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From Spaces to Circuits of Extraction: Value in Process and the Mine/City Nexus

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**ABSTRACT**

The reorganization of the extractive industries into transnational supply chains has signaled the functional integration of hitherto dispersed elements of social production and brought together natural resources and built environments, as well as city and non-city space, in novel and ever more intricate ways. On the basis of Marx’s theorization of the circulation of capital—laid out in Volume II of *Capital*—the paper develops the notion of *circuits of extraction* in order to rethink the extractive industries from the standpoint of three contradictory, crisis-riven, yet interrelated circulatory systems: a productive circuit of extraction; a commodity circuit of extraction; and a money circuit of extraction. With this the paper contributes to the development of an expanded conception of extractivism that is rooted in the actual dynamics of production and circulation of raw materials, but that can also illustrate the ways in which the extractive industries are remaking urban, financial, and logistical landscapes in their own image.

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**KEYWORDS** Extractivism; logistics; natural resources; financialization; circulation of capital

**Introduction**

In a series of recent articles Verónica Gago, Sandro Mezzadra, and Brett Neilson (Gago and Mezzadra 2015; Gago and Mezzadra 2017; Mezzadra and Neilson 2017) have called for “an expanded conception of extractivism.” This, the authors suggest, is premised on the idea that some of the dynamics and logics of primary commodity production are becoming rapidly extended to other domains of socio-economic activity such as finance, real estate, logistics, and the platform economy. Extractive processes, according to these authors, provide important analytical insights for elucidating the role of rent, primitive accumulation, and extra-economic force under contemporary capitalism, especially since the Great Recession of 2008. Although the notion and research program of “extractivism” emerged in the context of struggles
over the expansion of primary commodity frontiers in Latin America, Gago, Mezzadra, and Neilson have considered that it too often remains associated with the narrow and literal sense of extracting raw materials and foodstuffs from the soil. They point out that this obfuscates not only the extractive dimensions at work within capitalism in general, but also the ways in which primary commodity production becomes intermingled with finance, logistics, and urbanization (see Gago and Mezzadra 2017; Mezzadra and Neilson 2017).

This paper suggests that rethinking extraction in an expanded sense is indeed to be welcomed as an urgent and relevant intellectual project. However, and although Gago, Mezzadra, and Neilson suggest that there is an “organic relation” between extraction and other spheres of economic activity, such a relation is only hinted at through specific vignettes on data mining, urban speculation, popular financing, and so forth. That this relation remains obscure and undertheorized might possibly stem from the post-workerist rationale that informs their the authors’ account, as they consider extractivism to herald a new phase of global accumulation “beyond the industrial paradigm” (Gago and Mezzadra 2017, 575). And indeed, it has been argued that the tendency of post-workerist thought to declare the Marxian theory of value (i.e. “industrial capitalism”) as anachronistic and dated, has undermined the explanatory potential that much of the work in such tradition has to offer (see for example Caffentzis 2005; Henninger 2007; Starosta 2012). On this basis, this article builds upon value-theoretical readings of extraction (see for example Bunker and Ciccantell 2003, 2005; Bridge 2008; Labban 2008, 2014a, 2014b; Ciccantell 2009; Baglioni and Campling 2017; Huber 2018) to suggest that it is by placing natural resources squarely at the center of the dynamics of late-industrialization, that the organic relations between the primary, secondary, and tertiary sectors of the economy can be most adequately fleshed out.

