Performing the economy, digital media and crisis

A critique of Michel Callon

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Milton Friedman, who received the Nobel Prize in economics in 1976, published a famous and controversial essay in 1953. In "The Methodology of Positive Economics" he wrote:

> "Positive economics is in principle independent of any particular ethical position or normative judgments […]. Its performance is to be judged by the precision, scope, and conformity with experience of the predictions it yields. […] [T]he belief that a theory can be tested by the realism of its assumptions independently of the accuracy of its predictions is widespread and the source of much of the perennial criticism of economic theory as unrealistic. Such criticism is largely irrelevant, and, in consequence, most attempts to reform economic theory that it has stimulated have been unsuccessful." (Friedman 1966: 4 and 41)

Friedman argues that only the *predictions* of a given model, not its *assumptions*, have to be correct. This argument was and is used to defend different, more or less orthodox ('neoclassical') economic models, based on problematic assumptions (e.g. methodological individualism, *homo oeconomicus*, money as neutral 'veil', the 'auctionator'[1]). Friedman explicitly states that this kind of 'criticism is largely irrelevant'. Unfortunately, it also fails to support orthodox economic models, insofar as most of them predict that markets tend towards a state of equi-

1 There are lots of critiques on these points, see especially with regard to Friedman Keen (cf. 2001: 148-153). See Keen (2011) for a general critique of mainstream economics.

librium. This is not to say that there are no theoretical extensions and refinements that discuss the possibilities of market failure and of course the notion of 'neoclassical' is too narrow to describe what remains of pluralism in 'mainstream' economics. But since 2008, there's a growing feeling that 'orthodox' or 'mainstream' economics is somehow incorrect. Economist Kenneth Rogoff, former member of the International Monetary Fund, admitted that the "very elegant economic models that dominated academic science for decades turned out to be very useless in practice".[2] There was a "complete failure of neoclassical economics to anticipate the crisis" (Keen 2011: xi). Today it seems that only theoretical models that predict crises are correct.

It is significant that at least some economists criticize their own models – while Michel Callon says, admittedly five years before the crisis: "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" (Barry/Slater 2002: 301). This statement by Callon, implies that he follows the potentially obsolete models of 'hard economists' without any critique, already points to the necessity of analyzing his approach of the 'performativity of the markets' more closely.

Why Callon? He is one of the leading proponents of Actor-Network-Theory (ANT), which is highly fashionable at least in contemporary media studies. The aim of this paper is to show that ANT has no explanation for the economic crisis, not even a notion of it. In showing this, a deeper theoretical problem is addressed. In criticizing Callon's approach, I would also like to criticize what has recently be called the *practice turn* in media studies (often using ANT) and I will try to defend what one could call 'the logic of specific logics'. To avoid misunderstandings: It is of course to be welcomed that media studies analyze media practices empirically, e.g. using ethnographic methods, and do not just deduce abstractly potentials of a given medium from its alleged essential properties. But if this orientation on practices is radicalized, if it is stated that the media are simply an effect of practices and if a 'non-media centric media studies' is developed, as recently done by Shaun Moores and David Morley (cf. Krajina/Moores/Morley 2014), then we cross the line towards what I call *praxeo-*

2 „Neuorientierung der Wirtschaftswissenschaften“ see: http://www.handelsblatt.com/unternehmen/management/koepfe/star-oekonom-fordert-neuorientierung-der-wirtschaftswissenschaften/6097068.html

Cf. Keen (2011: 12-15) on the very few economists that predicted the crisis from 2008 (although the neo-marxian approaches are not mentioned).

centrism, in which the practices of presupposed human actors are privileged.[3] Callon's theory of the performativity of economics is quite exemplary for this problem – in forgetting the scripts of money and digital technologies and how these two non-human actors interact.

In her famous 1992 text on the "De-scription of technical objects", Madeleine Akrich, herself a central proponent of ANT, demanded a two-step analysis. *Firstly* there had to be the analysis of the technical object, the opening of the black box, the reading of the *scripts* of the object, a move also demanded by Bruno Latour (2005: 79-82), the most important author of ANT. Only then, as a *second* step, practices should be analyzed – because without knowing the scripts, one could not even know if a practice was a 'misuse' of the object or exactly the intended, prescribed use. One could not even know if there was room for different practices at all. Often the human actors are themselves, not aware of the contingency and historicity of the technological scripts. Ethnographic methodologies, as used by Morley for example, pay more attention to the actions of people because technical objects don't reveal their scripts if you simply observe them visually from the outside. The symmetry proposed by ANT between human and non-human actors tends to be dissolved by privileging human actors. Instead of 'non-media-centric media studies', it seems, a non-praxeocentric praxeology is required.

1. CALLON, PERFORMATIVITY AND CRISIS

The central slogan of ANT is: 'Follow the actors' and at least Latour (2005: 54) names Harold Garfinkel's (1967) ethnomethodological approach as one of his central intellectual sources. In this sense, ANT observes the ongoing, processual, performative production of 'the social' through ever changing networks of human and non-human actors. "The performativity program starts with an ethnography of socio-technical *agencements*" (Callon 2005: 5).

3 Of course in Callon this is more complex: human actors are themselves defined by relations and theoretically humans are not the fundamental unit of ANT-analyses (see Callon 2007: 346). But de facto human practices are often privileged above non-human actors, as I will try to show.

In 1998, Callon published the anthology, *The Laws of the Markets*, in which he presented his concept of the *performativity of* economics (Callon 1998a).[4] The main idea is that economics, – the science describing economical processes – does not just describe the economy but also *produces* it.[5] That means an entity like 'the market' is not given, but continuously produced[6] and one of the ingredients of these, as he calls it, (with a notion that can already be found in the work of Gilles Deleuze and Felix Guattari,) *agencements,* are economic theories (for a critique cf. Brisset 2016).

