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2019

https://doi.org/10.25969/mediarep/12242

Veröffentlichungsversion / published version
Sammelbandbeitrag / collection article

Empfohlene Zitierung / Suggested Citation:
Schröter, Jens: Money Determines Our Situation. In: Armin Beverungen, Philip Mirowski, Edward Nik-Khah u.a. (Hg.): *Markets*. Lüneburg: meson press 2019, S. 71–115. DOI: https://doi.org/10.25969/mediarep/12242.

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Money Determines Our Situation

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"Media determine our situation" (Kittler 1999, xxxix). This famous statement of Friedrich Kittler, which was the first sentence of his well-known book *Gramophone Film Typewriter* in 1986, was also the first sentence of the introduction to the conference in Lüneburg in summer 2015, on which this text is based. In German media studies today, it is no longer a widely shared premise, since there is a general trend toward praxeology or "the practice turn."[1] Although it is interesting and important to analyze media practices, the radicalization of this praxeological turn tends to erase the genuine contribution of the media themselves, their own dynamics, affordances, and scripts around which media studies ought to be centered. In praxeological studies media are all too often explicitly or implicitly reduced to neutral tools for the practices of human actors or to neutral channels for human intentions—exactly the instrumental conception of media criticized by media theory from its very inception (as my reading of Callon will show). If media were neutral they would be transparent, would have no significance of their own, and would therefore not be worth studying at all.

Of course media archaeology, that is, Kittler's technocentric approach, was criticized for its technodeterminism, if one understands this term as the idea that technologies determine human practices in the strict sense. But I doubt that Kittler ever made this argument. To me, it seems that the nonneutrality of media is in fact already a very simple logical fact. To say: "The technological medium of photography doesn't determine which kinds of photos people in diverse practices want to make" is of course correct. But without photography people wouldn't want to make photographs in the first place. They couldn't even think of doing so. They couldn't even discuss the potentials and limits of their photographic practices. Logically, the medium predates any practice. To say "There is no such thing as photography, but only different photographic practices" is simply nonsensical (I will come back to that "praxeocentric fallacy" later), because how can you identify the practices for your study if you don't already have a notion of photography in mind; a notion that has to be centered in some way or another around a *differentia specifica* of photography in the first place?

To say that media determine our situation first of all means that our situation is different when a medium exists. With regard to digital technologies this actually doesn't say much, because digital technologies are by definition programmable and have to be formed by a situation to be anything whatsoever. But even this shows: although digital computing technologies might be widely programmable (within the limits of what is calculable at all and in reasonable time), their programmability as such can again be seen as a specific script. And that script means that situations become sedimented and determine future situations (see Schröter 2004). It seems that there are media with flexible and with less flexible scripts. But be that as it may in detail, I just want to insist that media cannot be understood as neutral—even if they appear transparent from time to time.

This is especially important when we turn to a medium that seems to be, on the one hand, neutral to the extreme. That is, of course, money (if we can agree that it is a medium).[2] Money seems to be extremely neutral because it can substitute everything—at least in principle. On the other hand, the idea that media determine our situation seems in no case truer than in the case of money: "Money determines our situation." Take a conference as an example: Of course money doesn't determine the topic, the structure, or the personnel of the conference (although people with too expensive flights might be excluded from attending), but its pure existence of course depends on the availability of money. Seen in this way, money is nonneutral to the extreme. It is not just a neutral tool or a neutral channel through which preexisting entities are realized or flow. It is directly relevant to the existence of those entities. Only a strange platonic ontology would permit us to say that a given conference existed as such and only was actualized by using money.

I insist on that point because, interestingly enough, money isn't normally treated that way. In particular, hegemonial, so-called neoclassical economics[3] has always been criticized for conceptualizing money as a neutral tool that only makes preexisting practices of exchange easier to handle (Keen 2011, 14, 243, 298–99; see also Orléan 2014, 14; Kohl 2014, 59–94). We find an explicit statement already in 1848 in John Stuart Mill:

> There cannot, in short, be intrinsically a more insignificant thing, in the economy of society, than money. *It is a machine for doing quickly and commodiously, what would be done, though less quickly and commodiously, without it*: and like many other kinds of machinery, it only exerts a distinct and independent influence of its own when it gets out of order. (Mill 1936, 488; emphasis added)

This statement defines money clearly as a neutral channel that only accelerates and facilitates what exists without it. It stands in radical opposition to our very daily intuitions, namely that money makes the world go round (although interestingly Mill describes money as "machinery"). To refer to just one more example: German economist Wilhelm Gerloff stated in his book *Geld und Gesellschaft* ("Money and Society") from 1952 that in "classical theory" money would be seen only as a "neutral" and "indifferent . . . element" (1952, 217).[4]

This neutralization of money is not only incompatible with a media studies view in the tradition of Kittler. It also has some very dangerous implications, which I can only hint at here: In the aftermath of the so-called financial crisis of 2008, the question frequently came up regarding *who* was to be held accountable. That money rules the world was accepted, albeit always with the additional question: *and who rules money*? If money is seen as a neutral tool or channel, such a question is the logical next step. But this question, often verging on conspiracy theory, ignores the basic teaching of media theory that without money (and its scripts and dynamics) there would be no “greedy banksters” who want to accumulate ever more abstract wealth in the first place. The whole idea of potentially unlimited (and therefore somehow unethical) greed is possible only if one accepts the premise of money as an abstract and therefore potentially infinitely accumulatable medium.

Accumulating an infinite amount of, let’s say, apples is impossible, simply because they will rot. Moreover, the idea of people exerting their power through money was historically, especially in the German context, an anti-Semitic cliché. Ultimately, the argument was that money is neutral, but is *misused* by Jewish high finance for their more or less sinister goals—this was a central ideological element of National Socialism. The difference between *schaffendes* (productive) and *raffendes* (parasitic) capital, unfortunately still sometimes implicit in contemporary discourse,[5] *is directly related to the idea that money is a transparent and neutral channel*—it can be put to good or bad ends and transmits these indifferently. Therefore, media studies can and should contribute to this field of problems by providing a description of the specific agency of money, its scripts and limitations. But this is a complicated task for several reasons—as we will see.

In the second section of this chapter I want to sketch out some ideas concerning a possible media-theoretical description of money. Some of the relevant theoretical sources are discussed. One result of this discussion is that actor-network theory (ANT) might be an interesting candidate to work with when describing money as a medium. So in sections three and four I will discuss in more detail the writings of Michel Callon and Bruno Latour on money (and capitalism). I will demonstrate that ANT, at least in its current form, is not really suitable for the task of discussing money as a medium, especially since its reduces money to a transparent channel of pregiven human intentions—contrary to its own claims, firstly to describe human and nonhuman actors *symmetrically,* and secondly to only describe entities that make a difference (*mediators* in contrast to sheer *intermediaries*).[6] In the fifth section, I'll draw a conclusion.

Some General Remarks on Media Theory and Money

What could be the genuine contribution of media studies to the discussion of money, in contrast to the numerous contributions already made by philosophy, sociology, and economics (see, e.g., Ingham 2005)? Shouldn't it be—as already hinted at in the introduction—about the *mediality* of money? The abstract character of money seems to contradict this effort immediately, because no *specific materiality* that might be characteristic for the medium of money, its *mediality*, can be defined easily. Money can exist as metal coins, as paper strips, as numbers stored and transmitted electronically, and in several other forms. So it seems that the aforementioned "neutrality of money" is indeed a fact, insofar as the effects of money do not to depend on any kind of specific mediality.

