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## Harnessing big data for a multifunctional theory of the firm

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### ABSTRACT

This paper explores the potential of big data, such as those compiled by the Google Books project, to inform the dominant theories of the firm that tend to be grounded on strong assumptions about the capitalist nature of the modern society. Combining the novel methodologies of the digital age with Niklas Luhmann's theory of functional differentiation, we draw on big data-driven abductive reasoning to redirect the attention of management scholars away from the dominant contract-based and competence theories of capitalist firms toward organizations navigating the regime of functional differentiation, which is marked by contingent and historically evolving prominence of individual function systems. We conclude that this navigation requires appropriate strategic management tools which are no longer primarily geared to the economic function system but rather entail a radical reconfiguration of the firm as a multifunctional organization.

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### 1. Introduction. The neglect of society in strategic management theories of the firm

There is little use for theories of the firm that are out of touch with the corresponding organizational environment. Since its early development, strategic management theory and research have been oscillating between emphases on inside- and outside-orientations (Hoskisson, Wan, Yiu, & Hitt, 1999: 421). Wherever the pendulum is currently taking us, it remains clear today that strategic management would not work without at least some degree of outside-orientation and that the environment of a firm is not just a network of other firms or markets but rather a broader socio-ecological context (Raisch, Birkinshaw, Probst, & Tushman, 2009, p. 690; Müller & Kunisch, 2018, p. 459). Conclusively, therefore, it seems that all forms of organizations are both economies and adaptive social structures (Selznick, 1948, p. 25f).

However foundational this idea has been for strategic management theory, dominant theories of the firm still focus on the economic and underestimate the social and natural environments in the core of their architecture and the essence of their analyses (Hodgson, 2012, p. X; Foss, Klein, & Bjørnskov, 2018, p. 1). If at all systematically considered, the concept of society is typically associated with a nation state or other political actors, whereas the natural environment is reduced to a realm of always scarce and now potentially endangered resources. In this context, the standard role of (management) research and education is to provide either businesses or policy makers with (social) technologies that help manage their respective issues (Pfeffer, 2005, p. 98). Thus, the world view of firms is systematically shrunk down to the narrow vision of a technology-driven political economy, which is currently being radicalised rather than complemented by the vision of a green-tech-driven political ecology.

Whether conventional or green, this narrow focus on economy, politics, and technology is not only inherent to mainstream strategic management theories and tools (including the notorious political, economic, social and technical (PEST) analysis and its derivatives) but also the least common denominator of both orthodox and heterodox discourses on business and society.

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The few minds that attempt to broaden the narrow gaze often have to travel long historical or intellectual distances before they can regain firm ground. For example, [Murcia, Rocha, and Birkinshaw \(2018\)](#) have recently contrasted the predominantly money-, power-, and technology-focused civilizational model of the ancient Spartan culture with the holistic and humanistic model of its Athenian adversary. The authors concluded that contemporary management education and research are currently promoting Spartan programmes, whereas future “architects of a wholesome business environment” (589) instead need to cultivate Athenian worldviews, values, and virtues.

All its virtues notwithstanding, the issue with this Athenian approach remains that it is easily and often discounted as a normative or idealistic abstraction of reality, whereas the pertinence of the dominant Spartan perspective on money, power, and technology is almost auto-supported by the virtually incontestable fact that modern society is a capitalist society. In a capitalist society, organizations with a reductionist focus on either or both money and power appear well-adapted (even if, or precisely because, this adaptation may be made responsible for the problems it claims to solve). As both capitalists and anti-capitalists insist on the presence and thus maintain the existence of capitalism, ideas that challenge these and similar political-economy-biased definitions of contemporary societies are easily regarded as both unrealistic and uncritical.

