BOOK REVIEW

Assetization: Turning Things into Assets in Technoscientific Capitalism, edited by Kean Birch and Fabian Muniesa (2020) MIT Press, Cambridge MA, 338pp., $US40 (paperback) ISBN 9780262539173

Contrary to common belief, it is not the commodity but the asset that defines capitalism today. An asset is not a thing, or a matter of substance, but rather a logical and economic form given to something – a piece of land, a patent, a human emotion, traffic through a website – in order to own or control it or its properties as a revenue stream. Assetization is about not just extending accounting categories and the logics of capitalization and accrual to new relations, but also a socially transformative process generating new forms of ownership, control and revenue, and new subjects and subjectivities to inhabit them. Its theme is social constructivism: assets are made, not born, and conversely, at least in principle, anything can be turned into an asset.

Ground zero to this edited volume, Birch and Muniesa's introduction characterizes the asset form clinically. It is a legal construct, depending by definition on state or otherwise publicly defined and recognized allocations of rights of property, division/distribution and alienation. It involves distinct modes of ownership and control; it is often unique, meaning its value derives from a monopoly of specificity; as such, it has peculiar supply/demand, price and market clearing logics; its value and valuation depend on expectations, that is, interpretations of the future; on the actions of those who control it; and on an ecosystem of cultural, political, financial and various other logics (pp.5–7).

The editors' account places assetization as the most recent development at an intersection between science and technology studies, political economy, human geography, economics and cultural studies that has already given us financialization, capitalization, market devices, social studies of finance and similar contributions. From a less taxonomical and more broadly epochal angle, this volume reinforces an interdisciplinary turn towards both the logics of economic production and economic phenomena as something that is produced – a sort of 'production turn' (for canonical examples see Callon, 1998; Carrier and Miller, 1998; Barry and Slater, 2005; Mackenzie, 2006; Callon *et al*., 2007; Muniesa *et al*., 2017). This production turn is not cohesively organized as such, but seems to have emerged as a scattered counterpart to the predominant emphasis on consumption, barter, exchange and the market as an instant (Røyrvik, 2011; Carrier, 2016). This turn rejects, or is at least avowedly disinterested in, the presumed spontaneity and teleological inevitability of economic behaviours as understood in the neoclassical canon. It focuses instead on the work required to bring those behaviours about, and when necessary, to pass them off as natural. The notion of work here is not aiming for the abstract, abstractable labour proper to both Marxist and neoliberal epistemologies, a 'measuring rod for value' (Reinert, 2007, p.41), but rather towards the creative, qualitative undertakings of human-as-maker (Røyrvik, 2011, pp.29–31), whether they involve creating new kinds of wheat seeds or new combinations of legal texts to construct a patent as a tradeable thing. To this lineage, *Assetization* brings a focus on how this kind of work produces new proprietary modes: new ways of owning, controlling and capitalizing that result from a constant, deliberate, creative triangulation between pre-existing relations.

The asset form: a work of triangulation

Much of this work involves valuation, its methods and rationalities, indispensable to channel the logical and economic reasoning that extend the asset form to something in the first place. Readers interested in the ontology of value will have to look elsewhere: most examples of assetization in this book follow the flattening of value as a philosophical problem through the operational, certainty-generating actuarial grammar of increasingly intricate accounting and managerial discourses their case studies are deploying. This is in line with what the editors label the 'technoscientific' condition of contemporary capitalism, one where innovation and economic thinking are increasingly restricted to speculative rationalities and fintech bottom lines. The interest of these valuation practices and rationalities beyond mathematical acrobatics lies in the fact that assets exist through and because of a future written into their definition as 'revenue streams' to come: the valuing work that constitutes an asset requires imagining and circumscribing that which is not now, or not yet. Milyaeva and Neyland argue in this sense in their analysis of the transition of the UK's higher education system from a government-funded public good, accounted for as a net cost in the state's balance sheet, to an income-contingent repayment loans system, where some money will be repaid at some point in the future. The constitution of these loans as assets requires far more than the right accounting category: the triangulation between estimations of what percentage of the loans will ever be repaid, economic and demographic considerations of graduates' future incomes and aggregate professional trajectories, and an underlying normative principle that this particular asset must retain aspects of public good (it should not, for example, price out socioeconomically disadvantaged students) determine how and to what extent the loans become assets, specific kinds of revenue streams, in the first place (pp.264–72).