Perhaps this shows that money is not a medium at all—or at least a medium with a very low specificity.[7] This might also be the reason that theoreticians who are otherwise quite sympathetic to a strong, materiality-centered approach like that of Kittler take—when discussing money—recourse to Luhmannian systems theory and its definition of money as a "symbolically generalized medium of communication" (see Luhmann 1994, 230–71). Ganßmann underlines that the recourse to this definition of money already implies a kind of repression of money's materiality:

> Interestingly enough, all the other "media"—for example, power, confidence, truth, love—simply consist of an invocation of concepts which describe agents' attitudes towards each other or towards norms. Concepts are reified as media by theoretical decision. For money, this seems to work the other way around. Historically, it appears to have started its social role in the form of palpable pieces of precious metal. In a long process of social evolution, symbolic representations were introduced as substitutes for precious metal (coins) in one or the other function of money . . . Thus, money is obviously unique among the media of communication in terms of its history and the direction of its evolution. What, then, is the function of (or the motive for) theoretically treating money on a par with other such media? (Ganßmann 1988, 288)

Norbert Bolz, one of the authors who played an important role in the formation of media studies in Germany in the 1980s, admits right at the beginning of his book *Am Ende der Gutenberg-Galaxis* (1993), which contains a chapter explicitly titled "Geld als Medium" (money as a medium), that a certain eclecticism between Luhmannian systems theory and the (Kittlerian) theory of media is necessary (Bolz 1993, 8). Although this is not directly related to the discussion of money later in the book (Bolz 1993, 90–100), it seems to at least be symptomatic of money not easily being conceptualized with the usual notions of mediality and materiality. For Bolz, following the sociological approach of Luhmann, money is defined by its "code paying / not-paying" (1993, 94) and therefore a "pure medium of computation, freed of all earthly remainders" (1993, 96), meaning of all materiality. Jochen Hörisch wrote in a very similar vein:

> See, new media make everything new. They free us from the dirty aspects characteristic of traditional flows of media—from printing ink, from the eucharistic streams of blood, as well as from the indecent materiality of the pecunia-olet-stream-of-money. The new relations of

> communication are immaterial. Pixels are mostly free of earthly remainders. (Hörisch 2004, 170)[8]

But these and similar arguments for a "transcendental" (Bolz 1993, 95) character of money (that Bolz [2006, 96], following Luhmann, compares to the purely formal status of the Kantian transcendental ego) are problematic at least in two ways: *Firstly,* it remains to be seen if the description of the "medium" of money "as power without characteristics" (Bolz 2006, 94) is really compatible with its specific binary code paying / not-paying. To have *this* code and not another one means that money is at least not "without characteristics."

But *secondly,* more important for my discussion here is the question of whether money can really be described (only) as a "code," as Luhmann and Bolz do, meaning as a medium without materiality, insofar a (binary) code, as it seems, can be implemented in potentially any materiality without changing. Already in Talcott Parsons, who first described money as a symbolically generalized medium of communication, "money is 'essentially a 'symbolic' phenomenon and hence . . . its analysis required a frame of reference closer to that of linguistics than of technology'" (Ganßmann 1988, 290).[9]

Kittler's (1992) provocative thesis that "there is no software"—meaning that the ethereal and immaterial realm of software is erected upon an indispensable material infrastructure (hardware)—might also apply to money. Seitter (2002, 183–86) similarly underlines that it is absurd to speak of the immateriality of money, already given the fact that even money in the form of digital and electronic accounts presupposes an infrastructure of hardware, networks, and so on. Winkler (2004, 39) adds that there is another profoundly material side to money: there is the law, which for example strictly forbids counterfeiting, and the police, who will arrest and detain any counterfeiters behind very material walls.[10]

A traditional banknote is already a highly complex material object, protected against counterfeiting by holographic elements and other elaborate print-document security technologies that can only be realized in high-tech institutions. In this sense, a banknote is not less but even more material than a simple coin made of gold (see Schröter 2015). These materialities are by no means exterior to the operations of money: the much invoked "trust" that is necessary for the functioning of money is based on the (normally implicit) assumption that given banknotes are not counterfeited or—*a fortiori*—given electronic bank accounts are displayed correctly, that my online transactions are secure, and so on. All these operations do not only presuppose a law that forbids counterfeiting and manipulation, and a state that effectively punishes illegal behavior, but *technologies*—"technologies of trust"—that make illegal behavior detectable and traceable in the first place.[11]

Therefore, the materiality, meaning mediality, of given tokens of money is not an "earthly remainder" (as Bolz and Hörisch put it), to be rejected and erased in the near future, but *a very precondition of the operability of money as such.* Here the systematic interrelation between "symbolically generalized media of communication" and media as technologies comes into focus: only when my business partner trusts my money (due to an implicit heterogeneous assemblage of technological, juridical and political actors and operations), the money I offer can enhance the probability that she will accept my offer. This enhancement of the probability of communication is exactly the definition of "symbolically generalized media of communication" (see Luhmann 1994, 253; Ganßmann 1988, 305). Money might be *the* significant case to develop such a perspective, which bridges the gap between hitherto strictly separate definitions of medium.

Obviously, the first, decisive step toward an analysis of money from the perspective of media theory is hereby complete. Although the detailed contours of such a theoretical perspective remain to be developed, some further points can already be raised.

The further elaboration of such a theoretical perspective would not only entail a rereading of the different theoretical discussions of money in media theory (McLuhan, Hörisch, Bolz, Winkler, Rotman, Seitter, Krämer, etc.); it would also be necessary to read classical texts from philosophy, sociology, and, of course, economics for traces and building blocks of a media-theoretical perspective on money. For example: Menger discusses, in his classical text on the "Origins of Money," in which money is explicitly called a "medium of exchange" (1892, 239), the reasons rare metals like gold and silver came to be used as money. Ingham classifies Menger's approach to the field of "orthodox" or "commodity" theories of the genesis of money that describe the emergence of money out of the exchange of commodities: "It is contended that money takes its properties from its status as a commodity with intrinsic (or exchange) value. These are able to act as media of exchange" (Ingham 2005, xi). Metals like silver and gold seem to be "intrinsically" valuable and are therefore chosen or at least chosen by the market: Jones (1976, 775) argues exactly that media of exchange are selected by the market, which leads him to reject alongside "intrinsic value" also those "physical properties" that can be described as aspects of mediality:

> The important point is that this commonness is a market characteristic of goods rather than an intrinsic physical characteristic such as portability, divisibility, or cognizability. This is not to say that such physical characteristics play no role in determining *which* good will be used as a medium of exchange. However the analysis suggests that the rationale for using a medium of exchange in the first place might be found in the differing market characteristics of goods and the decentralized nature of exchange. (1976, 775)

Although he rejects the media-theoretical idea of the importance of the materiality of the medium, he does not seem sure. And of course the most important characteristic—countability, which is no physical but a symbolic property—is not even mentioned. So Jones's argument is at least unclear and has to be confronted with approaches that insist that not markets select media of exchange, as Jones argues, but on the contrary: media of exchange are presuppositions for markets. There have never been markets without such media (Kohl 2014, 280–85). This is close to media theory, insofar as it says that certain media allow practices like markets. And moreover, any concept that argues that money is chosen by the market is vulnerable to, for example, institutional theories that argue that money can only have "value" if the state guarantees it. An institutional-material assemblage seems to be more fundamental than practices of exchange.

Anyway, the discussion between "orthodox" or "metallist" versus "nominalist" or "institutionalist" theories of money is not my central concern here, nor is the alleged "intrinsic value" (that might or might not result from the labor necessary to produce them) of the metals. But Ingham (2005, xiv; see also 132) also states with regard to Menger: "Coinage is explained with the further conjecture that precious metals have additional advantageous, or 'efficient', properties—such as durability, divisibility, portability, etc." This aspect is more interesting here: the materials, e.g. gold and silver, firstly, *cannot easily be produced* by ordinary citizens, meaning: the coins cannot easily be counterfeited—and that's far more important for their operability as the alleged "intrinsic value" of gold and silver. The metals are chosen because they can be cut in precisely defined pieces that can be *counted.* They are *durable* and cannot corrode or burn easily—that is, they can "store" value in a reliable way (soap bubbles are definitely not very practical as a currency).

Their durability also means that they, secondly, are able to carry *nominal values* in the form of inscriptions that cannot be changed easily. The nominal value relates the money-media to a "money of account," which is very central for some approaches to money (see Ingham 2005, xvi–xvii). There have been forms of money that didn't carry a nominal value, but in which the value was directly related to materiality in the sense that, for example, such and such a quantity of gold was correlated to such and such a value (in a sense, such money is partially an analog medium). But, firstly, this kind of money is obviously prone to corrosion, insofar as any loss (unintended or intended) of the quantity of gold per coin reduces value (see Caffentzis [1989, 17–44] on clipped coins; see Rotman [1987, 22–26] for the argument that this at least caused the emergence of nominal values). Secondly, the relation of such and such a quantity of gold to such and such a nominal value remains of course conventional and is in that sense still not "intrinsic."

Whatever else money may be, it is a medium that makes it possible to attach countable numbers ("prices") to concrete objects or processes, in what may be described as the role of money in the operation of "measuring" value (see Ingham 2005; Engster 2014). Because of its structural countability, the code of money is digital, as Seitter (2002, 181) argues.[12] The "convergence between the logic of mathematical disciplines . . . and the logic of the mode of production," as Alexander Galloway (2013) puts it in his recent critique of speculative realism, is therefore not just a contemporary phenomenon "during the period of digital capitalism" (2013, 359), as he himself acknowledges in a footnote. The "mathematization of production" (359) is implicit in capitalism from its very beginning, insofar as value (however it is derived) is expressed, measured, and accumulated in the abstract form of exchange value, which finally finds its embodiment in digital, countable, and therefore mathematically describable money (and even the most complex "derivates" traded at stock markets today stem from this basic mathematical logic of money). Capitalism is from its very beginning the formalization and digitization of economy, even of society as a whole.