As common sensical as the idea of modern capitalism might seem, it still remains a hypothesis based on hardly more than traditional book knowledge with probably ideologically biased sources and origins. Moreover, pars-pro-toto definitions of society must generally be handled with care, as the risk of reductionism is evident. Finally, even if different classics of our broader fields of social sciences may have been right to highlight different pressing social issues and thus to generate pars-pro-toto definitions that were adequate to their historical context, there is still not much reason to believe that these historical definitions of society can, by default, remain unchanged throughout the decades and sometimes centuries of cultural and social change that have elapsed since their development.

Until recently, however, there have been only limited possibilities of testing whether and which traditional pars-pro-toto theories of society still are or ever have been adequate. Our definitions of the broader business environment, therefore, depended much on educated guesswork or serendipity and are often prone to suspicions and attempts at ideologization and other forms of opinion making.

This situation has changed with the advent of the age of big data. “Based on current trends of data doubling every two years” ([Johnson, Grey, & Sarker, 2019](#), p. 41), researchers in digital humanities and computational social sciences can now draw on datasets that are large enough to test and alter grand theories and hence to review the adequacy of popular pars-pro-toto definitions of society. In addition to the large-scale testing of assumptions deduced from theory, big data research is also used to “discover truly novel and surprising patterns that are ‘born from the data’” ([Kelling et al., 2009](#): 613). In either case, big data do not lead to “the end of theory” ([Anderson, 2008](#)) but rather to theoretical innovation and paradigmatic shifts across disciplines ([Kitchin, 2014](#)). Big data research that follows a deductive design from theory to data will revoke some theories and confirm others, whereas big data research that uses an abductive approach from a surprising observation to its plausible explanation remains theory-guided insofar as theoretical qualifications will always define which observations stand out as surprising against a background of already well-explained facts.

In this article, we pursue an abductive argument as we screen one of the world’s biggest data set for surprising results that help to

test and refine ([Wright, 2017](#)) dominant strategic management theories and theories of the firm. To this end, we draw on recent big data research ([Roth et al., 2017; 2018](#)) that has scrutinised popular definitions of society and has come to the surprising conclusion that society has not been economy-dominated or capitalist in the 19th and 20th centuries. As these results would have far-reaching consequences for our predominantly politics- and economy-focused, “Spartan” strategic management theories and tools, we use the results as an opportunity to make an abductive argument for a substantial update of dominant theories of the firm. We conclude that similar updates are critical for interfirm and market-level theories and analyses in strategic management research.

## 2. Big data research on social macro trends. Time series over one of the largest online bodies of human knowledge

The main ambition of [Roth et al. \(2017: 307\)](#) was “the analysis of social macro trends” such as the secularisation or the “economization” of societies. The conceptual framework for the combined analysis of and comparison between these and similar apparently disparate macro trends used Niklas [Luhmann’s \(1982\)](#) theory of functional differentiation. Functional differentiation, “i.e., the decomposition of the modern societies into function systems, such as the economy, law, politics, science, education and others” ([Roth, Valentinov, Augustinaitis, Mkrtychyan, & Kaivo-oja, 2018](#), p. 42), is often considered a key feature of modern society ([Apelt et al., 2017; Kieser & Leiner, 2009; Nicolai, 2004](#)).

[Roth et al. \(2018: 42\)](#) argue that the historical transition from medieval to modern times

“(M)ust have been associated with the rise to prominence of every function system, with the exception of religion, which has been losing traction over the course of modernisation. The notion of functional differentiation makes clear that the isolated observations of religious or economic trends do not suffice to prove or disprove that modern societies are adequately described as secularised or economy-biased. The observation of an increasing importance of the economy, for example, does not yet imply that the concerned society is actually dominated by the economy. In a similar way, the secularisation trend does not logically preclude that religion retains an important role. The question whether or not modern societies are on the whole characterised by overarching trends can only be decided through the overall comparison of the dynamics of all function systems”.

True to the authors, their Luhmannian framework allows for an integrated and systematic analysis of the relative importance of ten different “function systems”: politics, science, mass media, religion, economy, legal system, education, health, art, and sport.