More specifically, I argue that an engagement with a critical theorization of the circulation of capital—as laid out by Marx (1992; see also Marx 1973, sec. 2) in Volume II of Capital—can therefore contribute to the agenda of developing an expanded conception of extractivism that lays bare the actual inter-dependencies, crisis-tendencies, and points of intersection between the space-economy of extraction and the production of capitalist space in contemporary society. By positing the reproduction of capital in terms of three interrelated circulatory systems (money capital, productive capital, and commodity capital), Marx sought to supersede compartmentalized understandings of production, circulation, exchange, and distribution, and grasp the capitalist economy as a differentiated unity (see Arthur and Reuten 1998; Harvey 2013; Fine and Saad-Filho 2016, ch. 4). On this basis this article proposes a relational understanding of primary-commodity production in terms of three contradictory and yet integrated circuits of extraction:
• a *productive circuit of extraction*, which encompasses the actual territoriality and the material process of raw materials production—shafts, pits, wells, processing facilities, and agroindustrial hinterlands, among others;
• second, a *commodity circuit of extraction*, formed by all the webs of infrastructural and logistical connectivity that enable the journey of raw materials from sites of extraction to their realization in the market—ports, dry-bulk carriers, railways, pipelines, and highways;
• third, a *money circuit of extraction*, which entails all the financial actors, instruments, and institutional systems that mediate the activity of resource-based industries at multiple spatial scales.

At stake in the notion of circuits of extraction is not only the aspiration to contribute to Gago, Mezzadra, and Neilson’s timely provocation; it is also to shed light on the modes of sociospatial interdependence that emerge as processes of industrial upgrading in the so-called global South—and especially in East Asian economies—give rise to one of the most persistent and wide-ranging commodity supercycles in recent history. These distinct yet interrelated world-historical transformations, as the article shows, have brought together natural resources and built environments, as well as city and non-city space, into novel and ever more intricate configurations. The first section begins by reflecting on how the Marxian theorization of the circulation of capital can expand the methodological repertoires, analytical tools, and sociospatial imaginations of traditional studies of extractivism beyond its *locus classicus*—i.e. the geography of extraction. In the subsequent three sections the article goes on to explore the aforementioned circuits of extraction. Each of the three circuits is assessed in terms of the role it performs in broader processes of capitalist urbanization and global capital accumulation. In the final section the article explores the dynamics of expanded reproduction that emerge from the combined movement of the three circuits. Considering extractive economies in terms of their expanded reproduction, I suggest, enables understanding how resource economies are also pushing the frontier of real estate speculation, rent appropriation, and technoscientific innovation.

**Natural Resources and the Circulation of Capital**

In one of the programmatic statements that have emerged from the Latin American scholar-activist literature on *urban extractivism*, Enrique Viale

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1The specialized literature tends to refer to a “commodity boom” in order to define the overarching increase in the price of raw materials that began in the early 1990s and lost momentum in 2014. However, this major geo-economic event is most adequately understood as a commodity “supercycle,” because despite periods of decline (notably in the aftermath of the 2008 financial crisis and in 2014), demand has not returned to pre-1990s levels. In fact, 2017 has signaled a new iteration of price increases, also driven by China’s booming manufacturing sector.
(2017, 20) claims that a major challenge of our time consists on building “bridges between those who resist mining in remote places, those who stand up to glyphosate and the agribusiness, and those… who live in ever more expensive, fenced, and repressive cities.” And indeed, such geographies of social action appear as distinct, insular, and unrelated. However, an understanding of capital from the point of view of its circulatory movement, reveals that they are nonetheless brought together into a complex unity by the combined movement of three overlapping circuits of capital. In Volume I of Capital Marx assumes that commodities are traded at their value. This means that questions of market-making, transport, exchange, distribution, and consumption, are deliberately set aside for the sake of analytical clarity. In Volume II Marx problematizes said aspects by transcending a “shallow” understanding of circulation qua mere movement of commodities. Instead, as Arthur and Reuten (1998) explain, Marx develops a “deeper” reading that considers the circulation process of capital as a whole. This means that circulation not only involves the movement of goods in space (i.e. their journey from mine to smelter, or from smelter to factory), but the transitions or metamorphoses that capital undergoes in the course of its lifecycle. Capital, Marx thus argues in the Grundrisse (1973, 536; see also Labban 2017), is to be grasped as value in process or in transition between its various forms, rather than merely value in motion as usually considered.