To sum up: The digital code of money needs media that have a certain durability, countability, anticounterfeitability and thus trustworthiness (that is the site where materiality is entangled with the law and the state), and these properties make certain media interesting as money (rather than their status as "precious metals"—quite the contrary: their preciousness is the effect of those properties). Money is pure countability, operationalized in suitable media and *therefore it is counted.* This last statement is not as trivial as it sounds: the point is that the usage of a medium that is only countable leads to the counting of everything and to the description of everything in the categories of "less" and "more" where more is equated with "better." *The countable, digital specificity of money leads (at least potentially) to the phenomenon of accumulation.* This fundamental media logic of money is something that is repressed in ANT, as we will see below.

But although these quite basic characteristics are irreducible for the operations of money, that doesn't mean, obviously, that the media of money have never changed. Besides the media *theory* of money, which was very sketchily hinted at above, there is also a media *history* of money. And the change of the media of money is far more complex and interesting than the often repeated reductionist teleological trajectory toward ever increasing "immateriality," in which—as is sometimes suggested[13]—the medium of money reveals its proper essence as digital code. This Hegelian figure is questionable for several reasons. Firstly, it is not clear why money should unfold in this way at all; it might simply transform through a series of historically contingent configurations, in which, beside some basic properties that remain stable (otherwise different historical phenomena could not even be compared as *different forms* of money), other features radically change due to religious, political, social, cultural, or even intermedial reasons—and may also change back.[14] Secondly, the basic narrative seems flawed: is the production of gold coins or paper strips with an imprinted nominal value really more "material" than the vast and global network and computer infrastructure necessary for electronic banking today? Isn't it the other way round?

I will mention just one example that is quite interesting in this regard: Micronesian stone money (Gillilland 1975). This example might at first seem to be confirming the narrative of immaterialization, but stone money has been used for a long time alongside newer currencies.

One could debate if this is money at all (see Kohl 2014, 83–87), but at least it is also digital (it can be counted), it is (very) durable, it

[Figure 1.] Stone Money. Source: https://commons.wikimedia.org/wiki/File:Yap_Stone_Money.jpg. Photograph by Eric Guinther, copyright CC BY-SA 3.0.

cannot easily be counterfeited, and it is trusted. But it has at least one crucial difference to what we call money today. Due to its sheer size and materiality, it cannot be accumulated, you cannot pile up an infinite amount as you can, at least in principle, with the (in this sense it is true) more dematerialized electronic units of currency we have today. So one aspect of the money, namely its potential to be accumulated (and to be circulated easily), is not given (and it cannot be transported easily, so transportability might not be a necessary feature of money). Jappe (2005, 166) even argues that such forms of money with an excessive materiality (he uses the example of Spartanian metal bars) were invented to block the possibilities of accumulation *intentionally,* because the drive to accumulate was seen as disruptive for communal life. This seems to be consistent with the historical studies by Jacques LeGoff (2012) and others (e.g., Kurz 2012, 68–134), which note that the existence of money as such is not identical with the existence of capitalism—solely when the accumulation of ever *more* money becomes the *central principle* of society, then we can speak of capitalism, but I cannot go into that discussion here more deeply. At least this discussion suggests that there might be noncapitalist money. Or perhaps the stuff called “money” in precapitalist societies isn’t money in the modern sense or even money at all.

That points to a final and complicated problem for a media theory—namely the relation of the medium of money to society. Does the medium determine society (as in the classic Kittlerian position)? That markets presuppose money seems a case in point. Or is it the other way around, insofar there is no trustworthy money without the law and the state? Does the usage of money finally and unavoidably result in capitalism, that is, a society completely centered around the reproduction of the medium—which comes close to teleological models of the historical unfolding of the medium? On the one hand, the seemingly progressive acceleration of the circulation of money (nowadays by transforming money into electronic signals) seems to be the *necessary precondition* for this drive to accumulate. On the other hand, this ever increasing and accelerating speed of circulation might be the *result* of the drive to accumulate.[15]

But perhaps the questions are posed wrongly; perhaps this complicated problem (which at least is the problem of the emergence of capitalism as such) is better described as a kind of *co-constitution* of money and capital (capital defined as the ongoing and accelerating process of making more money out of money). So it seems advisable that the further development of a media theory of money tries to avoid the sterile discussion on determinism. That’s why it might seem promising to use ANT as an approach to analyze the medium of money, because ANT’s promise is to avoid distinctions such as “technology” (or “medium”) versus “society” in the first place. As Latour (2005, 75–76) writes: “There exists no relation whatsoever between ‘the material’ and ‘the social world,’ because it is this very division which is a complete artifact . . . There is no empirical case where the existence of two coherent and homogeneous aggregates, for instance technology ‘and’ society, could make any sense.”

In the following two sections I will read texts of Michel Callon and Bruno Latour, main protagonists of ANT, closely and will discuss their theories of money and capitalism. Both authors explicitly addressed that topic, Callon even published a volume entitled *The Laws of the Markets* in 1998 and has since been one of the main protagonists of the so-called "performativity of economics" debate.[16] But my readings will try to show that both authors miss (due to a certain "praxeological" bias of ANT) the logic of money (and the logic of capitalism). That shows that the development of a media theory of money cannot make use of ANT, or at least should use the heuristic principles of ANT in a modified way. It may be disappointing that the present article doesn't develop the promised theory in detail but instead focuses on the critique of other approaches. But that's a necessary beginning to define one's own position—I will come back to this in the conclusion.

The Repression of Money in ANT I: Michel Callon

Capitalism/Kapitalism

Callon writes:

> I use the word Kapitalism, with a capital K, to denote the reality imagined by everyone who considers the Western economic system to be a homogeneous reality, endowed *with its own logic.* The assumption of a homogeneous economic reality is made by those who criticize capitalism,[17] thus defined, as well as by those who defend it by talking of the market and its laws, in general. Experiments[18] in past decades have shown that Kapitalism could only be a fiction: no program has managed to make Kapitalism exist nor to overthrow it. There are only capitalisms. (Callon 2007, 354; emphasis added)

A typical move for praxeocentric discourses (i.e. discourses implicitly or explicitly privileging human practice) is to deny the possibility of an "inherent logic" in relation to nonhuman entities—the argument is always that entities are situated in historical and local practices and therefore are always different without any underlying homogeneous logic (see Callon 2005, 15: "I don't believe in A Kapitalism that could be reduced to AN impersonal logic."). Firstly, it is simply not true that the critics of capitalism, at whom Callon's argument is obviously directed (which is presumably why he uses the German-sounding "Kapitalism" to allude to the Marxist tradition), postulate a homogeneous entity called "capitalism." "They" always admitted that capitalism has had historical phases named, for example, "imperialism" and "state-monopolistic capitalism" or, in another theoretical vein, "Fordism" and "post-Fordism," or that there is "uneven development," etc. They just postulated that capitalism has one or more fundamental principles that remain in place below historical and local differences (as is the case when we speak of the media logic of money); that is why Marx analyzes capitalism in "its ideal average" (Marx 1991, 970; see Hodgson 2016).

Secondly and far more importantly, Callon unwittingly admits that, too: how could he even speak of "different capitalisms"? He presupposes a fundamental principle common to all these capitalisms or otherwise he couldn't even classify the different phenomena under the same label. Consider this symptomatic quote by Callon:

> Instead of assuming, for example, the existence of a spirit of capitalism or an overall logic of a mode of production, we can relate certain forms of economic activity to the more or less chaotic, regular, and general upsurge of calculative agencies formatted and equipped to act on the basis of a logic of accumulation and maximization. (Callon 2005, 5)

At first the idea of an "overall logic of a mode of production" is negated—but then self-contradictorily "a logic of accumulation and maximization" (that is of course the logic of capitalist accumulation) is reintroduced.

This typical praxeocentric fallacy is repeated over and over in his texts, and it finds its most radical expression in a statement he quotes approvingly: “Rationality is always situated” (Callon 1998b, 48). Clearly, this is not even a false statement—it is as nonsensical as the statement “there is no truth,” because it contradicts itself: it states as universally true, that is as nonsituated, that every truth is situated. For Callon, it seems to be universally rational to assume that rationality is never universal but always situated—that is self-contradictory. A radical praxeocentrism dissolving everything into locally and historically situated occurrences is *logically impossible*: it could not even compare two different occurrences to highlight their local specificity, because to compare them, a general principle of comparison (e.g. that both occurrences are “practices”) already has to be taken into account.