In order to analyse the relative importance of these systems to societies as differentiated by language areas, [Roth et al. \(2017\)](#) drew on the metaphors of the “global brain” ([Heylighen & Lenartowicz, 2017](#)) and a “global brain wave measurement” to present what actually is a comparative analysis of combined word frequency time-series plots for the English, Spanish, Russian, French, German, and Italian versions of the Google Books corpus. The Google Books project has digitalized over 25 million books (as of 2015) and thus created what some say could become “the largest online body of human knowledge” ([Wilson-Lee, 2017](#)). Google also provides the Google Ngram Viewer, an online search engine and graphing tool that charts the frequency of any ngram ( $\approx$  search term) as found in a specific language area between 1500 and 2008. The data are most reliable between 1800 and 2000.

The authors used the Google Ngram Viewer to plot time series for chunks of selected keywords. Keywords were selected if they

unambiguously referred to politics, economy, science, art, religion, and a number of similar categories. As the Ngram Viewer cannot process more than 35–40 search terms per query, the authors used Python to extract a word frequency list for each investigated language area and identified the five most frequent keywords per category [for example, the economic keyword chunk is (business + economic + money + company + cost)]. Five chunks of the five most frequent keywords per category were then entered into the Google Ngram Viewer. An exemplary result of this procedure is shown in Fig. 1:

Fig. 1 depicts the combined frequencies of the five most frequent political, economic, religious, scientific, and mass media-related keywords as found in the English language Google Books corpus between 1800 and 2000. As word frequency is commonly equated with word importance (Banerjee, 2018; Bohannon, 2011; Kloumann, Danforth, Harris, Bliss, & Dodds, 2012; Ophir, 2010), the authors suggest that the data adequately reflect a number of social macro trends, such as a declining importance of religion, starting in the mid-19th century, or the dominance of politics in the totalitarian 20th century. What the data do not show, however, is a dominant position of economy at any point in the sample period, which led to a follow-up article (Roth et al., 2018) in which some of the co-authors wondered whether the English language can be adequately described as capitalist between 1800 and 2000.

As the data for the other language areas are also overall consistent with the expected social macro trends, except for the unexpected importance of economy, the authors suggest that the idea of an economy-dominated or capitalist society ought to be turned from an implicit assumption into an explicit future research question.

The low performance of economy in the context of otherwise plausible interactions between the method and the established historical knowledge on macro trends such as secularisation comes as a considerable surprise. Whereas recent years have certainly seen the increasing importance of non-economic factors in both business and society and probably even the transition to a post-capitalist society (Last, 2017), there is a long-standing and paradigmatically diverse tradition of observing modern society as economy-biased or capitalist that clearly contradicts Roth et al (2017; 2018) most spectacular findings and conclusions.

### 3. From surprise to explanation. An abductive argument on the relative insignificance of economic issues

The results of this research are indeed in need of explanation insofar as the method managed to capture a number of social macro trends that are very much in line with our historical knowledge on the respective areas and periods. These trends include the 19th century secularisation and the 20th century politicisation of the

investigated language areas as well as the surprisingly stable interactions between the importance of politics and the occurrence of the two world wars. Given these and further examples in which the method plots plausible charts of social macro trends, it is indeed surprising and probably even improbable that the same method fails to display the “actual”, adequate importance of economy.

This is not to say that the method is free of flaws. In fact, one might speculate that there is a certain selection bias insofar as book writing is a discipline mastered by a specific, well-off stratum of modern society that, therefore, neglects the importance that economy typically has for the lower strata of what still is a capitalist society. In line with this argument, one would expect to find and therefore have to double check for capitalism in alternative corpora, such as those comprising newspaper articles or websites on the Internet. On the other hand, the concept of capitalism has itself been invented in books, which is why it remains hard to understand why it should not have left significant traces in books as well if it is valid.