I begin my reading with the observation that Callon surprisingly reinvents some basic concepts already invented by Marx. I insist on that point, because what is really problematic is that there is no notion of crisis, the word does not

4 It is not possible here to detail the history of notions like 'performativity' and 'praxeology' – but it is also not necessary, I will stick to the versions given by Callon and his followers, but see Reckwitz (2003).

5 The first obvious question arises already here: Callon just speaks of 'economics' and of 'economists' (see the quote above) 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; cf. also Mirowski/Nik-Khah 2008: 96 and 117). He refers to "standard economic theory" (1998c: 247) and marginalist analysis (ibid.: 247-248), which is of course part of 'standard' neoclassical theory. This already negates the conflict in economics between this mainstream and so-called heterodox economics (cf. Keen 2001 and 2011 for a scathing critique of the neoclassical mainstream; cf. Lee 2009 on the history of heterodox economics; see also http://paecon.net; Callon (2005: 11) at least mentions "heterodox or even radical currents" – but gives no clear explanation why he implicitly and explicitly prefers the orthodox one. One has to assume it is because it is dominant – but that would presuppose what has to be explained).

6 Here the next question arises. Fine (2003: 480) observes that markets of course existed long before economy as an academic discipline existed (as Callon 2005: 8 himself admits). So why is analyzing economics particularly important or relevant in order to understand how markets are performed? Of course one could argue that market participants have something like implicit theories of what a market is (cf. ibid.: 9), but then one should analyze these instead of academic economics (cf. Mirowski/Nik-Khah 2008: 99, they especially insist in the case of the so-called 'FCC auctions': "*Corporate imperatives played the decisive role in determining the auction*" (ibid.: 112; original emphasis) – and not 'performing economists').

even appear in the index of *The Laws of the Markets*[7] and at least Marxian theory, whatever else its flaws may be, has developed some ideas for the cause of economic crisis. This is a particularly pressing problem: Keen's controversial study, *Debunking Economics,* begins with the observation (2001: 1), that mainstream economics in the last decade was indeed very often involved in constructing ('performing') markets and economies – and that this went awry quite often. It is difficult to conceive how crisis comes about when the markets are 'performed' – and it is not very convincing just to say, well, performing something can also go wrong, or as Callon (2007: 326) puts it: "But the performation may well fail, and the conditions of felicity may not be fulfilled." But why and how does performation fail?

One of the rare examples for crisis in Callon is the crash of October 19, 1987, connected to the Black-Scholes Formula, a mathematical tool, developed in the early 1970s to calculate and therefore price risks of given assets (cf. Taleb 2010). Callon (2007: 321) writes: "Yet failure can occur when events take place that are incompatible with the formula and its world. Financial crisis is a crisis for the formula."

Firstly, this implies that the crisis is in a way an unexpected and unwanted event, a 'failure'. Although this may seem self-evident, it is not – especially in a framework in which the thesis is that the economy is performed and this 'performation' is described as the "construction of a world" (ibid.: 333). There are at least some conspiracytheory-style economists (cf. Bichler/Nitzan 2014; similar arguments can be found in Post-Operaism) who would argue that the crisis is wanted by 'the capitalists' and that 'unemployment' is one of their 'weapons'. So there should at least be an argument, why the crisis was not an *intended effect* of the 'formula' but its failure. Why should 'performing the economy' mean producing a successful economy? And by which criteria 'successful'?

Secondly, even when we exclude this first possibility, Callon's quote suggests that a better formula (with less "technical shortcomings", Callon 2007: 323) might not have failed – crisis is not a *structural property* of non-human ac-

7 Callon can, of course, not be criticized, for not mentioning the dot.com crisis of 2001 or the financial meltdown of 2008 in *The Laws of the Markets* from 1998. But the crash of 1987 is not mentioned once, the crash from 1929 is only mentioned three times (1998a: 78 (twice), 205). It seems that in a very 'neoclassical' fashion crashes and crises are ignored as purely contingent, external phenomena. Even after 2008, this didn't change in the Callon school. In Fabian Muniesa's book *The Provoked Economy* from 2014 there is one mentioning of the 1987 crash (77) and one of the 1929 crash (16). No theoretical explanations are given why such crises exist.

tors like money or capital (as Marxists would have it), but a mistake made by human actors, like financial mathematicians.

Thirdly, this formulation leads to deep problems in the overall makeup of the argument. Underlining the performative character of economics, Callon insists that the formula *produces its world*, otherwise it wouldn't be performative, that is producing what it only seems to describe. When "a world is put into motion by the formula describing it" (ibid.: 320), how then can "unexpected events" (ibid.: 326) appear? And if they occur, doesn't that point to an unperformed outside? Is 'crisis' not *by definition* the limit of the constructive activity[8] implied by the notion of performativity? And what exactly does it mean when Callon (ibid.: 323) then observes, that "it is not the formula itself that can cause that world […] to exist. Other forces, other interests are involved"? If the formula can be disrupted by those 'other forces', shouldn't they be of primary interest? And how is this boundary, between the performed world and its outside, to be described? To answer this, one would need a theory that does not perform, but describe (a possibility explicitly rejected by Callon[9]), because if this meta-theory would again perform, how could an un-performed outside be described by a performing theory? Wouldn't the meta-theory then perform the boundary between the performed and the un-performed? And how could this be understood – wouldn't this end in

8 As already quoted, Callon (2007: 333) speaks explicitly of "construction of a world". But admittedly it is not clear in the discussion on performativity if 'performing' something is the same as 'constructing' it (especially the work of Judith Butler 1993: 4-12 is a case in point). But in relation to Callon, MacKenzie, Muniesa and Liu write, that "he proposes considering economics not as a form of knowledge that depicts an already existing state of affairs but as a set of instruments and practices that contribute to the *construction* of economic settings, actors, and institutions" (2007: 4, emphasis added, JS).

