

ABSTRACT

Global heating jeopardises the climate regime that has been so generous to life on Earth. Despite fifty years of scientific evidence and 25 years of international political action, the threat of global heating is clear and present today. One of the reasons global heating isn't dealt with, is the price of sustainability transitions. Formation of prices can in part be explained by monetary design, as such money plays a role in the Anthropocene. Discussing the role of money in relation to global heating proves to be an unconventional approach. Money is a political object, which means that design of money requires to make choices between conflicting alternatives. Financial authorities frame money as natural, suggesting money isn't designed and therefore doesn't affect economic processes. Money is naturalised to allow for prioritisation of market distribution in the EU. If monetary design affects price rationing, the assumed naturalness of markets is invalidated. Because money is naturalised today, it can't be recognised as political object. This is problematic, since contemporary monetary design is disadvantageous for sustainability transitions. Today's design is best described as a single currency created as debt bearing interest issued by commercial banks. This design obstructs sustainability transitions in three ways. Commercial bank's standards for money issuance result in a shortage of money in circulation for sustainability transitions. Money created as debt bearing interest conditions use of money that isn't compatible with sustainability transitions. A single currency prescribes a single measure of value and deprives people of monetary agency, limiting the pool of available resources for sustainability transitions. Surviving in the Anthropocene requires re-establishing money as political object to allow democratic decision making regarding monetary design.

Key words: money, monetary design, climate crisis

INTRODUCTION

Imagine that sustainability transitions were profitable. There wouldn't be a climate crisis today. Unfortunately the threat of global heating is clear and present. How did we get here?

A fragile Earth floating in a vast dark space is an image engraved in collective memory. The year is 1968. This image produced a radical new perspective on the planet that is our home, contributing to the growing environmental movement of the sixties. In 1972 the report 'Limits to Growth' was published by the Club of Rome. It was one of the first major reports that warned the wider public of the risks of unrestrained industrial growth. The seventies also witnessed the appearance of green political parties in Europe. NGO's drawing attention to biodiversity loss start to appear around the same time: World Wide Fund for nature (1961), Friends of the Earth (1971), and Greenpeace (1971). The eighties marked the arrival of the official United Nations' definition of sustainable development. The Brundtland report 'Our Common Future' offered an official definition of sustainability in 1987: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." The nineties witnessed the establishment of the United Nations Framework Convention on Climate Change in Rio de Janeiro Earth Summit. Since then this body has gathered 24 times. In the short history of collective action against global warming, the COP 21 meeting in Paris, 2015, is the most famous. Then, governments of almost all countries agreed to keep the increase of global temperature well below 2°C.

Despite all these international state gatherings, many citizens today don't believe enough is happening to combat global heating. Urgenda sued the Dutch state for knowingly exposing its citizens to danger due to insufficient action to prevent climate change. Also, Australian citizens have filed a climate complaint against the Australian state at the United Nations, for violating human rights by taking too little action against climate change¹.

¹ <https://nos.nl/artikel/2284440-eilandbewoners-dienen-klimaatklacht-tegen-australie-in-bij-vn.html>

Extinction Rebellion, an international network of climate rebels, practices civil disobedience to enforce government action against global warming. The worldwide student strikes for climate action initiated by Greta Thunberg in 2018 are famous. In the same year, the number of climate marches spiralled. Forty thousand people attended the Amsterdam climate march of 2019 despite pouring rain².

The Anthropocene

For over 50 years the effects of fossil fuels on earth's ecosystem have been known. Yet the threat has only increased in urgency: "The Anthropocene is a proposed epoch dating from the commencement of significant human impact on Earth's geology and ecosystems, including, but not limited to, anthropogenic climate change." Ocean acidification, sedimentation of rivers, the introduction of chemical products, changes in the rhythm and nature of erosion, variations in the nitrogen cycle, continual growth of atmospheric CO₂ and the sixth mass extinction are due to human activity (Latour 115). Every day it becomes more visible that planet Earth is becoming sensitive to our actions (Latour 113). In Latour's book 'Down to Earth' a new political actor, the Terrestrial, is introduced. The Terrestrial as concept marks that Earth "is no longer the milieu or the background for human action" (Latour 41). Reading the Anthropocene with Latour, its core meaning is the redistribution of agency between an overly deanimated Nature and overly animated Human (Latour 68). In the Anthropocene humans become participants among other forces, Earth is no longer the stable stage for human as protagonist (Latour 42). As such, the epoch is named after the species that brought it about, but also marks the end of its central position. The term 'Anthropocene' has received justified critique as well. The mess the Anthropocene is, is not a result of human biology (Tsing 19). Humans emerged more than 2 million years ago, and global heating is a much more recent phenomenon, although the exact time of its emergence hasn't been decided upon. Moreover,

² <https://nos.nl/1/2275330>

not all humans are equally responsible for global heating. Moore (173) argues that the historical era that marks human influence on planet Earth is structured by “relations privileging the endless accumulation of capital”. Therefore Moore coins the term 'Capitalocene'. Haraway (51) as well points at “the great market and commodity reworldings of the long sixteenth and seventeenth centuries”. The term she suggests is 'Chthulucene'. This concept refers to “a time-place for learning to stay with the trouble of living and dying in response-ability on a damaged earth”, which requires to “be truly present, not as a vanishing pivot between awful or edenic pasts and apocalyptic or salvific futures, but as mortal critters entwined in myriad unfinished configurations of places, times, matters, meanings” (Haraway 1). Despite valid critique, this research maintains the concept of Anthropocene.

Posthumanism, the rejection of the classic humanist division of self and other, is what fundamentally informs my involvement in and dedication to questions of sustainability (Wolfe xvi). Human life is a single form among many and should be acknowledged as such.

Money

Knowledge regarding the causes and threats of global heating have been available for over 50 years and people have gathered over these issues as well. Technologies for sustainable conduct have become increasingly available. Yet, the threat is still more urgent than ever. One of the reasons too little has happened is money. Transitioning to more sustainable alternatives is often neglected because it's too expensive or because it's economically unviable.

Consultancy firm McKinsey expects that investment required for a sustainable society amounts to 200 billion euro up to 2040³. In the Netherlands government delays execution of sustainability transitions due to the high expenses⁴. Also in Germany, the costs of climate change are a source of difficulty: Merkel's greatest worry is “generating enough economic

³ <https://nos.nl/artikel/2197398-klimaatbeleid-nederland-dat-gaat-geld-kosten-veel-geld.html>

⁴ <https://www.ad.nl/politiek/rutte-geen-conflict-over-klimaatvoorstellen~a05452c6/>

wealth to tackle the environmental crisis”⁵. Sustainability transitions, defined as “long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption” (Markard et al. 2016), are key to the survival of the human species and many other species on planet Earth. These processes are invaluable, yet simultaneously too expensive. What allows this seeming contradiction to exist?

This raises questions of value and price. How is value assigned and how are prices determined? These questions shift attention to money. It’s often assumed money has no effect on economic processes (Hutchinson et al. 2011). But if we let go of this assumption, could it be that the price of sustainability transitions is contextual to money? Or more specifically, to today’s monetary design? “Despite the centrality of money and money access in contemporary societies, very little attention is paid in economic thought to what money actually *is*, how it comes into existence and how it mediates the relationships between resources, products and people” (Hutchinson et al. 2010). Generally money is approached as a technical device adopted to facilitate transactions (Hutchinson et al. 2011). But taking a closer look at money shows the topic is more ambiguous than expected. Henry Ford (1863-1947) is often quoted for saying: “It is well enough that people of the nation do not understand our banking and monetary system, for if they did, I believe there would be a revolution before tomorrow morning”. This gives the impression that there’s a disadvantaging side to money with the potential to harm people. Bernard Lietaer, an expert on money and financial systems, wrote a report for the Club of Rome arguing that reconsidering the monetary system is essential for sustainability transitions to succeed (Lietaer et al. 2000). Cowritten by Arnspenger, Goerner and Brunnhuber, the report is titled 'Money the missing link', referring to the inability to address the assumption of today’s monetary design. These quotes suggest money can be designed in

⁵ https://www.theguardian.com/world/2019/may/15/angela-merkel-interview-europe-eu-unite-challenge-us-russia-china?CMP=Share_AndroidApp_Tweet

different ways, and alternative designs condition different economic processes. Thinking about monetary design in relation to the Anthropocene proves to be unconventional.

Muting Money

Money and monetary design are almost completely missing in sustainability action plans. Ranging from education, to businesses and government institutions. Academic theories that problematise today's society never problematise the monetary system itself, for example theories by Moore and Negri and Hardt. Usually theories focus on alternative modes of production, aiming to bring an end to capitalism. Although Marx discussed money comprehensively, both communism and capitalism make use of the same monetary design: the monopoly of a centralised currency (Lietaer et. al 42). Also journalists that critique capitalism don't go into the problematics of today's money, for example Naomi Klein and Paul Mason. Educational programmes dealing with economics and sustainability, don't cover the role monetary design plays in the climate crisis. For instance both the *Massive Open Online Course* (MOOC) 'Money and Society' and the textbook 'Introduction to Environmental Economics' don't discuss money. Cooperatives, such as Heerenboeren, sustainable start-ups and commons networks often don't address the role of monetary design. Professor Jonker⁶ even says that "we tend to feel more sympathy for sustainable companies, but whether or not one's product is sustainable, it's always the art to translate one's idea to the market and scale up". He concludes: "If that doesn't work, you just have to continue without crocodile tears". Recently a new network has been established, 'Network for Greening the Financial System', aiming to build a green financial sector, and to enhance the efforts of the financial industry to meet the Paris climate objectives. This network doesn't discuss the topic of monetary design either. Nobel prize winner Kahneman said that if one wants to have a chance at winning the prize of the Swedish Central Bank in Economic Sciences in Memory of Alfred Nobel one shouldn't do

⁶ <https://www.rtlz.nl/business/artikel/4526881/faillissementen-duurzame-bedrijven-bankroet>

research on the topic of money (Lietaer & Dunne 35). Money is a blindspot in the sustainability debate. Why is money not part of sustainability discussions? This thesis argues that money is muted. Muting money means denying money as political object (Mouffe 10).

Today's monetary design falls short to facilitate sustainability transitions. Money needs to be re-established as a political object in the Anthropocene. Monetary design affects real economic processes. Deciding on monetary design is political, because it requires choices between conflicting alternatives (Mouffe 10). Only if money is acknowledged as political object, can monetary design that is productive in the Anthropocene be developed and executed. The research question of this thesis is: 'How is money constituted as an object outside of the political sphere, and what are the consequences for global warming?' This thesis focuses on dynamics in the Eurozone relevant for this question.

Structure & Methodology

As will be shown in chapter one, money is a human construct. How money is designed involves "decisions which require us to make a choice between conflicting alternatives" (Mouffe 10). Nevertheless, financial authorities present money as natural and a priori to human society, by alternating stories regarding money's essence, origin and creation. Money is presented as a natural and merely a technical matter, inhibiting democratic decision-making about design of the monetary system.

Chapter two looks at why money is muted. The conceptual framework of the European Union and the European Central Bank (ECB) is determined by market discourse. This requirement is part of their statutes, and therefore a legal obligation. As will be shown in chapter two, market discourse requires neutral money for the possibility of price rationing equilibrating supply and demand. Rationalised through the assumptions of market discourse, today's monetary design offers such a neutral currency. Today almost all monetary systems

adhere to the following design: a national fiat currency created as debt bearing interest (Lietaer 44).

Chapter three covers how this specific monetary design disadvantages sustainability transitions. Today's monetary design can be distinguished by three aspects. First, issuance of money by commercial banks, secondly creation of money as debt bearing interest and thirdly, the existence of single currency based on institutional trust. Money issuance by commercial banks constrains the amount of money available for sustainability transitions. Creating money as debt bearing interest inhibits use of money for sustainability transitions. Issuing a single currency based on institutional trust deprives people and communities of monetary agency, the power to create money. Chapter three draws the conclusion that conventional monetary design is incompatible with survival in the Anthropocene, because the fact that sustainability transitions are too expensive today is contextual to today's monetary design.

Methodologically, the first two chapters are based on Foucauldian discourse analysis. According to Foucault "statements and subjects emerge from a field of possibilities" (Barad 147). As such, the possibility of muting money, or the existence of the concept of natural money, must be treated as the product of a field of possibilities. Fields of possibilities are determined by apparatuses. Foucault describes an apparatus as "a heterogenous set consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions" (Agamben 2). An apparatus is a network that can be established between these elements to respond to an urgency. The strategic function of an apparatus entails manipulation of relations of forces to develop these forces in a particular direction (Agamben 2). Apparatuses are therefore always inscribed in power. Tracing the source of today's lack of knowledge about money exposes such an apparatus. I refer to it as the 'monetary apparatus'. Chapter one shows that such a network, consisting of the ECB, commercial banks, universities, schools and law, establishes an image of 'neutral money'. The strategic function of the

monetary apparatus is to prioritise market distribution. Analysing the monetary apparatus shows that the question of money contains much more than economics alone. Legal documents, primary school material and academic claims of truth, all take part in muting money. An important aspect of an apparatus is discourse. "Discourse constrains and enables what can be said" (Barad 146) The subsequent discourses of classical economics, the market and banking are of high importance for the monetary apparatus. Knowledge of money's essence, origin and creation circulating in society today is wholly incorrect, yet these statements are treated as meaningful. Making this grid intelligible helps to re-establish money as a political object.