As Matt Huber (2018) has recently argued, a revitalized and coherent theory of value provides fundamental tools to elucidate how natural resources flow through and underpin complex commodity chains and productive systems that are dispersed across multiple scales and places. In other words, it is important to interrogate not only how value is produced, but also how it flows through economic space. In this sense it is the contention of this article that a critical understanding of circulation can make important contributions to the recent turn towards value theory in environmentally-minded political economy (for an overview see Christophers 2018; Huber 2018; Purcell, Loftus, and March 2019). By conceptualizing the socioecological metabolism of capital in terms of three integrated circuits (money capital, productive capital, and commodity capital), Marx (1992) not only foregrounds the radical interdependence of economic life in modern society, but also the intrinsic instability and fragility of the movement of value. An alteration in any of the circuits, as Marx explains, triggers concomitant alterations and disruptions in the others. For David Harvey (2013), an exploration of capital from the standpoint of three integrated circuits is insightful insofar as it reveals that contradictions, obstacles, and crises not only emerge in production (i.e. the site of extraction), but can also arise—and often do arise—in the process of circulation and distribution, where various other classes and fractions of classes are at work.
Marx also notes that the interaction between circuits is not only crisis-prone and turbulent, but also invariably oriented towards ever-enlarging scales of operation. Surplus capitals that cannot be reabsorbed in any of the circuits are cast outwards, and so the movement of the circuit as a whole assumes the proverbial image of an upward spiral—a process that he conceptualizes under the notion of “expanded reproduction” (see Marx 1992, ch. 21). As Luxemburg ([1913] 2003, ch. 26) and Harvey (1985) have pointed out, the process of expanded reproduction results in periodic crises of overaccumulation that can only be circumvented by creating new sites for the realization of value produced elsewhere. As subsequent sections of this article show, it is through the switching, or reorientation, of surplus capitals, that the extractive industries unfold outwards and become actively involved in the remaking of economic life beyond the primary sector. On this basis the notion of circuits of extraction that this paper proposes is not only concerned with analyzing the territorial organization of integrated infrastructures (i.e. ports, railways, maritime transport systems, and so forth) for the swift circulation of raw materials across logistical and urban space. Crucially, it also involves a relational understanding of how the production, circulation, exchange, and distribution of natural resources come together as interrelated moments in the self-expansion of value.

**Productive Circuit of Extraction**

The productive circuit of extraction is circumscribed to the moment of value production when fixed and variable capitals are expended in order to yield minerals, oil, or foodstuffs. This circuit usually encompasses all the processes and territorialities that form the object of analysis of traditional studies of extractivism. In recent decades the physical organization of this circuit has become reconfigured in order to boost productivity, especially in the face of declining mineral grades and of escalating demand from rapidly industrializing “Asian Tigers.” Rather than unfolding within a post-industrial landscape of accumulation, Bunker and Ciccantell’s (2003, 2005) study of new resource frontiers reveals that it was actually the ship-building and steel-making capacity that emerged from processes of industrial upgrading in East Asia, which set the economies of Japan, South Korea, and China, on the path to become the world’s largest importers of raw materials. These processes of late-industrialization, it is worth pointing out, have underpinned a longstanding commodity supercycle in Latin America, starkly evidenced in the expansion of the balance of trade between China and Latin America, which went from $15 billion in 2009 to a staggering $200 billion in 2011 (Valdez Mingramm 2013, 32).

