, Latour introduces the notions of association and substitution. Association relates to the number of allies (both human and non-human) a statement manages to attract, while substitution relates to the statement's transformation, or the displacements that it undergoes (Latour, 1991). Often, a statement will have to transform or be transformed in order for it to increase the degree of attachment of human and non-human actants. In the case of the hotel manager wanting guests to leave their keys, he finds that he can not attach that many guests to his statement by simply asking them. However,

transforming the statement by putting up a notice board reading ‘please leave your keys at the front desk’ in combination with attaching a metal weight onto the keys, leads to guests actually leaving their keys at the hotel because they do not want to walk around all day with the heavy metal in their pockets (Latour, 1991). Not only does the statement transform, but so do the (human and non-human) actants that attach themselves to the statement (Latour, 1991). The guests now leave their keys at the front desk. The keys have become typical ‘European hotel keys’ (Latour, 1991). As the degree of attachment (or association) increases, a statement becomes more and more ‘real’. While the statement was naked in the beginning, it is loaded in the end (Latour, 1991). Hardly any guests left their keys at the reception when the statement was merely a wish of the hotel manager, whereas almost everyone is happy to get rid of them if a metal weight is attached. However, it should be noted that this end (‘reality’) is only temporary.

The association of actants to a program can be accomplished by translation. Translation relates to a constant series of transformations and displacements of goals, interests, people, devices, and so forth. Translation is the displacement of actants towards the actor, seeing him now as indispensable, but translation also occurs as an actor translates others’ wills into his own, thereby becoming the spokesperson for the others. Rather than being the result of anything, translation is the process that establishes power relationships and that forms both nature and society (Callon, 1986).

In his 1986 study of the scallops in St. Brieuc Bay in France, Callon identified four moments of translation: problematization, interessement, enrollment and mobilization. They are here described as four separate movements occurring chronologically, but could in reality overlap in time or swap places.

Problematization occurs when actors identify a problem and propose a solution for it, a solution for which they themselves are indispensable. By defining the problem and solution, the actors define the goals and identities of other actors, and regard themselves as an ‘obligatory passage point’ (Callon, 1986), a crucial factor in the network by which all the actors must pass in order to reach their newly defined goals.

Second, the initial actor has to use devices of ‘interessement’ which keep its new allies by its side: these are all the means that can be used to keep actants away from all the other actors fighting to define the actants in line with their respective programs.

Third comes enrollment. The newly acquired allies have to get clearly defined roles that they accept, transforming the initial statement into something more stable. This is achieved through various rounds of negotiations until the interessements succeed. Central to this is motivation or 'ideological control': changing the way actors evaluate the state of the world and introducing more desirable alternatives (Holmström & Robey, 2005).

The last phase in the translation process is mobilization. This is the end of the translation, where the network is stabilized, can be recognized as an actor in itself, and is 'black-boxed'. The interests of the various actors mobilized are aligned. Spokespersons who speak for the different groups of allies keep in line with the interests of the initial actors. If successful, the actor itself eventually becomes the spokesperson for all associated actants. However, the actor trying to enroll others into its program has to deal with dissidence and the controversies that can be created regarding the representativity of the spokespersons, as well as other matters such as the identity of the actants to be enrolled and the state of beliefs (Callon, 1986).

In the St. Brieuc Bay story, three researchers try to enroll fellow researchers as well as the fishermen and scallops in St. Brieuc Bay into their program. While the number of scallops in St. Brieuc Bay is declining, the researchers have discovered that in Japan the population of a similar though slightly different kind of scallops has been saved by anchoring larvae to collectors, where they can grow protected from predators. The researchers want to know whether the larvae in St. Brieuc Bay can be anchored as well. For their project to succeed, they need to enroll the scallops (that need to anchor themselves to the collectors); the fishermen, who should refrain from fishing the larvae as they grow; and fellow scientists, who have to accept the researchers' results as valid. These are groups that did not exist beforehand but have to be created by the researchers, and their interests have to be aligned with those of the researchers, who are trying to establish themselves as indispensable. If the displacements are successful, the researchers' statements that the scallops exist as a species and that they anchor, and that the fishermen want to restock the bay, are seen as true and a new 'reality' has been created (Callon, 1986). The associated actants no longer have any other option than to act in accordance with the researchers' will. They are now constrained within a network of relationships built around the researchers – an actor-network (Callon, 1986).

### *3.5. ANT and other theoretical approaches*

How does ANT relate to other theoretical approaches? Facilitating the comparison with other research paradigms, Hassard & Wolfram Cox (2013) provide a highly useful analysis of ANT's philosophical principles, placing it into the paradigm model of social theory developed by Burrell & Morgan (1979).

Burrell and Morgan have developed a model distinguishing four research paradigms within social theory based on their metatheoretical assumptions about the nature of society and that of social science (Burrell & Morgan, 1979). Paradigms were distinguished based on their ontology, epistemology, view on human nature, and methodology. In terms of its meta-theoretical characteristics, actor-network theory can be seen as post-constructionist, which is 'ontologically relativist, epistemologically relationist and methodologically reflexive' (Hassard & Wolfram Cox, 2013, p. 1703), and has a deconstructionist view on human nature.

Actor-network theory is different from the approaches employed so far on the study of mutual credit systems. Sartori & Dini (2016) and Vallet (2016) write their studies on Sardex and the WIR system from a social constructivist perspective, insofar as they focus on the social construction of money and the influence of cultural factors on currency systems. According to social constructivism, facts are not only the result of truths objectively existing in the world, but are also, or completely, created by social interactions (Detel, 2001). Ontologically, this may be described as nominalist, meaning that 'truths' do not exist objectively, but only as social constructs.

The ontological stance of relativism denies the existence of objective truths as well, but neither does it purport that 'truths' are mere social constructs. Within ANT, whether a social or technical phenomena is true or false, or good or bad, completely depends on the context (Hassard & Wolfram Cox, 2013). As long as society is 'in the making', truths have not yet established, but once the actors involved agree on the reality of an entity or phenomenon, there is no reason for the researcher to question its truthfulness (Latour, 1987). The ANT notion that no truths should be assumed beforehand is in itself an ontological position (Hassard & Wolfram Cox, 2013).

Social constructivism focuses on the social construction of phenomena. As scientific knowledge comes about through social forces it cannot be found using rational methods, but rather by studying the construction of beliefs. One should look for (social) factors such as institutions, rules and power relations to explain the formation of scientific knowledge.

Merely accumulating facts using scientific methods will not lead to more truthful claims (Detel, 2001). In line with this, Vallet and Sartori & Dini look at the influence of structural and cultural factors on currency systems, inspired by notions from economic sociology. In contrast, ANT's epistemological position is relationism, which entails the belief that entities do not possess any intrinsic attributes. Rather, according to ANT, an entity's properties are the result of relationships they enter into with other entities. Actor-networks only exist through relations that are continuously performed (Hassard & Wolfram Cox, 2013). The social is not an external force already in existence ready to affect or cause scientific beliefs and practices. On the contrary, the social is the result of interactions within networks that create such beliefs. ANT looks at science and society 'in the making' rather than at ready-made social forces such as power and institutions that determine what the world looks like.

The deconstructionist view of human nature refers to the removal of the human subject from the center stage of analysis, either as determined by external forces or as the epicenter of free will (Hassard & Wolfram Cox, 2013). Within ANT, humans and non-humans are treated symmetrically. Indeed, the most striking difference between ANT and social constructivist theories is the idea that being an actor is not reserved for humans, but simply means something or someone that can produce an effect, and can therefore also be non-human. In the process of creating the social, technology plays a crucial role.

Vallet (2016) and Sartori and Dini (2016) handle an interpretive approach, focused on the meaning of actors' actions, obtained by interviewing them and studying documents. ANT's methodological approach is reflexive. This relates to the idea that there is no best way to conduct research, and draws attention to the researcher's subjectivity when it comes to the development of theory and the interpretation of data (Hassard & Wolfram Cox, 2013). Methodology is discussed in more detailed in the next chapter.

### *3.6. Conclusion*

Actor-network theory differs from the social constructivist approach used so far on the study of mutual credit systems, being based on ontological relativism, epistemological relationism, a deconstructionist perspective on human nature and methodological reflection. Is the method that studies how the 'black boxes' or 'realities' constituting society are constructed. Such realities or power configurations come about after an initial actor manages to interest and enroll several groups of human and non-human actors for his program. The program will

undergo substitutions, or changes, as a result of the association of actors. The next thing we need to know is how to go about studying all these displacements and transformations, which is dealt with in the next chapter.