One of the main goals of Callon’s whole approach, and one I find quite appealing, is to show that markets are nothing natural and that the calculative agencies required in markets have to be constructed. Although Callon (1998b, 6) rejects “sociocultural frames,” he mentions such things as the law and the state, which also were named as preconditions for markets in the Marxian tradition (see Pashukanis 2002). But he insists particularly on the way in which *homo economicus* is produced. While the *homo economicus* would in the Marxian tradition perhaps be subsumed under the admittedly problematic notion of “ideology,” Callon is more interested in the concrete tools and operations that produce “calculativeness” on the side of the human actors and “calculability” on the side of the objects. Immediately, the question arises, *what* is calculated and *why* there is calculation at all? “Competition between calculative agencies . . . is largely determined by the respective qualities of the calculating devices. The probability of gain is on the side of the agency with the greatest power of calculation . . .” (Callon 1998b, 45).

Competition and the goal of “gain” are presupposed here and explain why calculation is used. This implies that Callon presupposes a social form in which any entity besides their specific and unique use-value has also an *abstract exchange value,* because only such an abstract value can be calculated. Without using these Marxian notions, he admits this in one of his examples (see Callon 2007, 336–39), Norwegian fishers that are turned into economic subjects by transforming the fish into calculable "cyborg-fish"; that is, commodities. This is nothing else than a reinvention of what Marx (1990, 873–907) called "primitive accumulation," in which objects are violently transformed into objects that have exchange value (and besides may be useful).[19] For Marx, primitive accumulation is the precondition of the establishment of capitalist societies. But Callon does not use the term "value" systematically in *The Laws of the Markets.* Sometimes he speaks of "usage value" (1998b, 33) or "use value" (35), "exchange value" is only to be found in a quote (19), so that basically it remains unclear *what* exactly is calculated in Callon's approach.[20]

Calculation and Money

At this precise point we have to return to the question of a "specific logic." Shouldn't we say that the reduction of everything to exchangeable, calculable abstract quantities—a process that is also implied in Callon's central notion of "framing" (see below)—is *specific* to capitalism? This is at least the answer Marxian theory would give: capitalism is most generally to be understood as the total reign of the abstract value-form, represented in money, meaning that everything, especially labor-power, is turned into exchangeable commodities with an exchange value that is measured or at least represented in its price (see Larsen et al. 2014). Due to his praxeocentrism, we should expect that Callon denies this, especially since it would force him to accept the existence of Kapitalism (with a capital "K"); and this is indeed the case:

> There is no Great Divide between societies populated by calculative agencies and societies in which the agents do not calculate. Even Deleuze and Guattari were on the wrong track with their concept of deterritorialization, that extraordinary faculty bestowed on capitalism for breaking

> all ties and undoing solidarity . . . So-called traditional societies are populated—sometimes even over-populated with calculative agencies. (Callon 1998b, 39)

Callon argues that there is *no* “great” divide between societies with and without calculative agencies, because there are no societies that do not calculate: there was always calculation, and as a consequence there is nothing special about capitalism; no Kapitalism exists. In consequence, we would either have to abandon the term “capitalism” or we would have to call all societies, even “so-called traditional societies,” capitalist, acknowledging that there are indeed only different capitalisms and no Kapitalism with any underlying specific principle. But this argument leads Callon to argue against himself: by stretching the principle of calculation to all societies and thereby erasing any (small or great) “divide,” he is the one who homogenizes unduly.

It is difficult to understand why he rejects, on the one hand, a homogenizing principle (“Kapitalism”) that allow us to relate different “capitalisms” to each other and, on the other hand, introduces an even wider homogenizing principle—calculation as such—that surprisingly and ahistorically unites “traditional societies” (by which, I guess, he means so-called primitive societies) and modern industrial capitalism under one category. His argumentation, however, is not only logically unconvincing but also historically wrong. If we assume that Callon relates the question of calculation to the existence of money (because he talks about the economy and not about mathematics), he would have to argue (if calculation is his homogenizing principle) that the sheer existence of money already means that there is capitalism. But that’s wrong. As already mentioned, as Jacques Le Goff (2012) and others have shown, even the existence of money (as a materialization of calculation) does not make a society capitalist. Money is much older than capitalism.

The question is if a society is *centered* around money and its scripts (to use a term from Akrich’s 1992 essay). Only when the basic script is M-C-M’, meaning that money (M) is used to produce commodities

(C) that are sold for more money (M), and when this script is fundamental for all activities—only then we can speak of capitalism (see, for a recent and particularly pointed argument, Lotz 2014). At least this is a definition that avoids the confusion created by Callon. This script (M-C-M') is the definition of capital, according to Marx (1990, 247–57): capital is the *process* of making more money out of money. Marx (1990, 166–67) writes: "They do this without being aware of it." Marx's definition implies that there is a script to money regulating our practices. Money is not just a transparent means for human ends existing independently of money as a praxeocentric theory would have it—and as neoclassical economics as a form of praxeocentrism[21] puts it, in which money plays nearly no role (see, among a lot of other authors, Pahl 2008, 9–16).

Money is, as media theorists like Sybille Krämer (2005, 88–89) underline, *the* medium of calculability. It is pure quantity and therefore its quantum can only diminish or grow. It is not surprising that in its practical use its quantum diminishes or grows. It is also not surprising that economic actors "calculate," as Callon rightly insists, because money can *only* be calculated with. All markets should be (and practically are) centered around calculability. But Callon always insists in a typically praxeocentric manner that there are only *different* markets: "The idea of the market as a unified category and institution is progressively disappearing" (Callon, in Barry and Slater 2002, 291). Yet surely no one would trade and calculate on markets if the outcome wasn't *more money* than the amount invested.

Callon (1998b, 12) states: "The agent is calculative because action can only be calculative." Firstly, this statement fails to differentiate economic practice ("action") from every other practice and thereby again underlines the status of calculation as Callon's homogenizing principle. Secondly, Callon deduces calculativeness from *action* ("because action can only be calculative"), that is, from practice and not from the central role of a medium whose script is pure calculability. Although the role of devices, technologies, and so on is so central for Callon's argument, they are (at least sometimes) reduced to useful tools in the hands of human actors. This is especially (and very significantly) the case for money. It seems that Callon, implicitly following the economic mainstream, also follows the neoclassical mainstream's exclusion and oblivion of money.[22] In Callon's discourse the script of money tends to disappear, and although Callon implies, as I have cited above, the goal of "gain" as central for markets (Callon 1998b, 45), the explicit "imperative of profitability is absent" (Fine 2003, 480). We can expect that this discursive operation appears as a reduction and erasure of the pure quantitativeness, calculability, and abstraction of money: that is, its mediality. That is exactly the case.

Money, Commodity, Production

Callon begins with describing the specific medial form of money:

> To be sure its main contribution was to provide a unit of account without which no calculation would be possible. However the essential is elsewhere. Money is required above all—even if this point is often overlooked—to delimit the circle of actions between which equivalence can be formulated. It makes commensurable that which was not so before . . . It provides the currency, the standard, the common language which enables us to reduce heterogeneity, to construct an equivalence and to create a translation . . . It is the final piece, the keystone in a metrological system that is already in place and of which it merely guarantees the unity and coherence. *Alone it can do nothing*; combined with all the measurements preceding it, it facilitates a calculation which makes commensurable that which was not so before. (Callon 1998b, 21–22; emphasis added)

At first sight, he seems to acknowledge the script of money—but with a significant twist: money is added as the endpoint of a metrological chain of measurements operating in a world without money. There is a world performatively produced as calculable by measurement and then money comes in—“merely” as a “final piece.” “Alone it can do nothing”—meaning it is reduced to an intermediary, that is an entity that “transports meaning or force without transformation” (Latour 2005, 39). But again he doesn’t explain how “equivalence” is achieved, how money is related to “measurement”: that is, *what it measures.* Yet some theory of value would be needed, which Callon does not provide.

But to reduce money to the “final piece” also negates that in the world we live in everything is already produced with regard to money. Nothing is produced that doesn’t at least potentially yield more money than was invested—and this rule even shapes the commodities in a very concrete way: think of so-called planned obsolescence (see Bulow 1986). In Callon’s model[23] money is added as a market device to a production devoid of money—even more so: production does not appear. To be sure, “producers” are mentioned a lot (Callon 1998b, 18, 19, 20, and passim), but there is no description or theory of production. But if production is already structured with regard to money, money is not just a practical means of exchange. Commodities are things that have a price; that is, they are equivalent to some amount of money. Being a commodity means being a thing *and* being money.