In this sense, the absence of indications of a dominant position of economic issues in a considerable share of the books of the world is indeed a surprising fact that can function as the basis of an abductive argument. In fact, a main function of “abductive reasoning is evaluating hypotheses ‘in order to make sense of puzzling facts’” (Dunne & Dougherty, 2016, p. 136), and, as mentioned earlier, this approach is consistent with up-to-date standards in big data-driven research (Kelling et al., 2009) as well as with our general ambition of theory crafting (Demetis & Lee, 2016) and refinement (Wright, 2017).

As is well known and detailed in (Kelemen, Rumens, & Vo, 2018, p. 3; 6f), abduction is generally associated with the work of Charles Sanders Peirce. Abduction refers to a form of logical inference “whereby theories are used to guide observation that further specifies the theories” (van de Ven & Poole, 2005, p. 1384). In an 1903 essay, Peirce (1940[1903]: 151) proposed the following as the standard form of abductive reasoning: “The surprising fact, C, is observed; but if A were true, C would be a matter of course, [and hence], there is reason to suspect that A is true”.

“Thus, with abduction we begin with some particular occurrence that is perhaps unexpected, or does not agree with current theories, and we then imagine some possible theory or hypothesis that would explain the event. So, we are neither going from empirical examples to a general rule (induction) nor going from a rule or law to consequences (deduction) but instead generating a plausible explanation.” (Mingers & Standing, 2017: 175).

In our case, the surprising fact is that economy has never had a dominant position in any of a set of three otherwise quite plausible

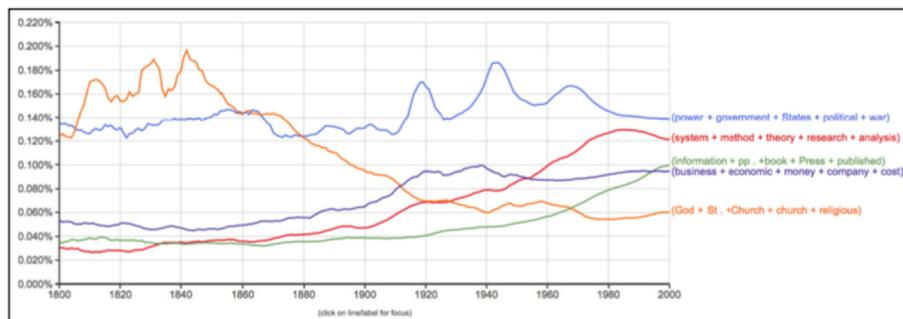


Fig. 1. Combined occurrence frequencies of the five most frequent keywords for political system (blue), economy (violet), religion (orange), mass media (green), and science (red) in the English language Google Books corpus (1800–2000) (Roth et al., 2017, p. 312).

charts depicting social macro trends in the English, Spanish, Russian, French, German, and Italian language areas between 1800 and 2000. However, if modern society had truly never been an economy-dominated society within these 200 years, then the only secondary position of economy would be a matter of course. Hence, there is reason to suspect that modern societies have not been characterized by a dominant position of economy between 1800 and 2000. To the extent that we associate capitalism with the dominance of a particular economic system over the rest of society, the results indeed suggest that the definition of modern societies as capitalist societies might be inaccurate.

The anticipated outcome of this article is, however, not the clarification of the question of whether modern societies have been capitalist societies. Rather, our ambition is a refinement of strategic management theory that is driven not only by the increasingly plausible speculation that economy-biased strategic management theory and tools might be completely inadequate for a proper understanding of what we commonly refer to as the business environment, but also by the more general and certainly more easily acceptable idea that the importance of “function systems” changes over time and space. In the remaining sections of this article, we shall therefore point to a number of far-reaching implications for strategic management theory and practice that follow from this circumstance that is probably still as little understood as it is self-evident.