9 Callon (1998b: 29, emphasis added, JS) writes: "Social science is no more outside the reality it studies than are the natural and life sciences. Like natural science, it actively participates in shaping the thing it describes." If describing a thing means producing it 'performatively' then this is also the case with Callon's approach itself. When he writes that the notion of "framing […] enables us to think and describe the process of 'marketization'" (19, emphasis added, JS), doesn't that mean that his notion of 'framing' not only describes 'marketization', but also shapes and produces it? Doesn't Callon's theory shape all things it describes as performative? And how then can he state in the title of Callon (2007: 311) that "economics is performative" (emphasis added, JS), as if this were an ontological (that is: non-performed) fact outside of his own theory?

a massive self-contradiction, a theory performing the un-performed? And so forth.

It is not possible here to read all passages of Callon and his followers closely to point to the somewhat vague character of the notion of performativity. A few remarks will suffice:

Firstly, the possibility of failure or "misfire" (Callon 2010) is central to the debate of performativity, already in an early text by Derrida (1988) on Austin's notion of the 'performative', which is relevant for Butler's (1993) arguments on performativity. In his debate with Judith Butler (2010), Callon insisted that "the general rule is a misfire" (2010: 164) and agrees with Butler's idea that "the risk of breakdown and disruption are constitutive to any and all performative operations" (ibid.: 165, quoting Butler 2010: 152). I cannot go into why exactly performative operations are in a way structurally prone to breakdown – in my view this question isn't clearly answered by Butler, Callon or Derrida. But even if we assume it to be correct, it still fails to demonstrate why the economy sometimes works (or at least: seems to work) and sometimes is in a state of manifest crisis – again the questions of the 'conditions' or the 'outside' which produce resistance to the performation becomes pressing.

Secondly, Callon writes:

"MacKenzie proposes the notion of counterperformativity to denote these failures, because in this case the formula produces behaviors that eventually undermine it. […] What Popper called refutation is another name for counterperformativity or what I have called overflowing." (2007: 323)[10]

Now it is the formula that produces what undermines it – how does this relate to the 'unexpected events' cited above? When 'counterperformativity' is the same as 'refutation' by Popper – which means that theories can never be positively confirmed, but only definitely be falsified by experimentation – why then is this complicated notion of 'performativity' necessary at all? Wouldn't it then be enough to say – as Keen (2001; 2011) does – that a certain model to describe the economy, let's say neoclassical economics, doesn't fit to the observed facts (the crisis) and therefore is simply wrong?[11] Of course, Callon (2007: 320) insists

10 The concept of 'overflowing' is discussed in more detail in Callon (1998c). Basically it's the "irrepressible" (ibid.: 250) result or side-effect of 'framing' – it is that what necessarily evades framing.

11 It is interesting that Callon (2007: 330) writes: „The Black and Scholes formula or the theory of general equilibrium, confined to the academic world can find its appropriate

that "the concept of performativity has led to the replacement of the concept of truth (or nontruth) by that of success or failure". But if a scientific theory makes a prediction that is confirmed by observation – then we call it a *successful* theory and also a 'true model', as long as (in accordance with Popper) it is not refuted by new observation. Otherwise "a prediction proves false" as Butler (2010: 153) puts it in a critical discussion of Callon's approach. So the difference of 'success' and 'truth' is not quite convincing. It is not clear that Callon's notion of the performativity of economics offers a 'successful' model to understand crisis.

2. CAPITALISM AND KAPITALISM

If we follow Friedman's methodological musings, meaning only theories predicting crisis are correct nowadays, the absence of a coherent theory of crisis points to fundamental problems in Callon's approach. My thesis is that *the praxeocentric reduction of the inner logic of non-human actors* is the reason for Callon's inability to cope with the crisis. *And the two non-human actors whose interior logic is erased are two media technologies: money and the digital computer*. Callon (2007: 354) 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* [emphasis added]. The assumption of a homogeneous economic reality is made by those who criticize capitalism[12], thus defined, as well as by those who defend it

milieu, its felicity conditions. But when they move over to the Chicago derivatives exchange or to ministries responsible for economic planning, they may encounter or even trigger resistance, for their felicity conditions are not filled. […] Within the academic world, marginalist analysis thrives without any problem. As soon as it leaves that world of textbooks and students, which suits it so well, it gets into trouble." 'General equilibrium' and 'marginalist analysis' show that Callon is talking here about so-called mainstream, neoclassical economics – but when 'marginalist analysis' gets into trouble when its confronted with the real world, doesn't that simply show that it is wrong (as Keen [2001; 2011] at least for some forms suggests)? And isn't it revealing that nowadays lots of students of economics demand 'real world economics' – obviously economics fitting better to the world (see: http://www.real-world-economics.de; http://paecon.net)?

12 See Callon (in: Barry/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

by talking of the market and its laws, in general. Experiments[13] 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."