Foucault argues that power and knowledge are intrinsically related concepts: "There is no power relation without the correlative constitution of a field of knowledge, nor any knowledge that does not presuppose and constitute at the same time power relations" (Foucault DP 27). Power-knowledge relations determine the forms and possible domains of knowledge (Foucault DP 28). Foucault explains that objects in society can be treated as effects produced by power-knowledge relations. This thesis approaches money as an object created by power-knowledge relations as well. Financial authorities spread information about money that can't be scientifically validated. Existence of this knowledge, its perception as meaningful statement, can't be separated from power. Analysing with Foucault allows to make visible that money is an object of power, enabled by a particular field of possibilities. Approaching money as such, also makes it possible to imagine other fields of possibilities that can inspire sustainable monetary design.

Methodologically, chapter three relies mostly on Tsing and Latour. Their descriptions of the dynamics of capitalism and modernism allow us to expose how today's monetary design is permeated by these conceptual framework. As such, chapter three builds a case for re-establishing money as a political object.

Towards Anthropocene Currencies

Society starts to move past theories of capitalism and modernism. Yet how these theories inform monetary design runs the risk of being overlooked. Today's monetary design disadvantages sustainability transitions. This undermines the effects of genuine action by sustainability groups. Financial authorities don't seem able to 'repair' the economy anymore. Klaas Knot, president of the DNB, acknowledged at a presentation hosted by Sustainable Finance Lab that a new financial crisis is inevitable. The economies across Europe are slowing down already, exhibiting the first signs. Tsing (4) finds guidance in the "uncontrolled lives of mushrooms when the controlled world we thought we had fails". In the Anthropocene, the controlled world we thought we had is lost forever. "The Earth system reacts henceforth to your action in such a way that you no longer have a stable and indifferent framework in which to lodge your desires for modernisation" (Latour 84). Latour (43) explains that today the decor, the wings, the background, the whole building have come on stage and are competing with the actors for the principal role. There is no distinction anymore between organisms and their environment: "if the composition of the air we breathe depends on living beings, the atmosphere is no longer simply the environment in which living beings are located and in which they evolve; it is, in part, a result of their actions" (Latour 76). The controlled world we thought we had begins to react to our actions, turns against us, encloses us, dominates us, demands something of us and carries us along in its path (Latour 41).

A faithful reaction to the redistribution of agency requires an alternative monetary system. Conventional monetary design is one of the core reasons climate breakdown can't be acted upon. Merely adjusting means of production, or allocation through the government or commons is an insufficient solution. Money is a leverage point for achieving sustainability transitions. The financial crash of 2007 proved to be a blessing in disguise for enlarging variety in monetary design. The amount of complementary currencies has increased a lot

since then. Two successful examples are Bristol Pound in Bristol and Sardex on Sicily⁷, proving the added value of alternative monetary design. Economic models based on alternative monetary design, such as monetary ecosystems or mutual credit systems, don't seem to exist. Academic knowledge regarding this topic needs to be developed. This thesis aims to contribute to such an academic endeavour by demonstrating the limitations of conventional monetary discourse by showing the effects of today's monetary design on the real economy. This research is modelled after Raworth's problem definition of the Economic discipline, aiming to provide the reader with an accessible critical analysis of the monetary system that can inspire change.

⁷ <https://www.ft.com/content/cf875d9a-5be6-11e5-a28b-50226830d644>

1. MUTING MONEY

Today, money's relation to the Anthropocene is not considered. Sustainability initiatives ranging from institutional to local levels do not address money and its effects on sustainability transitions. The Sustainable Development Goals do not cover the monetary system. Research into alternative currencies is unlikely to be part of municipal policy aimed at a more sustainable city. Consultancy firms like Accenture and McKinsey do not look at monetary design as a resource for addressing challenges. No matter whether it concerns renewable energy, local food production, or techniques to close loops, no new currency is introduced to support achieving these goals - by initiatives like Van de Bron, Heerenboeren and Circular Buiksloterham. Fair trade stores require payment in conventional money, sustainability hubs such as Impact Hub, and movements such as Global Shapers do not deal with questions of money. When sustainability companies such as Waka Waka and Mud jeans go bankrupt, it seems everyone is focused on solving profit and loss numbers, and no one questions whether something might be wrong with money itself.

Implicit Assumption

Today money is an implicit assumption. Unknowingly we accept the terms and conditions of today's monetary design, unaware of its consequences and alternatives. Money's role in the Anthropocene today is possible because few people are aware money plays a role at all in global warming. This chapter shows a network, consisting of discourse, institutions, regulatory decisions, law and scientific statements, that naturalises money. This network can be referred to as the monetary apparatus. Specifically the discourses of market and classical economics are crucial to this apparatus. Through these conceptual frameworks the superiority of market distribution is rationalised. As will be explained in chapter 2, the superiority of market distribution justifies the central role of the market in EU and ECB policy. It will be shown that market distribution requires neutrality of money, and prioritising market

distribution is the strategic function of the apparatus as such money is muted. This chapter analyses the documents and practices through which money is muted. The European Central Bank and commercial banks are central institutions in this analysis. The European Central Bank has the monopoly on creation of legal tender, and only commercial banks are allowed to create claims on legal tender.

Lack of knowledge regarding the disadvantageous effects of today's monetary design on sustainability transitions makes effective climate action impossible. Foucault (28) argues that lack of knowledge might not be a coincidence, but a strategic manipulation of forces to develop these forces in a particular direction. In this case establishing money as an object that isn't political but natural. "Discursive practices define what counts as meaningful statements" (Barad 147). This chapter analyses the practices through which the concept of natural money is produced. Subsequently practices regarding money's essence, origin and creation are examined. The following paragraph starts with an investigation of the banking discourse on money. This analysis manifests that information regarding the essence of money is twisted to enable 'natural money'.

Money's Essence according to Banking Discourse

If one wants to enhance her understanding of money and the monetary system, it's an evident choice to surf to the website of the European Central Bank (ECB). As central bank, it is the monetary authority in Europe. Entering the term 'money' in ECB's search bar results in lots of articles. The documents have complicated titles and count many pages. For instance 'House Prices, money, credit and the macroeconomy', counting 45 pages, or 'A stable model for euro area money demand: revisiting the role of wealth', counting 64 pages. A Google search with 'ECB' and 'money' is more successful. The first hit is a document called 'What is money?' published by the ECB in 2015. The other search results concern documents similar to the complicated ones on the ECB website, such as 'Currency Convert — ECB Statistical Data

Warehouse' and 'Euro foreign exchange reference rates — European Central Bank'. This first step shows information on money isn't easily available. Further analysis will show that the lack of information regarding money itself plays an important role in muting money.

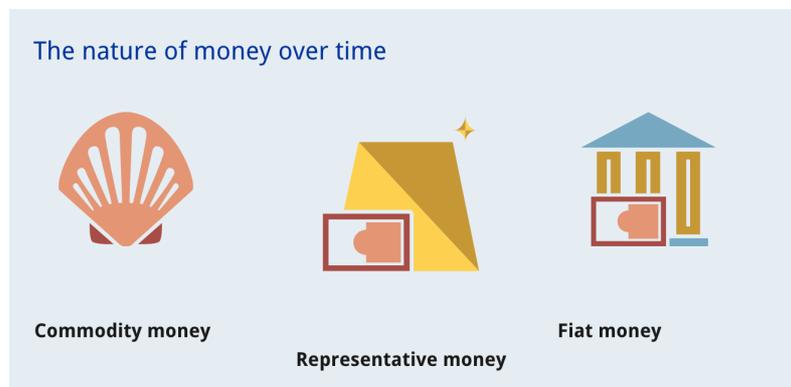


FIGURE 1. The nature of money according to ECB

The document 'What is money?' starts with a paragraph titled 'The changing essence of money'. The opening sentence reads: "The nature of money has evolved over time". Generally speaking a thing's nature indicates possessing inherent features that are inborn, qualities that precede intervention by humans (Oxford dictionary). By assuming money has a nature, the ECB implies the essence of money exists a priori to humans. A description of the evolution is as follows:

The nature of money has evolved over time. Early money was usually commodity money – an object made of something that had a market value, such as a gold coin. Later on, representative money consisted of banknotes that could be swapped against a certain amount of gold or silver. Modern economies, including the euro area, are based on fiat money. This is money that is declared legal tender and issued by a central bank but, unlike representative money, cannot be converted into, for example, a fixed weight of gold. It has no intrinsic value – the paper used for banknotes is in principle worthless – yet is still accepted in exchange for goods and services because people trust the central bank to keep the value of money stable over time (Praet 1).

According to the ECB the essence of money is the part of money that has changed, which in this case is the materiality of money. Money transitioned from commodity, to representative bills to legal tender. This leads to the conclusion that the ECB believes the materiality of money is the essence. Figure 1 confirms this. The image is called 'the nature of money over time' and shows how money's materiality transformed.

This claim requires critical reflection. Let's start with a question. Why do you accept money in exchange for the products or labour that you provide? You can't eat money or fulfil any other basic needs with it. Yet, everyone does it. Graeber (47) explains that when people trust they can employ something as means of payment in the future, it will be accepted as money today. What part does materiality play here? People accept money because they expect others to accept it. Why are certain units trusted with the power to be accepted as means of payment? This question is answered differently for the two types of money that are generally distinguished: commodity money and fiat money.

Commodity money almost always consists of valuable material. People accept a commodity as money when they expect its *market value* remains stable, and will therefore be accepted as money by others in the future. Trust in stable market value of the material plays a crucial role. Market value is not determined by the intrinsic value of the material, but by social dynamics. Soldiers in the Roman empire received salt as payment. Not because salt is intrinsically valuable, but because in those days salt was scarce which gave it high and stable market value.

The term fiat money is derived from the bible (Lietaer 46). Supposedly the first words God pronounced were 'fiat lux', translated as 'Let there be light'. Like light, fiat money can be created out of nothing. It's functioning is secured by establishing money as legal tender. By law legal tender can't be rejected as means of payment within the borders of the state and (state) taxes are required to be paid in legal tender (McLeay et al. 10). This secures a stable demand for the currency, therefore it can be trusted as means of payment. Trust plays a crucial role

here as well. People trust that the state will exert policy that maintains the value and usability of a fiat currency, otherwise they will refrain from accepting the money in return for their work. The Guilder, a previous Dutch fiat currency, functioned as money because of state backing. After transitioning to the Euro state backing ceased and people no longer accepted Guilders as means of payment, because others would no longer accept it as means of payment.

This shows that the essence of money can't be found in materiality. Any material can be used as monetary object if social dynamics in the market or state succeed to build trust that the object will be accepted by others as means of payment. This view aligns with ancient and contemporary thinkers. Aristotle described money as social convention, because gold and silver have no intrinsic value in themselves (Graeber 298). Lietaer (41) defines money as: "An agreement within a community to use something as a means of payment". Raworth (182) economist and author of *Doughnut Economics* states: "Money is, in essence, a social relationship: a promise to repay that is based on trust". Scott (226), financial journalist, describes money as a claim on goods and services, or 'COGAS'. Martin (26) states that "currency is ephemeral and cosmetic: it is the underlying mechanism of credit accounts and clearance that is the essence of money". These descriptions confirm that money essentially is a social technology. This thesis maintains the following definition of money: a communal agreement, based on trust, to use a substitute in the mechanism of exchange.

The object of money created by power-knowledge relations describes money as a priori to humans and appoint materiality as its essence. This presumes money is natural. The way money is presented, resembles Modern presentations of nature (Latour 36). Like nature, money is presented as an empty land without agency. In the Anthropocene, this kind of 'nature' makes the world uninhabitable (Latour 36). New introductions to nature and money are required in the Anthropocene. Using its far reaching institutional authority the ECB marginalises empirically substantiated information that shows money is a social agreement. People are led to believe only one type of money is possible. Framing money as natural

inhibits money as political object. This interferes with the possibility of critical reflection on the disadvantageous effects of monetary design on the real economy, as will be discussed in chapter three.

Money's Origins according to Banking Discourse

After establishing today's discourse leads people to believe money is not a human construct but essentially material, the second paragraph covers how monetary discourse presents the origins of money. Peter Praet, chief economist of the ECB and member of its Executive Board, covers the origins of money during a symposium at the Deutsche Bundesbank in 2012. Praet argues that money first emerged as a solution to the inefficiencies of barter economy. As in many economic stories, it starts with an imaginary merchant in an ancient society:

Imagine a clever merchant who regularly loads his produce onto a cart and heads to the market place where all merchants meet to exchange their goods. This market place is impossibly complicated. Any merchant in need of a commodity that he does not produce himself has to search endlessly. Much of his time is spent in trying to find a partner in a direct barter (Praet 3). Praet describes barter as extremely inconvenient. It's time consuming to find someone who supplies exactly what one needs in the exact right quantity, in exchange for the product one supplies. Luckily the merchant has an insight:

The clever merchant notes that a certain commodity is more frequently exchanged. Why? Probably because it is easy to carry and certainly because it is durable — it does not physically decay and maintenance costs are low. Also, probably its verification costs are relatively small so most merchants, even those who do not need the commodity for consumption, are happy to engage in trades where this commodity features at least temporarily (Praet 4).