# 4. Methodology

## *4.1. Introduction*

How does ANT go about the study of the construction of the social? ANT handles a methodologically reflexive approach, which entails the lack of belief in one best way to approach research. However, ANT research is characterized by case studies based on a method called 'follow the actor' (Latour, 2005). This chapter compares and contrasts the ANT approach to 'conventional' case study methodology. The 'follow the actor' approach and other methodological remarks by Latour are examined in detail, and the chapter finishes with some well-known difficulties that can be encountered when conducting a case study using actor-network theory.

## *4.2. Case study methodology*

Methodology refers to the approach used to study a certain topic, case study methodology referring to the ways in which to conduct a case study. Methodology directs a researcher towards the objects and subjects of study, the way to approach this, and the characteristics of a valid outcome. A researcher's methodology follows from his ontological and epistemological assumptions (Hansen, 2011).

The ANT case study methodology differs markedly from 'positivistic' or 'conventional' case study methodology as developed by Yin (1984). Yin set out to defend the case study against accusations of it not being as rigorous a method as statistical research and developed a set of guidelines for sound case study research (Hansen, 2011). A case study according to Yin studies a current phenomenon, of which the general characteristics can and should be determined, within its context in the real world. As phenomena have regular properties, knowledge can be accumulated and theories developed. The case study should add to existing theory and verify or falsify it, or lead towards the development of new theory. The researcher should aim for analytical generalization, or the generalization of theories, rather than statistical generalization. Finally, Yin (1984) argues that case studies should provide an explanation, which is a causal relationship between an independent and a dependent variable.

Yin's view on the case study methodology can be described as 'ostensive', which is based on the following assumption: 'in principle it is possible to discover properties which are typical

of life in society and could explain the social link and its evolution, though in practice they might be difficult to detect.' (Latour, 1986, p. 272) On the other hand, performative research, to which ANT belongs, assumes that 'it is impossible in principle to define the list of properties that would be typical of life in society although in practice it is possible to do so.' (Latour, 1986, p. 273)

In contrast to the ostensive view, ANT regards phenomena as real, but their meaning as constructed and re-constructed, and they can therefore not be readily observed in their 'real-life context'. Reality is not simply something 'out there', and any account written by researchers is a translation in itself that in turn has an effect on 'reality', and on what is being studied in particular. The impact of the researcher on the social and natural world is visible most clearly when ANT focuses on the construction of scientific knowledge itself (Latour, 1987). The analysis is a reflexive performance between the researcher and the studied phenomenon, and the result is therefore highly dependent on the researcher and the methods used (Hernes, 2005).

Moreover, performative research does not focus on explanations as revealing a causal relationship, but instead questions the construction of the idea of the 'dependent' and 'independent' variables and the way in which their relationship is created (Hansen, 2011). It should also be remembered that the goal of an ANT study is not theory-building, but only to provide a description (Latour 2005).

### *4.3. The case study according to Latour's ANT*

Owing to ANT's reflexive methodology, a clear step-by-step guideline to conducting research cannot be provided. However, throughout several publications, Latour provides a series of methodological rules and principles, and hints as to how a 'follow the actor' case study can be approached. Briefly summarized, an ANT researcher should have no assumptions before starting the analysis; provide a description that involves as many actors actively participating as possible; concentrate on the translation process that produces macro-actors and black boxes; and change the perspective of the observer to judge the success or failure of the translation process.

The most important principle to be kept in mind when using actor-network theory is that nothing should be defined *a priori*. It can never be determined by the analyst in advance what

is essential and what is not (Latour, 1991), or what is true and what is not (Latour, 1987). No definition should be imposed on the actors; instead, they should be followed so the researcher can learn about their nature from the actors themselves (Latour, 1999). Similarly, it should be left to the actors to say what makes them act, and if the drive behind their action is uncertain, so the researcher should treat it as uncertain. The 'social' has not yet been made, and is therefore not something that is hiding behind the observed actors' actions (Latour, 2005). The analyst cannot make any claims as to what is 'true' regarding the nature of society as long as the actors themselves are not sure. As we are following science and technology in the making, the (temporary) end products (be it a certain knowledge or an innovation) are not yet determined for the actors, so they should be treated equally undetermined by the researcher. As soon as a black box is formed, however, and something is no longer contested but treated as 'true', this has to be assumed as true by the researcher as well. The researcher's ontology shifts according to that of the actors followed (Latour, 1987).

It is imperative to avoid any research protocol. The limited ANT vocabulary (inscription, translation, spokesperson, network, etc.) should be used as instruments to let actors speak for themselves and let them build their own worlds, rather than to impose on them some kind of identity. Rather than providing just another 'universal language' to describe and interpret the social, the ANT vocabulary should only be providing the tools for a systematic description of how actors build their own worlds (Latour, 1999).

Now, keeping in mind the principle of no *a priori* assumptions, how should we go about ANT research? The short answer: we have to make a very good description. Some may say that a textual account is not objective, however, a good text is not any more or less objective than reports coming from the laboratories of 'hard' scientists (Latour, 2005). Yes, a textual account is artificial, but this does not automatically make it untrue or unobjective. A good description is both artificial and accurate. It is the laboratory of the social scientist, and just like the artificial setting of the laboratory makes it possible to reach objectivity, so does a good textual account enable objectivity for the social scientist (Latour, 2005). However, a textual account does not always succeed in capturing the circulation of the social. Just like an experiment, it may fail. A good description can fail because it has to deal with the completely artificial nature of the written text while remaining accurate (Latour, 2005).

Another objection one could have with a description as the final product of a research project, is that it does not provide an explanation. However, Latour insists that there is essentially no difference between description and explanation: once everything is described well, the

explanation follows naturally from the description (Latour, 1991). If an explanation seems needed, it just means that the description failed. Often, explanations in the social sciences are the bigger 'frame' put over the particularities of the description of a specific case (Latour, 2005). This, however, goes against the principle of no a priori assumptions about the social order. Instead of looking for explanations from existing social theories, they should be found in very deep, very detailed and specific descriptions. If a description does not provide an explanation, it just needs even more description.

A good description, one that at the same time provides explanations, should be tracing a network, the latter being defined as a collection of actions performed by active actors (Latour, 2005). Actors should be treated as mediators rather than intermediaries, meaning they play an active role in transformations rather than sit at the sidelines (Latour, 2005). Society is formed by the attempts of actors to translate others and form networks, therefore the actions of these actors should be followed in order to make society visible. When the researcher treats actors as mediators, the circulations that constitute society may become clear, showing that society is not something fixed but moving instead. The quality of research is related to the number of active actors included and the networks the writer is able to show by tracing translations (Latour, 2005). A network in this sense simply is an instrument for description, focusing it on circulation and movement, rather than something out there (Latour, 2005).

How to go about such a description? Latour suggests starting by defining the innovations and the actants, then moving on to describing the string of translations, and finishing off by varying the point of view of the observer (Latour, 1991).

Actants and innovations are defined in the same way. Whereas innovations are defined by the actants transforming it, actants are defined by the innovations in which they are involved (Latour, 1991). An innovation, claim or mechanism is defined by the actants it is passed on by (associations) and the transformations it goes through in the process (substitutions). An innovation is not defined or judged by its intrinsic qualities, but depends on what others do with it later on (Latour, 1987). Indeed, it can be understood by looking at the people, as an innovation is nothing more than a string of associations (Latour, 1987).

Turned around, an actant (human and non-human) is defined by its actions – the innovations to which it contributes. As stated earlier, an actant is something or someone with the ability to act and be acted upon (Czarniawska & Hernes, 2005). An actant gets more active the more actions are attributed to it, eventually becoming an actor with a more stable character,

building networks of associated actants to further its program (Czarniawska & Hernes, 2005). The more elaborately it can be defined, the more predictable an actor becomes, to the point where its performance can be inferred from its capabilities (Latour, 1991). It should be stressed that no special qualities should be ascribed to people's minds, unless something remains unexplained after the entire network has been described (Latour, 1987).

Having defined innovations and actants, one can go on looking at the translations. This process does not start with fixed actants, but rather describes the process of how one actant assigns certain interests to another actant and tries to enroll this actant in its program. Social links are only established through the process of translation (Latour, 1991).