A typical move for praxeocentric discourses is to deny the possibility of an 'inherent logic' in relation to non-human entities – the argument is always that entities are situated in historical and local practices and therefore are 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 wrong that the critics of capitalism, against whom Callon's argument is obviously made (explaining the German sounding "Kapitalism" with a capital 'K'[14]), postulate a homogeneous entity called 'capitalism'. 'They' always admitted that capitalism has had historical phases e.g. imperialism and state-monopolistic capitalism or in another theoretical vein, Fordism and post-Fordism or that there is uneven development etc.[15] They just postulated that capitalism has one or more fundamental principles that remain in place below historical and local differences, that is why Marx analyzes capitalism in "its ideal average" (1991: 970).

Secondly and far more importantly, Callon seems to at least gesture to the existence of such a principle 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 one label 'capitalism'.[16] See this symptomatic quote by Callon (2005: 5):

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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'). And you can use such a model to criticize what you describe. But that's of course true of all descriptions (also of that describing economics as performative) and insofar it makes no sense to say 'Capitalism is an invention of anti-capitalists' as if that would be a valid critique.

13 The 'experiments' seems to be Callon's word for so-called 'real socialism' (cf. Callon 2007: 349).

14 I guess that this is related to the German tradition coming from Marx.

15 The literature on these points is far too extensive as to be summed up here.

16 Of course different theorists (like Niklas Luhmann) would doubt that there is such a thing like 'capitalism'. For Luhmann there would only be different subsystems (one among them economy) whose difference is the unity of society, but ANT is no differentiation theory and Callon himself introduces the question of capitalism, therefore he has to live with the question how to define capitalism (and even in differentiation

"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."

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[17]) is reintroduced.

This logical flaw typical of praxeocentrism 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). 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 in locally and historically situated occurrences is logically impossible, because it could not even compare two different occurrences to highlight their local specificity, because to compare them, a general principle of comparison (here: that both occurrences are 'practices') has to already be taken into account. It makes no sense to say, 'there is no such thing as photography but only photographic practices', because even to select two practices to compare them as different *photographic* practices, presupposes an implicit knowledge of what photography is, otherwise the practices could not even be selected.

Coming back to Callon: One of the main goals of his 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 like the law and the state, which also were named as preconditions for markets in the Marxian tradition (cf. Pashukanis 2002). But he insists particularly on the way in which the *homo oeconomicus* is produced. While this would perhaps be subsumed under the problematic notion of 'ideology' in the Marxian tradition, 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. The question immediately arises, *what* is calculated and *why* there is calculation at all. "Competition between calculative agencies […] is largely de-

theories like systems theory there is a controversial discussion nowadays if economy is really just a subsystem among others, cf. Pahl 2008: 55-63). See also the discussion between Barry, Slater and Callon (in: Barry/Slater 2002: 296), where they discuss the question of a "fundamental aspect" of capitalism.

17 See Marx (1990: 742): "Accumulate, accumulate! That is Moses and the prophets."

termined 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. That means: Callon presupposes a social form in which any entity, besides their specific and unique use-value, also has an *abstract exchange value*, because only such an abstract value can be calculated. Although he doesn't use these Marxian notions, one of his examples is very telling (cf. Callon 2007: 336-339): Norwegian fishers that are turned into economic subjects by transforming the fish into calculable 'cyborg-fish', that is: commodities. This is nothing other 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).[18] 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 Market*, sometimes he speaks of "usage value" (1998b: 33) or "use value" (ibid.: 35), "exchange value" is only to be found in a quote (ibid.: 19), so basically it remains unclear *what* exactly is calculated in Callon's approach.[19] Interestingly, in another text he writes: "As the old Marx so clearly saw: there is no exchange value without a use value, and no use value in a market regime without the production of an exchange value" (2005: 6).

18 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' (*Gemeingut* or *Allmende* in German) 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 and 27) on "extending the spaces of calculation". See also Holm/Nielsen (2007) again on the 'cyborg-fish'.

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

3. 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* for capitalism? This is at least the answer Marxian theory would give – capitalism is most generally to be understood as the total reign of 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 (cf. Larsen et al. 2014).[20] 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:

"[T]here 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 – if capitalism can be equated with or related to calculation (see below), a connection Callon infers by referring to Deleuze and Guattari on capitalism next to his musings on calculation. 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 different capitalisms and no Kapitalism with any underlying principle. But this argument leads Callon to argue against himself: By stretching the principle of calculation to all societies and thereby erasing any (great) 'divide', he is the one who homogenizes unduly. It is difficult to understand why he rejects, on the one hand, a homogenizing principle

20 I'm ignoring here the difficulties of relating values and prices, whose relation turned into a difficult problem in the Marxian tradition. Keen (2001: 269-299) devastatingly criticizes Marxian economics on this 'transformation problem' as others do, but there are also defenders of Marx and authors who argue that this whole debate is completely beside the point (see Kliman 2007).

('Kapitalism') that allows to relate different 'capitalisms' to each other and on the other hand introduces an even wider homogenizing principle – a calculation as such – that surprisingly and a-historically unites 'traditional societies' (by which, I guess, he means so-called 'primitive societies') and modern industrial capitalism under one category. But his argumentation is not only logically but also historically unconvincing. 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. As Jacques Le Goff (2012) and others have shown, however, even the existence of money (as a materialization of calculation) does not make a society capitalist.[21] Money is much older than capitalism.