Tracing the work of triangulations between different kinds of relations sheds light on how ownership and control expand in unexpected ways. In his analysis of how multinational companies transform their ore deposits in the Global South from speculative resources to asset-like reserves, Paul Robert Gilbert shows how investors frame Global South governmental 'interference' with 'reasonable' investment decisions as 'creeping expropriations'. As the compensation they seek in courts of arbitration is estimated on the basis of 'legitimate revenue expectations', Gilbert argues, investors' capacity to shape the terrain of social reproduction, their skill in legal rhetoric and their capacity to exert pressure through other means turn these legitimate expectations into the asset from which the revenue stream will flow – whether the ore gets mined or not (pp.188–90). Similarly, Hyo Yoon Kang shows how innovation patents are valued and traded in derivative markets not on the basis of the particular invention's promise to generate future income once brought into production, but on the basis of the solidity of the patent's legal claim to a monopoly and the possibility of finding someone violating it. Beyond mathematics, the value that makes the patent an asset depends on 'the strength of legal language in the patent document, . . . the ability of the legal system to cope with the workload, courts' interpretive inclinations, as well as their willingness to enforce the law' (p.58). What is ultimately being assetized, in the strict sense of the definition given above, is the workings of the judicial system (not least, and not simply, since patents are, after all, a juridical construction).

Economic, juridical, technical limits: assetization's work along the edge

Because these relations of control, ownership and revenue do not exist spontaneously, assetization is always working through the limits of the asset form and the relations it produces. Assets are hard to set up, sustain, guard from other forms or from falling apart; as such, they are particularly hard to essentialise, empirically or theoretically, which makes them an apt object of study for a constructivist analysis. In a sense, assetization is itself a work of setting limits to begin with, or economically speaking, of setting up a monopoly fencing others out from the control or rentiership of a particular revenue stream. This monopoly-as-limit often takes an explicit juridical form, as in Kang and Roy's analysis of patent markets and the monopolization of knowledge. Even when it takes technical or other forms, as in Beauvisage and Mellet's thinking of data as an asset given businesses' effective technical ability to control and monetize its circulation (pp.75–97), the juridical framework is still there: any remotely formal transaction in capitalism is ultimately backed by an original distribution of rights of property.

Conversely, if a juridical framework is always there, assetization also evidences it alone is not enough. Aside from being made of limits, as it were, the asset form has limits to the extent that the work of assetization can be too onerous, susceptible to the actions of others who seek other economic forms (and to escape subjection to the monopoly logics of the asset form), or simply unable to account for the social and natural properties and propensities of the relations at stake. As Thomas Beauvisage and Kevin Mellet's chapter shows, for all the consumer-empowering hype around them, attempts to encourage individuals to assetize their own data (which they legally and in principle own) and sell the data to businesses failed: businesses can already get that data elsewhere and for free (p.82). Even if they had worked, individual-level information has virtually no worth, as it is as an aggregate that data are productive. In other words, there is nothing of value for the individual to monopolize, however ultimate their juridical sovereignty over their own data might be (p.83).

James Williams's chapter on the failure of social impact bonds (SIBs) to take hold points towards the limits of the asset form's specificity: when it comes to assets, there can be such a thing as too boutique. A sort of public–private cooperation where the private sector invests in and takes on canonically public responsibilities like palliating homelessness, criminal recidivism and unemployment, SIBs involved governmental backing, a bespoke juridical framework and big economic players. Yet the responsibilities were so specific and fragmented, the scheme so unprecedented and unmoored from common practices, and notions of value, success and performance so abstract (what are the gauges, drivers and granularity of success in avoiding drug relapse? how to value governmental savings?) that, beyond any normative reservations, the assets were mostly impossible to set up and the scheme remained niche (p.291, 296–7).