The success or failure of an innovation cannot be judged by the analyst. This depends solely on the viewpoints of the actors involved, and it can therefore only be gathered by constantly switching between the views of the various actors (Latour, 1991). Comparing actors' mutual expectations of each other's actions shows whether actants are aligning with some program or not (Latour, 1991). Changing the point of view and describing the links between them provides a way to see relationships and patterns that might go unnoticed when looking at 'society' from a single angle (Latour, 2005).

### *4.4. Difficulties when conducting ANT research*

Actor-network theory may be a rather confusing method to apply, as no clear guidelines are given, and it has been interpreted in various different ways. The main difficulty is dealing with ANT's relativist ontology and reflexive methodology and sticking to it (Hansen, 2011). Application of ANT is made even more difficult by the question of which actors to include and exclude; the distinction of the different moments of translation; and the definition of a 'network' within ANT. These points are elaborated on below.

*The inclusion/exclusion debate*

Since a good description requires the largest number of active actors possible to be described, it is very hard to know who to describe and where to stop describing actors (Latour, 2005). They are always part of a network of other actors, who in turn are part of still other networks… This problem of inclusion vs. exclusion is probably best articulated by Miller (1997):

*'Who decides who the actors are? It's fine to tell us that we should believe them when they speak to us, that we should refrain from judging them, but we have to know who to speak to in the first instance, which meeting to attend, who to call on the telephone, who to e-mail, and who to ask for an interview! Who is going to provide an answer to these questions? And should we believe them too? Of course you'll reply that the answer to this question is to be found in the technological project itself, in the activities of the contextualizers. But that won't do, because it presupposes that we know the boundaries of the project at the outset. While the territory of a project may not be limitless, neither is it as clear-cut as you make out. The linkages do not just stop at a certain point.'* (p. 363)

In the end, it is always the researcher who decides which actors are included and which are excluded. Indeed, 'ANT is just a lens for understanding the performance of whatever it is the researcher focuses on.' (Hansen, 2011, p. 125) The choice where to draw the line between actors that are described and actors that are not will always be slightly arbitrary and leaving out certain actors may lead to different conclusions than could have been drawn were they included. However, I would argue in line with Lowe (2001) that a qualitative study, not just an ANT account, always risks being incomplete or misinterpreting the data. One cannot go on forever describing all the actors in the world if a description, or indeed this thesis, is to end somewhere. For every innovation, there are actors that are more important for its evolution than others and in this thesis, I do my best to capture the important ones. After all, the best thing we can do is to add an account (Latour, 2005).

*Distinguishing the moments of translation*

Another difficulty would seem to lie in the four moments of translation as described by Callon. Although these are introduced as four phases that are relatively easy to recognize and separate, this may not be the case in practice:

*'In describing the story of the dossier, I started out with the intention of applying the distinction between terms such as enrollment, inscription, translation and mobilization. These terms looked distinctly different from a distance. Alas, when I began to use them in relation to the case I wanted to relate, the distinctions became blurred to the extent that I ended up using 'translation' as a general term for describing situations where actors enacted or evoked macro actors.'* (Hernes, 2005, p.117)

*The definition of a 'network'*

The ANT notion of 'network' may be hard to grasp, especially since a 'network' as deployed by ANT is different from what is usually understood to be a network. The word network within ANT was chosen at a time when it was not yet widely used, and therefore seemed rather neutral as a term. However, as time has gone by, the term 'network' has proliferated and come to mean an instant transportation, rather than a transformation – which it was supposed to mean within ANT (Latour, 1999). Within ANT, a network is not something with static properties, but is rather formed and re-formed by continuous interactions between actors. Law (1992) describes a network as used by ANT as a verb rather than a noun – it is a process rather than a stable entity. According to Latour, a network in the ANT sense is an instrument directing description towards movement and circulation (Latour, 2005). An ANT network does not even exist 'out in the world' and outside of the analysis (Hernes, 2005; Latour, 2005). A network may not be perceived by the researcher (Law, 1992). After all, we are mostly only aware that that there was a network the moment it breaks down.

This may be all the more confusing as the mutual credit system Dam can be perceived as a network in the 'conventional' sense, as a pattern of connected entities 'out there', observable and static; as well as a network of evolving relationships as per ANT. The two definitions should be carefully distinguished.

### *4.5. Conclusion*

In contrast to research producing 'conventional' case studies, ANT's ontology is relativist, meaning that the truthfulness of a phenomenon is dependent on the context. Their meaning is constructed and needs constant re-performing, but phenomena are nonetheless believed to exist 'out there'. This view leads to a reflexive methodology, which focuses on the 'conversation' between the researcher and the phenomenon under study; the influence of the researcher on the subjects studied and vice versa. ANT focuses on producing an account, which is in itself a translation of the translation studied. Even though it is acknowledged that the researcher plays a more than significant part in determining the final research outcome, he or she should make a great effort trying not to define or determine anything a priori and start the research project completely open-minded, leaving it to the actors themselves to build their own worlds.

The goal of an ANT account is description, not explanation in the sense of finding causal relationships between independent and dependent variables. However, a good description should automatically provide an explanation; if not, the description is inaccurate. A good description traces a network that includes as many active actors as possible. It should define the innovations and the actors involved; follow the string of translations; and finish with an evaluation of the innovation's success arrived at by varying the observer's viewpoint.

The main difficulties to be kept in mind when conducting an ANT case study, apart from dealing with the relativist ontology and reflexive methodology, are the question of which actors to include and which to exclude; distinguishing the various moments of translation; and the definition it gives to the term 'network'.

# 5. Case study

## *5.1. Introduction*

Actor-network theory provides a good method to uncover in detail the mechanisms underlying the construction of aspects of the social world, without making any assumptions about it beforehand. This is particularly useful when there is ambiguity about these mechanisms, which is the case with the mutual credit system. For this study, the case selected is Dam, a mutual credit system established in 2013 in Rotterdam. The research question is "How and to what extent is the statement 'Dam provides an additional source of credit' turned into reality?"

This chapter refers back to the available literature, which suggests that shared social values and trust are important determinants for a functioning credit system, and argues why it may be problematic, constituting the research problem. It then discusses the research question and method before moving on to the case at hand, and discussing the role of shared values and trust.

## *5.2. Research problem*

The papers by Vallet (2016) and Sartori & Dini (2016) argue that the mutual credit systems WIR and Sardex are constructed by beliefs and practices that enable the system to function, the system in turn shaping the participants' practices and beliefs. Their constructivist approaches allow them to use such concepts as relational networks, cultural factors, social values and trust, to explain the creation of a credit system. The role of trust in particular is highlighted. It is seen as a force essential for the functioning of the system, as it is trust that attracts members and enables smooth transactions. According to Sartori & Dini, trust follows from shared values and expectations of reciprocity and the extent to which others will use the system.

This line of reasoning is impossible for actor-network theorists as it uses social forces such as 'shared values' and 'culture' as explanatory variables: social relations and 'values' are seen as both a source and as a result of the credit system. ANT researchers would agree that social relations are a result of the formation of the network. The constant movement of social interactions creates networks of people and things in which their relations are stabilized, as

are their beliefs and what we could call ‘values’. However, the existence of concepts such as ‘values’ and ‘trust’ cannot be assumed beforehand. The social is not the explanation but the result of interactions; it does not come out of nowhere.

There are further grounds to question the role of trust and its supposed underlying values in the creation of a credit system. As Sartori & Dini already admit, the main reason for joining Sardex is its economic benefits, and existing members make an effort finding new participants as a growing network is also beneficial for them. Once a network of members has formed, the fact that the system does not offer interest on positive balances ensures that the money keeps circulating.

Additionally, neither Vallet nor Sartori and Dini provide a clear definition of trust. Trust is a complicated concept. Trust research has proliferated within almost all management disciplines, but there appear to be almost as many definitions of trust as there are articles. This wide variety of definitions is problematic for the advancement of knowledge (Castaldo et al., 2010). New research can only build on prior studies if settings, concepts and models are comparable. This becomes more unlikely when key concepts are defined in a myriad different ways. A researcher runs the risk of borrowing the word ‘trust’ without verifying its precise contents (Castaldo et al., 2010). It is called ‘reification’ when researchers keep using and building on a construct of which the original meaning is opaque. The construct risks being adapted with each successive paper and losing its touch with the original meaning, while it is still connected to the original theory (Lane et al., 2006). Therefore, it is vital for theory advancement that concepts be clearly defined.