This emerging trans-Pacific landscape of mineral trade has pushed the extractive industries towards a greater degree of functional integration, not
only between the various phases of the production process—exploration, blasting, crushing, haulage, but also between the port and shipping industries. Efforts to implement technologies for mineral traceability and supply chain mapping in order to reduce asymmetries of information between the different phases of production have been contingent on the standardization of operations across the supply chain (Arboleda 2018).\(^2\) Moreover, increasing complexity in the technical division of labor has also favored the emergence of large-scale contractors in a manner akin to that of the “Wintelist” or Modular Production Networks that tend to predominate in the electronics industry—characterized by a sharp division between design and execution, and by vertical reintegration of manufacturing activity. The tasks initially outsourced in the mining industry were labor-intensive and marginal to the core operation, such as catering, hostels, and shaft sinking, but gradually shifted towards a constellation of more complex services such as mineral forecasting, geological modeling, and process engineering. The trend toward a larger degree of diversification of functions seems to have taken off in the South African mining industry during the 1990s, when whole shafts began to be outsourced to third parties (Kenny and Bezuidenhout 1999). In Latin America the rescaling and specialization of contractors has evolved to the extent that large transnational corporations such as Komatsu, Siemens, Atlas Copco, and Cat-Finning now commonly operate alongside extractive corporations in shafts, pits, and industrial facilities for mineral processing (Innovum/Fundación Chile 2014).

Processes of organizational restructuring of this sort have enabled quantum leaps in labor productivity, but they have also triggered new forms of sociospatial inequality as a result of a workforce that is increasingly polarized not only in terms of gender, race, and citizenship, but also in terms of the productive attributes that it embodies (Arboleda forthcoming). During the national-developmentalist phase of capitalist development, settlement space in resource geographies was structured around relatively equitable and socially homogeneous “company towns” for the salaried workers of mining and oil firms. The commodification of labor-powers of heterogeneous complexity that technological upgrading in the mining industry requires has brought overspecialization among intellectual workers (geologists, engineers, geophysicists), as well as deskilling and labor insecurity among industrial and manual operators. The proliferation of networks of subcontracted, temporary, and piecemeal labor has therefore heralded a shift to a “far west,” ephemeral paradigm of resource urbanism structured on the basis of boom towns, agropolises, and camp sites (see Canales 2012; Vera and Mehrotra 2018; Gordillo 2019; for resource extraction urbanism in Sub-Saharan Africa see Kirshner

\(^2\)Although mineral traceability began as a private initiative by mineral buyers in Asian markets to reduce costs, it has recently been embraced by civil society and multilateral organizations such as the OECD and the UN as a way to increase transparency and avoid human-rights violations, especially with respect to conflict minerals such as coltan, tin, tungsten, and gold.
and Power 2015). Moreover, recent reconfigurations in the productive circuit of extraction have also become manifested in encroaching environmental plunder, soil depletion, land-use change, and water pollution, leading to a veritable exodus of rural populations towards the outskirts of both intermediate and large cities across Latin America. This new iteration of resource-driven global depeasantization is well documented in the literature (see for example Ruiz Ruiz and Santana Rivas 2016; Vásquez Duplat 2017).

### Commodity Circuit of Extraction

The commodity circuit of extraction encompasses all the physical and social infrastructures that are put in place in order to facilitate the swift movement of primary commodities from the point of production to their subsequent realization in the market. Reducing the time that it takes for capital to transition from its determination as commodity-form, to the point when it becomes realized in its money-form and returns to the capitalist as profits to be reinvested—its *turnover time*—has consistently figured as a key driver for inter-capitalist competition in modern society. It is therefore unsurprising, as Marx (1992) argues, that the ongoing reproduction of capital is contingent upon the constant development and concentration (i.e. scaling-up) of means of transport and communication. As he puts in the *Grundrisse*, “the creation by capital of *absolute surplus value*—more objectified labour—is conditional upon an expansion, specifically a constant expansion, of the sphere of circulation” (Marx 1973, 407, emphasis original). For Bunker and Ciccantell (2003, 2005), it is the drive to access ever more remote resource peripheries which has triggered the types of technological breakthroughs in the means of transportation that have come to define historical cycles of accumulation proper. Notable examples in this regard are perhaps the *bergantines* that Spain used to carry gold and silver across the Atlantic in the 16th century, the motorized ships that the British Empire devised to gain access to guano and rubber in the Amazon, and the *Valemax*, the largest dry bulk vessel ship ever built, which carries iron ore from Brazil to China across the Pacific Ocean.