Praet suggests that the invention of money occurred when a clever merchant recognised an object suitable as money. This reinforces money as material. It's implied that the material characteristics of a certain object conditioned the emergence of money. It gives the impression that the conception of money occurred at a single place and spread from there, without constitution, by social organisation. "In reality, in the money domain, everything starts and ends with government" (Lietaer & Dunne 27). The frugality of government is a question central to the appearance of political economy, the precursor of contemporary economics (Foucault BP 29). In the banking discourse, government is only mentioned because the ECB is legally forbidden to directly finance governments. Government's role for the functioning of the monetary system is never mentioned, since this would violate money's image as natural. The ECB frames 'the market' as a spontaneous mechanism that is able to produce the 'natural' or true price (Foucault BP 31). Economic experts have the task "to tell government what in truth the natural mechanisms are of what it is manipulating" (Foucault BP 17). Economists claim to describe natural mechanisms and therefore aren't normative (Taylor and Mankiw 23). Denying the role of governments plays a crucial role in the monetary apparatus, it allows for the possibility of natural money instead of political object.

The chief economist doesn't touch upon when and where the emergence of natural money took place. Neither do the academic books that also narrate money as the solution to barter economies (Mishkin, Taylor and Mankiw). There is no reference to time and place because this moment can't be traced, nor can evidence be found that barter economies occurred at all (Graeber 39). Many experts agree that money was first used by Mesopotamian civilisation in Sumer around 3200 BC (Lietaer 34). Cuneiform documents have made the financial administration of Sumerian temple and palace complexes accessible for today's scientists. This financial administration operated through a single, uniform system of accountancy (Graeber 39). The basic monetary unit of the first monetary system was the silver shekel. The temple bureaucrats used the system to calculate debt in silver, but silver did

not circulate a lot. While debts would be calculated in silver, they could be settled in barley, goat, lapis lazuli or furniture (Graeber 39). In Mesopotamian market places most transactions were based on credit. People kept track of expenditures, by running a tab, which would often be settled at harvest time in barley. This is a radically different origin story: anthropological research shows that many objects functioned as money at the same time, and the monetary system was organised by governmental institutions. The fact that empirically validated knowledge is marginalised today can't be separated from power-knowledge relations.

Nevertheless education programmes teach students from a young age money is a solution to the inefficiencies of barter economies. A clip by Schooltv, Dutch Public Broadcasting, claims money was a solution to the inefficiencies of barter economies⁸. Rabobank offers material to primary school students for a presentation about money, where it's explained that money was a solution to barter economies⁹. At high school the origin of money as solution to the inefficiencies of barter economy is repeated¹⁰. A publication by the Dutch Central Bank claims as well that money originated as solution to barter economies¹¹. Academic books are somewhat more nuanced. They ask the reader to imagine how inefficient a barter economy would be, developing a natural preference for today's monetary system (Mishkin 44, Taylor and Mankiw 558). ECB's origin story of money marginalises the possibilities of other types of money. In effect, this prevents money from being perceived as a political object, because it seems no conflicting alternatives even exist (Mouffe 10). Today's power-knowledge relations build money as natural object, which is 'just there'. Since money is already there, this object of money can only exist in one way. The monetary apparatus

⁸ <https://schooltv.nl/video/de-geschiedenis-van-geld-geld-als-modern-ruilmiddel/>

⁹ https://www.rabobank.nl/images/pdf_1219_Jouw_spreekbeurt_over_geld_29838301.pdf

¹⁰ <https://lweo.nl/leerling-2/456vwo/monetaire-zaken/hoofdstuk-2>

¹¹ https://www.dnb.nl/binaries/De%20geschiedenis%20van%20ons%20geld_tcm46-210321.pdf

manipulates relations of power to establish a natural image of money, that allows the monetary system to remain unchallenged.

Representative Money Then Praet (5) rationalised how money developed from commodity money to representative money:

Another day, the clever merchant makes a second smart observation. If only the extraordinary commodity acting as money could be replaced in trade by an IOU, a sight draft, a representative claim on a given quantity of the same commodity! Society could retain the exchange services of money while economising on the capital – say, gold or silver coins – which is used up to embody the commodity medium of exchange. Bills convertible into the commodity money would be circulating in lieu of – or at least in parallel to – gold or silver coins.

Again Praet doesn't specify time and place. This is because the transition never occurred. Throughout human history there has been a complex jumble of different sorts of currency, interchangeably fiat and commodity based, as well as privately, commonly and publicly organised money (Graeber 75). Monetary monocultures, the use of a single currency within a state, have only been operative for less than three centuries. To claim that money was conceived of at a single point in time and spread from there while progressing into the ultimate form it takes today, is false, and reveals a modernist framework.

Today's monetary apparatus models money as progressive object. If today's money is the ultimate form of money, people are less likely to question today's money or consider the use of complementary currencies, since the outcomes are by definition inferior.

According to Praet the development towards representative money marks a crucial point, because it marks the emergence of banks. Praet (7) claims that trust only became an intimate attribute of money when commodity money developed into representative money.

This is because traders are supposed to have an incentive to use fake representative money. It's unlikely one meets people twice in a market place, which allows for paying with illegitimate money (Praet 7). Praet claims that banks emerged to solve this trust issue by validating bills of exchange. This claim is invalidated because money never started as natural object. From the start validation of money was required. It's more likely banks emerged because of a commercial opportunity. This commercial opportunity was possible through, what Praet calls, 'the law of large numbers'. The law of large numbers is not a law of physics. The concept is that only a fraction of money-holders wishes to convert their bills into commodity at the same time, therefore only a small amount of commodity is required to be directly accessible. It gives the possibility to create extra money, since only a few people will want to exchange their representative money for the underlying commodity simultaneously. Praet argues that issuance of private currency is a natural course of action with representative money. However, historical analysis shows that this course of action was far from natural. Harsh penalties were required by medieval governments to make sure fractional reserve bankers didn't create too much money, and were unable to make restitutions. Spanish banker Francesch Castello was beheaded in front of his own bank in Barcelona in 1360 when he couldn't reimburse depositors (Graeber 338).

Moreover, Praet claims that the origins of paper money are found in private institutions. But the origins of paper money in the Western world are actually Venetian municipal bonds (Graeber 338). Monetisation of these bonds is how paper money originated. It's true that before this, bills of exchange, a privately issued currency, were already used to settle debts. However these bills were personalised, and couldn't be exchanged with random persons. Government debt wasn't personal. Impersonal government bonds were generally transferable. And so paper money started with government. By claiming that paper money originated from private institutions, banking discourse normalises money creation by both private/commercial entities and fractional reserve banking. Money is constituted as a natural

private object and fractional reserve banking as a natural course of action. These frames conceal that these are political choices. The legitimacy of the institutional position of the ECB is used to mute money. The fact that the information is distributed by the ECB, and not just any other organisation, is crucial for how the monetary apparatus functions.

Fiat money The last step in ECB's evolution of money is the invention of fiat money. Praet (8) argues that people will continue to accept a medium of exchange because the service that a medium of exchange offers can be valued independently from the material value of a medium of exchange. As such, the chief economist of the ECB argues that fiat money exists due to the service money provides: minimising time and effort needed for trade. This reduces money to a tool maximising efficiency. Money functions on the basis of trust.

This monetary apparatus makes efficiency the purpose of the produced object of money. So far, the object of money produced by power-knowledge relations can be described as essentially material, natural, progressive, privately organised and efficient.

Money's Creation

The monetary apparatus presents both the essence and origin of money incorrectly. The fact that statements by the ECB on the essence and origin of money are perceived as meaningful knowledge, confirms the inherent relationship of power and knowledge described by Foucault. The last part of analysis concerns money creation. Money's source is not touched upon during education at school or university, not discussed by commercial and legal financial entities or central banks. Research by Motivaction and Sustainable Finance Lab has shown that only 5% of the Dutch population knows that almost all money is created by commercial banks. Most bankers don't even know they are responsible for creating money. Before explaining money creation, it's discussed how different aspects of the monetary apparatus cover money creation.

At central banks, until the financial crash, money was assumed to be just there. This can largely be explained by the dominant model named *Intermediation of Loanable Funds*. Jakab and Kumhof (1) state that this model is universally used in literature, whilst being false. The model describes banks as merely converting savings into loans. Implying that savings are converted into investments by commercial banks. As financial intermediaries banks wouldn't play an important role in how an economy develops. Until the financial crash commercial banks weren't part of macro-economic models of the FED. Because commercial banks were perceived as merely converting savings into loans, the central bank was constrained in predicting the financial crash in 2007 (Kumhof and Jakab 51). During the Alternative Finance Festival, Aerd Houben and Arnoud Boot shared on stage that after a theatre performance on money creation was performed by 'De Verleiders', employees had to be assured by Knot, president of the Dutch Central Bank, the performance was truthful. Regimes of veridiction allow for asserting things as truths, that turn out to be not true at all (Foucault BP 36). This causes confusion when reality is discovered. Even (central) bankers, the people who create money, the experts, fall prey to the regime of veridiction and the lack of information emitted by their own institution.

'Just there' Commercial banks affirm their image as financial intermediaries. Triodos Bank, Volksbank and ING Bank all describe their activities as converting savings into loans. Triodos bank says banking is the art of balancing, referring to balancing between savers and borrowers¹². In an informative clip meant for the wider public Volksbank portrays itself as a financial intermediary¹³. The communications director of ASN Bank even claimed in an official letter that ASN doesn't create money¹⁴. As figure 2 shows, in its terms and conditions for

¹² <https://dekleurvangel.nl/bankieren-evenwichtskunst/>

¹³ <https://www.youtube.com/watch?v=IWfSkr3MLt0>

¹⁴ <https://www.ftm.nl/artikelen/geldstelsel?share=1>

credit ING explicitly states that the bank converts deposits into loans. The ING informative clip doesn't mention money creation either¹⁵. ABN Amro and Rabobank do not share information on their website regarding the activities of a bank or money creation at all. The Dutch Banking Association, the Dutch lobby group for commercial banks, maintains that commercial banks are financial intermediaries. Money creation isn't mentioned on their websites.

2.2 De bank moet zorgvuldig met aan haar toevertrouwd geld omgaan

De bank moet zorgvuldig met aan haar toevertrouwd geld omgaan. De bank leent het geld dat zij aan de kredietnemer uitleent op haar beurt ook weer van anderen, zoals spaarders, beleggers en andere banken. De zorgvuldigheid betekent dat de bank haar risico's moet beperken. Daarom stelt de bank voorwaarden aan het verstrekken van de kredietfaciliteit. Er zijn voorwaarden waaraan de kredietnemer moet voldoen voordat de bank de diensten verleent. Dit zijn voorwaarden voor vrijgave van het krediet. Er zijn ook voorwaarden waaraan de kredietnemer gedurende de gehele looptijd van het krediet moet voldoen. De voorwaarden staan in de kredietovereenkomst en ook in deze AKV en in de Algemene Bankvoorwaarden.

FIGURE 2 ING claims to convert savings into loans
source: ING *Zakelijk Krediet Kredietvoorwaarden*

Figure 3 on the circular flow of dollars, doesn't cover the source of money (Mankiw 46).

Academic economic education largely consists of mathematics. Although text books are part of the curriculum, exams generally concerns math assignments. Theory underlying equations doesn't receive much thought. Courses directly concerning money such as 'Money and Banking' and 'International Money and Finance' at the UvA don't cover money creation. In Economic models the source of money doesn't receive attention, as such students learn to assume money is 'just there'.