The question is, if a society is *centered* around money and, to use Akrich's term, its scripts. 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 (cf. e.g. for a recent and especially pointed argument Lotz 2014), then we can speak of capitalism. 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: 247-257): Capital is the *process* of making more money out of money.[22] Marx (ibid.: 166-167) writes: "They

21 As these remarks suggest, there is a profound lack of historical thinking in Callon. One can see this already at the very beginning of his introduction of *The Laws of the Markets*, where he writes: "The aim of the present book is to contribute to the analysis and understanding of the subtle relationships between economics and the economy; not within an historical perspective, although some chapters do include historical material, but within a deliberately anthropological one." (Callon 1998b: 2) It is of course legitimate to choose an anthropological perspective, but as I suggested (and will go on arguing) this produces severe problems of understanding 'the economy'. But worse, just one page after he explicitly rejected a 'historical perspective' he writes: "[T]he market is a process in which calculative agencies oppose one another, without resorting to physical violence, to reach an acceptable compromise in the form of a contract and/or a price […] Hence, the importance of the historical dimension which helps us to understand the construction of markets and the competitive arrangements in which they are stabilized, for a time and in a place." (ibid.: 3) The least one can say is that Callon's relation to history is somewhat unclear. See also Callon (2007: 347) on his ideas for a "history of economics".

22 My reading of Marx follows recent neo-marxian approaches like the 'critique of value' (cf. Larsen et al. 2014) that focus not on class struggle but on the autopoietic

do this without being aware of it." Marx' 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 by the way, also neoclassical economics has it, in which money plays nearly no role, cf. among a lot of other authors Pahl 2008: 9-16).

Insofar as money is pure abstraction, that is: pure quantity, its quantum can only diminish or grow. It is not surprising that in its practical use, its quantum diminishes or grows. And therefore it is also not surprising that economic actors 'calculate', as Callon rightly insists, because money can *only* be calculated. Callon argues in a typically praxeocentric matter, that there are only *different* markets: "The idea of the market as a unified category and institution is progressively disappearing" (Callon, in Barry/Slater 2002: 291)[23] but of course no one would trade and calculate on markets if the outcome wasn't *more money* than the amount invested. Again: This script disappears and although Callon implies, as I have argued above, the goal of 'gain' as central for markets (1998b: 45) the ex-

movement of value in the form of money as central for capitalism. One point might seem problematic here: If the tendency of money to become more money would lie – as I suggested – in its purely quantitative character, shouldn't the existence of money automatically lead to capitalism and how can there be societies with money but without capital (understood as infinite process of accumulation of money)? Although this is a complex question, which cannot be answered here in detail, it seems that firstly in many 'traditional' societies money-commodity-relations are marginal (compared to subsistence) and secondly that the disruptive script of money was deliberately repressed, e.g. by the ban of interest (as in Islam) or giving money such a heavy and cumbersome materiality that it cannot be accumulated easily, as in the classical case of the 'stone money of Yap' (cf. Gillilland 1975).

23 The context of the quote is: "But the market is not this unified category as it was in the nineteenth century, or even in the first half of the twentieth century. I think that the paradox is the following: everybody agrees that the market is a very effective institution, but now it seems to me that more and more people consider that there are various ways of organizing concrete and specific markets. So it's a very different situation because you now have an abundance of ways of seeing economic markets. The idea of the market as a unified category and institution is progressively disappearing." Again: that different forms of markets may exist is plausible – but that doesn't mean that there isn't an underlying principle (a 'unified category') that makes it possible to address this different phenomena *as markets* in the first place. Interestingly, Callon argues that the idea of the market 'as a unified category' is 'progressively disappearing', although he gives no hint what the reasons for that might be.

plicit "imperative of profitability is absent" (Fine 2003: 480), because this would explicitly (and rightly so) introduce a unifying principle.

Callon (1998b: 12) states: "The agent is calculative because action can only be calculative." For one, 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. Moreover, 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 etc. is so central for Callon's argument, they are suspiciously often 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 (and not criticizing, as was noted above) the economical mainstream, also follows the neoclassical mainstream's exclusion and oblivion of money.[24] We can expect that this discursive operation appears as a reduction and erasure of the pure quantitativeness, calculability and abstraction of money. That is exactly the case.

4. MONEY, COMMODITY, PRODUCTION

Callon (1998b: 21-22) begins with describing the script 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* [emphasis added, JS]; combined with all the measurements preceding it, it facilitates a calculation which makes commensurable that which was not so before."

24 See also Orléan (2014: 4) who underlines that for the „neoclassical theory of value […] money is a peripheral fact, a secondary device, a mere adjunct to utility that exists solely as a means of facilitating transactions". It should be noted that in Latour's theory of 'immutable mobiles' there is also a reduction of money to just one 'immutable mobile' amongst others, so this repression of money seems to be common to different authors from ANT, cf. Schröter (2011: 229-241).

At first sight, Callon seems to acknowledge the script of money – but with a significant twist: Money is added as the endpoint of a metrological chain of measurements onto a world before money. There is a world performatively roduced as calculable by measurement and then money comes in – 'merely' as a 'final piece'. But this doesn't explain how 'equivalence' is achieved, how money is related to 'measurement', that is: *what it measures*. Therefore, as was already stated above, some theory of value would be needed, which is not provided by Callon.[25]

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' (cf. Bulow 1986). In Callon's model,[26] money is added as a market device to a production devoid of money: production does not appear.[27] 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: "[T]o 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." (ibid.: 186-187; see also Callon 1998c)

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25 Callon (1998: 22) writes: "Money establishes an ultimate equivalence between the value of a human life and that of investment in pollution abatement." He makes this statement in relation to an example, in which the "negative externalities, for example the effects of pollution produced by a chemical plant" (ibid.: 21) are concerned. But the question arises: How can such different things be compared and made equivalent? 'Measurement' alone cannot be the answer, because you need something to be measured – that is 'value'. But Callon does not define 'value' (see above).