Veit Braun's fascinating Latourian analysis of the assetization of wheat seeds in Germany brings all these limits to bear. German wheat breeders patented the seed varieties they produced to sell to farmers, thus assetizing the biological make up of particular varieties of wheat. Farmers planted these seeds in their fields, tended their crop and, upon harvesting, saved some seeds to reproduce the same variety without having to pay breeders for seeds or royalties the following year. Not only did the elemental organic processes of plant reproduction defy the monopoly of assetization, but from the perspective of the farmers the seeds were always a commodity to begin with. From the farmers' side, the original purchase allocated complete ownership to them, severing the links between seeds and breeders and dissolving the possibility of any ongoing ownership claim and revenue stream from the breeders (p.210). To reallocate control, breeders began selling varieties lacking transgenerational stability: seeds from these hybrids would grow into plants ripening at different times and yielding uneven grain, making the harvest economically sterile. The seeds breeders now sold became for all players involved a commodity and, working alongside the Mendelian patterns written into the dynamics of plant reproduction, the breeders redirected the asset form towards the parental plants in their possession (p.212).

By its own internal logics, the asset form also represents a more subtle limit, that of the horizon of capitalist rationality, explored by Natalia Buier's nuanced analysis of the discourses framing the historical trajectory of the Spanish railway system. From a certain perspective, the system's purpose was to integrate Spain as a nation, and should thus have been financed centrally; from a competing point of view, the system had to be subjected to optimal pricing and costing measures to incentivize private investment and use resources efficiently. In the first case, the asset form was extended to a nation-integrating infrastructure from which would emerge Spain as a unified, revenue-producing market. In the second case, the asset form was extended to a profit-producing service from which revenues would accrue to private capitalists or to a capitalist state. In both cases, however, the problem remained firmly within the order of worth of the market; the point of disagreement was only whether the trains should be a foundational element in the construction of a national capitalist market, or an outgrowth of market calculation in itself (p.145). In this sense, assetization exposes the inability of the asset form to formulate a genuinely alternative order.

Assetization: between its apocryphal edge and its parental lines

Buier's argument that the asset form in itself represents the limit of a certain imagination points perhaps to the greatest contribution assetization might make to an increasingly crowded epistemological field. Strangely, this is a contribution that, except for Victor Roy's study of biomedical innovation, *Assetization*'s various chapters and introduction only hint at casually and do not fully develop. I am referring here to assetization as a differentially fertile heuristics to capture the logics of what I will call the monstrosities multiplying along the limit of that imagination. In her analysis of the pragmatics of neoliberal reasoning, Argentine ethnographer Verónica Gago (2017) defines monstrosities as the results of triangulations between relations of different natures where agents have come to exploit a surplus, a value, that should not be there. 'Should not' here does not point to a doctrinal moral injunction; if and when it does, it is only to qualify a should not that points to the Frankenstein-ian calculative aberration of an arbitration between irreducibly inconsistent bottom lines.

Roy's chapter makes this argument organically. Two epistemic shifts have reshuffled contemporary biomedicine: the redefinition of health from a binary of healthy/sick to a continuum of risk to be managed and minimized, and the emergence of health economics as a rationality of commensuration between cost of therapeutic interventions and value of health improvement (pp.108–10). Together, Roy argues, they have turned clinical treatments into a pharmaceutical asset, incentivizing the development of mitigatory treatments, encouraging cultural medicalization and writing off cures as an unsustainable business model (p.113). Crucially, the triangulation between the bottom lines of what Roy labels 'public health facts' (p.109), those of the temporalities of the industry's shareholder-value maximization strategy (p.104) and those of a quantification of health along a single scale (p.110) has generated drug laboratories that thrive through no longer producing drugs and a medical industry that cannot afford to cure.

Assetization's spontaneous attention towards the surplus logics of production and away from the zero-sum logics of consumption (mentioned by Braun in this volume, p.210) could have been a particularly elegant approach towards these increasingly common, and increasingly deliberate, monstrosities of 'technoscientific capitalism'. Rereading the volume from this apocryphal angle, one finds that the assetization of patents is not only producing inventions that will never be invented, but is purposely seeking to do so (p.55); the assetization of student loans is producing policy decisions antagonistic to the interest of the students, university and education industry they were set up to serve (p.276); the assetization of mining revenues that do not yet exist and maybe never will is creating profits from keeping the ore unmined (p.189); and the assetization of data creates more data about data to further assetize, 'cannibal(izing) the original' (pp.91–2) and producing logics and revenue streams completely detached from the original purchase. The work of triangulation mentioned above re-emerges time and again to perpetuate these arbitrations and guard, by legal, cultural and organic means, the resulting hybrids. German wheat breeders' constant work to (re)produce increasingly uniform wheat leading to as diverse an offspring as possible to stay in the trade is perhaps the most effective epitome of the kind of differential surplus the asset form captures – and of the economic subjectivities assets animate.