The tendency to constantly modernize and overhaul infrastructures of circulation has been the hallmark of industrial capitalism since its inception. However, it is in the context of the logistics revolution that the productive circuit and the commodity circuits of extraction have reached a more advanced degree of functional integration. It has been argued that one of the central features of the logistics revolution is that in the interests of speed, connectivity, and homeostasis, it has blurred the boundaries between transport and other forms of productive labor (Cowen 2014; Toscano 2014). As the previous section explained, technologies for supply chain mapping and mineral traceability implemented in the mining industry have deliberately shifted the emphasis from extraction sites individually
considered, to the supply chain understood as a total system. The implications of the logistics revolution in the geography of extraction are also evinced in the geoeconomic shift that enabled Japan and South Korea to achieve a tenfold increase in the number of dry-bulk carriers between 1961 and 1992, going from 471 to 4846 (Ciccantelli 2009, 197). The genesis of this reconfiguration in naval capacity, as Bunker and Ciccantelli (2005) explain, can be traced to Japan and South Korea’s need to reduce transport costs to access remote resource peripheries. In 1995 China became the world’s largest steel producer, a landmark shift that later enabled it to become the main importer of raw materials and develop the largest merchant marine fleet, boasting more than 2000 vessels (Khanna 2016), as well as five of the ten largest container ports in the world.3

The processes of infrastructural and institutional transformation that revolve around the construction of ports, ships, railways, canals, highways, and bridges, for the swift movement of raw materials, however, is rarely problematized in the literature. In fact, Bridge (2008) has argued that the debate on resource peripheries has advanced through a default to national-scale modes of analysis that pushes questions about the transnational organization of production into the background (see also Baglioni and Campling 2017). Recent accounts of mega-infrastructure developments and connectivity infrastructure in the extractive industries have begun to tackle important questions of raw materials circulation, especially via the interrogation of inter-oceanic corridors, port cities, and logistics networks for mineral trade—with China’s Belt and Road initiative perhaps being the most illustrative example of emerging initiatives for the transcontinental circulation of raw materials (Ciccantelli 2009; Harvey and Knox 2015; Kanai 2016; Khanna 2016; Wilson and Bayón 2017; Irarrázaval and Bustos-Gallardo 2018; Kanai and Schindler 2018; Uribe 2018).

The increasing relevance that the commodity circuit of extraction has acquired in the context of the entire geography of primary-commodity production has led to novel expressions of sociopolitical protest and unrest. In other words, the enlargement of the sphere of circulation as evolved alongside its concomitant politicization. And indeed, Mezzadra and Neilson (2017) argue that an understanding of extraction in a narrow sense has ended up by obfuscating emerging forms of contestation and revolt that take place beyond extractive sites but still have direct incidence on them. This is patently manifested in the context of the logistics revolution, which has elevated the “chokepoints” of global supply chains into key sites of political struggle and labor insurgency across the global economy. Indeed, technical sabotage in ports, railways, and road infrastructure, has become one of the staple tactics

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of sociopolitical movements involved in territorial struggles concerning natural resource governance and circulation (see Khanna 2016; Arboleda 2018; Budrovich Sáez and Cuevas Valenzuela 2018). The effectiveness of these forms of sociopolitical contestation stem from the fact that their disruptive effects are not exclusively confined to the commodity circuit. In fact, they spill over to the productive circuit of extraction, as extractive operations are often brought to a halt as a result of blockages taking place downstream, putting enormous pressure on physical producers.

