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Sustainable finance. A critical realist perspective☆

Thomas Lagoarde-Segot

KEDGE BS, Rue Antoine Bourdelle, 13288, Marseille, France and LEST, UMR 7317, Aix-Marseille Université

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ABSTRACT

This article seeks to respond to certain epistemological challenges which are posed to the traditional methods of inquiry used in finance by the emergence of sustainable finance. We first underline the qualitative changes that have been induced in the finance function by the imperatives of sustainable finance. Then, through the prism of critical realism, we analyse it to reveal a contradiction, which we attribute to a misconceived social ontology in academic finance. Finally, we outline methodological avenues which might allow us to overcome these difficulties and pave the way for a more realist and pluralist approach to finance research in the 21st century.

1. Introduction

On 22 March 2018, in Brussels, the European Commission announced an ambitious action plan for sustainable finance, based on the findings of the High-Level Expert Group (HLEG). The expert group announced that reorienting capital flows towards sustainable projects would require "*changing the investment culture and behaviour of all market participants*" (HLEG, 2018, p. 2). Higher education institutions, academic research, and the finance discipline in particular, would therefore have an important role to play in aligning financial institutions and market participants with the long-term decision-making required for financing sustainable economies and societies. Yet research and education in finance have yet to fully take into account the ways in which the rise of social and sustainable finance modify financial theory.[1] Locked in a positivist straightjacket, mainstream academic finance—and therefore finance education—hinders the emergence of sustainable financial practices where it should be a bolster for social change, (Lagoarde-Segot, 2015; Paranque and Pérez, 2015; Lagoarde-Segot and Paranque, 2017; Schinckus, 2015; Walter, 2016; Dupré and Perluss, 2016; Alijani and Karyotis, 2016; Boussard, 2016).

This article argues that at the source of the problem lies an epistemological mismatch between the modifications of the 'finance function' brought about by sustainable finance and the traditional methods of inquiry used in finance. Financial theory is indeed rooted in *empirical realism* and relies mainly on a deductive method of inquiry (Ardalan, 2008; Lagoarde-Segot, 2014). In essence, this approach entails a determinate account of phenomena in which statements are developed through deductive methods (in particular, mathematical methods) and tested by econometric techniques. Using a critical realist framework (as initiated by Lawson (1997, 2015)), we argue that impact investment entails deep *qualitative changes* in the practice of finance that are by essence incompatible with this framework. We argue that inquiring into impact investment would require instead an open system which acknowledges that human agency is embedded in an organic social context. Misconceptions about social ontology, which are common in the field if

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E-mail address: thomas.lagoardesegot@kedgebs.com.

[1] In December 2015, a search on the Science Direct website using the key words "*impact investment*" and "*social finance*" returned fewer than ten articles published since 2005.

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academic finance, could quite possibly explain the apparent inability of mainstream financial models to grasp the reality of sustainable finance and therefore to realign financial research with societal needs. Our intended contribution will therefore be to excavate these areas of epistemological, ontological and methodological tension separating sustainable finance from standard financial theory, and to provide methodological alternatives permitting the inclusion of the former in a modern finance research agenda. We call on financial economists to formally engage in methodological discussion as part of research projects. This rethinking is necessary if our discipline is to rise to the challenge of the current sustainability crisis.

We first review the social purpose and practical characteristics of sustainable finance, with a particular focus on impact investing, which we illustrate with a case study (the *Slow Money Alliance*). We show that sustainable finance indeed tends to disconnect capital accumulation from capital allocation by establishing a circular relationship between savers, entrepreneurs and investors—while also internalizing social and environmental externalities in the process. In doing so, the 'finance function' is subject to two contradictory forces. On the one hand, it is reduced to the status of a mere tool enabling an organisation to sustain its business over the long term. In the meantime, it is seeing increased complexity resulting from the inclusion of social criteria in capital owners' decision making and the adoption of a participatory management method.[2] We then highlight the contradiction between the deep qualitative changes brought about by impact investment, and the rigid content of mainstream academic finance. To do so, we focus on the subject of the analysis of corporate governance and show that calquing agency theory onto impact investing amounts either to ignoring it or to wrongly considering it as a *malfunction in corporate governance*.