As is the case with many other approaches named after processes (like financialization) or abstract/abstracted nouns (like infrastructure), and with most social constructivist approaches, assetization's premise is that anything can be assetized in the right circumstances, just like most things can be framed as infrastructure for other things. Most often these approaches cannot really be falsified or shown to be erroneous, and if they can, the exercise is usually beside the point. The point of probing their empirical limitations is to show that they are particularly and uniquely well- or ill-suited to explain particular cases. What does thinking about a process as assetization (or thinking about a particular phenomenon as infrastructure) reveal that other approaches cannot? In this sense, that *Assetization* did not exploit its differential potential to explore these monstrosities, or cynical arbitraging, or whatever we choose to call them, matters because it could have propped up assetization itself as an analytical asset, as it were, guarding it from the many approaches it now shares an increasingly crowded epistemological space, many of them developed by some of these same authors, such as capitalization devices (Doganova and Muniesa, 2015), capitalization (Muniesa *et al.*, 2017) and market devices (Callon *et al.*, 2007).

In their introduction, the editors recognize the need to fence in an analytical-interpretive market; they also realize that the way to do so is to separate assetization from these by now intuitively competing approaches. In particular, both financialization and capitalization are also future-oriented; both can, and often do, involve new forms of ownership and revenue; and both are also framed and often sustained more or less visibly by legal and accounting discourses and valuing practices. In a succinct discussion, Birch and Muniesa acknowledge that 'the notion of assetization surely speaks to the notion of financialization' and quickly settle assetization as financialization in a way, but more specific in scope and precise in its workings (p.5). Thoroughly examined in Muniesa *et al.* (2017), the editors argue just as succinctly that capitalization already captures the processual aspect of assetization, but add that 'unless explicitly defined as a wide cultural process consisting precisely in turning things into assets', capitalization emphasized the accounting sense of the process a bit more (p.4).

Assetization thus emerges as a species within an analytical genus whose taxonomy is increasingly adjectival, adverbial and self-referential, and requires an increasingly sustained work of precision at those levels to legitimize, by minutely characterizing it, its perpetual diversification. That this work comes across at times as rhetorically and grammatically specific to the point of oblivion, and at times contrived, only emphasizes how indispensable its fastidiousness is for assetization to stand still. It is not that assetization lacks versatility, lines of flight or points of entry; rather, any deviation or hiatus from this strict work for accidental, rhetorical or argumentative reasons, or even a poetic, metaphoric, or playful extension into case studies that do not wholly fit the asset form's editorial characterization, dissolves assetization in the general, and even particular, logics of its parental lines. As an example, Birch and Muniesa place particular emphasis on legal construction and discourse when defining assetization and separating it from similar approaches. In some chapters, readers must ferret for the legal framework; in others, such as Levidow's timely and very interesting chapter on the assetization of nature, it is virtually absent. That Levidow's argument still fits the general élan of assetization, if not its exact definition; that it would fit just as well that of financialization spontaneously; and that with the right rhetorical work it would fit that of capitalization are together evidence less of assetization's versatility or limitations and more of the looming saturation (in Beauvisage and Mellet's term, 'cannibalisation') of an epistemological field assetized to exhaustion.

Assetization remains an interesting spin on what is by now more canonical and paradigmatic work figuring out how contemporary capitalism works and why. The volume is pitched at the same interdisciplinary audience that has been growing around the approaches mentioned above; in fact, if many of the chapters reference the science and technology studies (STS) canon and the general logics of financialization only summarily, it is not because they are not relevant but because they are assuming, probably rightly, that *Assetization's* readers are already familiar with them. Similarly, the often quite dense, jargon- and acronym- laden writing of several of its chapters will be a laborious, if rewarding, undertaking for readers not seasoned in legal, accounting, economic and financial discourses, often all simultaneously. For these reasons, the volume could work as coursework reading mostly, if not only, at master's level and above, and preferably for courses that have already covered both the bedrock of STS through more amenable reads and what is becoming the financialization canon.

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