Callon (1999, 189) writes about the being of a commodity: “to transform something into a commodity, it is necessary to cut the ties between this thing and other objects or human beings one by one.” The central notion here is “framing”:

> a clear and precise boundary must be drawn between the relations which the agents will take into account and which will serve in their calculations, on the one hand, and the multitude of relations which will be ignored by the calculation as such, on the other. (1999, 186–87; see also Callon 1998c)

The objects simply seem to be there, out of nothing, and framing seems to mean ripping them out of, for example, emotional contexts to sell them. This looks more like a flea market than a real economy in which commodities *are produced as commodities for the markets*. Callon (1999, 189) writes: “one is not born a commodity, one becomes it.” This is simply wrong for the vast majority of objects surrounding us.

Although the book is called *The Laws of the Markets,* Callon speaks right on the first page of the introduction of “economy” (1998b, 1), as if markets and (capitalist) economy were identical. He only talks about markets. This is also typical for the neoclassical approach, which tends to focus on exchange (see, for example, Orléan 2014, 37). To argue that way is to erase production, which means to erase capital from the picture, understood as M-C-M’. Capital in this sense means that the production of commodities is part of the movement of value, where commodities and money are in a way the same, namely metamorphoses of capital (see Marx 1990, 255). It seems that Callon has this theoretical (Marxian) argument in mind when he writes:

> Money seems to be the epitome of the commodity; it is pure equivalence, pure disentanglement, pure circulation. Yet, as Viviana Zelizer showed so convincingly, agents are capable of constantly creating private money which embodies and conveys ties . . . This is the case of grand-mothers who gives her grand-daughter silver coins, or supermarkets which give fidelity vouchers to their customers. (Callon 1999, 190)

It is strange that Callon defines the commodity by framing, that is untying (“cut the ties between this thing and other objects or human beings one by one” [1999, 189])—but at the same time doubts that money is “disentanglement” and follows Zelizer (1998) on “money which embodies and conveys ties.” With this argument, he again separates commodities from money (because only commodities seem to follow the basic operation of “framing”), although commodities can only be understood *as* commodities in relation to money. Giving away a thing on the market (and in that sense “untying” it from me as the seller) means exchanging it against money—money is the force that allows generalized “untying” and in that sense it is “pure disentanglement.” It is a basic move in Callon to tear apart money and the commodity—to erase the basic logic of capitalism.

Or see a similar quote from a different publication:

> Earmarking is deployed as much in the domestic sphere, with silver coins which a grandmother gifts to her grandchildren to put in their piggybanks in memory of her, as in systems of mass distribution, with vouchers, fidelity or credit cards and other such devices. (Callon 1998b, 35)

This is highly symptomatic: the coins grandma gives her granddaughter are treated as “private money,” that is a form of money proper, although these coins cannot be exchanged against commodities. Grandma can give as many coins as she wants to her granddaughter, she could even produce new “private money” by writing the word *money* on paper snippets as much as she likes, but she shouldn’t try to go to a supermarket (even to one that emits vouchers) and try to acquire commodities with the private money.[24] “Private money” is not money at all.

Armin Beverungen made an important comment on an earlier version of this text. He problematized the formulation “private money is not money at all,” by invoking as an example M-Pesa, a very successful digital currency issued by Vodafone and Safaricom, first realized in Kenya in 2007. He seemed to understand my argument as directed against all currencies that are emitted by *privately owned companies,* although I made it only in relation to Callon’s example, which isn’t about a privately owned company but about “silver coins which a grandmother gifts to her grandchildren” (Callon 1998b, 35). Money emitted by private companies can be money in the full sense, as the case of M-Pesa shows (my sources are Hughes and Lonie 2007; Makin 2011; Wölbert 2015). Firstly, the whole development was subsidized by a public-sector challenge grant, meaning that M-Pesa is not a child of private enterprises alone. But secondly, and far more importantly, it was developed in close conversation with regulating bodies and the Kenyan government concerning questions of security, customer identity, trustworthiness, and so on. The forms of state currency are, at least partially, mapped onto the digital currency, otherwise it wouldn't work. In that sense, it remains deeply connected to the law and the state. Thirdly, it is therefore not an alternative to the official state currency: costumers go to an agent, where they can deposit or withdraw cash from their e-money accounts. That means that M-Pesa is convertible into official state currency and vice versa. It is just a different form of distribution for state currency.

None of the three points apply to "silver coins which a grandmother gifts to her grandchildren." Callon's example is from the—as he writes—"domestic sphere" and therefore really *private.* And this type of private money is not money at all, whereas M-Pesa, deeply anchored in state currency, law, the state, and so on, is money. We should avoid confusing the two meanings of "private," on the one hand the "private" (in the sense of "domestic") sphere and on the other hand "privately owned" companies (in contrast to, let's say, state departments). Tokens circulating in the "private sphere" are not money. Seitter (2002, 188; my translation) writes: "What Wittgenstein said of language, although he spoke of 'language games,' is true for money too: there is no private language." *Human actors can of course name anything "money," but that doesn't turn it into money—which demonstrates that there's an irreducible script that cannot be easily changed by different practices*.

Callon (1998b, 35, 54) gives an example of a prostitute who writes the day and the date of an especially beautiful night with a client on a banknote—this is an example that "the banknote is an excellent medium for the exercise of rewriting." Apart from the interesting point that he explicitly calls the banknote a medium, he wants to argue that money is not abstract and that its "official attachments" can be "overloaded" with "new, private, messages" (1998b, 35). What does he want so say? Of course, I can use a banknote as medium of writing, but if he wants to suggest that the role of money is thereby changed from the universal equivalent, pure calculability, to something personal and individual (as the individual banknote might be) this is simply outlandish. In a similar way, you could say that you can change the rules of soccer by writing some personal notes on the ball. Money is again severed from the notion of commodity. *The script of money is repressed in favor of practices by human actors*. *ANT's own principle of symmetry is violated.* Remember Latour's (2005, 76) formulation: "To be symmetric, for us, simply means *not* to impose a priori some spurious *asymmetry* among human intentional action and a material world of causal relations." But Callon exactly establishes such an asymmetry.

The Repression of Money in ANT II: Bruno Latour

One can find a similar repression of money in the work of Bruno Latour, which suggests that this repression might be characteristic for the whole discourse of ANT. Latour writes, discussing capitalism in a way similar to Callon:

> Once its ordinary character is recognized, the "abstraction" of money can no longer be the object of a fetish cult . . . "Capitalism" is . . . an empty word as long as precise material instruments are not proposed to explain any capitalization at all, be it of specimens, books, information or money. (Latour 1986, 31)

Hence, Latour criticizes the description of money as a fetish based on the abstraction of value (central to modern sociality in a Marxian perspective). Although this complex topic cannot be discussed here in detail, Latour is of course alluding to Marx's notion of the fetish (see Marx 1990, 163–77).[25] Somewhat similar to Callon, Latour argues against the Marxian tradition. Money, according to Latour, is "ordinary" because it resembles other *immutable mobiles.* What does this term mean? It refers to all processes that transmit specific information that remains stable during this process of transmission. Latour mentions "printing, linear perspective, geometric projections and transformations collectively, cartographic discoveries, the camera obscura; and also processes for accounting and for producing graphs, tables and statistics of all kinds" (Schüttpelz 2009, 70). These processes enable the accumulation of knowledge in what Latour calls *centers of calculation,* that is, military high commands, government authorities, and scientific and bureaucratic centers of power. This accumulation of knowledge allows to rule the entities about which knowledge has been accumulated. Hence, Latour (1986, 13) writes on the role of the immutable mobiles in the history of "the West": "*Anything* that will accelerate the mobility of the traces that a location may obtain about another place, or *anything* that will allow these traces to move without transformation from one place to another, will be favored." Schüttpelz (2009, 70; emphasis added) explains:

> Every increase in mobility and every increase in immutability through transformations can help organizations to regulate the distances in a space and obtain small organizational advantages in an *agonistic* relation to other organizations.