'Money week' a European wide programme coordinated by the European Banking Federation, the European lobby group for banks, aims to improve 'financial literacy' in children through better financial education. This points out that banking is perceived to be the ultimate 'neutral activity'. Money is perceived to be so natural, people can't even imagine

¹⁵ <https://www.ing.nl/de-ing/over-de-ing/uw-vraag-over-ing-beleid/wat-is-een-bank/index.html>

'Money week' in reality is a marketing project. Bankers are invited in primary school classes to

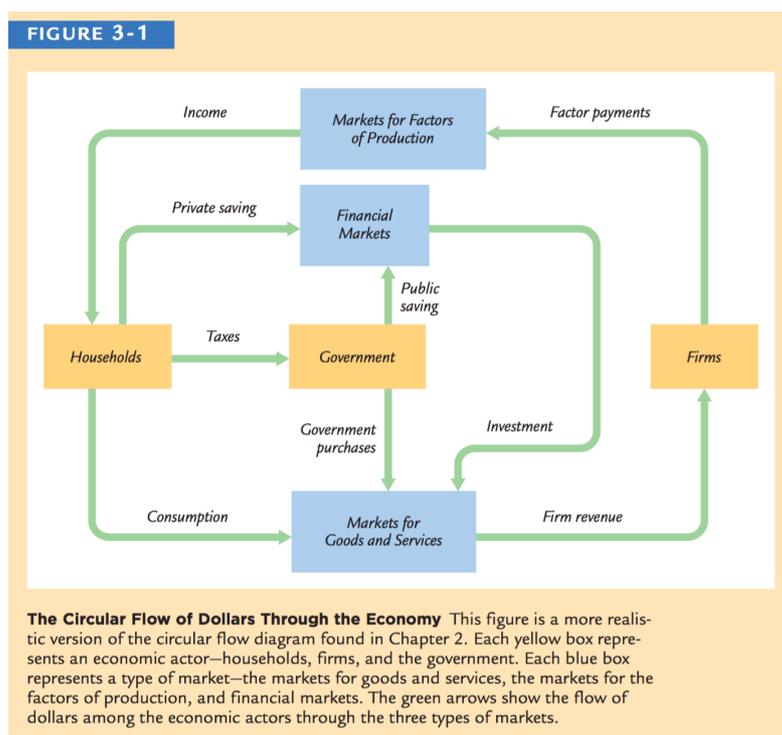


FIGURE 3 Money creation assumed to be 'just there'
source: Mankiw (46)

teach about money, so it's no surprise that money creation is not part of the programme.

Money creation explained Information about money creation for the wider public wasn't provided by central banks until recently. In 2014, under pressure from NGO 'Positive Money', the Bank of England published an article explaining money creation. Financial experts reacted surprised that this information had been made publicly available by such an authority¹⁶. Today, ECB's provision of information is limited. In 2015 the Dutch Central Bank uploaded clips on YouTube that explain money creation. A report by the Dutch Scientific Council critically reflecting on today's mode of money creation is exceptional in Europe. The absence of information plays an important role in the monetary apparatus. It reinforces the image that money is just there and banks are merely financial intermediaries.

¹⁶ <https://www.theguardian.com/commentisfree/2014/mar/18/truth-money-iou-bank-of-england-austerity>

Based on the Bank of England's article, money creation will be explained here. The article starts with acknowledging the incorrect information on money creation: "money creation in practice differs from some popular misconceptions — banks do not act simply as intermediaries, lending out deposits that savers place with them, and nor do they 'multiply up' central bank money to create new loans and deposits". The text explains that money creation occurs through double-entry bookkeeping by commercial banks. Double-entry bookkeeping means money is created by adding the same amount of money to both sides of the bank balance. The balance of a commercial bank consists of two sides: assets and liabilities. By definition these two sides must be equal. The assets represent the bank's possessions. On the side of assets they add the loan. The borrower owes the loan to the bank, therefore it's an asset to the bank. The liabilities represent obligations the bank has to others. On this side of the balance the bank adds money to the account of the borrower. Adding the same amount of money to both sides of the balance, is how money is created.

In principal everyone can create money like this. However, there is a difference between money created by a random individual through double entry bookkeeping and money created through double entry bookkeeping by commercial banks. The difference is the extent to which money can be ubiquitously spent. Money created by commercial banks is backed by a comprehensive system supervised by central banks. Money created by commercial banks is unrestrictedly accepted as means of payment. Few people today would accept money created by a random person. Money created by commercial banks is trusted as means of payment. The system that enables unrestricted use of commercial bank's money consists of three currencies: cash, bank deposits and central bank reserves. This system will be explained in the next paragraph.

When commercial banks create money, they create *bank deposits*. Today most money is created as bank deposits (95%), therefore most money takes the shape of bank deposits (60%). Bank deposits do not have a tangible form, they only exist as digital numbers in one's

bank account. When one withdraws money from a bank account at an ATM, bank deposits are converted into *cash*. Bank deposits are a claim on cash. As such they are a claim on legal tender since cash is the only form of legal tender. The value of bank deposits is maintained as long as they can be converted into legal tender. The last currency required for securing unrestricted use of commercial bank deposits, *central bank reserves*. Central bank reserves (CBR) is a currency created by the central bank exclusively for commercial banks. The currency is used to settle interbank payments. Controlling the currency through which commercial banks have to settle interbank payments, allows the central bank theoretically to control creation of bank deposits by commercial banks. Commercial banks are obliged to hold quantities of CBR respective to their balance total. How do commercial banks pay for central bank reserves? Paying with bank deposits would make central bank reserves unreliable, since they would be freely accessible for commercial banks. Cash is not used either for acquiring central bank deposits, because cash has to be acquired by commercial banks as well. Through supplying the central bank with collateral, called eligible assets, commercial banks can access CBR and cash. A collateral framework determines what types of assets are allowed to function as collateral. An example is Dutch state bonds. Holding central bank reserves comes at a cost. Commercial banks need to optimise between the costs of capital requirements (amongst others central bank reserves) and the profits gained by money creation. Money creation is claimed to be driven by a pricing mechanism, the market. This is a very significant claim for the monetary apparatus. According to market discourse, outcomes produced by the market are 'true' outcomes, because they are the spontaneous result of a mediation of all individual preferences (Mankiw & Taylor 188). According to market discourse money creation organised by the market, will secure that the right amount of money is in circulation based on the individual preferences of all individuals. In chapter three this claim will be discredited. Amongst other reasons precisely because the market only takes individualised preferences into account, not accounting for collective interests.

The monetary apparatus pushes questions about the source of money to the margins, because this allows for the possibility of the concept of natural money. People can't come to know that the amount of money in circulation is a political choice. Money creation is actively suppressed so that money's natural image, instead of political, can be maintained. As a consequence, people remain unaware of the effects of today's money. Therefore the obstructing effects of the monetary system on sustainability transitions persist.

Money creation in legal documents The muting of money extends even to the law which shows that the monetary apparatus contains more than economic discourse alone. This paragraph explains how it's possible that even the law doesn't mention money creation. The Treaty on the Functioning of the European Union is one of two founding documents of the European Union. These documents are composed by governments of the member states. Article 128 (1) of this treaty determines that: "The European Central Bank shall have the exclusive right to authorise the issue of euro banknotes within the Union. The European Central Bank and the national central banks may issue such notes. The banknotes issued by the European Central Bank and the national central banks shall be the only such notes to have the status of legal tender within the Union." This article makes possible that governments transfer their monopoly on money creation to the ECB, a 'descriptive' instead of 'normative' institution. The statutes of the ECB are attached to the Treaty on the Functioning of the European Union. This means that the statutes directly come from the European Council. Article 16 of the statutes of the ECB repeats that the ECB has a monopoly on the issuance of legal tender. Article 17 of the statutes of the ECB adds: "In order to conduct their operations, the ECB and the national central banks may open accounts for credit institutions, public entities and other market participants and accept assets, including book entry securities, as collateral." A commercial bank needs an account with the ECB to hold central bank reserves, and central bank reserves are a prerequisite for supervising money creation by the market. As such, this article arranges

an important aspect of today's monetary system. Subsequently article 18.1 allows the ECB and national central banks to operate in the financial markets "by buying and selling outright, or under repurchase agreement, and by lending or borrowing claims and marketable instruments, whether in euro or other currencies, as well as precious metals" and also to "conduct credit operations with credit institutions and other market participants, with lending being based on adequate collateral." This makes it legal for the ECB to receive eligible assets as collateral by commercial banks to purchase central bank reserves, as well as to set interest rates and provide liquidity as part of monetary policy. The steps taken so far, governments transferring the right to create legal tender to a third party, and establishing the conditions for this technical instead of political institution to supervise the creation of legal tender, are all possible without mentioning money creation.

Is money creation mentioned in laws concerning commercial banks? The Dutch Act on Financial Supervision defines 'bank' in article 1 as follows: a credit institution as referred to in Regulation No 575/2013. Regulation No 575/2013 is composed by the European Parliament and Council. The definition of credit institution given in article 4 is as follows: "'credit institution' means an undertaking the business of which is to take deposits or other repayable funds from the public and to grant credits for its own account". This describes banks' activities according to the incorrect Intermediary of Loanable Funds model explained by Jakab and Kumhof. Although it doesn't explicitly say deposits are converted into credits, the impression is made. Also, money creation is not mentioned.

The definition of 'credit' also fails to reveal that creation of credit involves creation of money. The ECB has no definition of credit. When inquiring via email for a definition, a response takes more than three weeks. They refer to the definition of 'consumer credit' in the ECB glossary: "Loans granted to households for personal use in the consumption of goods and services". The definition of credit also omits to reveal money creation.

In article 2.11 of the Law regarding financial supervision, it's stated that it's forbidden in the Netherlands to perform the practice of banking without a license. This license can only be granted by the Dutch Central Bank. The requirements for receiving a banking license are open to interpretation. A banking license is given unless DNB believes initiators have 'lack of knowledge', are 'not trustworthy', have 'lack of expertise', have 'investments that disable healthy banking policy', or are 'not transparent'. There are no standards that measure a lack of knowledge or deficient trustworthiness. This is an arbitrary process leaving a lot of room for personal judgment by central bank employees to license a bank.

Money creation is not mentioned in any of the legal documents that legally bind money creation by commercial banks. Nor are the tools mentioned that condition money creation as it takes place today. The terms 'bank deposits', 'central bank reserves' and even 'money' itself, can't be found in legal documents. Central bank reserves are mentioned once in the special terms and conditions of Target2, the interbank settlement platform. Article 3 states: "Target2 provides real-time gross settlement for payments in euro, with settlement in central bank reserves". Only here is it acknowledged that the euro functions through separate currencies.

Parity Not mentioning money creation itself, nor mentioning the tools through which money creation today is possible or making explicit the effect of the articles that legalise these tools, conceals money creation and obstructs people from knowing how money creation works. The absence of money creation in legal documents plays a critical role in muting money.

Fabricating natural money through scientific claims and legal documents gives market discourse the object it needs, authenticated by the 'sciences', that enables it to function on a general horizon of 'truth' (Foucault DP 256). Foucault's (282) description of delinquency can be applied to natural money: "This delinquency [...] is a result of the system; but it also becomes a part and an instrument of it. So that one should speak of an ensemble whose three terms (police-prison-delinquency) support one another and form a circuit that is never

interrupted". Banking institutions, scientific claims and legal documents without interruption emit the same message of natural money, as such enabling the concept of natural money while simultaneously being dependent upon it. Barad (147) explains that according to Foucault: "Discursive practices produce, rather than merely describe, the subjects and objects of knowledge practices". In this case, the object of natural money is produced by discourse. Discursive practices, such as the speech by ECB's chief economist, make natural money count as a meaningful statement, whilst not being empirically valid.

Technically, the fact that money creation is not recorded by law is explained through parity. Parity means two currencies are exchanged on equal basis, implying that a single unit of one currency is always exchanged for a single unit of the other currency. Usually parity exists between currencies of different countries. However in this case, parity is established between cash, CBR and bank deposits. This veils that the euro functions through different currencies. Commercial banks merely are "credit institutions that grant credits". The bank deposits they create through credit aren't money, they are perceived as money. Because they can be exchanged for cash on an equal and stable basis. Parity is established through monetary policy, which is legally allowed. In this sense, money creation by commercial banks is merely perception, established through parity between bank deposits and cash.

By muting money creation the image of money as already there, a natural object that exists a priori to human society, is reinforced. It makes the Intermediary of Loanable Funds model central to monetary discourse, and denies the role of commercial banks as creators of money. By building the implicit assumption that money is already there, money is created as a natural object, which inhibits a political approach.

Producing natural money Approaching money as object produced by the effects of power-knowledge relations produces insights (Foucault DP 28). A summary of the object of money produced by power-knowledge relations is as follows. Money exists a priori to humans. The

physical properties of a natural object inspired a merchant on the market to use a substitute in exchange when bartering. Money emerged into human society as a means to increase efficiency, by turning a barter economy into a monetary economy. Money originated as natural object. Therefore the discourse describes materiality as the essence of money. Since money is natural, it exists in one way only. However, in time money progressed into more complexity and abstraction. During this development banks 'naturally' came into existence when fractional reserve banking was discovered through 'the law of large numbers'. Then paper money was invented by banks, constituting money as a private object. This analysis adds up to money as a neutral object, merely in existence for simplifying trade. Discursive practices are circulated through education, scientific statements, governmental statements and statements by commercial bankers and central bankers. Central bankers, teachers, government, academics and businesses are enabled by a regime of veridiction to spread unsubstantiated knowledge. Power-knowledge relations enable them to say and assert a number of things about money as truths, that are not true at all (Foucault BP 36). Foucault (BP 19) explains: "The question here is the same as the question I addressed with regard to madness, disease, delinquency, and sexuality. In all of these cases, it was not a question of showing how these objects were for a long time hidden before finally having reached its zenith. It was a matter of showing by what conjunctions a whole set of practices — from the moment they become coordinated with a regime of truth — was able to make exist what does not exist, [...] nonetheless become something, something however that continues not to exist." Natural money doesn't exist, however specific conjunctions made possible a certain set of practices through which natural money could be established. Natural money is being taught in schools today, it's the central assumption underlying all ECB's frameworks (ECB 55) and money creation is absent from legal documents. These are real practices, as such natural money exists. At the same time, natural money doesn't exist. Foucault (BP 20) explains that things such as politics and the economy "are not things that exist, or errors, or illusions, or

ideologies. They are things that do not exist and yet which are inscribed in reality and fall under a regime of truth dividing the true and the false". This can be said about money as well. Like politics and economics, money is a social construct, that doesn't exist but is inscribed into reality by numerous practices, including wallets, debit cards, and ATM's, which are always subject to change and can always be changed.