For these reasons, it is relevant to revisit the question of how a mutual credit system is created and kept alive. Working with ANT allows us to follow the actors in their own world-building activities and to do away with any assumptions of what ‘forces’ could be of importance. The actors will be left to determine for themselves what plays a role. This approach could offer new insights into the creation of a mutual credit system and the factors of importance.

### *5.3. Research question*

A mutual credit system is a system that provides additional credit to firms during times of crisis when access to bank credit is low, thereby performing a countercyclical function (Stodder, 2009). The mutual credit system studied is Dam, which was founded in 2013 and

centers around the city of Rotterdam. It has a little above 500 account holders. Dam was only established after the 2008 crisis and has only existed for five years; it has not (yet) experienced an economic crisis or significant changes in bank credit accessibility. The extent to which Dam can truly exercise a countercyclical function in times of crisis can therefore not be determined. Nonetheless, a mutual credit system can still be a source of additional credit to individual firms during 'normal' economic times. This is exactly what Dam purports to be. As it states in its founding document, the Dam Foundation was established in order to increase economic prosperity in Rotterdam by issuing a currency. Entrepreneurs opening an account would benefit from the extra credit for which they do not need euros and which is interest-free. This is in line with the statement made by Stodder that a mutual credit system provides additional credit to those businesses involved. The question is how such a system is created and turned into a black box. The extent to which Dam is already turned into a black box may also be questioned considering its relative newness and most people's unfamiliarity with it.

In ANT terms, this translates to the research question:

*How and to what extent is the statement 'Dam provides an additional source of credit' turned into reality?*

Answering this question requires following the actors first enunciating this statement; the actors (both human and non-human) that are associated, translated, and enrolled, and the roles that are ascribed to them; the resistances that are overcome; and the transformations that the statement undergoes. The success of the translations, or the truthfulness of the statement in the end, can be judged by varying the point of view of the observer and comparing the mutual expectations of the actors involved.

Following the translation process of the statement 'Dam provides an additional source of credit' will reveal whether and how trust and social values play a role. If they do show up even though their existence was not assumed from the outset, an even stronger case can be made for their importance. Finally, due to ANT's focus on detailed description, a clearer definition of trust may present itself.

### *5.4. Method*

The sources used for this case study include interviews, my attendance of a Dam event (participant observation), annual reports, news items and Youtube videos. The use of a

multiplicity of data sources can be seen in line with Hansen's (2011) suggestion to move performative ANT research more into the direction of ostensive research according to Yin. I would ideally have performed more participant observation, 'following the actor' being ANT's main method, but this could not be realized due to constraints of time and distance. Participant observation was approximated by closely studying the Dam Foundation's development in its annual reports and news items.

I approached the Dam Foundation with a series of e-mails to the members of the core team, whose e-mail addresses are published on the website rotter-dam.nl. Within a couple of hours, founder and IT-responsible Arie Smitskamp had agreed to an interview and I received a call from founder and chairman Harry te Riele, saying the Dam team would be happy to help. A week later, I held two interviews by phone, one with Arie Smitskamp and one with Klaas van der Burg, another member of the core team.

The interviews were semi-structured and revolved around the development of the Dam Foundation and the functioning of the system, difficulties encountered while building Dam, differences between the original idea and the current situation, and the two men's own role in creating and developing Dam and the Dam Foundation. Rather than strictly following a list of questions, I attempted a reflexive interview style (Alvesson, 2003), focusing on the dialogue between researcher and interviewees, whereby the latter were given space to elaborate on what they thought was important regarding Dam. This approach is in line with ANT's reflexive methodology and the important rule to do away with any assumptions, instead following the actors in their own reasoning. Concepts such as trust and social values were not put forward deliberately, as I wanted the interviewees to mention such things only if they were deemed important by them.

Besides the two interviews, I attended Dam's five-year anniversary party in Rotterdam on Sunday, July 1st. This was a small gathering of members of the core team and other volunteers, and a few other entrepreneurs with a Dam account. It was held in the park next to a restaurant that was owned by a Dam account holder, and for the occasion, drinks could be paid for in Dam. The event gave an interesting insight into the way payments in Dam function, and gave a taste of the atmosphere of Dam events. Naturally, it also provided a great way to get in contact with many other people involved in Dam, with whom I also engaged in dialogues focusing on their own lines of reasoning rather than putting forward questionnaires.

### *5.5. The Dam story*

In following the translation process involved in the creation of Dam, I mostly draw on the early writings of Callon and Latour on transformations and the process of translation, in order to stay close to the original ideas. The focus is on association and substitution, as described in Latour (1991), and on the four moments of translation according to Callon (1987).

The Dam story can be described most accurately if we see it as involving two separate translation processes. In the first translation process, founder Harry te Riele is the initiating actor who needs to interest other entrepreneurs to take up the role of 'core team member', so they can together establish a foundation that will later issue the currency. This first step can be seen as successful, as the Dam Foundation is established and its existence and properties are no longer questioned by the actors constituting it.

The Dam Foundation being established as an actor in itself, with its own goals, is the initiating actor in the second translation process. The Foundation's goal is to establish an alternative currency that functions as a source of additional credit to entrepreneurs who open an account with the Foundation. It tries to establish itself as an obligatory passage point by considering itself as the solution to the problem of too little economic prosperity in Rotterdam and a lack of credit for individual entrepreneurs. The solution according to the Foundation involves an alternative currency that functions as a mutual credit clearing system, works in practice through banking software and an app and website, and requires entrepreneurs to open an account with the Foundation. These three groups of actors need to pass by the Foundation in order to reach their newly established goals, making the Foundation indispensable. The enrollment of these actors, in particular the translation of entrepreneurs to 'account holders' and preferably 'active members', turns out to be a tough task and translation remains partial.

#### *5.5.1. Translation process 1: Establishment of the Dam Foundation*

The initiating actor in the first translation process is Harry te Riele, self-proclaimed 'transition specialist', focusing on and guiding transitions towards sustainability within society and organizations. According to Harry, finance is still to make the transition towards sustainability, but this process will be aided by the increasing instability of the financial sector and new private initiatives popping up to replace banks as the sole sources of finance. His ultimate goal is the creation of monetary diversity. An alternative currency should be

established to show that this ideal is possible. Harry's wish for the creation of an alternative currency is expressed in the pitch he gives during an event in Rotterdam called Inspiration Monday. It is clear that he already has a rough idea of what it would take to establish a currency:

> *'Nowadays, all kinds of free software can be found on the Internet, with which you can create your own bank. Open source, standard download, and it works on the PC. You gather people around you to create a community with its own goals, and you design the rules for your monetary system.'* (Inspiration Monday, 2012)

The first step towards the creation of an alternative currency, therefore, is the gathering of people into an organization that will issue and administer the currency. For the realization of an alternative currency and for the organization creating it, Harry needs other people with additional skills. The main allies to be enrolled into the program of setting up such an organization, are entrepreneurs willing to take up the role of 'core team member', who together form the core team representing the organization.

The devices of interessement mostly consist of seduction and immediate consent. After Harry te Riele has held his pitch, cited above, he meets Arie Smitskamp: fond of the city of Rotterdam, a degree in business economics and some years of experience in automation. He immediately recognizes the potential of Harry's idea and wants to take practical steps to realize it, particularly regarding implementing the software. Other people are quite easily interested as well:

> *'[…] and that's how we recruited a banker: simply found on the schoolyard when picking up the children. You're talking to other parents and you find out that people actually quite like it. In no-time, we had a team together, which quickly grew to twenty people holding meetings in a neighborhood center.*' – Arie Smitskamp, core team member

Eventually, only 7 enroll into the program, committing to their roles as 'core team member' after negotiating their roles and what the Foundation and Dam would look like. Most importantly, the 7 agree on the nature of the Foundation, which is deliberately created as non-commercial and functions on a very small budget. This is due to a motto expressed by original founder and chairman Harry te Riele: 'One should travel light in times of transition', meaning the budget of an experiment like Dam should be kept as low as possible. This can be achieved mainly by depending on volunteers rather than on paid professionals. The Foundation of

course does incur costs, for such things as hosting and the board members' insurance, and its yearly budget lies around 3,500 euros. In the first year, this is funded by the core members themselves, who all contribute 500 euros. In later years, the Foundation occasionally receives funds that allow to cover the costs. According to the core team members, the insistence on a low yearly budget is the main reason why Dam is still in existence today.