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

27 To be sure, "producers" are mentioned a lot (Callon 1998b: 18, 19, 20 and passim), but there is no description or theory of production.

The objects simply seem to be there, out of nothing, and framing seems to mean ripping them out of emotional contexts to sell them. This looks more like a flea market than like a real economy in which commodities *are produced as commodities for the markets*. When Callon (1999: 189) writes: “one is not born a commodity, one becomes it”,[28] this is not quite correct for the vast majority of objects surrounding us (the processes of primitive accumulation mentioned above set aside here, because in primitive accumulation, objects that weren’t commodities are turned into commodities). 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 of the neoclassical approach, which tends to focus on exchange (cf. e.g. Orléan 2014: 37). To argue that way is to erase production, which means to erase capital from the picture, understood as M-C-M’ in which production of commodities is part of the movement of value, where commodities and money are in a way the same, namely metamorphoses of capital (cf. 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

28 See also Callon (1998b: 19), where he develops basically the same argument, quoting anthropologist Nicolas Thomas on the definition of ‘commodity’: “Commodities are here understood as objects, persons, or elements of persons which are placed in a context in which they have exchange value and can be alienated. The alienation of a thing is its dissociation from producers, former users, or prior context.” Interestingly enough, Callon doesn’t take his definition of ‘commodity’ from economic theory (as one might expect, given his argument that economic theory performs the economy), but from an anthropologist. Firstly that shows that he consequently follows his line of equating traditional societies and industrial capitalism (by means of ‘calculation’). But secondly, and in line with my critique of this being ahistorical, this is highly problematic. To me it simply makes no sense to describe commodity production in industrial capitalism with a notion like ‘alienation’ in the sense that the product has to be torn away from its producer – products (commodities) in industrial capitalism *are made to be given away*, no one is emotionally attached to them.

which give fidelity vouchers to their customers." (Callon 1999: 190; he is alluding to Zelizer 1998)[29]

Or see a similar quote from another 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' – 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.[30] 'Private money' is not money at all (there is no 'private money' as there is no 'private language'), even if the human actors name it 'money' – which demonstrates that there's an irreducible script that cannot be easily changed by different practices.[31] Callon (1998b: 35 and 54, FN 6) 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 fact that the banknote here is explicitly called a medium the argument seems to be that money is not abstract and that its "official attachments" can be 'overloaded' with

29 It is strange that Callon defines the commodity by framing, that is untying (1999: 189: "cut the ties between this thing and other objects or human beings one by one"); but doubts that money is 'disentanglement' and follows Zelizer on 'money which embodies and conveys ties'. With this argument he separates again 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.

30 This shows that money cannot easily be understood as a 'sign' (on the sign-theories of money see Hutter 1995).

31 Callon mentions the law – and the law, the state, the police and ideological state apparatuses have exactly to ensure the stability of the script, or to put it precisely: one set of aspects of the potentiality of the script.

"new, private, messages" (ibid.: 35). But what does this mean? Of course, I can use a banknote as a medium of writing, but it would be outlandish 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). In a similar way, you could say that you can change the rules of soccer by writing some personal notes on the ball. *The script of money is repressed in favor of practices by human actors. ANT's own principle of symmetry is violated.*

To sum up: Money is severed from the notion of commodity.[32] This means that Callon, contrary to his talk of performativity which implies processuality, erases the endless processual character of money changing into commodities and back, a movement that Marx (1990: 255) called the "automatic subject" of society – and which is perhaps the 'outside' of the performation of the economy in Callon's sense.

5. LABOR AND COMPUTERS

If production is erased from Callon's discourse, then labor of or in production is erased too. The word 'labor' is not mentioned once in *The Laws of the Market* (except from some titles in bibliographies); not surprisingly, for ANT, the word 'laboratory' is much more frequent. The erasure of production also means that digital technologies can only play a role on the level of the markets, that is on the level of distribution and circulation – and it's even more radical: In *The Laws of the Markets* (1998) the computer is only mentioned a few times and in *Market Devices* (2007), the word 'computer' shows up only once; the word 'digital'

32 It is interesting that one of the paradigmatic examples for Callon is an experimental strawberry market in southern France (cf. Garcia-Parpet 2007). As Callon (1998b: 20) underlines this was a "market with characteristics corresponding to those described in political economy manuals" – meaning a demonstration of the performativity of economics. But this strangely constructed market adhered indeed closely to neoclassical manuals, in that it was a market with an 'auctioneer' in the Walrasian sense (cf. Keen 2011: 178-180). Firstly, real markets don't have 'auctioneers' (cf. Binswanger 1990: 345), insofar this example doesn't show that real markets can be constructed according to neoclassical manuals and secondly the Walrasian market is a market *without money* (cf. Binswanger 1990). Although Callon discusses money right next to the strawberry market (cf. 1998b: 21) he doesn't mention with a word the exclusion of money in Walras' model of markets. Again money is reduced and repressed.

doesn't appear at all (cf. Mirowski/Nik-Khah 2008: 118 for a critique of Callon leaving out "the notorious quasi-material shape-shifter the computer").

We can sum up: Callon severs money from commodities and in this way, from capital, and he represses production and therefore, on the one hand, labor, and on the other hand, the role of computers or digital technologies in production. I insist on that point, because by excluding money, labor and digital technologies from his picture of the "economy" (1998b: 1),[33] Callon excludes the relationship that gives at least *one* explanation for the moments of crisis we witness – at least if we follow the 'critique of value' (cf. Larsen et al. 2014). The thesis is – to put it in highly simplified terms – that the unavoidable competition results in individual companies needing to produce commodities more cheaply in order to succeed in the market. In order to achieve this, increasingly advanced technologies must be used, hence increasing productivity. This means *firstly*, that increasingly large advance investment in infrastructure is required – the first reason for the increasing inflation of credit, i.e. the financial superstructure.