How then, can we reconcile finance research with societal needs? Answering this question requires us to shift the discussion to a deeper epistemological level. In particular, we argue that adopting a more plausible form of social ontology in finance research would not only facilitate the incorporation of impact investment in the field, but also open up new avenues for financial research in general. We suggest that using a critical realist approach in finance (as developed by Lawson (1997, 2015) in the field of economics) may lead to a virtuous spiral in which new financial practices would foster paradigmatic diversification in finance while, in return, the emergence and dissemination of new finance research would contribute to reshaping financial ideology and practices.

The remainder of this article thus runs as follows. Section 2 reviews the basics of impact investing. Section 3 analyses the relationship between impact investing and financial theory from an epistemological viewpoint. Section 4 offers fresh prospects for finance research through the lens of critical realism, and Section 5 draws together our conclusions

2. Impact investing: principles and *modus operandi*

2.1. Sustainability and the finance function

Although produced as a result of financial liberalisation, sustainable finance cannot simply be reduced to that alone insofar as it involves the agency of stakeholders (investors and entrepreneurs) in response to the sustainability crisis (Lagoarde-Segot, 2014; Artis, 2013). It is therefore important to review the concept and its implications for the finance function. The standard definition of sustainability implies that the current generation "*manages the resource base such that the average quality of life that we ensure ourselves can potentially be shared by all future generations*". However, economists make a distinction between weak sustainability and strong sustainability (Neumayer, 2013). In a simplified form, weak sustainability requires the economic dynamic to stabilise the aggregate stock of capital, K:

$$K_n + K_h + K_m = K$$

Where K_n is natural capital, K_h is human capital and K_{mis} manufactured capital. The depletion of natural capital, K_n, can then be offset by a reciprocal increase in human capital, K_h, and manufactured capital, K_m, such that the overall capital stock, K, is held steady. Natural capital and manufactured capital are thereby seen as "substitutes in production" providing the same type of benefit (Stiglitz, 1979). Sustainability consequently results from a market mechanism, where at a given level of aggregate demand, the depletion of natural resources, K_n, leads to an increase in their price. This inflation pushes producers to innovate, to produce good quality substitutes (i.e. increases in K_h and K_m) which helps to reduce the pressure exerted on natural resources and ultimately brings about stability in the overall stock of capital, K.

Strong sustainability, on the other hand, describes a system in which a reduction in natural capital, K_n, cannot be offset by an increase in the other types of capital (Georgescu-Roegen, 1979). Natural capital can indeed be defined as a set of complex systems consisting of both biotic and abiotic elements, the interaction of which determines the ecosystem's capacity to directly or indirectly provide a wide range of functions and services to human societies (Pelenc et al., 2015). Natural capital, human capital and manufactured capital are then modelled as *complements* in production. In this view, there is no trade-off between the three types of capital considered in sustainability. Sustainability instead requires three necessary conditions: (i) the rate at which renewable natural resources are used must be equal to the rate at which they are renewed; (ii) the rate at which waste is produced must not exceed the rate at which the environment can assimilate it; and (iii) the rate at which non-renewable natural resources are exploited must not exceed the rate at which they are replaced by renewable resources.

Regardless of the form selected, the sustainability principle has strong implications for intertemporal preferences. This aspect is

[2] In ontological terms, impact investment could thus be qualified as an *emerging* phenomenon, i.e. "*the sudden onset of something that was not totally foreseeable and that includes new characteristics; but that produces, from the basis of a reality having a certain complexity, a property or entity that cannot be reduced to that basis, and the appearance of which marks a qualitative leap*".