All core team members have their own reasons for joining, which can be aligned with the program. Recurring motives for joining the core team are the belief shared by most that the current financial system is unsustainable; the idea that change should come from individuals with their own initiatives; a connection to the city of Rotterdam and its people, and the wish to do something for them; and a personal interest in setting up the experiment and their own tasks within the organization, the experiment often being described as fun (Riele, 2013):

*'I think the banks are failing. They are only focused on grabbing as much money as they can. They pay out top salaries and the customer is not important. We have to establish a good bank for its customers.'* – Hermann Matieschek, core team member

*'I have worked for a bank for years and immersed myself in the workings of the monetary system. It is highly efficient but there are some points at which it does not always function as well in today's world. […] We offer people a choice. I think this is what makes people happy, as it gives them autonomy.'* – Bob Bennink, core team member

*'Dam for me is my belief in a nutshell, that people and initiatives have to take control themselves to get society ahead. We are on a dead end and I think things have to change. […] It is a lot of fun to do, I learn a lot from it, I am proud that I can contribute, as marketeer, for such a good initiative.*' – Caspar Bouhof, core team member

*'We are showing that we can realize things in Rotterdam that cannot be realized in other cities. It is terribly fun.'* – Arie Smitskamp, core team member

*'I was working in a bank and had been interested in money creation for a while. I thought it would be interesting to see if this could be done outside of the bank or the euro. Moreover, Rotterdam is still rather poor compared to the other big cities in the Netherlands. I am interested in strengthening the city with innovative companies.'* – Klaas van der Burg, core team member (joined Dam in 2014)

Furthermore, all members of the core team agree that they constitute a 'dream team', the fact that they work well together as a team being an important reason to continue working on the project.

On June 11, 2013, a document is signed establishing a foundation that, as described in Article 2, 'aims to promote prosperity in the Netherlands, especially in Rotterdam and surroundings' (Stichting DAM, 2013). This goal is to be achieved by issuing, promoting and administering a currency, providing other financial services and by promoting the cooperation between the currency's users. The foundation is called 'Stichting De alternatieve munt' (DAM), in English 'The alternative currency foundation'.

The signing of the founding document establishes the Foundation as a reality for the actors involved. It furthermore establishes the core team as its spokesperson, as the Foundation itself cannot speak and needs human beings to do that for it. The Foundation, now established as a reality to the actors that are part of it, can start acting as a single actor.

### *5.5.2. Translation process 2: Establishing Dam as an additional source of credit*

In the first translation process, by locking seven entrepreneurs into the position of 'core team member', Harry te Riele manages to create the Dam Foundation. It can now be tested to what extent the Foundation is itself an actor, able to 'bend space around itself' (Callon & Latour, 1981) and pursuing a program in which it becomes indispensable. As can be read in the founding document, the Foundation has a clear goal: promoting economic prosperity, in Rotterdam in particular, by issuing an alternative currency that functions as an extra source of credit besides euros. The Foundation wants the statement 'Dam provides an additional source of credit for entrepreneurs' to become reality.

The creation of a currency with the characteristic of an extra credit source requires the enrollment of several (groups of) allies. These are the banking software, and software supporting the website; volunteers besides the core team that provide essential services to the Foundation; and the entrepreneurs willing to become an 'account holder' within the system and start to trade in Dam. These groups of actors are singled out as the most important ones, due to the fact that they were most often mentioned by the interviewees when asked about the development of Dam and the difficulties encountered. However, the boundary drawn between

actors included and those excluded will always remain slightly arbitrary and is mostly a result of my own judgement.

Note that these allies are all referred to as actors, rather than actants. The difference between actants and actors is their level of activity. Actants become actants in a program once they are mentioned as such. As they start to perform more actions and thereby acquire more characteristics, they turn into actors. Since they are more active, actors have a higher impact on an innovation than actants; therefore, the most important allies, who are shaping the innovation, are always actors. They may have started out as actants, but since there is no clear point at which an actant becomes an actor, all allies are referred to as actors throughout the text.

As suggested by Latour (1991), I start by defining the innovation (Dam), and the associated actors (software, volunteers, entrepreneurs). The description of the translations and the evaluation of the translation's successes follow automatically from describing the actors' actions with regard to the innovation.

*The innovation: Dam*

Dam is based on the system of mutual credit clearing. As exemplified by Arie Smitskamp, one of the founders and responsible for the technical realization of the Dam, this works as follows:

> *'We both open an account and start with zero Dam. You give me a beer and I pay you two Dam. I now have a beer and a two Dam overdraft, and you have two Dam. We have made a transaction, created value, and the sum of the accounts is zero. In fact, you have given me credit, with the beer as collateral.'*

Dam is designed as a medium for entrepreneurs to extend credit to each other, and created to support business accounts only. Despite the beer example, Dam is used mostly as payment for services. Interest is charged on positive rather than negative balances. This is in contrast to the interest paid by businesses on short-term credit in euros. The latter is thought to be unfair, as it means that people with debts or those willing to invest are financing the bank. The lack of interest on negative balances should make Dam more attractive as a source of credit.

The system is furthermore supposed to provide additional credit to those who join, exactly because the currency is local and thereby excludes many other businesses – entrepreneurs in Rotterdam with a Dam account are favored over similar businesses without.

> *'With the extra local currency, people are more inclined to do business locally. Spending Dam with others within the system creates a system of favors. It is fun to do business in Dam, and it saves euros. I don't have to repay immediately; I am not paying interest. And if you do not know beforehand who is more suited for the job, there is a preference for someone who accepts Dam, which gives a local boost. The more people who join, the bigger the boost can be. It strengthens the cohesion and fabric of the city.'*
> – Klaas van der Burg, core team member

However, the exact rules and meaning of Dam change over time; Dam is transformed or substituted as more actants are associated with it. This is described later on.

*The actors: Digital actors: banking system, app and website*

ANT tends to have a strong focus on non-human actors. When it comes to the creation of Dam, the banking software, app and website are crucially important. Without these, the project could not exist. However, I do not want to overly focus on the technical actors. Instead, I give the story of the software and app just as much attention as it gets from the actors involved in implementing and using it, sticking to the ANT rule of letting the actors themselves assign importance to factors.

The software is crucial to the system and one of the first things that was implemented. When he started talking about setting up an alternative currency, Harry knew that banking software was freely available on the Internet. However, it was Arie, who had experience working in automation, who implemented it and became the main responsible for IT matters.

Dam is created with the open source banking software Cyclos (Stichting DAM, 2017). developed by the Social Trade Organisation (STRO). This software was originally developed for use in developing countries, and used by hundreds of local currency systems worldwide ("Social TRade Organisation (STRO)", n.d.). Cyclos is the same software that is used by Sardex in Sardinia. The banking software is already in existence and aimed precisely at local projects like Dam, and it only needs implementing. The software itself does not need

developing and can be treated by the Dam Foundation as a black box. Already designed for similar projects, the interessement and enrollment of Cyclos into this project is rather easy.

An app is developed so that payments can be made quickly and easily. Account holders, some of which are involved to test and develop the app (Stichting DAM, 2015), are generally quite satisfied with the way it works. The internet address rotter-dam.nl was created prior to the official launch and functioning well, as it hardly experiences any down-time. It functions as a marketing instrument to entrepreneurs and other organizations not yet involved, and provides advertising space for Dam account holders. Slight changes early on ensure that Dam advertisements are easily visible on the front page.

The Dam Foundation works on the banking system, website and app with Rotterdam hosting company CloudVPS (Stichting DAM, 2015). It gives the Foundation professional support and sponsors it with two servers, one for the website and one for the banking system. The first server is put into operation without any issues, whereas the second requires some preparations and is more difficult technically.

However, when it comes to IT, the system has always been quite stable. The banking system and website mostly work according to the program, and as such are normally taken for granted. Once in a while, there is an issue which breaks open these ‘black boxes’, but major issues do not occur. IT does need constant attention and upkeep to keep running smoothly and requires most of the Foundation’s available budget. As a result, disagreements within the core team tend to erupt over the importance of automation. Those more involved with it realize that it needs the money it uses for it to keep functioning, while the others take it for granted more and wish that the available money were used more for marketing events. So far, those prioritizing IT seem to be ‘winning’, leading to a lot of the available attention and money going towards IT and resulting in a rather well-functioning payment system and website, that are kept in line with the program.