Historical analysis shows that banking discourse is far from accurate and can't be empirically validated. The potential of monetary design to facilitate sustainability transitions is concealed by today's apparatus, as evidenced in this chapter. In reality, money is a human agreement. Money can be designed in many different ways, and its design affects real economic processes. Money is presented as natural object, therefore political questions regarding money are impeded. This explains why the effects of monetary design on global heating are not part of sustainability debates today. To understand how money can be unmuted and re-established as political object, chapter two establishes why money is muted today.

2. NEUTRAL MONEY AS PREREQUISITE FOR MARKET DISTRIBUTION

In the first chapter it was established that in the present system money is muted. An apparatus functioning through discourse, law, state and science conceals money as natural, thereby pressing to the margins money's potential to facilitate sustainability transitions. The apparatus manipulates relations between forces to develop these forces in a particular direction. Chapter one shows that manipulation of forces takes place. This chapter will establish the direction of these forces. What is the strategic function of this apparatus? To understand how muted money relates to Anthropocene, it needs to be established why money is muted. By analysing statutes, policy papers and scientific statements, this chapter will determine strategic purpose for which money is muted.

Monetary Policy

A dominant actor in today's monetary apparatus is the European Central Bank. Therefore, the official objective of the European Central Bank can help explain what the strategic function is of the apparatus. The statutes of the ESCB, the European System of Central Banks, consisting of the ECB and the Eurosystem national central banks, read: "In accordance with Article 127 (1) and Article 282 (2) of the Treaty on the Functioning of the European Union, the primary objective of the ESCB shall be to maintain price stability". The treaty doesn't give a definition of price stability, but in 1998 the ECB's governing council adopted the following definition of price stability: "Price stability is defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%." Price stability is understood as maintaining inflation rates below, but close to, 2% over the medium term. Despite 2500 people working at the ECB, the ECB has difficulty with achieving its inflation target. Clearly, price stability is not something that happens by itself. Monetary policy is executed to achieve price stability. How monetary policy is executed can be described as follows. Because the ECB has a monopoly on the creation of legal tender, the ECB can "influence money market

conditions and steer short-term interest rates". This is called the monetary policy transmission mechanism (ECB 55). In the short term a change in the money market interest rates influences economic variables such as output or prices. However, in the long run it merely affects the general price level, and "not the real level of income or employment". The ECB writes that it doesn't fully comprehend how this process works. But this seems to be also a way to hide money creation. Remember that money creation is steered by the ECB through targeting the business models of commercial banks. Interest rates on the monetary base affect profitability of loans, and therefore affect the amount of bank deposits created. If bank deposits become more expensive, loans will become more expensive and borrowing will decline. Price stability is achieved through monetary policy by conditioning the right amount of money in circulation. Bank deposits represent a big part of the total amount of money. Therefore creation of bank deposits by commercial banks is argued to be directly affected by changing interest rates.

The ECB argues that influencing the amount of money in circulation doesn't affect the real economy, because "a change in the quantity of money in circulation ultimately represents a change in the unit of account (and thereby the general price level) which leaves all other variables unchanged". Because of only affecting prices and not real output, the ECB claims "neutrality of money". They write that "neutrality of money is a widely accepted and empirically validated proposition in the economic profession". Neutrality of money is such an uncontested concept that "long-run neutrality of money underlies all standard macro-economic thinking and theoretical frameworks" (ECB 55). However, in chapter one it was established that the concept of natural money is produced by an apparatus. In reality money is a political object, inherently subject to questions requiring us to make choices between conflicting alternatives. Haraway (168) argues that in a world of connections "it matters which ones get made and unmade". Nothing is ever just there. During the production process choices about what connections to make and unmake, prevent instruments from being neutral. Barad

(146) argues that “apparatuses produce differences that matter”. “They are boundary-making practices that are formative of matter and meaning, productive of, and part of, the phenomena produced” (Barad 146). This means that how money is designed matters for the real economy. Money isn’t neutral. Why would the ECB argue otherwise?

Market discourse

This can be explained by the framework underlying ECB’s technical interventions. Article 2 of ECB statutes states that the ESCB “shall act in accordance with the principle of an open market economy with free competition, favouring an efficient allocation of resources, and in compliance with the principles set out in Article 119 of the Treaty of the Functioning of the European Union”. The principles in Article 119 of the treaty on the functioning of the European Union read: “The activities of the Member States and the Union shall be conducted in accordance with the principle of an open market economy with free competition”. The concepts 'open market', 'free competition' and 'efficient allocation of resources' find consistency in market discourse. What does market discourse say about neutrality of money?

The laws of the market were 'discovered' by Adam Smith. However, these laws are in reality merely claims about human behaviour. This model claims that if humans act primarily in self-interested and competition the market will produce outcomes that benefit society best (Heilbronner 61). This needs to be seen in the light of Political Economy. Political Economy claims to reveal the existence of phenomena, processes and regularities that necessarily occur as a result of natural mechanisms (Foucault BP 15). Political Economy discovers a certain naturalness to the market which transforms the notion of nature (Foucault BP 15). The claim of being natural is a permanent correlative for legitimising market discourse (Foucault BP 16). For example, the laws of the market are modelled after physics models of the 18th century, such as the laws of motion and universal gravitation produced by physicist Isaac Newton to give the impression that the market is natural and therefore neutral (Raworth x). “The

importance of economic theory [...], the importance of the theory of the price-value relationship is due precisely to the fact that it enables economic theory to pick out something that will become fundamental: that the market must be that which reveals something like a truth." (Foucault BP 32) Indeed Heilbroner (57) explains that market forces are naturally set in motion when output strays away from socially ordained levels and operate to keep prices from ranging arbitrarily away from the actual cost of producing a good. This gives the impression that markets function naturally and condition the emergence of 'true' prices. According to market discourse, the market constitutes a site of veridiction, which means that if it's produced by the market, it must be right or true. Heilbroner (55) concludes that the combination of self-interest and competition results in the goods that society wants, in the quantities that society desires. By rationalising the market as a natural and spontaneous mechanism, economists argue that the outcome produced by market contains a form of truth.

How does the market mechanism work, how does it produce its truth? The market is able to produce the optimal allocation of resources by equilibrating supply and demand. A simple model is used here to explain how this works (Mankiw 8).

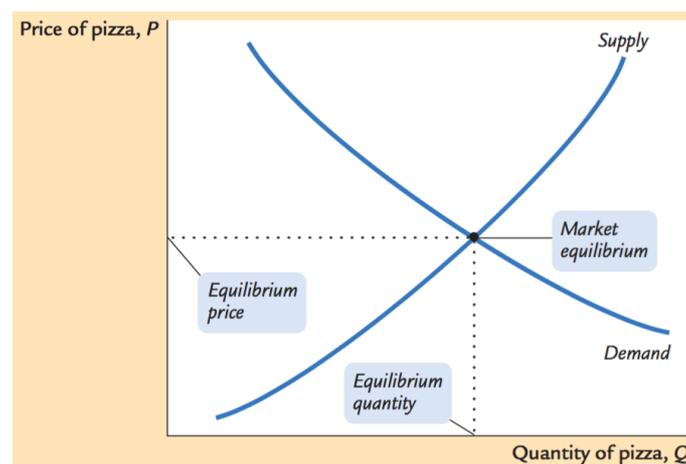


FIGURE 4 Model of supply and demand
source: Mankiw (8)

On the horizontal x-axis you find quantity of pizza, on the y-axis you find the price of pizza. The demand curve expresses the relationship between the quantity of pizza demanded and the price of pizza. This is a downward sloping curve, since the quantity demanded for pizza

diminishes when the price increases. The supply curve shows the relationship between the quantity of pizza supplied considering a specific price. This curve slopes upward, since higher quantity of pizza will be supplied when the received price is higher.

The model is based upon three different equations. These three different equations describe the behaviour of pizza buyers, pizza sellers and their interaction in the market for pizza. The demand for pizza is described as:

$$Q_d = D(P, Y)$$

the demand (Q) for pizza depends upon the price of pizza (P) and national income (Y). The supply of pizza depends on the price of pizza and on the price of the material required to make the pizza:

$$Q_s = S(P, P_m)$$

The third relation assumes that the price of pizza adjusts until the quantity of supplied and demanded quantity is balanced.

$$Q_d = Q_s$$

Somewhere in the graph these two curves cross each other. This crossing is described as market equilibrium. How is equilibrium achieved? It's assumed that consumers and producers always maximise their surplus. So for a consumer, when the price is lower than his/her willingness-to-pay, s/he will consume more. When the production costs of good X is lower than the price offered in the market, a producer will expand his/her production. Thus, prices function as signals. They will motivate consumers or producers to consume and produce more or less depending on their willingness-to-pay or production costs in relation to price. When supply is greater than demand there is pressure on the price to change, the price will decrease because consumers are only willing to buy such amounts only against low prices (Taylor and Mankiw 56). When the price decreases, some producers will opt out, because their production costs are no longer covered by the price. Therefore the market is said to secure 'efficiency',

there is only place for the most efficient production in the market. When demand equals supply, the price at which no one in the economy is willing to buy or sell more has been reached. This point marks maximisation of surplus value: the supplied amount of good is exactly equal to all consumers willing to buy against this price. This means consumer surplus is maximised, because everyone willing to pay the price, is able to acquire the good. The same counts for producers: all producers willing to supply for this price can sell total production. Therefore producer surplus value is maximised as well. All potential surplus value has been realised. This point marks market equilibrium and is constituted by the equilibrium price or market price. Market equilibrium is by definition equal to efficient allocation, which is defined as the maximisation of total surplus. The ECB and the European Union believe distribution by the market maximises total surplus, and therefore they act in accordance with the principles of an open market economy and free competition to achieve efficient allocation.

Price stability to allow price rationing

The ECB is informed by market discourse. This explains why their primary objective is price stability. Market economies harness the forces of demand and supply to allocate scarce resources among competing users. In this process prices are the mechanism through which supply and demand are equilibrated (Mankiw 74). Smith's invisible hand is the conductor of the market, and "prices are the baton that the invisible hand uses to conduct the economic orchestra" (Taylor and Mankiw 67). Taylor and Mankiw (67) write: "What prevents decentralised decision making from degenerating into chaos? What coordinates the actions of the millions of people with their varying abilities and desires? What ensures that what needs to get done does in fact get done? The answer, in a word, is *prices*." Foucault (136) summarises: "Prices are the regulatory mechanism of the market." For the market to function prices need to be stable, such that changes in prices are exclusively a reflection of changes in supply and demand.

ECB (55) illustrates this point: “Price stability makes it easier for people to disentangle changes in relative prices (i.e. movement in prices of any individual good or service) from changes in the general price level”. The ECB states that movement in prices typically mirrors changes in supply and demand. Price stability contributes to clear price signals, therefore it helps “the market to allocate resources more efficiently.” This clearly reveals ECB investment in market discourse and mainstream economic thought. It gives evidence for why the ECB has price stability as its primary objective. Does market discourse also explain why the ECB claims money is neutral?

Today university students are taught that “prices reflect both the value of a good to society and the cost to society of making that good” (Taylor and Mankiw 8). Today economists describe the market as a self-regulating system through prices: “The market must be left free to find its own *natural* levels of prices and wages and profits and production; whatever interferes with the market does so only at the expense of the true wealth of nation” (Heilbroner 57). Due to this price-value relationship the market is able to reveal a truth (Foucault BP 31). Foucault (BP 31) explains that this claim of naturalness inhibits human intervention: “Even if it’s not possible to grasp these mechanisms in their complexity, their spontaneity is such that attempts to modify them will only impair and distort them” (Foucault BP 31). The *raison d’être* or rationality of the market, according to its discourse, is the superiority of market allocation due to the naturalness of its mechanisms.

The market as constituted by natural mechanisms also explains the necessity of neutral money. Only if money is natural are price formations not interfered with by human action. If money isn’t natural, the market isn’t natural. If the market isn’t natural, the claim of market discourse that market equilibrium is equal to efficient allocation is invalidated. Market distribution can still be used, but no longer with the claim that it produces superior outcomes and can be applied in any situation. Only if money is neutral do prices determined in

accordance with the natural mechanisms of the market constitute a standard of truth (BP 31). Taylor and Mankiw (24) describe government interference in markets as normative, implying that market mechanisms are not mediated by human norms, but merely optimisation of natural forces. However, if the medium through which prices are expressed isn't neutral, if these 'true prices' are actually influenced by the design of money, market equilibrium is no longer natural or objective. It then loses its claim of superiority over other modes of distribution.