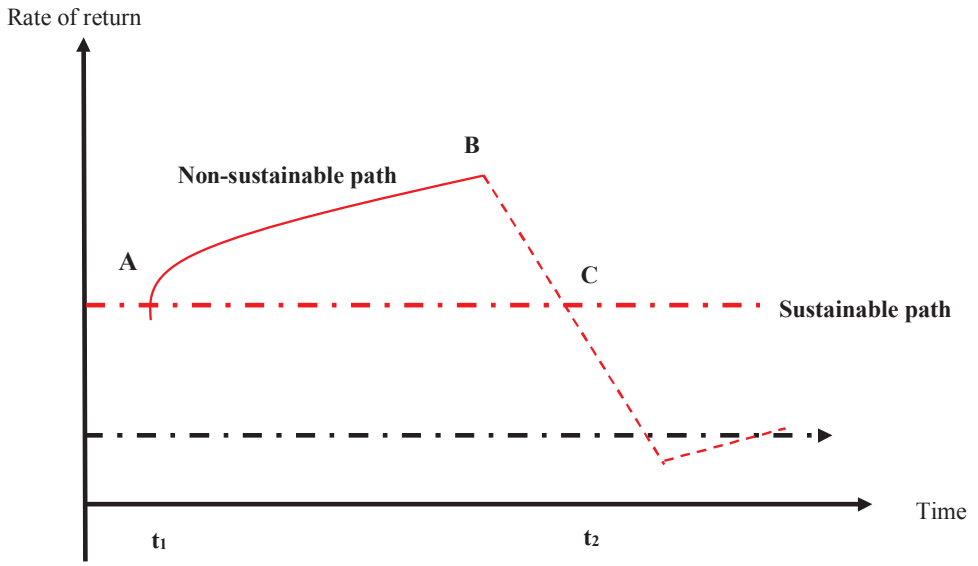

Fig. 1. Economic trajectory and sustainability.
Source: Wilson (2018).

illustrated by Fig. 1 where, for a given level of technology, an investor can choose, at the time t_1, between two capital allocation strategies, namely the maximum short-term rate of return culminating in collapse in the longer term, or a lower profit that is, however, stable over time.

This graph highlights the fundamental tension between conventional financial reasoning and the constraint imposed by sustainability. Opting for the sustainable path indeed requires the current generation to prioritize the welfare of the next generations (in a distant future t_2) over its own welfare. Indeed, opting for the 'sustainable path' implies short-term welfare losses that are represented by the area *ABC*. Given that intertemporal preferences in finance are measured through the cost of capital, a necessary condition for sustainability is therefore the use by investors of a "required rate of return" which may be lower than the 'equilibrium market return' (that is given by the weighted average cost of capital). This adjustment alone would make it possible to increase the marginal effect of long-term flows on the net present value of planned investments, and thus to align investment choices with sustainability criteria (for a more detailed analysis, see Baur and Lagoarde-Segot, 2016).

The issue is therefore one of modifying the investors' decision-making function. Yet this requirement entails adding significant complexity to the "finance function", as conventional financing, irrespective of the method chosen (loans, purchase of bonds or shares, equity investments, the formation of specialist funds, etc.) is based on monetary values supplied by accountants. These monetary values are then used to develop decision-support systems based on solvency and capital accumulation criteria.

When looking at sustainable finance through the prism of mainstream financial theory, a confusion arises from the fact that the inclusion of the sustainability principle shifts the investment objective from the accumulation of *money* to the accumulation of *value*. In financial terminology, the two are of course synonymous. Yet while money is the device used to measure value, it does not in itself constitute value which, from a sustainability viewpoint, also encompasses social and environmental aspects and manifests itself over the long term. Under these circumstances, the innovation brought by impact investment is to identify the externalities of economic activities correctly, to allocate them a "price",[3] and lastly to include that price within a participatory decision-making process.

The effect of adding such complexity to the "finance function" is to embed it in a new, social space, where interpersonal links (social capital, cooperation, etc.) are no longer viewed as "off-topic" notions, but form a shared framework within which organisational governance and capital allocation are determined. Accounting data and related managerial tools are consequently demoted to the ranks of corporate conventions, and weighed against the "social and environmental returns"[4] of the activity being financed. Financing as a result takes on an axiological aspect: people, freedom and happiness constitute the only "value", and it is only to the extent that they contribute to the development of this "value" that profits and dividends can find the justification of their existence (Benedikter, 2010). Impact investment thus obviously entails deep *qualitative* changes in the practice of finance. We argue that mainstream financial thinking, with its focus on quantitative measures of unidimensional performance, is profoundly ill-equipped to tackle such qualitative changes in its study object.

[3] Techniques used in giving extra-financial factors a monetary value could, for example, be based on the preferences method revealed by the market (which consists of deriving the price of non-market goods from the price of a market good) or preferences stated by agents (which consists of evaluating the price agents give to a non-financial service).

[4] Specific managerial devices, such as the social return on investment (SROI) are accordingly used for the purposes of both evaluation (calculated retrospectively on past results) and prediction (to anticipate the value created by an investment).