#### 4. Theoretical refinement. Implications for the theory of the firm

The gradual crystallization of the function systems of politics, science, economy, and law in the Western world not only reflects dramatic sociological trends featuring the rise of modern society but also stands for the co-evolution of the institution of the business firm and its polycontextual environment, which is constituted by distinct and incommensurable function systems. A more general question suggested by this co-evolution pertains to the conceptualization of the interrelation between organization and function systems as different types of social systems, which Niklas Luhmann associated with modernity (see Nicolai, 2004; Kieser & Leiner, 2009; Von Groddeck, 2011; Demetis & Lee, 2016; Apelt et al., 2017; Grothe-Hammer, 2018). Some commentators suggested that, while organizations are generally open to being active in an indefinite number of function systems, they exhibit a dominant function system affiliation that guides organizational decision making in ambiguous or conflictual situations (e.g., Kieser, 1989; Kieser & Leiner, 2009). Other commentators were more sceptical about the possibility of identifying the most important function system affiliation for most organizations (Andersen, 2003a; 2003b) and viewed organizations as radically multifunctional (e.g., Will, Roth, & Valentinov, 2018).

The relatively uncontroversial bottom line of this debate is that the regime of functional differentiation constitutes the societal environment of organizations that are in need of tools and strategies to navigate this regime. The nature of these tools and strategies thus emerges as a highly pertinent scholarly issue that, in a special economic context, has been addressed by the voluminous literature on the theory of the firm. Some of the fundamental questions of the theory of the firm are the rationale of the firm and the definition of the firm boundaries relative to the market environment (Foss, 1993; Hodgson, 1998; Kroszner & Putterman, 2009; Zenger, Felin, & Bigelow, 2011). Given that the market environment can be seen as the internal environment of the function system of the economy, as argued by Luhmann (1989), the theory of the firm holds some potential to inform the more general debate on the interrelation and co-evolution between organizations and function systems as

well as to benefit from what this debate so far has to offer.

Seen against the backdrop of this more general debate, the theory of the firm is necessarily one sided in that it is framed by the semantic categories of the economic function system. Being chiefly focused on that system, the mainstream theory of the firm is relatively far from appreciating the idea of organizational multi-functionality. However, the theory does shed considerable light on the delineation of the boundary between the organization and its outer environment within the economic function system. As noted by Zenger et al. (2011), the delineation of this boundary is of clear managerial concern: managers need to decide whether specific transactions are advantageously organized within and across firms given that both firms and markets have distinct strengths and limitations. According to Josefy, Kuban, Ireland, and Hitt (2015), firms generally excel at ensuring complex coordination in situations of high interdependence, even though firm boundaries cannot expand indefinitely without putting firm competitiveness and survival at risk.

More precisely, the theory of the firm includes two types of theories involving radically different visions of the strengths and limitations of both firms and markets (Kroszner & Putterman, 2009). The contractual theories of the firm explain the nature of the firm in terms of the costs of making and monitoring transactions as well as formulating, monitoring and policing contracts (Hodgson, 1998, p. 180). By emphasizing the contractual nature of the firm, these theories turn a blind eye to the possible non-contractibility of specific production activities and pay little attention to organizational learning and cultural transmission (Foss, 1993; Hodgson, 1998). These issues are well addressed by the competence-based theories that accordingly explain the nature of the firm in terms of “the largely non-communicable, idiosyncratic and non-contractible nature of competence” (Foss, 1993, p. 139). However, for all their fundamental differences of approach, both types of theories seem to draw on a common systems-theoretic idea that, for a social system such as the firm, it may be impossible to rely on or take for granted a certain favourable state of its outer environment. Whereas the contractual theories justify a firm's refraining from relying on the market environment through the contractual risks of specific transactions, the competence-based theories explain the difficulties of such reliance in terms of the “non-contractible nature of competence” (Foss, 1993, p. 139).