When asked about difficulties encountered when developing Dam, core team members do not mention the software or hosting. These elements are enrolled with relative ease, aided by the money and attention that they get, and as such do not alter the program to a great extent.

*The actors: the volunteers*

The Foundation's core team consists of seven members. However, these cannot provide all the services that are needed to make the program Dam succeed. The interessement of other volunteers is done by core team members by talking to entrepreneurs from their existing networks and trying to enthuse them for the project. However, hardly any devices of interessement are needed to enroll the volunteers, as most of them are ready to get involved. Enrollment of volunteers into the 'second circle' (the circle of volunteers outside the core team, who provide services but are not primarily responsible) is relatively easy, because aligning themselves with the project does not require as much time and effort as it does for the members of the core team. Volunteers' motivations for joining are similar to those of the core team members: the fun of being involved in an innovative experiment, supporting friends, and sharing values related to (financial) sustainability and improving the economic situation in Rotterdam.

*The actors: the account holders*

An entrepreneur whose will is aligned with that of the Foundation, is one who realizes he wants more credit leeway and needs the Foundation in order to get it. Entrepreneurs are interested to become enrolled as 'account holder' with the Foundation, and preferably become an 'active member', someone who regularly trades in Dam, rather than opening an account and leaving it there. The Foundation needs entrepreneurs to be enrolled as active members for Dam to have any use, and for the statement 'Dam provides an additional source of credit' to become reality.

Entrepreneurs are interested in several ways. One way is making an appeal on their personal relationships with core team members. This strategy is used in the beginning especially:

> *'We had thought of a launch, which took place on July 1st, 2013, at 12 AM. We were all gathered together in my living room; we would all invite three entrepreneurs from our own network to open an account. We would immediately challenge these entrepreneurs to in turn invite three valuable entrepreneurs from their own networks. At 2 AM, and by this time we were pleasantly tipsy, we had our own team of 7 plus 21, equals 28, account holders.'* – Arie Smitskamp, core team member

Most new members are found among existing networks and first-degree LinkedIn contacts:

*'We have always said: invite people you know from your own environment, people you trust. For example, I invited my brother-in-law, a photographer in Rotterdam. He had of course already heard about the project, and joined because he thought: Arie does it and he deserves support, so I will join as well.'* – Arie Smitskamp, core team member

At present, many account holders are still known personally by the board members as it has proven difficult to break out of their own circles. There are some account holders who have come 'from nowhere' and learned about Dam through one of their promotional activities. Apart from personal invites, the Dam Foundation holds several marketing events a year in order to interest entrepreneurs. Furthermore, account holders' advertisements for products or services that they provide for Dam are published on the Foundation's website.

However, the entrepreneurs who are supposed to take up the position of 'account holder' are proving to be the most difficult actors to interest and to enroll. The organization quickly reaches 120 to 130 account holders, before growth slows down. Nowadays, the number of accounts lies around 500 and is quite stable; new accounts are only opened sporadically. Furthermore, getting 'account holders' to stabilize in the role of 'active member' is another major challenge. Only an estimated 40% of participants is an active member, meaning they buy and sell in Dam at least once a year.

The difficulties regarding interesting and enrolling entrepreneurs into the project leads to most of the substitutions the program 'Dam' undergoes. The earliest example of this is the introduction of private accounts next to business accounts, which happens in 2014. Dam is created to be a medium for entrepreneurs to extend credit to each other via business accounts. Although account holders do use their accounts to some extent to do business with each other, it starts to quickly slow down. The founders realize that the network needs individuals with purchasing power, who are willing to shop with the business participants. People are now allowed to have private accounts as well as business accounts. This in turn gives birth to the next challenge, which is finding enough suppliers of consumer products, to cater to the needs of those with private accounts. These are still in insufficient supply, and this poses one of the main problems for the network, according to volunteers and participating entrepreneurs:

*'We always have a surplus in Dam, as there are not enough options to spend it. A while back, there was a woman who tried to pay for everything she needed in Dam only, but I don't know how she did it.*' – Sybren Vlasblom, account holder and volunteer

*'I am completely in favor of further strengthening the Dam community: I would like to spend Dam on my daily purchases. We have to keep the Dam system active, because it is only successful when it is being spent.'* – Unico Wilkens, account holder ("De Bergse Cave, Unico Wilkens", n.d.)

Another substitution regards the interest initially charged on positive balances. It discourages entrepreneurs from joining and it is abandoned after one year. It gave people the impression that the Dam foundation was a bunch of thieves. In an effort to counter this impression, the founders decide to call it 'demurrage' or a contribution based on capacity ('contributie naar draagkracht') rather than 'interest': the rate of demurrage on Dam accounts is 1% per month. Entrepreneurs with higher positive balances pay more 'contribution'. This system is thought to be more fair than one charging negative balances, as it is now the richest people within the system that are financing it. According to Arie Smitskamp, for someone with a continuous positive balance of a thousand Dam, this would amount to yearly costs similar to a relatively cheap and simple business account in the Netherlands. Unfortunately, even renaming interest 'contribution according to capacity', and keeping the costs lower than the average costs for a business account with a bank, still does not necessarily attract entrepreneurs.

Indeed, the money itself or the credit possibilities it provides are not the reason entrepreneurs open an account – *'It's a pity it doesn't work.*' (Pieter Kuiper, account holder and volunteer). Rather, people join because they think the idea is interesting, it is often simply described as 'fun', and they know people who use it; the wish to show support for friends and acquaintances who are members plays a role. Most importantly, people value being part of a network or community.

*'By accepting Dam, I am part of a network. A circle of people who believe in Dam in the same way.'* – Unico Wilkens, account holder ("De Bergse Cave, Unico Wilkens", n.d.)

*'It just feels good to pay in Dam. The knowledge that the money goes back to the community is a nice thought.'* – Dennis Last, account holder ("WOODY-WOODY, Dennis Last", n.d.)

*'Paying someone in Dam is making a personal connection: it is doing a favor for someone else within the community.'* – Susannah Burnette, account holder ("Wiser Film, Susannah Burnette", n.d.)

The community or network aspect is beneficial in two ways. On the one hand, Dam provides an opportunity to be part of a network of entrepreneurs that will favor those using Dam over those who do not. Dam is a way to become embedded within a professional network and enlarge it. Apart from this professional or economic function, Dam is seen as a network of like-minded people, who are motivated to help others within the community, granting each other favors. This makes it a deeply personal network as well.

A network in this sense should not be confused with the ANT notion of a network. When referred to by Dam members, a network is best understood in its more conventional sense of a stable entity connecting actors without transforming them.

Apart from the motivations related to becoming part of a network, those who join all seem to relate to certain social values, including community spirit, innovation, sustainability and poverty alleviation. In fact, I do not recall having a conversation with a Dam volunteer or account holder who did not refer to one of these values. Some examples:

> *'I have been thinking for a while now: how can we make society fairer and more social? Dam inspires me, I believe in the platform. It is important that members of the community meet and inspire each other.'* – Hans van Meggelen, account holder ("Drive to Connect, Hans van Meggelen", n.d.)

> *'As a creator and designer in reused products, I am more interested in the story behind products than in mass production. A customer once asked me to make a bag out of an old sail from his boat. I love to create quality products for a green audience. That is also why I accept Dam. It completes the circle with other local entrepreneurs, like when I had my website built and partly paid for it in Dam.'* – Heleen van Zantvoort, account holder ("RECOVER, Heleen van Zantvoort", n.d.)

The fact that entrepreneurs are not drawn towards Dam because of its credit function is acknowledged by the core team – '*The money itself is not a hard sell*.' (Klaas van der Burg, core team member). If the Dam Foundation is to remain in existence, the focus may have to be on the network it provides for entrepreneurs and the values it represents, rather than on its potential as a source of additional credit. As Dam has always had a specific focus on Rotterdam and the city's cohesion and economic betterment, the substitution of Dam to a medium that connects entrepreneurs who value community, sustainability and poverty alleviation, and provides them with an enlargement to their network is not that far off from the currency's original goal. Moreover, the motivations entrepreneurs give for joining are similar

to those mentioned by the core team, and both core team members and account holders ascribe to the same values. This may explain the ease with which the Dam core team has accepted the new meaning of Dam, why Dam could undergo the substitution without being dismantled by a core team that does not identify itself with the currency's meaning anymore.

Thereby, the biggest substitution Dam has undergone is its meaning as a currency, from a medium of extra interest-free credit to one that enables entrepreneurs to be part of a professional and personal network of entrepreneurs with a similar value system.