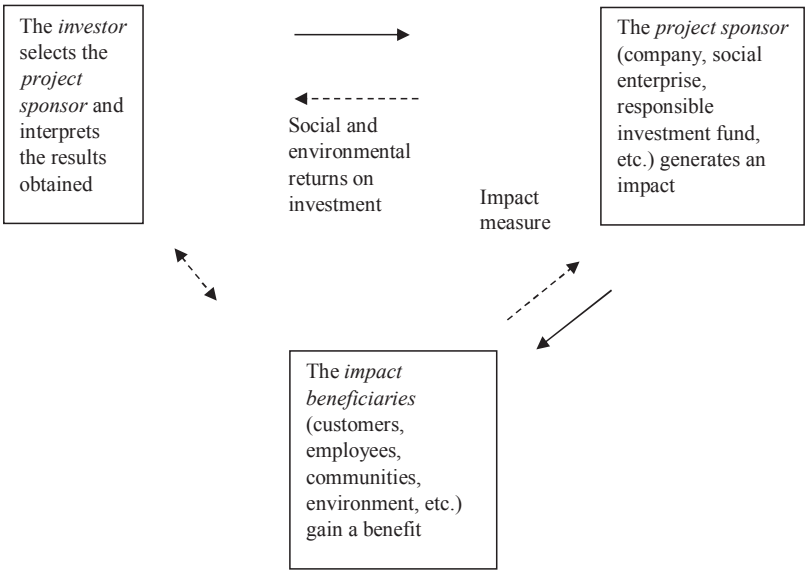

Fig. 2. Stakeholders in impact investments.
Source: Lagoarde-Segot (2014).

2.2. A case study: the Slow Money Alliance

The Slow Money Alliance non-profit organisation, formed in California in 2009 and operating in France, Australia, Canada and Japan, aims to "fix the economy from the ground up" and can be used an illustration. Its members believe there is a negative relationship between the speed of capital circulation and soil preservation (Tasch, 2008). The "financialization" of economies is claimed to have resulted in the development of food processing industry cartels the activities of which compromise sustainability (deterioration of food quality, the continuous decline in soil fertility, harmful consequences on human health (cancer, obesity, etc.)). The response from Slow Money Alliance stakeholders is to leverage savings and channel them to local businesses having a positive impact on soil fertility. Financial stakeholders thus commit to a process of economic and cultural change by "extending their fiduciary responsibility to include maintaining the living environment and biological and cultural diversity, preserving commons, and non-violence" (Tasch, 2008).

The Slow Money Alliance aims to be a participatory finance intermediary: the relationship between financial backers and project sponsors is circular, and takes the form of stakeholder assemblies (Fig. 2). Basically, allocation of investments involves three categories of stakeholder, namely the project sponsor (entrepreneurs, farmers, NGOs, etc.), the community and environment (as the beneficiaries of the desired impact), and the financial backer. While the financing decision is a matter for the investor, the three stakeholders do have a role to play in measuring and interpreting the resulting effects, with the objective of generating a shared benefit. Decisions are accordingly based on in-depth discussions with all project stakeholders, in order to evaluate projects on a case-by-case basis.[5]

The financial services offered by the Slow Money Alliance concern companies' full balance sheets. Local Slow Money Alliance groups can consequently provide short-term liquidity to entrepreneurs, by buying their goods and services in advance. They also grant them short- and medium-term loans, by means of online crowdfunding platforms ("Beetcoin"). These loans can also serve as collateral in loan applications to the conventional banking sector. Lastly, they inject equity into these enterprises to firm up their financial structure. Table 1 lists a few examples of initiatives and financial products on offer. In our view, the emergence of impact investing worldwide is a key phenomenon in that it constitutes a response from *stakeholders* to the sustainability crisis.

3. Critical realist insights

As noted earlier, impact investment, sustainable and social finance are fairly consistently excluded from the scope of scientific publications in finance. The small body of existing research in this field has considered these new practices almost exclusively from the lenses of shareholder value maximization (with the question of their contribution to financial portfolio value coming into particular focus). In what follows, we argue that a set of epistemological factors make academic finance unable to grasp these new financial initiatives as an object of study. In particular, we show that the source of the problem is that the ontology used in academic

[5] This particular feature sets the Slow Money Alliance apart from other impact investment agencies, such as extra-financial rating agencies, major banks and investment funds. Such investors in fact typically favour quantitative tools that use past data and predictions within conventional statistical devices (data regression, cost-benefit analysis, etc.)

Table 1
Slow Money investment funds.
Source: www.slowmoney.org.