Secondly, so-called 'rationalisation' gradually eliminates labor. A primary historical compensatory mechanism for this was provided by the fact that the reduction in prices for products caused by increased productivity used to result in expanding markets (e.g. nowadays, many people have a car). Even if the increased productivity undermined the creation of surplus value, provided the absolute quantity of commodities increased, then more surplus value could still have been produced.

One argument of the 'critique of value' at this juncture is that, with the introduction of new digital technologies, for the first time in history, the elimination of labor is proceeding faster than markets can expand. The argument, that in the past technological progress didn't lead to structural unemployment and therefore this won't happen now, is flawed. Digital technologies are much more flexible and can substitute cognitive work, too. The script of digital computers is their programmability, leading to flexibility. One might say that the medium of money is struggling against digital technologies – they do not coexist or 'co-perform' (cf. Callon 2007: 335) peacefully.[34] Their scripts come into conflict, independent of human practice. Marx knew this too, in a surprising anticipation of automa-

33 Or at least reducing them.

34 Another aspect is the discrete digital code, which can in principle be reproduced without loss – meaning the digital products are more and more difficult to 'frame' as commodities, to use Callon's words. These are products for which Callon's thesis "one is not born a commodity, one becomes it" (1999: 189) does really apply and he doesn't even mention them.

tion: after all, if people increasingly only relate "watchman and regulator to the production process itself", then (at least for most of them) labor will cease to be a "great well-spring of wealth". The less that production depends on "labour time and on the amount of labour employed than on the power of the agencies set in motion during labour time [...], the general state of science and on the progress of technology", the more "production based on exchange value breaks down" (Marx 1993: 704-705). In 2005, the world's 200 largest companies already accounted for over 25 per cent of global economic activity, but are only able to employ 0.75 per cent of all people (cf. Kurz 2005: 81). It is therefore revealing that there have been, especially in the last years, several publications addressing exactly this problem. In 2009, the computer entrepreneur, Martin Ford, published a much-discussed book, *The Lights in the Tunnel*. The book's blurb already poses unmistakable questions: "Where will advancing technology, job automation, outsourcing and globalization lead? Is it possible that accelerating computer technology was a primary cause of the current global economic crisis?" (Ford 2009). In one chapter (ibid.: 67-73) he emphasizes that a significant number of cognitively more complex tasks can be taken over by the growing artificial intelligence of our 'smart' devices (which is of course why they are called 'smart'). Mental labor is rationalized, too. Erik Brynjolfsson, a professor at MIT and Director of the MIT Center for Digital Business[35], published in 2011 with Andrew McAfee a book titled *Race against the Machine. How the Digital Revolution is Accelerating Innovation, Driving Productivity, and Irreversibly Transforming Employment and the Economy*, where the authors also discuss the potential disappearance of labor.[36] Finally, I want to mention a current study that predicts that up to 47 per cent of all jobs in the United States will be prone to rationalization (cf. Frey/Osborne 2013).

After all, a jobless person consumes less, i.e. products that are manufactured cannot be sold (domestic market crisis) or consumers have to take up credits to maintain their lifestyles, the second reason for the inflation of debt. People who don't have work may be unable to pay taxes. Therefore the state, which is supposed to provide the legal, educational, etc. framework for the market. cannot

35 See http://ebusiness.mit.edu/erik/

36 This is especially interesting because Brynjolffson (1993) wrote an overview on the 'IT productivity paradox'. If even he admits, as he does in *Race against the Machine*, that there is a problem, it really has to be serious.

continue to function without credits – third reason for the inflation of debt.[37] If it is no longer possible to consume and produce, then – to put it in simplified terms – it is also not possible to valorize value: one consequence is the flight to 'fictional capital', as Marx (1991: 525-542) called it, meaning, the inflation of financial markets: if you can't make profits with production, you may make profits with assets. And the inflated financial markets can collapse, but the collapse from 2008 was not the cause of the crisis, but one of its symptoms (cf. Lohhoff/Trenkle 2012 for a very firm, but surely controversial position).[38] The expansion of computer-based technologies, the increase in structural mass unemployment and the ever-denser chain of financial crises, large and small, since the late 1970s, stand in an internal, systematic relationship. Even if one doesn't accept *this* explanation for the crisis, it is at least *an* explanation for the crisis, whereas Callon has none.

Interestingly enough, he writes (Callon 2007: 315): "Without assistance, economic agents are not able to produce […] all the innovations that will guarantee them a competitive advantage. They need chemists, physicists, or biologists working in universities." Here, production and the role of 'science' and 'technology' for competitive advantage - basically by reducing costs through reducing labor – is at least implicitly addressed. And: "Competition between calculative agencies, focused on their ability to have their decisions recognized and accepted (for example, to propose a given product on a given market segment), 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 powers of calculation" (Callon 1998b: 45). Similarly, if you understand the 'powers of calculation' as those computing powers that help companies to reduce costs and to increase productivity, you could come close to a theory of crisis – but Callon doesn't develop this any further.

37 Of course these are not linear developments, there are lots of digressions and counter movements (e. g. there are nowadays also lots of savings; in some countries like Germany the unemployment rate falls due to successful export economies etc.).