Neutral money invalidated

Chapter two shows that the concept of natural money exists to prioritise distribution through market mechanisms. It's rationalised that price stability secures the achievement of market equilibrium, because then changes in prices are wholly a reflection of changes in supply and demand. But money isn't natural, and therefore monetary design inherently affects processes of price rationing and the resulting outcome of market equilibrium. The market is legitimised as a superior mode of distribution because of its naturalness. However, exposing the effect of money on the formation of prices invalidates this claim. Today's distribution of goods and services clearly can't be described as an optimal outcome. Global heating threatens the existence of the climate regime that has been so generous to many forms of life. Chapter three looks at the effects of today's monetary design. How does today's monetary design disadvantage sustainability transitions? What role does money play in the Anthropocene?

3. CONVENTIONAL MONETARY DESIGN IS INCOMPATIBLE WITH SUSTAINABILITY TRANSITIONS

Market discourse claims that the position of market equilibrium is a spontaneous result of natural processes. This chapter will show that design of money influences the position of market equilibrium. In chapter two it's explained that market equilibrium is achieved through price rationing. Monetary design affects price formations, and therefore influences the outcome position of market equilibrium. The way in which monetary design influences the position of market equilibrium negatively impacts sustainability transitions.

'Invisible hand'

Only if money were a mere 'veil' can the EU and ECB claim that the market is the superior mode of distribution and as a consequence privilege market distribution over other modes of resource allocation. Showing that money isn't neutral invalidates their claim. Prices and price signals aren't natural, but influenced by monetary design, a human construct. Therefore market equilibrium is not the outcome of natural mechanisms. The theory of the invisible hand is a disappearing act for the effects of monetary design on price rationing. The invisible hand is a concept that covers up human interference. Upon closer look the hand isn't invisible, but fleshy. It's Draghi's hand, the president of the ECB.



FIGURE 5 The 'invisible' hand

As established in chapter one, the design of Eurozone monetary system has three important characteristics: a single currency created as debt bearing interest by commercial banks. This design is required for privileging distribution by the market. A single currency conditions the possibility of general market equilibrium. The amount of money in circulation is determined by allowing commercial banks to issue money based on the profitability of loans. Interest on money is used to create scarcity, such that bank deposits maintain value (Lietaer & Dunne 37). These three reasons explain the motivation for today's monetary design. But, what are the effects of this design? First the effects of money creation by commercial banks on the position of market equilibrium is discussed. Then the effects of money as debt bearing interest are discussed. In conclusion, the effects of a single currency based solely on institutional trust are discussed.

Issuance by commercial banks

Commercial banks issue money on the basis of profitability in the market. Profitability of goods and services is determined by their economic return. Economic return can be described as the return generated by a product or service on the market. A particular distribution of this economic return can be observed in the market: companies trading in data or oil and investing companies are among the most profitable companies in the world today¹⁷. This is because the market is well equipped to distribute goods and services that are self-contained, measurable and homogenous. These types of goods are susceptible to the effects of competition: private ownership, quantitative valuation and mass are required to be susceptible to the effects of price rationing. As such, in the market these characteristics determine the value of a good or service. Products and services that fit this profile to the greatest extent generate increasing economic return. However, there are few products than can really be described as self-contained, measurable and homogenous. Trade in goods and services that meet these

¹⁷ <http://fortune.com/2017/06/07/fortune-500-companies-profit-apple-berkshire-hathaway/>

requirements to a lesser extent are less profitable. Healthcare, art and education are minimally self-contained, measurable and homogenous, therefore economic return on these activities is low. Factory farmed meat, oil or data fits the valuation model of the market and the trade in these domains yields high economic return. Banks are profit driven, therefore if something produces economic return, capital will flow in. If not, there is lack of money. Banks are less likely to create money for goods and services that don't fit the value logic of the market.

An important sustainability transition is the energy transition. For instance replacing oil by wind energy. Oil is ahistorical, can be used anywhere, can be transported anywhere, and has no expiration date. More oil generates more economic return, as such more is better. Stock can be predicted quite precisely, enabling a reliable risk analysis. It has negative effects on the environment, but these are outside of self-containment, and therefore not taken into account by market valuation. Money is available in abundance for investment in oil, even during times of divestment. Wind energy slowly becomes a more conventional source of energy. In 2018 9% of total energy supply came from wind energy in the Netherlands¹⁸. But wind is hard to predict, more difficult to store, harder to transport, emergent to weather which inhibits unpredictability of supply. Due to limited storage options 'more is better' doesn't hold in the case of wind energy. Scaling wind turbines makes less sense, and spreading wind turbines more. This source of energy is hard to distribute through the market. Because it's networked, local, unpredictable and emergent. Wind energy doesn't yield high economic returns today. Elderson, director at DNB, explained during a meeting hosted by Triodos Bank and Pakhuis de Zwijger that low profitability is partly responsible for a lack of available money for financing renewable energy.

¹⁸ <https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Statistics-2018.pdf>

What is the effect of money creation based on maximising economic return for the position of market equilibrium? Money creation determined by the distribution of economic return creates shortage of money for activities that don't match the market profile. A market for goods and services yielding high economic return exists because money, the lubricant required for the machine of price rationing to run, can be created by the banker's fountain pen. For economically profitable, yet environmental destructive activities money is available without limits because money is issued by profit driven banks. Due to the availability of money, market actors can express their preferences for certain products. But when there is a lack of money, demand can't be expressed and therefore a market can't emerge. Sustainability transitions aren't profitable, so money needs to be sourced elsewhere. For sustainability transitions money needs to be sourced from the pool of money first created for short-term maximising goods and services. Obviously this is costly and time consuming. So, because sustainability transitions do not fit the profile for market profitability, commercial banks don't issue money for sustainability transitions. This lack of money impedes the ability to express preference for sustainability transitions in the market. This distorts the position of the general market equilibrium.

Commodification The distribution of economic return is largely structured by commodification of goods and services. Maximising economic return implies commodification.

Commodification means alienating by making human activities or non-humans into stand alone's (Tsing 5). An example is cattle. Any living being can't be privately owned, isn't quantitatively measurable and is unique. However, factory farming commodifies non-human animals. In factory farming industry animals are purely treated as resource. Conditions of life of pigs, chicken, cows and other animals show that they are merely seen as meat production machines. It's the maximisation of the extent to which an animal can be commodified. This type of meat realises maximised economic return. Animals in free range farming, still

captivated but a bit more acknowledged as beings worthy of life, are less profitable. Money creation based on profitability requires maximum commodification. Acting otherwise is possible, but is against the logic of money. Commodification turns everything but the crop into waste, turning landscape into ruin when the commodity is extracted (Tsing 6). In the Anthropocene, precisely valuing the remainders of ruins (or 'salvaging') is what will allow survival. Money creation that allows to notice waste as valuable, means not all money must be created on the condition of profitability.

Collective action Money creation is delegated to commercial banks today to make optimally distributed money creation possible. The rationale is that the aggregation of individual preferences for money best informs how much money is required in circulation. These individuals are assumed to be self-interested. Meanwhile sustainability transitions almost always concern public goods or other forms of commonly shared ownership. This requires collective action, which can't be expressed by the sum of individual preferences for the amount of money in circulation. Money creation by commercial banks only brings money in circulation based on individual preferences, simply because pricing mechanisms can't process collective preferences. Action is required to reverse or minimise air pollution, rising sea temperatures and deforestation. This requires creation of money based on collective preferences. Money is abundantly available for goods and services that can be individually consumed, but is scarce for activities that require collective action. By design the market can't express demand for collective action, this distorts position of market equilibrium.

Competition The market creates value through competition. Market discourse claims competition conditions efficient allocation of resources. Commercial banks create money for economically profitable companies, thereby privileging the condition of competition over other productive relationships. Restricting issuing money to commercial banks disables

money creation for activities that create value through collaboration. Many examples prove that installing dynamics of competition doesn't maximise creation of value in a non-market situation, such as the academic world. It shows that only in specific settings competition benefits value creation. Moreover competition crowds out collaboration. Precisely in the Anthropocene is collaboration required (Tsing 23). This results in a shortage of money in circulation for non-market activities. The lack of means to express demand for non-commodified goods and activities, influences the position of market equilibrium.

Shortage of money Today 95% of money that is generally accepted as means of payment is created on the conditions of profitability, individual preference and competition. Making transitions possible with an alternative purpose, requires saving up or collecting before money can be spent to realise the transition. Bank's have the privilege to finance transitions without the time consuming process of saving or accumulation. The issue with affording money creation exclusively to commercial banks is that what is creditworthy for banks is not creditworthy for Terrestrials. Monopoly on money creation for commercial banks means that creditors' policy determines the possible futures for society (Christiaens 50). Firstly, money doesn't have to be created on the condition of economic return. An increase of money not created on the condition of maximising economic return, could accelerate sustainability transitions. Secondly, only allowing individual preferences to inform the required amount of money in circulation, constrains expressing demand for the required amount of money. Collectives aren't merely the aggregates of individual parts. This results in a shortage of money available for collective actions. Thirdly, money creation is only possible for initiatives that create value through competition, but sustainability transitions require collaboration. All three reasons maintain that because money is issued by commercial banks, a shortage of money in circulation exists. "Most of us fervently believe that financial woes and tribulations are occurring because there simply isn't enough money to go around" (Lietaer & Dunne 1).

This shortage of money exists by design. The experience of scarcity is an artefact of our money system (Eisenstein 281). "As long as conventional money retains its monopoly, there will always be insufficiency and untended needs" (Lietaer & Dunne 217). Due to shortage of money, sustainability transitions can't be executed at an appropriate speed and level.

In a market society exchange value becomes the dominant type of value (Foucault BP 146). Today the idea that price determines value and that prices are best determined by the market is the dominant theory of value (Mazzucato 8). "While economic students used to get a rich and varied education in the idea of value, learning what different schools of economic thought had to say about it, today they are taught only that value is determined by the dynamics of price" (Mazzucato 9). Moreover, the theory that price determines value is not presented as a particular theory of value, but simply assumed to be true. It's this of exchange value that is responsible for making sustainability transitions too expensive, whilst simultaneously being invaluable. In the Anthropocene, a radical different notion of value is required. This will be explored in the third paragraph. First it will be established what the effects are of creation of money as debt bearing interest.

Debt bearing interest

Most money is created is by commercial banks. The result is most money in circulation is created for short term profitable, individually consumed and competitive activities. Yet money is reasonably required for other purposes as well. Due to a lack of money created for alternative goods and activities, their demand can't be adequately expressed through a pricing mechanism. In this way, the design of money affects the point of market equilibrium. Money created by banks (95% of all available money) has two characteristics: debt and interest. This paragraph explores how these two characteristics affect economic activity in the real economy. Money can be created in many different ways. Money as it's created by commercial banks conditions it's use to be scaleable, risk averse and consumption driven. Secondly it will

be explored how interest imposes economic growth in the real economy and is accountable for increasing inequality.

Scalability Debt is an exchange that hasn't been brought to completion (Graeber 121). An exchange implies that both parties can walk away and having nothing further to do with each other (Graeber 122). Only when debt is repaid is equality between debtor and creditor restored. Since debt requires repayment, commercial banks need to be careful for whom they create money. To secure safe lending commercial banks have extensive processes in place that make loans costly. For commercial banks the smallest sum for a loan is between €20.000 and €50.0000, however there are also banks that have €100.000 as minimum amount. Below that amount a loan is simply not profitable. Scaleability of projects increases profitability of a loan. Scaleability refers to expanding a project without having to change the framing assumptions (Tsing 38). Because of these costly processes, a commercial bank has interest in scaling up. Financing growing businesses increases economic return. Today banks face difficulties to finance energy transitions. Amongst others because local energy cooperatives are too small to make profitable cases. Elderson, director at DNB, proposes to merge energy cooperations such that they become eligible for bank finance. Tsing explains that the difference between scalability and non-scalability isn't that the one is good and the other is bad, but the possibility of diversity (Tsing 38). Local energy cooperatives allow for diversity, while unified conglomerates don't. Reducing our carbon footprint also entails alternative modes of social organisation, substituting privileging scaling for allowing both spreading and scaling. DNB's director Elderson proposes to accustom organisational structures to commercial bank's requirements. However, there is no reason to let commercial bank's requirements dictate social organisation. Instead, types of money are required that do not impose scale.

Risk averse Since loans require repayment, money can only be created for verified concepts. This results in bias against innovative practices, since no track record is available that allows for assessing risks. Profit-wise a bank prefers repetition over innovation. Therefore money creation today is skewed towards old methods rather than innovative methods. Sustainability transitions typically involve innovative methods. Boyan Slat's revolutionary technique for retrieving plastics from oceans is funded without any bank loans. Money can't be created for cleaning the ocean, since no risk assessment for the developed machine is possible. However, all inhabitants of planet Earth can agree that retrieving plastics from oceans is valuable. Despite the value of Slat's work, it's not worthy of money creation. In Anthropocene times these kinds of revolutionary ideas shouldn't be restricted by finance.