**Money Circuit of Extraction**

Mediating the combined movement of the commodity circuit and the production circuit we find the money circuit of extraction, personified in the figure of financial institutions, bankers, debt instruments, regulatory policy frameworks, and so forth. For Marx, the circuit of money capital is of fundamental relevance because it manages the existing contradictions between production and realization through the extension of credit, which provides liquidity to material operations in advance of real accumulation (Harvey [1982] 2006, 2013; Heinrich 2012; Fine and Saad-Filho 2016). Through an elaborate array of debt instruments—bonds, mortgages and corporate stock—the financial system has historically furthered the momentum for the technological innovations in transport systems, as well as for the construction of infrastructural developments across resource-rich countries (Bunker and Cic-cantell 2005). In fact, the very possibility for the mining industry to become increasingly capital-intensive, smart, horizontally integrated, and autonomous, has been directly contingent upon the mediations of a complex network of financial actors, practices, and instruments. Findings from the 2019 *Banking on Climate Change* report, for example, reveal that financial institutions such as JP Morgan Chase, Barclays, Bank of China, and the Japanese MUFG, have furnished the fossil fuel industry with USD 1.9 trillion since the Paris Agreement was adopted in 2016.

Far from subordinating industrial production to the financial system—as mainstream readings of financialization assume—it has been argued that the financialization of investment strategies has in fact served as a lever to expand material operations across extraction sites. This, in turn, has increased the organic composition of capital at points of production and intensified the antagonism between capital and living labor (Labban 2010, 2014a; Arboleda 2015). In specific terms, the relation between the money circuit of extraction and the productive circuit of extraction can be disaggregated into three different scales or domains of sociospatial intervention. First, sovereign debt has historically functioned as a key mechanism by which nation-states can finance the mega-infrastructural systems required to attract foreign direct investment for primary commodity production such as ports, power plants,
dams, highways, railways, airports, etc. The rise of East Asian economies as the main creditor nations is indicative of how the financial system dovetails with the geographical relocation of large-scale industry. Several studies have concluded that Latin American states have become increasingly indebted to international financial institutions, and more recently to East Asian economies and multilateral banks (Bunker and Cicacell 2005; Schmalz 2016; Stanley 2016). Second, physical producers in the extractive industries—mining, oil and energy firms—have also developed systematic engagements with the credit system, as well as reoriented their corporate behavior and strategies towards financial and/or speculative operations (see for example Labban 2010, 2014a; De Los Reyes 2017). Publicly traded mining and oil companies, for example, tend to exaggerate the size of their reserves, because in so doing they also manage to inflate and distort the price of their shares in stock markets (Tsing 2005; Labban 2010).

Third, geographies of consumer debt have increasingly asserted themselves as one of the foremost sources of financial liquidity for primary-commodity production, especially as institutional investors systematically reoriented investment flows towards land and natural resources in the aftermath of the 2008 financial crisis (see Sassen 2014). In investment models of this sort households have been rendered into “human revenue streams,” especially as hedge funds, pension funds, and investment banks tap into the premiums of workers and middle class homes in order to increase their value through financial engineering (French, Leyshon, and Wainwright 2011; Loftus and March 2016). The ways in which the variegated revenue streams extracted from households and workers are channeled by institutional investors towards the extractive industries (Tsing 2005; De Los Reyes 2017), and towards territorial and environmental infrastructures in general (Christophers 2011; Loftus and March 2016), is adequately documented in the literature. It is in its continuous expansion of the frontiers of profit-making towards new realms of social and ecological existence that the financial system has been recently paralleled to an extractive industry (Mezzadra and Neilson 2017; Sassen 2017). In the section that follows we begin to frame the question of frontier-making through an exploration of the expanded reproduction of what Marx terms the circuit of “industrial capital.”