While capturing a systems-theoretic core of both the contractual and competence-based theories of the firm, the idea of the impossibility or difficulty of the system's reliance on its outer environment potentially informs the more general sociological analysis of the interrelation between organizations and function systems that constitute the outer environment of organizations. In fact, a key theme of the Luhmannian sociological systems theory is the precariousness of system-environment relations. A more familiar terminological rendition of this theme is the acknowledgement of the pervasive sustainability risks of social systems. In view of the systemic attributes of complexity reduction and operational closure (Ahrne, Brunsson, & Seidl, 2016; Luhmann, 1989; Schad & Bansal, 2018; Schneider, Wickert, & Marti, 2017), the growing internal complexity might entail an increasing risk of systemic insensitivity to critical environmental conditions. It therefore stands to reason that, if system-environment relations are precarious or fraught with sustainability risks, and if they are observed to systematically transcend systems' boundaries (Shrivastava, 1995, p. 121), then the system's reliance on inadequate concepts of its environment may indeed be dangerous from the systemic sustainability point of view.

The theory of the firm reveals a general strategy utilized by the firm, as a social system, to address the precariousness of system-environment relations. If the firm cannot delegate the governance

of specific transactions to the market environment, it must internalise them. In the same fashion, if an organization is critically dependent on specific function system performances that cannot be guaranteed or taken for granted, it must internalise these performances, i.e., carry out functionally equivalent operations. On reflection, this “internalisation” seems to present the general mechanism of how organizations become multifunctional (Andersen, 2003a; 2003b). For an illustration, consider the case of a firm experiencing that the critically important performances of the legal system, science system, and political system cannot be guaranteed. To secure its own sustainability, the firm then must itself develop its own profile in these systems and assume legal, scientific, and political functions, thereby becoming multifunctional. Fanciful as it may sound, this conclusion is not only compatible with but also sheds new light on the theory of the firm, especially by illuminating the way in which the distinct contractual and competence-based approaches hang together. As suggested by the following brief exposition, the complementarity of these approaches merely reflects the complementarity of function systems in the functionally differentiated society.

Consider the contract-based approaches explaining the nature of the firm through its ability to secure acceptable levels of contract execution, despite human tendencies towards opportunistic and shirking behaviour. While these tendencies are bound to cause conflicts, the contract-based approaches see a rationale for the firm in its ability to resolve these conflicts without taking recourse to the legal system. Among the contract-based theorists, the limits of the legal system were most emphatically accentuated by Williamson (1996: 57) who saw the transaction cost theory of the firm as grounded in the tradition of private ordering rather than legal centralism. More specifically, Williamson distinguished among litigation, arbitration, and fiat as distinct generic methods to resolve business disputes. Litigation evidently means a reliance on the legal system, whereas arbitration and fiat envision the private ordering possibilities of conflict resolution. For example, the intrafirm resolution of conflicts by fiat is superior to litigation in two respects: “(1) parties to an internal dispute have deep knowledge ... that can be communicated to the court only at great cost, and (2) permitting the internal disputes to be appealed to the court would undermine the efficacy and integrity of hierarchy” (Williamson, 1996, p. 100). Similar arguments would presumably likewise apply to the superiority of arbitration over litigation in specific contractual circumstances. A firm's reliance on arbitration and fiat indicates its unwillingness to rely on litigation, i.e., to delegate conflict resolution to the legal system. By refraining from a full reliance on the legal system, the firm comes to develop its own profile in that system in such a way that this profile comes to be recognized as a distinctive feature of the firm relative to the market.

The competence-based theories are concerned with the way in which the firm develops, bundles, and utilizes productive knowledge, which, generally speaking, can be presumed to be the output of the function system of science. However, the bottom line of the competence-based theories is that the firm relies on far more knowledge than this function system generates and makes available in a form that is readily accessible for all interested actors. The very point of these theories is that the firm provides a platform for organizational learning processes that produce unique competences that cannot be easily imitated by other firms (cf. Argyles, Felin, Foss, & Zenger, 2012). In the words of Hodgson (1998: 194), “firms may exist because they provide a relatively protected cultural enclave in which wider group and individual learning can take place”. The knowledge and competences generated through this learning have not been borrowed from the science system; rather, they are the product of the firm's own activity, which, at the same time, is enabled by the firm's profile in that function system.