Consumption driven A loan requires a business case. The first question for most bankers is: how will you repay your loan? The prospects of repayment aren't only dependent on one's business model, but also on the economy's conjuncture. Money creation through loans entails that loans become less risky and therefore more profitable when it's expected that the economy will grow and consumption increase. In upward times more people will invest because they expect their investment will yield enough profit to pay back debt and interest. Ultimately repayment of loans is dependent on consumption levels. When money is created as loans, consumption levels dictate the possibilities of sustainability transitions. This contradiction needs to be resolved by allowing creation of money in other ways as well. Moreover, consumption driven money creation drives pro-cyclical money policy. This results in financial bubbles and cyclical recessions that obstruct effective execution of sustainability transitions (Lietaer & Dunne 2).

Interest and economic growth The next paragraph establishes how charging interest affects the real economy. What is interest? The standard macro-economic textbook by Mankiw (579)

defines interest as “the market price at which resources are transferred between the present and the future; the return to saving and the cost of borrowing”. Neoclassical models refer to interest as the price of money (Hutchinson, Mellor and Olsen 182). In this case the price of money reflects the value of the utility of money in time (Foucault 44), or the price of renting money (Scott 29). Charging interest has been forbidden for large parts of history (Graeber 290). Dante was so disgusted by usurers that he put them in hottest part of hell (Mazzucato 61). Today, charging interest rates is an accepted practice.

Bank debt money functions on the basis of scarcity. As long as supply of money is smaller than demand, bank deposits retain their value. By charging interest without creating interest, surplus demand is secured. In the words of Lietaer & Dunne (39): “Not creating money to pay interest is the device used to generate scarcity necessary for a bank-debt monetary system to function”. In today’s economy there is always too little money available to repay debt and interest, resulting in a competition on money. “When a bank checks a customer’s creditworthiness, it is really verifying his or her ability to compete successfully against the other players — that is to say, assessing the customer’s ability to extract from others the money that is required to reimburse the interest payment” (Lietaer & Dunne 39). Because of interest, borrowers have to compete for money to be able to repay debt and interest. The imperative of interest requires people to focus on production of economic growth, while they might not be interested in this intrinsically. If almost all money bears interest, economic growth is required to repay debt and interest. When there is no economic growth, businesses and consumers have to default on their debt payments, which unsettles the economy.

Increasing inequality In addition, the interest affects the price of all goods and services.

Eventually each transaction is required to generate economic return such that enough economic value is created, to be able to fulfil interest payments over the period of the loan.

Each transaction with today's type of money needs to generate economic value and therefore the costs of borrowing are included in the price of goods and services. If specific use of money doesn't create economic value to repay interest, this burden is doubled for other transactions. Interest also incentivises accumulation instead of distribution (Tsing 68). Piketty shows the return on capital (interest) increases faster than the return on labour. This widens the inequality gap. Moreover, poorer people generally pay for the costs of capital, while rich people are the beneficiary of these payments. Little information about the distribution of interest payments is available, but this mechanism further increases inequality. Tsing argues that accumulation converts ownership into power. Currencies that charge demurrage, the opposite of interest, have been in existence for a long time. Negative interest stimulates circulation of money, as experienced by users of the Berkshare, a community currency in Berkshire, Massachusetts (Lietaer 75). Eisenstein (246) adds that demurrage encourages reciprocation and sharing, because demurrage shifts the attention to relationships instead of accumulation. Perpetual economic growth isn't possible in a circular system. Money without interest is needed to make a world possible in which growth is not a necessity.

So far this chapter established that money creation by commercial banks constrains the amount of money in circulation, because money creation is conditioned by:

1. economic return on commodities
2. individual preferences
3. competition

Secondly this chapter showed use of money created as interest bearing is conditioned by:

1. Scalability
2. Risk averse
3. Consumption driven
4. Economic growth
5. Increasing inequality

This shows that monetary design has an effect on the real economy. The last characteristic of today's monetary design is that there is only one currency based on institutional trust.

Institutional trust as legal tender

Today only a single currency functions as legal tender. Therefore all money in circulation is subject to the above established characteristics. This paragraph will substantiate the following consequences of a single currency based on institutional trust as legal tender: single value regime, value extraction, system flaws, efficient use and restricted accessibility to money.

Institutional trust Today's money functions through institutional trust. Money is trusted, because the ECB and governments are trusted. It doesn't matter who gave it to you, or on the basis of what value or promise the money was created. By design, today's money allows for exchange in anonymity. Euro bills and coins portray bridges and arches in different historical European styles, ranging from Ancient Greece to modern times. All notes contain Draghi's signature, marking institutional trust. This type of design is efficient in the sense that money can be used to make a payment to anyone anywhere, maybe on the condition of currency conversion. This allows for anonymous partnerships. Serres (32) describes money as the general equivalent: "Blank pages, null and void of meaning, indeterminate, they are pure capacity. Money is the general equivalent, it is worth everything and it is worth itself, money is the joker, it has all values, it has all meanings, having none, smooth as a subject, white as a whore, an abstraction, a politician." Money as general equivalent enables anonymous collaboration, and thereby global trade. But anonymised money also alienates. The Kula ring, an exchange of necklaces and arm shells made by Melanesians east of New Guinea, upsets the self-evidence of anonymous money (Tsing 122). In Kula exchange the ornaments become

valuable through the social relationships and reputations of which they are part (Tsing 122). Today, things exchanged with conventional money bear no relation to the personal networks in which they are made and deployed (Tsing 122). Tsing (122) writes: "Just as factory workers are alienated from the things they make, so too, things are alienated from the people who make and exchange them". The value regime constituted by today's monetary design conditions alienation and anonymity to privilege distribution by the invisible hand. But now that we know that money isn't neutral, and market equilibrium therefore not superior, there is no longer a strict need to privilege the invisible hand. The possibility emerges to explore monetary design that expresses local relations, acknowledges delicate interdependencies and reinforces social cohesion. Today's money only gives expression to the market price of a good, constraining the ways value can be created (Tsing 126). Alternative monetary design can account for local values based on local trust relations. For instance Torekes money in Ghent can be earned by repairing local buildings or taking care of flower beds (Lietaer & Dunne 151). The citizens of Ghent indicated that they would like to be able to use earned money to access vegetable gardens. They also had the opportunity to use them as means of payment for public facilities, such as public transport and a cinema. The municipality of Ghent didn't had access to euro's to pay for local green facilities and repairing buildings, but it did have vacant lots and surplus capacity in public facilities available. Due to lack of conventional money the neighbourhood degenerated and vacant plots couldn't be rented out. However, combining the two resulted in abundance of new value creation. Another example is the following. Today locally or organically produced products often come at a cost. A quantitative value regime marks these aspects as crowding out efficiency. However, from a non-quantitative perspective maybe local production is more important than maximising efficiency. Designing a currency specific to the neighbourhood allows for accounting for alternative value regimes.

Value extraction Anonymised money enables extractive use of value creation. Tsing defines capitalism as translations across sites of difference (Tsing 62). Capitalism operates to concentrate wealth, by taking “advantage of value produced without capitalist control” (Tsing 63). Life processes such as photosynthesis and animal digestion condition (industrial) farms, and many capitalist raw materials came into existence long before capitalism. The translation of non-capitalist values to capitalist value systems is facilitated by today’s anonymised money. Since money isn’t specific to a location, the value it represents can be extracted and stored somewhere completely different. Value created locally is alienated through expression in conventional money. Value is defined separately from the place of production or its maker. Therefore it can be sourced from a place and stored, while retaining value, anywhere else. Kula exchange shows that this is specific to capitalist value regimes (Tsing 122). If local value was denominated in monetary design that defines value partly through the creator or place of creation, multinational companies would be restrained in extracting value, because this type of money would lose value outside of that area. An example is the currency Fomentos initiated by Social Trade Organisation. Conjunto Palmeira suffered from a shortage of money, because currency quickly left the local economy. By setting up a local currency, value created in the neighbourhood remained in the neighbourhood. Store-owners were offered loans without interest in Fomentos, in exchange for accepting Fomentos as means of payment. Local builders were asked to accept payment in Fomentos. Soon the currency circulated throughout the entire community. Value created in Palmeira denominated in Fomentos, allows to define value by the location of creation. Because value is dependent on place of creation, it’s less likely value will leave the community. Availability of money through local currency makes it possible to allow circulation of value that couldn’t be exchanged before due to lack of money (Lieater & Dunne 104). Scarcity is contextual. It depends on a value regimes: what is the logic for making value according to monetary design (Tsing 122). Designing money based on alternative value regimes has the potential to turn local scarcity into abundance.

System flaws Although money itself is anonymised, people creating money aren't. It's quite a homogenous group. All presidents of national central banks in Europe are white men. All CEO's of Dutch commercial banks are white men. The ECB supervisory board counts 7 women out of 27 people, and no people of colour. Only one woman is part of the six-headed board of directors, and no person of colour sits in the board. The ECB's board of commissioners counts 22 people, of whom 2 are women and no people of colour are present. Apart from gender and colour, these people are very likely to adhere mostly to the same assumptions and theoretical framework. Namely that of market discourse. A homogenous group runs the risk of a single standard for assessing disturbances. Tsing (161) explains: "Rosalind Shaw has elegantly shown how men and women, urban and rural, and rich and poor each conceptualise 'floods' differently in Bangladesh, because they are differently affected by rising waters; for each group, the rise exceeds what is bearable — and thus becomes a flood — at a different point". Assessing disturbances matters in relation to how we live, therefore attention is required to the assessment through which we know disturbance (Tsing 161). Classical economic theory teaches a single theory of value, which is presented as the truth. Different theories of value perceive disturbances differently. Tsing (161) continues: "Disturbance is never a matter of 'yes' or 'no'; disturbance refers to an open-ended range of unsettling phenomena." A homogenous group in charge of design of the monetary system runs the risk of too narrow a perspective on what is marked as bad and what's a good thing. Initiator of the 'Network for Greening the Financial System', director Elderson is a frontrunner in the realms of central banking. He argues that the best way to facilitate sustainability transitions is to price climate risks and internalise them into models. In that way price rationing is improved, and the market as mode of distribution restored. Elderson is convinced that this monetary system can facilitate sustainability transitions. These are the most progressive strategies within the central bank world. It shows that more diversity is highly required to really act on climate

change. Money is inherently social, but money creation is not organised accordingly. The population of European bankers is not at all representative of wider European society. Bankers belong to one of the best earning groups of the workforce. More often than not, they don't experience socio-economic struggles first hand. This largely prevents questioning market discourse.

Efficiency For market discourse a single currency is required to achieve general market equilibrium. Only a single currency allows prices to equilibrate all supply and demand. A single currency is secured through legal binding, which shows a single currency is deemed very important. Historically a plurality of currencies could often be found in communities: people used to create their own money as they saw fit (Graeber 74). Different currency schemes were used for different purposes, such as local trade or long distance trade, or to distinguish between transactions and gifts. These different monetary designs allowed people to adjust money to the specific requirements of a relation. The establishment of a single dominant currency took place quite recently, at most 350 years ago when the Bank of England was established, contrasted to 5000 years of monetary history. A single value regime is not as carved in stone as it might seem. If people can't create their own money, assignation of value is regulated by a single measure. According to market discourse a single measure of value enables efficient exchange and the possibility of market equilibrium. However, ecosystem studies show that only focusing on efficiency harms resilience (Ulanowicz et al. 31). When the single measure of value is not accurate in a specific context, as can be said of market value today, this poses a threat for whole wider society because there are no alternatives. Today's concept of value has for a long time been "soaked in normative strictures and stained by complicity with capitalist power" (Massumi 3). Making efficiency central to all exchanges,

explains why locally or sustainably products can be more expensive than environmentally destructive products.

Accessibility A single currency limits the accessibility of money, because it implies that the power to create money is centralised. Hypothetically everyone can create money, but it requires social organisation to have money accepted as means of payment within an economy. When Smith wrote that it's not from the benevolence of the baker that one expects one's bread, he was drawing a utopian picture (Graeber 335). Back then, most English shopkeepers were carrying out the main part of their business on credit. This network functioned through mutual trust. Smith wanted to introduce the use of cash such that these ongoing entanglements of trust would no longer intervene with the logic of the invisible hand (Graeber 335). Disappearance of monetary agency, the ability to create money, is referred to by Graeber as the 'price revolution'. In Western Europe during the 17th century distributed money creation was violently ended through a regime of bullion money (Graeber 313). Requiring taxes to be paid in metal, while everyday payments were settled in virtual credit money, forced people of their lands. Once-independent townsfolk and villagers were hammered into working for those who had access to credit, to get access to bullion required for paying taxes (Graeber 339). Hutchinson, Mellor and Olsen (13) state restricted accessibility of money is highly problematic: "Access to money or its future existence through credit is a profoundly social question that determines wealth and well-being". Today's single currency is issued mostly as loan. Acquiring a loan requires a track record and collateral. A saying describes the requirements as: "A banker is a fellow who lends you his umbrella when the sun is shining, but wants it back the minute it begins to rain." Moreover often banker's aren't fully aware of the internal dynamics of the models that determine whether a loan will be made or not. Inaccessibility of loans excludes people from accessing the new influx of money in its creation. Creation of loans is highly regulated by the market. Allowing the market to regulate

accessibility to money, amounts to the market as the ultimate organising and regulating principle of the future possibilities of state and society (Foucault BP 116). A single currency results in an exclusionary mechanism. If within a community no other measures of value are allowed to price transactions people lose autonomy. A single currency excludes people from expressing their own value regimes by meaningfully making their own money, and including their contexts and relationships in this process of creation. A more distributed assignation of value allows for multiple measures of value. Moreover giving back to people and communities the possibility to independently assign value, allows bringing into circulation a more diverse set of resources for executing sustainability transitions.