### *5.6. Social values and trust*

At this point, I need to return to the papers by Sartori & Dini (2016) and Vallet (2016), who emphasized the importance of trust and social values in the creation and maintenance of a mutual credit system.

When talking to account holders and volunteers both in the core team and second circle, I deliberately refrained from asking about the role of trust or social values. This is in line with the ANT method which stipulates that it should not be determined by the researcher what is important, but by the actors themselves.

As mentioned, shared values – sustainability, community spirit, poverty alleviation, innovation – are reported to be important for almost all Dam members. Especially since the system lacks any clear economic benefits at the moment, such values seem to be crucial in terms of tying people to the project and keeping them interested. This relates to the arguments made by Vallet and Sartori & Dini. It is in line with the idea from economic sociology, brought up by Sartori & Dini (2016), of 'values change money', which suggests that money emerges from social values.

Trust was not mentioned often, but when it came up it nonetheless seemed important to the actors in certain contexts. Arie Smitskamp mentioned that, especially in the beginning, account holders were urged to only invite other entrepreneurs if they *trusted* them, indicating that the Dam network was supposed to be built on trust. Similarly, the interview with Klaas van der Burg revealed: 'People do not join based on the hard facts, but because they *trust* the system. This trust is created at events, at which they get to talk to people.' Trust came up with regard to the currency when it was said by some in the core team that *trust* in Dam would

increase among the general public if the municipality were to associate itself with it and accept some kind of municipal taxes in Dam.

Trust in this case is related to the belief that others within the system will cooperate with the (mostly unwritten) rules: by accepting Dam for their services and refraining from accumulating large negative balances. This cannot be guaranteed, so people can only *trust* that this will happen. The perceived likelihood that others will contribute to the system rather than misuse it to their own advantage, is increased when these other entrepreneurs are known, and are known to have a history of trustworthiness. For them, misusing the system would mean losing their existing business contacts and reputation. Similarly, an organization like the municipality is regarded as trustworthy and its participation would ensure that there is always a way to spend Dam. Trust therefore is the belief that others will contribute favorably to the system, which is based on past experiences of the other's reliability. This definition relates closely to Morgan and Hunt's (1994), which is focused on the confidence one has in another actor's integrity and reliability.

Trust in this case is not so much about trusting the monetary system in itself, as it is about trusting the people who shape it. This is the kind of trust that Vallet (2016) refers to as methodical trust, or trust between a money's users. This kind of trust can exist before it is developed by the system, because it is the trust in existing relationships. Trust in the system is derived from trust in the people constituting it. This makes sense in the world of Latour, in which an innovation is nothing more than the actors constituting it (Latour, 1987).

When it was mentioned, trust was seen as an obvious necessity that, because of its obviousness, was not questioned or seen to be in need of further explanation. By those aiming to advance the Dam system, trust is explicitly mentioned as a crucial requirement: things will fall into place once trust is established. It is mostly seen as something that should be in place, rather than something that is. This relates to the finding by Mouritsen and Thrane (2006), who showed that trust tends to be mobilized precisely when it is absent; in their case brought up when activities within an inter-organizational network contradicted the network ideology.

Account holders are less likely than core team members to mention trust, possibly as they are less concerned with the advancement of the system. However, even though it is not explicitly mentioned as trust, familiarity with other members is an important motivation for entrepreneurs to join the system.

While shared social values are currently important in creating the network of entrepreneurs and keeping them interested in being part of Dam, trust is mainly seen as a prerequisite that will turn Dam in a source of additional credit, which was the original statement. The system itself has not yet gotten enough characteristics of its own, it is not enough of a macro-actor, to be a significant creator of values and trust itself.

### *5.7. Conclusion*

The initial idea for Dam came from Harry te Riele, who managed to gather a team of core members around him that together represented the Dam Foundation. This Foundation was inscribed with the goal of establishing a currency based on a mutual credit clearing system, and it was aimed at improving Rotterdam entrepreneurs' economic situation by providing a source of additional rent-free credit next to euros, eventually meant to boost the economy of the city of Rotterdam. The main allies to be enrolled into the program of creating this kind of currency were the IT systems, the volunteers running the organization, and the entrepreneurs who would open an account and trade in Dam. Whereas the IT systems and volunteers were relatively easily interested and enrolled, enrolling entrepreneurs into the role of account holder (and, preferably, active member) turned out to be a lot more challenging.

It turned out to be hard to convince entrepreneurs of the meaning and usefulness of Dam as an additional credit source, and of the need to open an account. The main reason for this, is because Dam cannot perform its role as a credit source as long as there are too few entrepreneurs who join as an account holder and active member and provide the supply necessary for others to spend their Dam on. This is a vicious cycle. Moreover, marketing and visibility remain weak points as the Foundation is run on a very tight budget and most of this money is directed toward the upkeep and development of IT.

The main substitution Dam has undergone concerns its very meaning. Dam exists, in the sense that volunteers and account holders agree that there is an alternative currency and they can use it; they can see their account balance on the app and use it to get certain services or goods, albeit to a limited extent; and meetings and events take place with others involved in Dam as well. These things would not happen if Dam did not exist. However, Dam as a currency is seen as fun or interesting rather than useful as a source of credit, as was the Dam Foundation's original program. The main meaning account holders currently ascribe to Dam, is that as the provider of a personal and professional network, a way of setting up new

connections with people who hold similar values, and to be another entrepreneur's first choice when it comes to a business transaction.

The research question was the following: *How and to what extent is the statement 'Dam provides an additional source of credit' turned into reality?*

Dam as an extra source of credit has not been turned into reality, because enrolling active account holders has proven a tough challenge, and it needs account holders that actively trade in Dam in order to function as a source of credit. Rather, Dam has undergone several substitutions due to the efforts of enrolling account holders, and could currently be described as 'Dam provides a professional and personal network of entrepreneurs with a similar value system.'

Indeed, the system is in large part based on a sense of shared values, which may be related to the fact that the economic potential of Dam has not come to fruition. Interestingly, trust (the confidence, based on past experiences of the other actor's reliability, that he/she will contribute favorably to the system) is mostly referred to as a factor that is not currently present but essential for the future of Dam, in particular in its perceived role as an additional credit source, which remains the goal. However, personal relationships, which are related to trust, are important.

# 6. Discussion

## *6.1. Introduction*

A few things are still in need of discussion. First, relating the story of Dam to the studies of Stodder (2009) and Studer (1998) may shed more light on the reasons why Dam does not work as a source of additional credit. I secondly touch on some of the limitations of the current study, to end with a speculation on possible future substitutions to Dam.

## *6.2. Dam and economic benefits*

Dam does not provide the economic benefits, via the provision of additional credit to entrepreneurs, it initially set out to. One underlying reason for this may be its lack of interest. In contrast to Dam, the WIR system charges interest over longer-term loans. It is argued by Studer (1998) that the interest rates are what keeps the WIR currency circulating, as they require that the loan-taker builds up his WIR account in order to repay the loan and the interest. Systems that do not have this, risk becoming redundant over time.

More importantly, however, Dam has not lived through a crisis, leaving its potential countercyclical role untapped. Dam was established in 2013, five years after the 2008 economic crisis. It has therefore not yet been possible to analyze how the currency behaves in times of crisis. If Stodder (2009) is right, the use of the secondary currency should increase in times of crisis as banks reduce credit opportunities. The lack of crisis in the years in which Dam has been active may explain part of its lack of success: there has simply not been a necessity to use alternative forms of finance. It would be interesting to see what happens to Dam if it experiences an economic crisis.

As a local currency, Dam will always remain less useful than the euro. The opportunities to spend it will always be lower, and using a secondary currency will always be more complicated compared to dealing with only one currency. Especially at the moment, spending opportunities within the Dam system are limited, seriously reducing its usefulness. As suggested by Stodder (2009), the higher the relative price of the secondary currency, the less it will be used, reducing its ability to provide extra credit.

Lastly, it is interesting to note that Dam envisioned another way through which it would be a source of additional credit to entrepreneurs, namely exactly because it is local – entrepreneurs in Rotterdam with a Dam account are favored over similar businesses who do not hold an account in Dam.