Latour's demand for "precise material instruments" means that the fetish remains an all-too-nebulous description; by way of contrast, immutable mobiles (in Latour's view) make it possible to explain the dynamism of capitalism as a process of "capitalization." Instead of saying "capital is the movement of the valorisation of value" (as Marxians would have it), the question would be: "how is this accumulation (capitalization) of money realized in detailed terms?"[26] Money is one immutable mobile among others in this regard. Returning to Latour:

> As soon as money starts to circulate through different cultures, it develops a few clear-cut characteristics: it is mobile (once in small pieces), it is immutable (once in metal), it is countable (once it is coined), combinable, and can circulate from the things valued to the center that evaluates and back . . . As a type of immutable mobile

> *amongst others* it has, however, received too little attention . . . Money is neither more nor less “material” than map making, engineering drawings or statistics. (Latour 1986, 30–31)

Obviously, Latour agrees in principle with the media-theoretical descriptions of money given in section one of this chapter. But the following two key questions arise from this outline of Latour’s argument:

(a) Symmetry of the immutable mobiles? Categorizing money amongst other equally ranked immutable mobiles could be problematic—in two ways: it could, first, be that the relation of money to other immutable mobiles is asymmetric and, second, following on from the first point, Latour’s argument could be problematic because it ignores the centrality of money at least in capitalist societies. Schüttpelz writes:

> Latour’s observation brings the continuity of scientific practice into focus, as well as the unceasing, time- and capital-intensive maintenance of symbolic stability . . . The actual establishment and heightening of the combined properties of “mobility” and “immutability” are based on conditions that are neglected in many media histories, especially a significant increase in capital expenditure for transport infrastructure and education as well as for state and commercial research investment since the late 18th century. It was only with this investment that cartographic recording of European and non-European territories was stabilized and unified; and this investment did indeed lead to the far more consistent text reproduction of 19th-century printing . . . Media innovation, technical standardization and laboratory culture were first united in the laboratory of the 19th century, and this already presupposed a whole host of capital- and time-intensive developments. (Schüttpelz 2013, 36)

In this account, it is noteworthy that the properties of the immutable mobiles—mobility and immutability—are *conditioned* above all by "capital expenditure" and "investment." Clearly, money and its accumulation *are the condition of possibility for other immutable mobiles*—and indeed, the complex machinery and media of recording and dissemination all cost money for development, procurement, and utilization. But then money is precisely not *one immutable mobile among others* but their *conditio sine qua non.*[27] All media (at least in capitalism) presuppose money for their technological infrastructure, their skilled workers, the production of their content. This is a first indication of a fundamental asymmetry. There are other such indications.

Latour (2005, 30) himself emphasizes, as one of the key methodological premises of ANT, that "actors, too, have their own elaborate and fully reflexive meta-language." Unlike "critical sociology," Latour does not wish to "render actors mute altogether": "Are the concepts of the actors allowed to be stronger than that of the analysts, or is it the analyst who is doing all the talking?" (2005, 30). How can this premise be combined with the presupposed ordinariness of money—in view of the phenomenon that sentences like "Money rules the world" or "Money makes the world go round" are part of everyday language, that there is a vast literature of money management guides and that the Cree proverb (Daley 2009, 89) warning that you cannot eat money once adorned every "alternative" cafe? Are there not "concepts of actors" that acknowledge that money is not just an arbitrary immutable mobile among others? Should this not be taken seriously?

Finally, Latour's account contains a peculiar feature that once again indicates an asymmetry. As cited above, he says that money—just like the other immutable mobiles[28]—can "circulate from the things valued to the center that evaluates and back." What does this mean? A central authority that evaluates things is precisely what is lacking under market allocation—unlike, say, the central price-setting in Stalinist planned economies. Moreover, even where centralized planning authorities exist, the setting of prices does not proceed by means of money circulating to the center so that things can *then* be evaluated. Or does Latour's formulation refer to the fact that central banks can vary the quantity of money and hence at least indirectly alter the value of things, inasmuch as an (excessive) increase in the quantity of money would lead to, for example, inflation and hence price rises (at least according to monetarist theory)? But even if one were to accept this, it would not really correspond to the description according to which money can "circulate from the things valued to the center that evaluates and back." Latour may be imposing onto money a scheme that works for other immutable mobiles, even though it does not quite fit here. And this strange reference to a "center that evaluates" suggests something else: Latour takes many other examples of immutable mobiles from the spheres of the military (see also Law 1987), state bureaucracies, or the sciences.[29] These examples concern technologies that are, in part, highly developed and only usable by specialists. By contrast, everyone has to use money. Again, there appears to be an asymmetry here.

(b) What means ". . . will be favored"? Let us recall the crucial sentence from Latour (1986, 13): "*Anything* that will accelerate the mobility of the traces that a location may obtain about another place, or *anything* that will allow these traces to move without transformation from one place to another, will be favored." "Will be favored"—why? And by whom? Latour (1986, 14) writes: "It is, first of all, the unique advantage they give in the rhetorical or polemical situation. 'You doubt of what I say? I'll show you.'" The point is to assert one's own position: immutable mobiles are allies in this enterprise, displaying evidence that is hard to ignore. As Schüttpelz (2009, 70) clarifies, organizations can "obtain small organizational advantages in an agonistic relation to other organizations" if they increase mobility and "immutability across transformations." Hence, it is a matter of *agon* and *polemos,* of competition and even war. In both these areas, immutable mobiles are allies. To once again quote Latour at length:

> Who will win in an agonistic encounter between two authors, and between them and all the others they need to build up a statement? Answer: *the one able to muster on the spot the largest number of well aligned and faithful allies.* This definition of victory is common to war, politics, law, and, I shall now show, to science and technology. My contention is that writing and imaging cannot by themselves explain the changes in our scientific societies, except insofar as *they help to make this agonistic situation more favorable* . . . If we remain at the level of the visual aspects only, we fall back into a series of weak clichés or are led into all sorts of fascinating problems of scholarship far away from our problem; but, on the other hand, if we concentrate on the agonistic situation alone, the principle of any victory, any solidity in science and technology escapes us forever. We have to hold the two eyepieces together so that we turn it into a real *bi*nocular. (Latour 1986, 5)

It is becoming clear that the "agonistic situation" is being presupposed—initially, it would appear, as equiprimordial with the "level of the visual aspects,"[30] that is the immutable mobiles. But it is more: it is a "reference point" (1986, 13); it is the driving force behind the use of immutable mobiles that are increasingly mobile and increasingly immutable. To quote Latour (1986, 18) again: "This trend toward simpler and simpler inscriptions that mobilize larger and larger numbers of events in one spot, cannot be understood if separated from the agonistic model that we use as our point of reference." The "agonistic model" is thus posited in order to explain the genesis of immutable mobiles—and not *vice versa.* It is already there.

What exactly the various organizations are that stand in an agonistic relation is made clear in a passage in Schüttpelz (2009, 106): "Standardization always occurs agonistically: in competition with other companies (or state authorities) and with the intention of commercial (or bureaucratic) expansion." Can it not be said that a certain commercial and thus market-economic model of "perfect competition," as it is called in neoclassical economics (see Keen 2011, 74–102), provides the template for Callon's agonistic model? And doesn't that remind us of the positions that the media suitable as money are selected by the market—thereby privileging the practice of exchange over the medium, even though historical studies have shown that markets are the effect of money and not its precondition?

And finally: Does this not fundamentally contradict Latour's own elaborate efforts in the entire first part of his *Reassembling the Social* to distinguish ANT from conventional sociologies precisely inasmuch as for ANT "there is *no* preferable type of social aggregates" (Latour 2005, 40)? Instead of presupposing what the ingredients of the social are, ANT aims to observe how actors form bonds with each other. But how, then, can it assume an apparently universal "agonistic model," especially when ANT "maintains there is nothing that is purely universal" (Koch 2009, 6)? How, for instance, can it reject the a priori conviction that "society is unequal and hierarchical" (Latour 2005, 64) from the outset but accept that it is agonistic and polemical (instead of, say, cooperative, what doubtlessly can also be observed[31]) from the outset? How can one of its "basic hypotheses" consist in "the refusal to give an a priori definition of the actor" (Callon 1999, 182)[32] and yet its actors nonetheless be defined as a priori antagonistic? There seems to be a certain conflict between the methodological premises of ANT and a certain ideological subtext in Latour.

This observation can be confirmed by critically discussing the idea of "description" central to ANT: Latour insists that the task of ANT is pure and neutral description: "I told you, we are in the business of descriptions" (2005, 146). But a "pure description" without any premises is impossible; even if it were possible, it is never completed, because networks are infinite; and even if it were possible and it could be completed in a meaningful way, the question still remains what exactly the use is in simply doubling and mirroring an existing practice (and/or network). Purely doubling the practices of actors makes social science superfluous—Callon, by the way, admits that: after having written "that social scientists don't have special access to a truth that would be inaccessible to actors themselves," some lines later he states:

> The role of the anthropology of (the) econom(y)ics *[sic]* is, I believe, to make these anthropological struggles explainable in their theoretical and practical dimensions, by *identifying and revealing the forces* that, in a more or less articulated way, challenge the dominant models and their grip on real markets. (Callon 2005, 12; emphasis added)

Here, the social scientist or anthropologist "reveals" and "identifies" something, meaning that it obviously has been hidden and misunderstood before, hidden to the actors involved and misunderstood by them. Obviously, scientists also according to Callon need access "to a truth that would be inaccessible to actors themselves"—otherwise they simply would be no scientists and couldn't "explain" anything, a notion Callon uses in the quote. The intended pure description is not possible. Description is always already affected by background models. The conclusion seems unavoidable that the "agonistic model" is precisely one such ideological and political model structuring the discourse of ANT—or at least ANT as performed by Callon and Latour.