38 For English-speaking readers here's the translated introduction to the book: http://www.krisis.org/2012/the-great-devaluation-introduction. Interestingly Butler (2010: 153) writes in her debate with Callon: „The present recession in some ways highlights this failure at the heart of financial performativity" – meaning she really tries to connect the discussion on the performativity of economics to the crisis of 2008, although she also seems to locate the reasons for the crisis in the financial realm without asking why there is such an inflated financial superstructure in the first place.

6. CONCLUSION

My readings of Callon's texts on the performativity of economics tried to show that there is a privileging of human practices in Callon's discourse, contrary to the alleged symmetry of human and non-human actors.[39] Perhaps the most blatant example of this is the idea – following Viviana Zelizer – that earmarking money can somehow change the script of money (or that actors can produce 'private money'). This *praxeocentric* erasure of the specific logic or script of the non-human actor of money is consistent with the erasure of the idea of 'specific logics' in general, which leads to inconsistencies in Callon's argument. The praxeocentrism of his (and Latour's) discourse is masked by the alleged 'agnosticism' of ANT-style description: "I consider that social scientists don't have special access to a truth that would be inaccessible to actors themselves" (Callon 2005: 12). This idea of a pure description of the actors themselves (cf. also Latour 2005: 46-50 and 147) has the problem, besides others,[40] that the non-human actors cannot speak for themselves.[41] The descriptivist discourse of ANT

39 It seems that Butler (2010: 153) basically critiques the same point: „My worry is that the cultural constructivist position thinks performativity works and that it imputes a certain sovereign agency to the operation of performativity."

40 A 'pure description' without any premises is impossible (Hands 2001: 208-210 underlines the role of economic metaphors in ANT, meaning that there is always already a specific framework in place); even if it were impossible, 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. 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 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, JS). 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 in 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.

41 And even human actors might not know exactly what they are doing and why.

leads automatically to a praxeocentric reduction of non-human actors, contrary to all alleged symmetry.

Moreover, this theoretical structure makes it impossible for Callon to develop a consistent theory of crisis, a theory which allows for the 'crisicity' of crisis, if you allow this strange neologism – meaning a notion of crisis, in which it is not a mistake of human actors (e.g. developing unfortunately flawed formulas), but a result of the failing 'co-performation' of non-human actors, that is money and digital technologies,[42] beyond all human intentions. That's why humans then experience the crisis as incomprehensible disruption, as happened in 2008. Only a non-praxeocentric praxeology, as might be implied by the 'value-critical' reading of Marx, can be an appropriate theory of this.[43] Marx' notion of the "automatic subject" (1990: 255) of capital – a non-human actor – is interestingly enough confirmed by a much-discussed paper by Gode and Sunder (1993), in which they made simulations of markets with 'zero intelligence traders'. Although the simulated actors had no intelligence at all, the allocative efficieny of the markets was stable – meaning that no human practices, no human knowledge, is necessary at all. The structure alone ('the rules') determines the output, which is a clear indication that human practices should not be overemphasized. Instead of this – with Marx – the social forms (structural dynamics) have to be analyzed and perhaps criticized.

Although more should be said on that topic, finally a few words on the political implications of Callon's discourse. Although we already heard that Callon doesn't want to criticize the economists, that doesn't mean that he just and only follows the mainstream discourse – he tends to argue for "diversity":

> "[S]aying that economics, with the multiplicity of frames of analysis and theoretical models that it develops, contributes to the constitution of the object that it studies, means implicitly claiming that there is no single way of organizing the economy and moreover of organizing it satisfactorily or even effectively."

42 One could perhaps translate this failing co-performation into the conflict between forces of production and the relations of production, which are so important for the Marxian tradition.

43 It would be interesting to read Marx' notion of the "automatic subject" (1990: 255), which is decidedly processual and is 'performed' unknowingly by (and 'through') human actors everyday with Butler's non-subject-centered notion of performativity (cf. Butler 1993: 7ff.). I will develop this in another essay.

But this diversity and pluralism is not very far-reaching:

> "In itself the thesis of diverse modalities of organization of economic life is by no means new or revolutionary – no more than that of the diversity of market configurations. What the performativity thesis does add, is that there is no one best way, no single form of organization that imposes itself naturally and compellingly, so to speak, as the only one able to ensure the optimal functioning of markets."

The form of the market, "to stick to this very specific economic form of organization" (Callon 2010: 163), is simply presupposed as – it seems – natural form.[44] The actors are not asked. No choice beyond the dichotomy of state and market (cf. Callon 2007: 349), although the 2009 Nobel Prize for economics was awarded to Elinor Ostrom, who showed that there might be solutions beyond state and market, solutions which, by the way, might lead to forms beyond Kapitalism.[45] Why not let these insights perform the economy?

There is one passage in Callon (2007: 330) which sounds like an explicit allusion to Friedman's 'Methodology of Positive Economics', with which my text began: "All of the economists who say that the unrealism of their propositions are of no concern to them have chosen their world, a world of papers, colleagues, and students – the one that suits their theories." Apart from the point that here he surprisingly criticizes 'hard economists', one cannot avoid the conclusion that this also applies to Callon himself.

44 It is puzzling that Callon states: "To be sure, the market can be put to the service of political action". This seems quite unrealistic given the neo-classical and neo-liberal hegemony – on the contrary, we have to read about 'market-conforming democracy' (cf. Berger 2013).

45 To be sure, Callon (2007: 350/351; with reference to Gibson-Graham 2003) also mentions in passing experimentation in cooperative forms, but not surprisingly the result is: "The cooperative does not propose the alternative solution to a general problem but a particular solution to a series of very specific problems. In so doing it does not help to strengthen the illusion that global forms of organization of the economy exist." For Callon obviously such 'global forms of organization of the economy' do exist – and that are of course the holy markets.

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