Organisation	Eligibility	Minimum investment	Maturity	Description
RSF Social Finance: Social Investment Fund	General public	$1000	90 days	Social enterprise investment product http://rsfsocialfinance.org/services/investing/overview
Equal Exchange CD	General public	$1000	3 years	Hybrid product comprising a certificate of deposit and a stake in a fair trade or agri-food cooperative http://www.equalexchange.coop/eecd
Montana CDC	General public	$5000	2 years	Investment product offering low financial returns but strong community impact (state of Montana) http://www.mtcdc.org/howtoinvest.html
The Carrot Project	General public	$5000	3 years	Investment supporting small and medium-sized farms in the north-eastern USA http://www.thecarrotproject.org/for_investors
Conservation Fund: Natural Capital Investment Fund	General public	$50,000	Variable	Financing credit and equity requirements of small businesses involved in protecting natural capital http://www.ncifund.org
RSF Social Finance: Mezzanine Fund	Accredited investors	$500,000	7 years	Providing equity resources to enable social enterprises to grow and stay true to their missions http://rsfsocialfinance.org/services/investing/overview
The Sustainability Group Impact Portfolio	Accredited investors	$500,000	5 years	Investment portfolio with high environmental impact http://www.sustainabilitygroup.com/contct-us
Farmland LP	Accredited investors	$50,000	3 years	Purchase of conventional farmland for conversion to organic farming http://www.farmlandlp.com/contactus.html

finance is at odds with the way the socio-economic world *really is*. Our proposition is based on a sound philosophical framework—critical realism—which has been at the centre of much discussion within the social sciences (Harre and Madden, 1975; Keat and Urry, 1975; Bhaskar, 1978, 1979; Outhwaite, 1987) and applied successfully to the field of economics following the seminal work of Lawson (1997, 2003) and his colleagues from the Cambridge Social Ontology Group.[6]

3.1. From a flat to a multi-layered ontology

Critical realism rests on two important assumptions. The first is a separation between *ontology*, which is concerned with the nature of reality, and *epistemology*, which is concerned with the nature of knowledge. The second is that ontology *precedes* epistemology: not only does social reality exist independently of the knowledge we construct about it, but our vision of reality also determines how we construct knowledge about it. In this sense, critical realism adopts an intermediary position between constructivism (for which there are no objective 'facts' but only socially constructed knowledge of the world) and positivism. For critical realists, an external reality does exist, but it is not immediately accessible by sense experience. Instead of asking the epistemological question '*how can we scientifically know about the world?*', critical realism thus leads us to ask the ontological question '*what must the world be like if we are to take seriously what science seems to reveal about the world?*' (Walter and Young, 2016, p. 53).

If we are willing to accept that the real world is different from our knowledge of it, it follows that reality must exist at different levels. Critical realism suggests that there are three nested levels of reality: the *empirical*, which is an attempt to measure the actual (i.e. the database), the *actual*, which we experience directly, and the *real,* to which we do not have access. It is at the deeper level of the *real* that the causal mechanisms, generative structures and powers which science seeks to uncover operate. However, given that these levels of reality are generally *out of phase*, deducing statements from observing conjunction of events (i.e. statistical correlation) at the empirical level is misleading. Rather than a focus on empirical regularities, the existence of a nested social reality necessitates to move ontologically, from the empirical surface of the events to their deeper causes. The identification of event regularities does not constitute the end of the research process but a *starting point*. Rather than induction or deduction, critical realism thus calls for *retroduction* or *abduction*:

> "If *deduction* is, for example, to mive from the *general* claim that all grass is green to the particular inference that the next lawn to be seen will be green, and *induction* is to move from the particular observation on green grass to the general claim that all grass is green then *retroduction* or *abduction* is to move from the particular observations on green grass to a theory of a mechanism intrinsic to grass that predisposes it to be green".