That would only be permissible if this model were proclaimed to be the "natural" and hence only possible form—but this would contradict not only the premises of ANT[33] but also historical observations to the effect that societies have by no means always been organized in a market form and indeed that a "disembedding" of markets (from religious and guild structures) was required to make them into a central mediating entity in modern societies (see Polanyi 2002).

One conclusion that emerges from points (a) and (b) is that the rejection of the "fetish cult" in favor of "precise material instruments" in order to explain capitalization has two problems. First, the "precise material instruments" appear to presuppose money as their condition of possibility, which means that money cannot be symmetrically categorized among the other immutable mobiles. Money determines the situation of the immutable mobiles too. And, second, the development and distribution of the immutable mobiles apparently depends on an "agonistic model"—the market—that in the context of Latour's argument appears to be ahistorical[34] and possibly even an anthropological norm, whereas critical approaches, such as neo-Marxian theory, conversely attempt to describe and explain the historical establishment of this (or other) model(s).

Instead of being one immutable mobile among others, money seems to be—as my reading of Latour tries to show—*their model.* But this knowledge of the centrality of money and how Latour in his theoretical practice follows the scripts of the medium (and thereby contradicts his manifest praxeocentrism) is repressed.

It is interesting that there is a kind of mirror symmetry between Callon and Latour on money. Callon upholds an a priori asymmetry between human actors and money, reducing the latter to a tool and neutral channel, to an intermediary (in the jargon of ANT), of human practices. Even more so: "Agents are capable of constantly creating private money" (Callon 1999, 190)—but the reverse, i.e. that money creates agents or actors (or at least parts of their behavior) through its scripts, does not appear. In that sense his discourse is clearly praxeocentric and reproduces the praxeocentric fallacy. Latour seems to more strictly follow his own methodological premises, insofar he avoids any a priori asymmetry between money and other immutable mobiles. But in doing this he obviously doesn't follow the actors, who would surely underline the central role of money for their practices and the myriad ways in which money determines their situation (remember: no conference without money). In this way he erases the central role that money plays in relation to all other nonhuman actors.

So in fact we can find a *double repression of money in the discourse of ANT*: One concerning the relation between money and human actors and one concerning the relation between money and nonhuman actors (or to be more precise: that subset of nonhuman actors that Latour calls “immutable mobiles”). My critique does not mean that the theoretical and methodological interventions made by ANT are not useful for the study of money, especially when one tries to avoid the trap of determinisms. Moreover, I would argue, strictly adhering to the methodological principles of ANT would have avoided the double erasure of money—it seems to me that implicit political assumptions (connected to the nearly phobic avoidance of “critique”[35]) in Callon and Latour distort the possibilities of ANT.

A media theory of money to be developed can and should nevertheless draw on ANT and connect it to the theoretical resources available from media studies, philosophy, sociology, and economics. First of all, the idea of a symmetry between human and nonhuman actors should be taken seriously by granting the nonhuman actors agency. Money should be conceived neither a neutral tool nor as just one immutable mobile among others, but having a specific agency as a historically grown material, juridical, and governmental assemblage (or actor-network, if you like). Or to put it again in ANT-terms: money became a black box that now indeed operates as a determining force—this black-boxing process might explain why human actors normally take for granted that “money makes the world go round.” This analysis might lead at the end to an—horribile dictum—informed critique of money; beyond a critique of the (perhaps “wrong”) uses of money,[36] a political critique that may seem necessary today, more necessary than it ever was. It might in the end point to the possibilities of postmonetary societal structures, a discussion that has already begun: Rifkin (2014) argues for the possibility of “collaborative commons” replacing markets (see also, among many others, Siefkes 2016).

The conclusion is: When we search for media in markets, we might discover that not only the basic scripts of money (calculability, durability) changed with its changing medial form (mobility, stabilization through law, and copy protection, etc.) but also that new digital technologies might offer completely new forms that *even* *replace the basic scripts* (see Heidenreich and Heidenreich 2015, 104–36; Schröter 2017). Just designing new forms of currencies that, for example, cannot be accumulated because they lose value over time, might not be enough. It might be necessary to ask if there could be a co-constitution of new medial and social forms, which in the end moves beyond markets and its correlated and co-constituted medium: money. In the research project “Society after Money: Beginning a Dialogue,”[37] which the author started together with collaborators from sociology, (heterodox) economics, and theory of the commons, such questions are discussed. The contribution of media theory (following Seitter, Winkler, and others) to this endeavor is the insistence on the different layers of scripts, materiality, and “institutionality” of money as a medium—and the question how they can be described, differentiated, analyzed, and perhaps substituted or even made superfluous.

Such historical, empirical, and theoretical research is part of the program of “neocritical media studies” that I am proposing (see Schröter and Heilmann 2016). This program necessitates three steps: First, the rereading of texts on money, trying precisely to specify the contribution of media theory to the theory of money (in contrast to sociology, philosophy, and economics). The critical discussion of certain versions of ANT (not ANT as a whole) in this essay was part of this step. Second, a “monetary media archeology” has to be developed that rewrites the history of media in relation to money and its institutions, and thereby specifies the media history of money. And third, this should lead to a critical reevaluation of media history, part of which would be the rewriting of the media history of money. The entanglement and mutual co-constitution of specific material properties of money (as discussed in the section “Some General Remarks on Media Theory and Money”), law, and technologies of the police can be reconstructed historically. In case studies it could be shown how the coins made of silver or gold are connected to specific juridical and governmental regimes (see Caffentzis 1989). Nowadays, the emergence of bitcoins would be an interesting case (see Golumbia 2016).

Finally, when we search for media we might find out that changing media and correlated practices and institutions might put an end to forms that seemed to be natural—in our example: the formalization and digitization of society as a whole, what we could call "capital." We should at least develop theoretical tools that allow us a critical distance.

Notes

1 See Schüttpelz (2014). See also the very concise general introduction to praxeological theories in Reckwitz (2003).

2 Already in his texts from around 1857 or 1858, which were published much later as the *Grundrisse* (Marx 1993), Marx repeatedly called money a "medium of exchange." In 1892, Menger (1892, 239) also called money a "medium of exchange"—this shows, by the way, that the notion of "medium" has a history in the history of economic thought, which is often overlooked (e.g., in Hoffmann 2002, an otherwise impressive history of the notion of medium, the description of money as "medium of exchange" is not mentioned). Later in 1956, Parsons and Smelser (2005, 141) again used the definition of money as a medium of exchange. In 1964, Marshall McLuhan (2003, 179–96) called money a medium in his famous study *Understanding Media.*

3 To put it in somewhat simplified terms, since there is also the neoclassical-Keynesian synthesis and so on; see on its historical emergence Morgan and Rutherford (1998). On heterodox currents see Lee (2009).

4 That this holds true even in modern theories of market equilibrium was shown by Hahn (1987).

5 Although this would need a much more detailed analysis, one could mention the recent popularity of Nitzan and Bichler (2009) in so-called accelerationist discourse (see, e.g., Malik 2014). Although—of course—Nitzan and Bichler are themselves of Israeli origin and cannot be called "anti-Semitic" in any meaningful way, it remains problematic that their model of capital-as-power is built on (among other sources) Thorstein Veblen's difference between industry and business (Nitzan and Bichler 2009, 219–21), which seems to be analogous to the difference between productive and parasitic capital—an analogy that was already observed by Adorno (1955), who wrote on Veblen: "there is implicitly something like parasitic and productive" (1955, 95; my own translation of: "Es gibt bei ihm implizit etwas wie raffend und schaffend").

6 On symmetry see Latour (2005, 76): "ANT is not, I repeat is not, the establishment of some absurd 'symmetry between humans and non-humans.' To be symmetric, for us, simply means *not* to impose a priori some spurious *asymmetry* among human intentional action and a material world of causal relations." On intermediaries and mediators see Latour (2006, 37–42). The following statement by Latour especially indicates that mediators (in contrast

to intermediaries) are central for ANT: "The real difference between the two schools of thought becomes visible when the 'means' or 'tools' used in 'construction' are treated as mediators and not as mere intermediaries." (2006, 39)

7 One could debate if it is meaningful to discriminate high and low specificity, although digital code (as mentioned above) and money both seem to be of low specificity—and, not surprisingly, money has been compared to digital code (see Vief 1991). Some argue that the similarity of money and digital code regarding their universality may be the source of their conflict, at least as it is described in recent, neo-Marxian theories of economic crisis. See, e.g., Meretz (2007), who argues that digital data cannot easily be made to conform to the commodity form and therefore cannot easily be exchanged against money.