### *6.3. Limitations*

Some limitations of the present study need to be mentioned. First of all, any ANT account, or any case study for that matter, depends on the researcher writing or conducting it. All the actions taken to arrive at the end result, including method, interpretation of the results and conclusion, are influenced by the researcher herself. I have attempted to give as detailed an account of the process of conducting this case study and the reasons behind the decisions taken, but someone else may still arrive at a different conclusion than I do. In the end, this thesis is simply my own translation of the translation processes studied.

Another limitation relates to the inclusion/exclusion debate. It is difficult to establish which actors should be included and which should not. I arrived at a select group of actors (volunteers, software, and account holders), and I believe these to be the crucial actors in the story based on what the people involved in creating Dam have told me. However, this again depends on my own interpretation. Furthermore, there are groups of actors out there who I have failed to speak to, but who may have been important nonetheless. For example, I only spoke to active members since, logically, these were the ones answering my e-mails and showing up at the Dam event, but the perspective of less active members may have been very informative. Taking this even further from the network's core, talking to others explicitly outside of the network may be insightful in order to judge what Dam's meaning is to outsiders, but who to choose or how to find someone who is outside of the network but still somehow connected would amount to near impossibility.

Lastly, my time studying Dam has been rather limited, restricting my ability to really 'follow the actors', even though I have made up for this using diverse data sources. Ideally, however, more of the network forming activities should be observed right as they happen, depending less on what people remember when they are being interviewed.

### *6.4. The future of Dam*

The current rate at which new account holders join Dam is rather low. For some time now, Dam team members have been looking into recruiting a 'big club' into their program, these for instance being the municipality, a retailers association or care institution. If another organization were to take part and accept Dam for a certain service, such as parking tickets or waste collection levies, this would greatly increase the usefulness of Dam by ensuring that people always have an option to spend their Dam. So far, the interessement of such organizations has failed, usually due to the perceived difficulty of working with multiple currencies.

Despite past setbacks, Dam is currently working on a new plan to involve larger organizations. From the beginning, the extra credit possibilities Dam would offer to entrepreneurs would eventually lead to a boost to the city of Rotterdam. Dam has always had its ultimate focus on the economic situation of Rotterdam as a whole. In the initial statement, this would be achieved by granting extra credit opportunities to entrepreneurs; in the current statement, the network function increases cooperation and cohesion within the city. It is in line with this view of improving the socio-economic situation of Rotterdam, that Dam is looking to cooperate with other initiatives that aim to fight poverty in the region. Together with the Pauluskerk in Rotterdam, a church that simultaneously provides food, shelter and other basic services to asylum seekers and others at the fringes of society, Dam has drawn up a plan to help people with extreme debts by giving them 50 Dam a week. For this, Dam has applied for a subsidy from the municipality, the outcome of which will be known by September 2018. If successful, this would again change the meaning of Dam as a currency, from a medium that provides a professional network to participating entrepreneurs, to one that is also aimed at fighting poverty, moving more towards a charity. It would be very interesting to follow Dam's future developments and its substitutions due to newly associated actors. Association with a larger player like the municipality might furthermore increase Dam's effectiveness as a currency, giving more truth to the original statement.

# 7. Conclusion

A mutual credit system has a countercyclical potential, as it provides additional credit in times of economic difficulty. Besides the economic function, this kind of system is said to be based on shared social values and trust. However, existing research does not provide satisfying answers regarding the relative importance of economic benefits versus values and trust, the precise meanings of these concepts and the circumstances under which they arise.

Actor-network theory provides a method for studying the creation of social phenomena: 'follow the actors'. It follows an initiating actor in its attempts to build a 'black box', a social or technical 'reality' about which there are no longer any controversies, by interesting and enrolling several groups of both human and non-human actors.

ANT lets actors speak about what they feel is important in the creation of a certain 'reality' like, in this case, the Dam mutual credit system in Rotterdam: founded in 2013; around 500 account holders; run by the volunteers of the Dam Foundation: seven core team members and an additional group of volunteers in the 'second circle'. A reflexive research style focuses on the 'conversation' between researcher and subjects, resulting in a detailed description of the case at hand.

This thesis handled the following research question: *How and to what extent is the statement 'Dam provides an additional source of credit' turned into reality?*

Following the actors resulted in a couple of insights. The case of Dam can best be described as involving two separate translation processes. The first tells the story of initiator Harry te Riele, who manages to gather around himself a core team of entrepreneurs who set up the Dam Foundation. The second story starts with this Foundation, which aims to pursue the program 'Dam provides an additional source of credit'. Attempts are made at associating software, additional volunteers, and account holders. While the first two groups are enrolled rather easily, the latter poses a challenge. Dam is only able to function as a currency, and thereby as a credit source, if account holders actively spend and accept Dam. Too few entrepreneurs opening an account leads to a very limited supply of goods and services available in Dam, in turn limiting the number of accounts opened. This cycle is hard to break as the Foundation's minimal budget does not allow for expensive marketing campaigns.

This study's main finding lies in the very meaning of Dam as a currency. It is clear that the statement 'Dam provides an additional source of credit' has not gained much reality. However, Dam is still there and still valued to those involved. The difference being that it is not valued as a source of additional credit, but rather as a professional network of entrepreneurs holding similar values. These values are related to innovation, sustainability, and building a sense of community and alleviating poverty in Rotterdam. Due to the difficulties faced enrolling entrepreneurs as account holders, the currency has undergone a substitution of its meaning: 'Dam provides an additional source of credit' has become 'Dam provides a professional and personal network of entrepreneurs with a similar value system'.

The findings from the Dam case study are largely in line with those of previous literature. The literature on the macroeconomic impact of mutual credit systems provides answers to the question why Dam is currently not successful in economic terms. Even though the Dam system is set up to provide interest-free credit to its account holders at all times, a secondary currency will be most appealing at times of crisis, at which it can enact its countercyclical function by providing more additional credit (Stodder, 2009). Additionally, a secondary currency is always less useful than the primary currency (Stodder, 2009), but its price relative to the euro can fluctuate, determining its use. As supply in Dam is limited, its relative price is high and use remains low. Finally, Studer (1998) hints at the disadvantage of not offering longer-term loans over which interest is charged. WIR does do this and it allegedly keeps the currency circulating since it results in the WIR loan being spent and WIR accounts built up to repay the loan plus interest (Studer, 1998).

The literature on trust and social values provides a better understanding of the creation and development of a mutual credit system. Sartori & Dini (2016) and Vallet (2016) emphasize the importance of social values and trust, although the latter is not clearly defined. In the Dam case, social values and familiarity with the members constituting the system are indeed important aspects that enable the creation and existence of the system, especially since clear economic benefits are lacking. Trust is defined as the expectation that other actors will contribute to the system rather than corrupt it, an expectation which is based on previous experience of the actors' reliability. Interestingly, trust tends to be mentioned by core team members as a crucial factor, but one that is currently absent.

This study contributes to the existing literature on mutual credit systems by providing a clear definition of trust as it is mobilized by those creating the system. It furthermore gives a reason behind the existence of a mutual credit system hitherto not mentioned in the literature: the

benefits experienced by being part of a network, which is thought to be beneficial both in professional as well as personal terms – 'Because it is so much fun' being an oft-heard argument for joining. The study contributes to actor-network theory by once again showing how the meaning of an innovation can change as actors start using it, or refrain from using it, even though the system itself – in terms of the rules or the software – does not change.

It should however be noted that there are a few limitations to this study, which constitute the inherent subjectivity of any ANT account; the conclusion's dependence on choices made regarding the inclusion and exclusion of actors; and the limited amount of time I could spend 'following the actors'.

In the future, it would be interesting to see what happens if Dam manages to align itself with a bigger organization, which may substantially increase the spending possibilities and make the currency more attractive economically. If Dam starts playing a more substantial economic role, an interesting question would be whether trust is mentioned as an important present rather than absent factor. On the other hand, alignment with an organization may result in further substitutions to the program, possibly leading it even further away from the original statement of Dam as a credit source. Future research could focus on these questions, as well as turning to other mutual credit systems created in different settings: for example, is trust regarded as present in a system that has a clear economic function? It may also be questioned whether understandings of trust are the same under different circumstances, and to what extent the role of a mutual credit system as the provider of a professional and personal network is representative for other systems.

Mutual credit systems have the potential to contribute to the economy in times of recession by way of their countercyclical function. It may be worthwhile for government agencies such as the municipality to consider partaking in these initiatives, as such support would increase the spending opportunities within the system and create a sense of trust as government agencies are regarded as trustworthy institutions.

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