This chapter shows why today's conventional monetary design can't facilitate sustainability transitions. First of all, issuance of money by commercial banks constrains the amount of money in circulation. Sustainability transitions are valued, but can't be priced due to the absence of market. Therefore commercial banks can't issue money for sustainability transitions. Secondly creation of money as debt bearing interest, conditions use of money that isn't compatible with sustainability transitions. Lastly, a single, anonymised currency based on institutional trust conditions a single value regime that enables value extraction, runs the risk of system flaws, conditions efficient use and deprives people of monetary agency, decreasing resources to battle global heating. Reaching the conclusion that monetary design affects real economic processes. Requires exploration of a new conceptual framework that can inform monetary design, such that the monetary system becomes compatible with the Anthropocene.

Exploration of Anthropocene framework for monetary design

Most of us were raised on dreams of modernisation and progress (Tsing 20). These promises of modernisation made the direction of the future well-known (Tsing 3). Progress is a forward march, drawing other kinds of time into its rhythms (Tsing 21). Money creation today takes place on the basis of a single concept of value. In modern times, there was no doubt but

profitable business models would advance society. In the Anthropocene it's clear that industrial progress has proven more deadly than anything else (Tsing 1). Progress is the story of pioneers transforming 'empty' spaces into industrial resource fields (Tsing 18). Everything except the stand-alone asset is turned into waste or weeds. "When its singular asset can no longer be produced, a place can be abandoned. [...] Simplification for alienation produces ruins, spaces of abandonment for asset production." (Tsing 6) Such narrow concept of value can no longer be operated if we want to be able to live on a planet whose landscapes are strewn by these kinds of ruins. Accustoming money to facilitate sustainability transitions in the Anthropocene is mainly about rethinking value regimes. How is value created and what can be perceived as valuable? Developing alternative arts of noticing helps us perceive that despite their announced deaths, abandoned asset fields can be quite lively (Tsing 6). In the Anthropocene, we have no other choice than looking for life in ruins. Monetary design can be informed by arts of noticing. What value regimes need to be constitutive of our monetary system? How can these value regimes become tangible through monetary design? These are some ideas.

The arts of noticing In the Anthropocene economic growth is no longer sublime. If we become agnostic about where we are going, we might look for what has been ignored because it never fitted the time line of progress (Tsing 21). Without the driving beat of progress, what other temporal patterns are there to notice? Monetary design that accounts for local dwelling places can express the heterogeneity of space and time patterns (Tsing 4). Latour (95) defines dwelling places as the land a terrestrial depends on for its survival, while also asking what other terrestrials depend on that land. Tuning into local rhythms of time and place is illustrated by the following example from Lietaer and Dunne (142). In Curitiba trash was a serious issue. But no funds were available to solve the issue. Having a closer look at this specific location showed two other types of abundant available resources: time and capacity

on the municipal bus system. Large metallic bins were located at the edge of the favela neighbourhoods. If one collected trash, one received tokens to ride the local bus system. Riding the local bus system was essentially a ticket to a job down town. Soon these tokens were accepted as well as payment at the market for food. This example shows value is often already present, but today's monetary design, isn't able to notice. In contrast to modern advocacy, monetary design that accounts for attachment to land, maintenance of traditions and attention to Earth is legitimate (Latour 14).

Today's monetary design limits money issuance to activities driven by commodities, competition and individual preferences. This results in shortages of money to execute sustainability transitions. While potential is abundantly available, the means to exchange value are lacking. In previous times, people created their own money, but this possibility is pressed into the margins. To notice value, distributed assignation of value is again required. LETS systems are systems that allow people to autonomously assign value. They provide people with monetary agency. Noppes in Amsterdam is an example of a Local Exchange Trade System. Any participant in the system creates money when s/he wishes to acquire a good or service. As such, there is never shortage of money. Every participant is as well producer and consumer. When one's account is already credited, creation of new money is not required. Switzerland has a dual currency system dating from the 1930's (Lietaer & Dunne 99). When the financial crisis drained credit lines, bankruptcy was the consequence for many Swiss businesses. Two business men set up a mutual credit system. A mutual credit system implies that businesses buy on credit from one another. Banks are cut out of the system, because institutional trust is replaced by mutual trust. Banks massively campaigned against the idea, however as of today over 60.000 companies, about 17% of all Swiss businesses, participate in interest free mutual credit operations. Types of money creation without interference of commercial banks allow more dynamic access to credit for a more diverse group of people.

Contamination Tsing (21) explains that there might not be a collective happy ending: “Why would we expect economies to grow and sciences to advance?” If a world without progress is indeterminate and multidirectional, this allows us to suspend the idea of a single currency. Efficiency was useful to advance towards the shared horizon of progress as quick as possible, but in assemblages divergent lifeways gather. “Interspecies entanglement that once seemed the stuff of fables are now materials for serious discussion among biologists and ecologists, who show life requires the interplay of many kinds of beings. Humans cannot survive by stomping on all the others” (Tsing vii).

In the Anthropocene efficiency loses its central position, and productivity might be found in fragmentation. The trope of progress is no longer sufficient to know the world (Tsing 21). Value regimes in the Anthropocene need to allow for unintentional coordination of open-ended assemblages. We all are involved in multi-species world-making projects. “Each living thing remakes the world through seasonal pulses of growth, lifetime reproductive patterns and geographies of expansion” (Tsing 21). Humans, beavers and pines all make living arrangements for themselves and others. We live in a multi-species world that is structured by contamination. Contamination changes who we are. New directions and worlds may appear from this contamination (Tsing 27). Everyone is contaminated, “purity is not an option”. Neoclassical economics assumed that individuals are self-contained. Led by self-interest individuals, they maximise utility through encounters without being transformed by these encounters. However, as most of us will recognise: “the important stuff for life on earth happens in [the indeterminacy of self-and-other] transformations, not in the decision trees of self-contained individuals” (Tsing 29). It’s privilege to think we can survive as self-contained individuals. Anonymised money undermines the possibility of expressing local relations or planetary interests. It conditions people to privilege self-interest over other values. Conventional monetary design allows only information about self-interest to inform the position of market equilibrium. Designing money that isn’t created on the condition of

maximising individual preferences, makes room for indeterminacy and multiplicity of directions.

In U.S. television shows 'survival' is a synonym for conquest and expansion, survival is presented as the advancement of individual interests (Tsing 27, 28). Tsing (28) argues that for every species survival requires liveable collaborations. "It is hard for me to think of any challenge I might face without soliciting the assistance of others, human and not human" (Tsing 29). A single perspective constituted by the concept of self-contained individuals no longer works now that Earth is no longer indifferent. The Anthropocene requires issuance of money not on the basis of a single metric. A multiplicity of currencies, issued by a multiplicity of entities is required. Co-existing value regimes informing divergent monetary designs can help bring resources into circulation required for sustainability transitions. "Without collaborations, we all die" (Tsing 28). Moreover monetary design is required that doesn't condition competition. By refraining from charging interest, or even charging demurrage, people are no longer by default put into competition with one another. Money that always grows, but never decomposes, might be the ultimate manifestation of progress.

Staying alive in the mess we made Progress stopped making sense. The Terrestrial as political force demands us to practice the arts of noticing. The Terrestrial as political actor makes clear there is no longer a milieu or background to human action that can be filled up. Before global heating it was possible to say that humans were 'on earth' or 'in nature' (Latour 41). In the Anthropocene, the territory itself begins to participate in history, to fight back, in short, to concern itself with us. "How do we occupy land if it is this land itself that is occupying us?" We can no longer say where we are if the place 'on' or 'in' which we are located begins to react to our actions, turns against us, encloses us, dominates us, demands something of us and carries us along in its path. The Nature/Culture divide deanimated one sector of the world, proposed

to be objective and inert, while over-animating another sector, deemed to be subjective, conscious and free (Latour FG 85). In the Anthropocene the oppositions between Nature and Human are suspended based on a redistribution of agency (Latour FG 113). Latour (87) adds: "We also avoid the trap of thinking that it would be possible to live in sympathy, in harmony, with the so-called 'natural' agents. We are not seeking agreement among all these overlapping agents, but we are learning to be dependent on them. No reduction, no harmony." The redistribution of agency between Nature and Human, that abolished both concepts, requires reflection in a monetary system if it wishes to facilitate sustainability transitions. Only then can the resources and value required for successful survival be generated. "Without Man and Nature, all creatures can come back to life, men and women can express themselves without the strictures of a parochially imagined rationality. No longer relegated to whispers in the night, such stories might be simultaneously true and fabulous. How else can we account for the fact that anything is alive in the mess we have made?" Tsing (vii)

CONCLUSION

Simmel (135) wrote: “The debate on the future of money is not about inflation or deflation, fixed or flexible exchange rates, gold or paper standards, but about the kind of society in which money is to operate”. Money is a political object. It’s design has effects on real economic processes. Today’s monetary design is one of the core reasons climate change can’t be solved. Operating the monetary system in alternative ways can spiral the possibilities and effectiveness of sustainability transitions. Monetary design is a leverage point for achieving sustainability transitions.

Faithfully acknowledging the redistribution of agency brought about by the Anthropocene requires alternative monetary designs. The first step to make monetary design part of sustainability transitions, is unmuting money. Taking away money’s veil shows that money is a political object. How is it that possible that the concept of natural money exists? Chapter one traced how an apparatus constitutes money as a natural object. Chapter two traced why power relations are deployed in this way to prioritise distribution by the market. Chapter three established the disadvantageous consequences of muting money. Today’s monetary design detains sustainability transitions, yet this obstruction can’t be discussed because money is naturalised. This thesis concludes that today’s monetary apparatus needs to be adapted to employ power relations in more sustainable directions.

Foucault argues that power relations are not bad in themselves. “I do not think that a society can exist without power relations, if by that one means the strategies by which individuals try to direct and control the conduct over others”. “Power is not evil”, it’s not something we have to break free from (Foucault EST 298) . Nevertheless, Foucault distinguishes three different types of power relations: “strategic relations, techniques of government and states of domination”. State of domination is conventionally referred to in society as 'power' (Foucault EST 299). When power relations are dynamic, states of domination between actors oscillate. However, when these relations ossify a state of

domination is the result. Today's monetary design establishes a state of domination. Only the ECB is allowed to create money. Its domination is so extensive, people don't even know the ECB holds the power to create money. This state of domination is responsible for the shortage of money in circulation for sustainability transitions, for the inability to use today's money for sustainability transitions and for establishing a single measure of value in society. Facilitating sustainability transitions requires strategic monetary relations. Strategic monetary relations make space for attuning monetary design to different types of relations and other local needs. When states, communities and commons are allowed to create money attuned to their necessities, money can be used to facilitate sustainability transitions. Possibilities are multiple currencies, currencies charging demurrage and collectively created currency, or defining the amount of money no longer through the concept of equilibrium, but by Meadow's model of multiple feedback loops for systems thinking. A first step towards strategic monetary relations could be to democratise banking licenses. Who will receive the power to create money would become a political debate on how this power would be deployed.

There is both a conceptual and technical side to research into monetary design. Philosophical work can account and inform the conceptual design of a currency. This work could be advanced with Tsing, Latour and Haraway by asking the questions central to their work: 'What monetary designs help to survive in the ruins of capitalism?', 'What monetary designs help to land?' and 'What monetary design allows to stay with the trouble?'. Technical knowledge needs to be developed to understand how these philosophical concepts can be translated into monetary attributes.

Lietaer & Dunne (32) quote Gregory Bateson: "The source of all our problems today comes from the gap between how we think and how nature works". To survive in the Anthropocene new fields of possibilities are required on many levels. They need to be informed by the fact that humans are one of many species, and acknowledge the need for the redistribution of agency as a result of global heating. Bateson makes a distinction between

'human' and 'nature', but we are nature as well. Money isn't natural, but it is nature. Today's monetary design can inhibit us to recognise ourselves as nature. This hindrance might be the most fundamental role money plays in the Anthropocene. Nevertheless, Bateson is right in the sense that the way we think today isn't compatible with Earth's ecological principles.

Surviving in the Anthropocene demands that we insert ourselves in lineages that are allowed to last. Conventional money just isn't part of lineages that can last. The Terrestrial demands of us that we make money political again to be able to accommodate monetary design to contemporary needs.

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