8 My translation. The German original is: "Siehe, die neuen Medien machen alles neu. Sie befreien uns von den schmutzigen Aspekten, die die traditionellen Medienströme kennzeichneten—von der Druckerschwärze, vom eucharistischen Blutstrom und auch von der anrüchigen Materialität des Pecunia-olet-Geldstroms. Die neuen Kommunikationsverhältnisse sind immateriell. Pixel sind weitgehend frei von Erdenschwere."

9 Ganßmann is quoting Parsons. On the problems of the notions of medium and code in Parsons and Luhmann, see Künzler (1987); see also Esposito (2008).

10 In this regard Winkler's position is close to chartalist theories of money that emphasize the constitutive role of the state for money (see Ingham 2005, xx–xxii). As one historical example for the problems of the forgery and manipulation of money, the so-called clipped coins problem in England, see Caffentzis (1989, 17–44).

11 The important role of these technologies is underlined by the fact that they themselves are juridically protected—an important mechanism of the entanglement of technology and law (see Senftleben 2010).

12 Krämer (2005, 88–89) underlines this: "One structural condition must be fulfilled by every embodiment of money. It has to have the form of an easily transportable, incorruptible piecework, that is: it has to be divisible into elements and thereby to be made discrete, so that it can be counted. Money is the stuff designed to be countable." (My translation of: "Eine strukturelle Bedingung allerdings muß jede Verkörperung des Geldes erfüllen. Sie muß die Gestalt eines einfach zu transportierenden, unverderblichen Stückwerks haben, also in Elemente teilbar, mithin diskretisierbar und abzählbar sein. Geld ist der Stoff, der auf seine Zählbarkeit hin entworfen ist.") Therefore, histories of digital media should be rewritten to include money.

13 Remember the quote from Hörisch (2004, 170) above, which suggests that money *becomes* more and more immaterial with the advent of "new media." The teleology is: first you have metal coins, then you have more "immaterial" banknotes, and then you have total immaterial electronic money. If money is digital, then one could argue that the advent of electronic money (administered by digital computing systems) is the coming-to-itself of money as such.

14 This is a complicated problem and only some hints can be provided. In times of crisis, calls often arise for a return to the gold standard, and most governments

today still hold remarkable reserves of gold. This shows that the (theoretically disputable) idea of intrinsically precious metals is still very much around (although gold nowadays is not used as money, but as a kind of allegedly stable commodity). In times of crisis, new forms of currency (like cigarettes) may also take the place of discredited money. These examples contradict a linear teleology of dematerialization.

15 See Marx (1992, 203): "The more the circulation metamorphoses of capital are only ideal, i.e. the closer the circulation time comes to zero, the more the capital functions, and the greater is its productivity and self-valorization." Clearly, Virilio's (1977) well-known diagnosis that modernity accelerates and accelerates is a direct effect of the circulation of capital and its tendency toward "zero time."

16 I cannot discuss the problems connected with the notion of performativity here; I discuss that at length in another article (see Schröter 2016). In that paper I also discuss the missing theory of crisis in Callon, a topic I do not mention here.

17 See Callon (in Barry and Slater 2002, 297): "Capitalism is an invention of anti-capitalists." In a way this statement isn't very helpful because it is obvious that a notion like "capitalism" is the result of a description that is based on a theoretical model (e.g. differentiation theorists like Niklas Luhmann wouldn't use it; he would speak of "functionally differentiated society").

18 The "experiments" seems to be Callon's term for so-called "real socialism" (see Callon 2007, 349).

19 Holm (2007, 239) is very explicit about that: "When the cyborg fish is in place, the most violent acts of dispossession against coastal communities have already been undertaken; the fisheries commons have already been closed; the heritage of the coastal people has already been parceled and laid out, ready for the auction. With the successful introduction of fisheries resource management, most of the organizational and institutional apparatus that could have served as a power base for those who want to resist ITQs has already been squashed." We read of "violence" through which the "commons" of the fishermen are closed and thereby the fishermen are "dispossessed." This is *exactly* the process of primitive accumulation as described by Marx. See also Callon (1998b, 24, 27) on "extending the spaces of calculation." See also Holm and Nielsen (2007) again on the "cyborg-fish."

20 The word *value* is sometimes used in Callon (1998b, 38, 50) in a vaguely moral sense: "values" that are opposed to the market.

21 The foundation of neoclassical theory on the principle of "methodological individualism" can be described as praxeocentric, insofar as the practices of principally isolatable actors (be they human and/or non-human) are the building blocks of the theoretical model. The relations of praxeocentrism to methodological individualism have to be discussed in more detail in future.

22 Callon often speaks of "economics" and of "economists" without specifying *which* economics he means. That suggests he simply accepts the reigning mainstream economics: that is, simply put, neoclassical theory (mentioned

e.g. in Callon 1998b, 22; see also Mirowski and Nik-Khah 2008, 96, 117). Callon refers to "standard economic theory" (1998c, 247) and marginalist analysis (1998c, 247–48), which is of course part of "standard" neoclassical theory. This already negates the conflict in economics between this mainstream and so-called heterodox economics (see Keen 2001; 2011 for a scathing critique of the neoclassical mainstream; see Lee 2009 on the history of heterodox economics). Callon (2005, 11) at least mentions "heterodox or even radical currents"—but prefers the orthodox one, presumably because it is dominant (in accordance to his theory of the performativity of economics). But by this he seems also to follow mainstream economics.

23 And it is a model, even when Callon (1999, 194) insists that ANT is not a theory.

24 This shows that money cannot easily be understood as a mere "sign" (on the sign-theories of money, see Hutter 1995).

25 See also Latour (1999, 289–90) on the Marxist critique of commodity fetishism. It has to be underlined that he is apparently familiar with a rather traditional version of Marxian theory: there is no indication that he is aware of newer theoretical approaches, e.g. the critique of value, although similar approaches exist in France. See Vincent (1997).

26 One example of such an investigation might be Preda (2006).

27 The situation is complicated by the fact that at least some forms of money in turn presuppose other immutable mobiles, such as security technology, etc. However, these in turn then presuppose money. It may be the case that the totality also has to be described as a kind of interdependent accretion (rather than as an addition), in which, however, money is ultimately, unlike other immutable mobiles, never dispensable—which is where the asymmetry would reside.

28 It is a separate question whether it always makes sense to talk of accumulating centers of calculation in relation to all other kinds of immutable mobiles. One gains the impression that the strongly centralized form of the French state has left its mark here.

29 Already in the title of Latour's famous study *Science in Action: How to Follow Scientists and Engineers through Society* (1987), it is made clear that "scientists" and "engineers" are the focus of observation. Schüttpelz (2009, 93) also talks of the "bureaucratic archive[s] of large, powerful organizations."

30 Although Latour insists on the visual aspects, it might be possible that immutable mobiles also have auditory, tactile, and other aspects. But perhaps the concept of the "immutable mobile" is somewhat oculocentric.

31 To be fair, Callon (2007, 350–51) also mentions in passing experimentation in cooperative forms.

32 See also Callon (1999, 181): "The most important is that ANT is based on no stable theory of the actor; in other words, it assumes the *radical indeterminacy* of the actor. For example, neither the actor's size nor its psychological make-up nor the motivations behind its actions are predetermined."

33 See Latour (1988, point 3.4.9) on the rejection of "nature" as origin. See also Latour (2005, 93): "In effect, what ANT was trying to modify was simply the use

of the whole critical repertoire by abandoning simultaneously the use of Nature and the use of Society, which had been invented to reveal 'behind' social phenomena what was 'really taking place.'"

34 See Potthast and Guggenheim (2015, 9) on the point that, for Latour, "the concept of network . . . refers to an ahistorical mode of connecting humans and non-humans."

35 See Latour (2005, 136–40) critically on "critique." See Callon regarding economics: "There are . . . positions we have to abandon. The first is the idea of critique of hard economists, which is intended to show them that [they] are wrong" (in Barry and Slater 2002, 301).

36 See Nelson (2012), who as a political activist explicitly criticizes the idea of money as a "neutral tool."

37 See http://nach-dem-geld.de. A publication in English is in preparation.

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