The *abduction* methodology is clearly at odds with mainstream finance research. To explain something, in finance, typically consists in moving sequentially from a set of assumptions and axioms to a statement supported by a set of empirical regularities.[7] This

[6] There are other study groups at an international level, such as the Berkeley Social Ontology Group in the USA or the KEDGE Social Ontology Group in France.
[7] Indeed, academic finance can be characterized as *empirical realist* in so far as it entails "*a determinate account of phenomena developed by deductive methods that can fully be described at the level of events*" (Downwards, 2016, p. 4).

implies that what *is*, is wrongly presumed coexistent with *what is perceived*: for the finance researcher, if some event is perceived, one can only seek its cause in terms of another perceived event. For instance, mainstream finance can only explain a variation in a firm's ROE by a variation of other data points (such as the cost structure of the firm, market conditions, etc…). Factors operating at the deeper ontological levels (such as, for instance, the exercise of human agency among impact investors, which renders the concept of "return on equity" obsolete in measuring firm performance) are inaccessible in this framework. Such a flat and misconceived social ontology (in which the real is collapsed into the empirical) explains the inability of financial models to understand the qualitative changes brought about by social finance, insofar as the latter transform the object of study at a deeper level without modifying its empirical surface.

3.2. The epistemic fallacy problem

As explained above, every time one makes a knowledge claim, one has already made explicit or implicit claims *about the way the world is thought to be*—in other words, one has adopted an ontological position. Lawson (1997) warns of confusing epistemology and ontology, more precisely of committing the *epistemic fallacy* (that is, the supposition that ontology can be reduced to epistemology):

> "… by the supposition that statements about being can always be rephrased as statements about knowledge (of being), that ontology can be reduced to epistemology. With ontology unavoidable, this error functions only to cover the generation of an implicit ontology, in which the real is collapsed onto the actual which is then… identified with…human experience, measurement or some other human attribute" (Lawson, 1997, p. 62)

We argue that analysing social finance through the prism of mainstream academic finance would be tantamount to committing an *epistemic fallacy*. Let us take the issue of corporate governance as an example.

First of all, it is reiterated that agency theory analyses governance as a technical problem, arising when the owner of an enterprise (the principal) delegates management to a manager (the agent). In this situation, the manager is encouraged to prioritise his/her personal interest over that of the owner, which tends to reduce the value of the business, that value furthermore being determined by financial markets that are supposedly efficient (Jensen and Meckling, 1976). This conceptual framework reduces corporate governance to a set of procedures making it possible to maximise the firm's "value", measured by the market capitalisation of its equity.[8] Shareholders are accordingly presented as the custodians of collective benefits, within a methodological framework where utilitarian rationality is the sole driver behind individual and collective action.

From a critical realist perspective, the above theoretical framework is inadequate for inquiring into sustainable finance. Indeed, academic finance proceeds in re-conceptualizing, redefining or reducing events to *variables*. Such variables (market capitalization, ROE, EBIT, etc…), which are assumed to retain a stable reference to some feature of economic reality (the performance of the corporation), and are only permitted to change in terms of number, quantity or magnitude (Fleetwood, 2016). However, sustainable finance modifies both the nature of investment and the mission of the corporation in *qualitative* terms. A correspondence problem thus arises: the real object (firm performance) to which the variable refers undergoes a *transformation* (the inclusion of extra-financial objectives and the broadening of the 'mission' of the firm) which cannot be perceived by looking at the predetermined variables (which, again, are only allowed to change in number, magnitude or quantity). In other terms, the categories upon which the empirical analysis is based are unable to maintain a stable reference to their object. Given that the theory and the data necessary to support the theory both exist, researchers, mostly preoccupied by statistical robustness have the illusion that the things represented (the universal shareholder value maximization corporate governance model) also exist. Financial theory thus becomes a statistically sophisticated, yet inadequate, conceptualization of reality.

3.3. The epistemological dilemma

This situation confronts academic finance researchers with an epistemological dilemma. Indeed, it calls for either one of the following two intellectual stances to be adopted. The first stance consists in calquing agency theory onto sustainable finance, which amounts to considering the latter as a *malfunction in corporate governance*. Indeed, under the assumption of narrow economic rationality, the inclusion of extra-financial criteria results in a reduction in the rate of investment, an increase in production costs, a decrease in market share, lower financial profitability, and a drop in the firm's value. Impact investing would therefore have a tendency to disappear because it is evidence of a form of irrationality.[9] The second stance consists in stating that sustainable finance obeys principles that place it outside the scope of financial theory research from the outset. Indeed, financial economists, motivated by a desire to measure and preoccupied with the search for statistical robustness, have no way of discovering qualitative phenomena, which, as pointed out by Fleetwood (2016), can only be discovered by sociological or anthropological techniques. Adopting these techniques in financial research, however, would imply breaking away from the scientific model in finance and acknowledging that

[8] These procedures include, for example, legal mechanisms, internal audit procedures, competition on product markets, etc. A huge amount of empirical research accordingly exists, aiming to understand the origins of agency costs, to measure their impact on the market value of shareholders' equity, and to propose strategies to mitigate those costs.