The cornerstone of the competence-based theories has been the limited usefulness of market contracting in the face of Knightian uncertainty, which primarily pertains to the unpredictability of learning processes and technological developments and the irreducibility of organizational and individual learning to inherently incomplete contractual relations. From the organizational multifunctionality point of view, however, it is evident that the feasibility of market contracting testifies to the relatively codifiable, transmissible, non-tacit nature of the knowledge for which contracting is possible. This kind of knowledge does not need to be developed in the “protected cultural enclave” of the firm (Hodgson, 1998, p. 194); it is obtainable from the function system of science. Hence, if the feasibility of market contracting for knowledge and competence is limited, it is an indication of the firm's limited reliance on the latter system and of the firm's own engagement in the generation of unique firm-specific and probably idiosyncratic knowledge.

The debates between the contract-based and competence theories of the firm have tended to be relatively unconcerned with corporate social responsibility (CSR). The prominence of CSR, both academically and politically, has long reached levels that do warrant the incorporation of this phenomenon into the theory of the firm, with the notion of instrumental CSR being an evident connecting link (McWilliams & Siegel, 2001). However, instrumental CSR has been subject to much controversy because the reduction of CSR to economic rationality alone misses important normative and moral considerations that are relevant to understanding the pervasive and multifaceted business-society tensions. To pay heed to these considerations, Scherer, Rasche, Palazzo, and Spicer (2016) speak of political CSR, which essentially boils down to the engagement of the firm in the function system of politics. Crucially, this engagement goes much further than a mere reliance on the performance of the political system; the firm engages in political CSR if it itself turns into a political actor “by engaging in public deliberations, collective decisions, and the provision of public goods or the restrictions of public bads in cases where public authorities are unable or unwilling to fulfill this role” (Scherer et al., 2016, p. 276).

In the CSR scholarship, much ink has been spilled on the relative merits of instrumental and ethical approaches. For example, in Scherer et al. (2016) vision of political CSR, the normative considerations of social welfare presumably trump the instrumental considerations. However, if political CSR is viewed from the perspective of organizational multifunctionality, then the case for the conflictual or trade-off relation between these considerations is largely undermined because the distinctive feature of functional differentiation is the equal validity and necessity of observational perspectives pertaining to function systems. Thus, the condition of functional differentiation lends credence to those visions of CSR that link it to the idea of the mutually beneficial interactions between the firm and its stakeholders (Freeman, Wicks, & Parmar, 2010; Pies, Beckmann, & Hielscher, 2014). Finally, as suggested by Roth et al. (2018), while much of CSR is seen as the firm's engagement with the political system, this strong focus on the political system is probably too narrow. It is not unthinkable to conceptualize CSR as the firm's own engagement in a function system other than economy and politics (ibid). If this argument is correct, it allows for a comprehensive and systematic vision of how the phenomenon of CSR complements the arguments of the contract-based and competence theories of the firm in the explicit context of the functionally differentiated society.

##### 5. Strategic multifunctionality. Outlook on challenges for strategic management and practice

In the present article, we drew on previous research by Roth

et al. (2017) that showed that different societies place different value on “function systems” such as religion, economy, politics, science, or mass media and that the prominence of these function systems is also subject to change over time. We therefore reframed the key idea of Roth et al (2018) capitalism-sceptical opinion piece as an abductive argument for the idea that modern societies *might* not have been capitalist societies in the 19th and 20th centuries. We then proceeded to use this argument as the starting point for a refinement of the dominant theories of the firm that still imply that contemporary business environments are capitalist societies mainly driven by money and power.

If economy has been only a secondary aspect of society over the last two centuries, however, then contemporary theories of the firm would indeed be one sided and reductionist insofar as they remain focused on economic issues. This focus on what might be only a secondary aspect would imply an underestimation of actually more critical aspects of the business environment. We concluded that this neglect of the broader social context of business might result in decisions that are unsustainable for both firms and their business environment.