[9] Rationality here has its most commonplace meaning in finance: the maximisation of a second-degree utility function defining an investor's total utility as the sum of the investor's anticipated income and the standard deviation of this income. This argument, with its roots in the ideas of Friedman (1970), nevertheless appears to be contradicted firstly by worldwide growth in the social and responsible economy, and secondly by empirical controversies concerning the existence of a financial premium associated with social responsibility (Revelli and Viviani, 2015).

'objectivity' in social sciences is really intersubjectivity (i.e. interaction between individual consciousnesses), and by extension, that corporate governance is a transient phenomenon founded on a specific historical and cultural context.

At another level, the apparent inability of academic finance to inquire into sustainable finance reveals another tacit stance, according to which the sole legitimate subject of finance studies would be a capitalist corporation, and the only form of rationality considered would be utilitarian rationality. This becomes problematic once a distinction is established between an "enterprise" (one of the means of taking collective action, independent of time and place) and a "company" (one of the main forms taken by enterprises since the Industrial Revolution) (Paranque, 2014). Placing impact investing outside the scope of financial theory therefore reflects confusion linked to a semantic slide from "enterprise" to "company". In fact, while economic rationality can cast helpful light on a "company", it cannot alone fully explain an "enterprise". An enterprise is indeed necessarily set in a social and historical context, and its existence presupposes certain institutions (such as contract law and capital ownership). This being the case, assuming a separation between stakeholders, or separating shareholders from stakeholders, and is only of little use in deciphering the complexities and particularities of the corporate environment in space in time. Corporate governance being constructed, deconstructed and reconstructed differently depending on cultural, legal, institutional contexts, there are necessarily several definitions of "good governance", all of which are relative. It follows that superposing a uniform model for corporate governance (the so called "shareholder value maximization" governance model) for appraising corporate governance in such a variety of contexts constitutes an ideological distortion of reality (on the relationship between finance and ideology, see for instance Lagoarde-Segot and Paranque, 2017).

3.4. The effect of open systems

Covering laws in economics—and finance—are typically postulated such as "*whenever event x then event y*" (Lawson, 1997, p.17). This mode of explanation, however, implies a 'closed system' ontology, in which conditions of extrinsic closure (e.g. no unaccounted for external forces) and intrinsic closure (e.g. no unaccounted relationship between the different parts of the system) are both met. However, a number of convincing arguments tend to suggest that the social world is in fact not a closed system, but rather, an open system, in which outside influences, interaction and evolution within the system cannot be anticipated. These arguments have to do with (i) the fact that the physical world itself is not a closed system,[10] (ii) the existence of human creativity and agency, (iii) the ongoing evolution of social institutions and (iv) the capacity of humans to make *effective choices* (i.e. the ability to act differently in a given set of circumstances). In such an open system as the social world, causal mechanisms "*take the form of powers, or tendencies, which may or may not be active at any one time, and which when active may operate simultaneously and in ways which may counteract each other*" (Downward, 2016). Among these mechanisms are the reasons financiers have for supporting entrepreneurial projects and the meanings these entrepreneurial projects have for financiers (in this sentence, 'financiers' could of course be replaced by 'consumers' or by 'entrepreneurs'). Amidst such social and psychological complexity, the rational agent/shareholder value maximization model underlying empirical studies of corporate governance appears rather superficial.

Let us give an example. Empirical researchers generally ignore the effects of the language they develop in referring to things. These effects become apparent when one considers the problem of the *description*. In fact, a distinction is generally made between *constative utterances* (meaning the methods, texts and statements that describe a reality external to them) and *performative utterances* (meaning methods, texts and statements that act upon their own reference). The principal-agent relationship, which is at the core of corporate governance theory, belongs to the second category, in that its purpose is to serve as a guide to corporate governance (MacKenzie and Millo, 2003; Boussard, 2016). Further, as Muniesa (2015) points out, the subject matter of agency theory study is not an external reality, but a collection of contracts between agents. But a contract, though, is nothing other than a document describing expected behaviour and payment terms. The way in which the subject matter of study (the contract) is written will therefore structure the enterprise's actual operation. We therefore uncover two embedded levels of performativity here: firstly, agency theory affects contracts, and secondly, the contracts themselves (which are the subject matter of agency theory), give tangible shape to economic and financial reality, which is then further analysed by financial research. Finance researchers should therefore be aware of the interdependency relationship between discourses *about* the economy and discourse *in* the economy, and how this relationship fabricates the empirical data they manipulate. An awareness of these issues will certainly facilitate the development of new avenues for financial research in the wake of the sustainability crisis.

3.5. New directions in finance research

Such observations lead us to question the scientific-ness of mainstream financial research, and to underline the necessarily *ideological* nature[11] of research into finance. In fact, like any political system, mainstream shareholder governance (and alternative sustainable finance) cannot be maintained solely through coercion, but requires a certain degree of consent. We are proposing here that the ideological role of academic finance is to mitigate the tension between the pretence of legitimacy claimed by those with power (financial markets and shareholders in the case of mainstream finance, stakeholders in the case of sustainable finance) and the effective belief in this legitimacy by others, by providing a common code of interpretation. Furthermore, according to Hegel, an ideology is only a transient product of the fluctuating conditions of the existence of men in society. As a result, financial theory can never reflect any universal principle, but always constitutes a historically determined intellectual system, the validity of which is

[10] Indeed, laboratory experiments in the natural sciences specifically aim at artificially create closure conditions.

[11] We are using this term in the sense used by Weber, i.e. the legitimisation of a system of domination or rule (*Herrschaft*).

based on criteria that are themselves subject to changes connected to the demands and opportunities of human life. Given the current stakes, we argue that the following question is the relevant one: How can the process be triggered that would enable researchers to respond to the rise of sustainable finance and generate (through teaching and through the dissemination of research within organizations) the performative effects that will make the necessary overhaul of the "finance function" possible?

We put forth that critical realism offers very valuable and pragmatic perspectives for 21st century finance research. The *retroduction* approach to scientific inquiry clearly calls for applying a multimethod research in finance (in which data analysis could be combined with case studies, interviews or other ethnographic sources) and for interpreting research findings from a multidisciplinary perspective, while also paying specific attention to the specific institutional, political and historical context of the research. Another solution for liberating finance research from the positivist straightjacket where it finds itself tied in lies in *praxis*, that is an involvement in the economy whilst improving our understanding of it (Kanth, 1999). A practical understanding of the functioning of organizations, and an increased awareness for sustainability issues among finance researchers (for instance through the development of subject-specific research chairs or the opening of new specialized programs) would certainly help the discipline rise to the challenge of sustainability by blending theory and practice in a continual spiral of transformative learning.

4. Conclusion

This article began with the observation of a discrepancy between the need to align financial institutions and market participants with the long-term decision-making required for financing sustainable economies and societies; and the absence of such topics from finance-related research and education. After briefly presenting the conceptual motivations and main managerial innovations delivered by sustainable finance, we proposed that misconceptions about social ontology quite possibly explain the apparent inability of mainstream financial models to respond to societal needs.

Using a critical realist framework (as initiated by Lawson (1997, 2015)), we argued that the rise of sustainable finance entails deep *qualitative changes* in the practice of finance that are by essence incompatible with a positivist framework. Inquiring into sustainable finance would rather require adopting an *open-system* view in which human agency is embedded in an organic social context. In sum, we attempted to excavate those areas of epistemological, ontological and methodological tension separating social finance and investment from standard financial theory, and provided methodological alternatives for the inclusion of these topics in a modern finance research agenda.

To conclude, we note that developing knowledge in different, even opposite, directions − without necessarily seeking to determine which is more worthwhile − would considerably enhance our understanding of the financial world. Interaction and dialogue between the different approaches would certainly enable the differences in points of view to be summarised, transformed, polarised and clarified, without aiming to obtain a uniform reference base. It would concomitantly make researchers accountable by making them entirely responsible for research protocol decisions. Researchers would in fact have to explicitly justify the approach selected, hypotheses posited, and the objectives of their research, on the basis of the problem posed and existing alternatives. These parallel research routes are therefore entirely consistent with the idea of diversifying academic finance studies defended in other works (Ardalan, 2008; Lagoarde-Segot, 2015; Paranque and Pérez, 2015; Schinckus, 2015). Our future research and practitioner work will endeavour to cover this scientific programme.

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