As outlined in the previous section of this article, more refined theories of the firm would seek to internalise the complexity of the business environment to an extent that enables firms to account for the possibility of changing trends of functional differentiation in general and a changing importance of economic issues in particular. This attitude is what we mean by cultivating a multifunctional perspective. Multifunctional theories of the firm would start from the assumption that organizations are per se multifunctional and therefore feature—potentially changeable—biases to particular function systems that may or may not in line with the importance these function systems have for the organizational environment. While it remains reasonable to hold that a firm necessarily has a certain bias towards economic issues, it is also plausible to assume that other non-economic function systems, such as politics, the legal system, or religion, might play a co-equal and occasionally even dominant role even in firms, for example, in an Islamic business and finance context. Thus, a multifunctional approach would also be useful to challenge culturalist biases of traditional and contemporary strategic management theories and tools. In this context, it is worthwhile to remember that a tool such as PEST was invented and probably made perfect sense for a conveniently sampled research setting in the 1960s American chemical industry (Aguilar, 1967), where a focus on political regulation and (natural) scientific progress must have appeared extremely critical for economic success. Nevertheless, it is evident that the strong focus on politics, economy, and technology that places everything else into an overcrowded socio-cultural residual category is often inadequate for other industries, cultures, or epochs; and arbitrary extensions of the political, economic, social, technological, environmental, values (PESTEV) or social, technological, economical, ecological, political, legal, ethical and demographical (STEEPLED) frames have not yet fixed this problem. In this context, a multifunctional approach might also offer a more comprehensive and systematic account of the business environment.

On the inter-organizational level, a multifunctional approach would suggest not analysing competition in terms of only firm-to-firm or business-to-business competition. Whereas strategic cooperation between business and non-business partners is a fairly well-established topic, e.g., in the context of discourses on innovation systems or the triple helix of industry-government-university (Etzkowitz & Leydesdorff, 2000), competition and (open) cooperation between these and similar partners remains an under-researched field, although it is evident that, e.g., for-profit and governmental organizations regularly compete for attention

from the public or for-profit and national public research organizations compete for EU funding.

Finally, we would have to redefine the locus of this multifunctional competition, which suggests freeing not only the concept of the firm but also the concept of the market from its narrow economy-dominated connotation. In 2001, UNESCO proclaimed the Jemaa el-Fnaa, a market place in Marrakesh, Morocco, one of the first Masterpieces of the Oral and Intangible Heritage of Humanity to prevent this market from succumbing to the gradual commodification of the broader socio-cultural institution that, according to UNESCO, the market still is. Whereas one might certainly plead that every attempt to prevent change in a social system will necessarily result in (probably a different kind of) change in that social system, the basic ambition to prevent a market from “marketizing” is a compact argument for the idea that markets are more than economic institutions. The consequently required interactions between strategic management research and fields such as economic sociology or economic anthropology would certainly be worthwhile, as they might indeed lead to the discovery of a broader market concept in the context of which we could analyse exchanges rates not only between different economic market segments and their corresponding currencies but also between the exchange media of all function systems (see Roth, Leydesdorff, Kaivo-Oja, & Sales, 2019, Fig. 1). This approach would considerably advance existing multimarket firm perspectives. The vision therefore is that of strategic management research that exchanges the narrow focus of economy-biased theories of the firm for a worldview in which firms as much as other organizations ensure complex coordination in high-interdependence business environments by a strategic focus not only on economic values but also on political, religious, and other values as well as on the current exchange rates among them.

As a similar shift of perspective would be required not only for firms but also for political, religious, scientific and other organizations, multifunctional theories of firms and markets would ultimately add a layer of reflexivity that would promote the second-order observation of both the current socio-ecological costs and benefits of one's own organization's operations and would therefore constitute viable strategies for addressing some of the most pressing social and environmental sustainability issues of our time.

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