**Expanded Reproduction and the Mine/City Nexus**

In his introduction to the 1978 edition of Volume II of *Capital*, Ernest Mandel (in Marx 1992, 61) explains that conceptualizing the movement of capital in terms of three integrated circuits enabled Marx to point out how money capital becomes recurrently expelled from the process of value production and is mobilized to increase the scale of the circuit as a whole—a phenomenon that he termed “expanded reproduction.” As is well-known, Marx’s insights
on this question were left only partially developed, and it was actually Rosa Luxemburg who first developed a systematic theorization of expanded reproduction as an instance—if not the instance—of crisis-formation within capitalism (Luxemburg [1913] 2003). Gago and Mezzadra (2017), for example, build upon Luxemburg’s work to frame extractivism as the continuous appropriation of the non-commodified outside. Although the question of appropriation is without a doubt fundamental for understanding the extractive nature of capital’s motion of self-expansion, it is worth pointing out that Luxemburg’s notion of expanded reproduction is also, crucially, an economic theory of overaccumulation, and not merely a political theory of imperialism. By positing expanded reproduction as a problem of surplus money capitals that become realized elsewhere, Luxemburg ([1913] 2003, 332–333) offers important elements for grasping the nature of accumulation as a contradictory unity of production and realization.

The sociospatial and urban implications that underpin the realization of overaccumulated capitals under conditions of enlarged reproduction are notably theorized by David Harvey ([1982] 2006, 1985) through the notion of “capital switching.” Specifically, Harvey (1985) claims that crisis tendencies emerge when overaccumulation in a “primary circuit” yield surpluses that cannot be reabsorbed in the productive process. As a result, money capital becomes periodically reoriented towards a “secondary circuit,” which is formed by a physical framework for investment in the built environment, and which entails the creation of the spatial arrangements for production, circulation, transportation, and consumption that are most patently embodied in the city. The transformation of the urban landscape as a result of surpluses that originate in primary-commodity production and are later jettisoned outwards to the secondary circuit has been an overarching trend in the historical evolution of extractive industries. Gray Brechin’s (2006) landmark historical-geographical study suggests that it was precisely the vast material wealth springing from the silver and gold rushes of the Nevada and California mines during the mid-19th century that fueled similar construction and real estate speculation booms in the city of San Francisco. Joe Feagin’s (1990) comparative study of the oil boom of the postwar period concludes that Aberdeen and Houston were reconfigured through similar dynamics of capital circulation and investment in the built environment.

The scale at which these capital switching strategies operate, however, has been redefined by the combined world-historical tendency towards the intensification of monopoly power, the globalization of production, and the pervasiveness of social and ecological crises, which John Bellamy Foster (2019) has aptly termed late imperialism. The pervasiveness and magnitude of contemporary investment strategies in the built environment are hinted at in Khanna’s (2016, 95) claim that “China is not ‘buying the world’ per se but building it in exchange for natural resources.” Moreover, recent studies
show that export booms in the Chilean mining industry under the commodity supercycle have tended to further vast surpluses of financial liquidity that are consistently reabsorbed by the real estate sector, either through direct construction of housing and infrastructure, or through the expansion of credit via the mortgage system and other forms of personal debt (see Rehner and Vergara 2014; Rehner and Rodríguez-Leiva 2017; Vergara-Perucich 2018). Also, it is estimated that the dramatic growth of transgenic soybean production in Argentina has metastasized into large-scale urban redevelopment projects and speculation, thereby triggering gentrification, environmental degradation, and the enclosure of urban space across several cities (see Pintos 2017).

It is precisely the increasing structural circularity which exists between extraction and urbanization that has given rise to a vibrant scholar-activist literature in Latin America around the notion of “urban extractivism.” Although this concept tends to assume several meanings, it is often used to designate the rise of a frontier culture that is starkly reminiscent of that which tends to predominate in the extractive industries, and which is premised on the treating land as a financial asset, mobilizing monopoly power, displacing urban populations, plundering natural resources, enclosing public space, and deploying aggressive techniques of urban rent-exaction (see for example Hidalgo et al. 2016; Vásquez Duplat 2017; Viale 2017). In broad terms, one of the central concerns that gravitate around the discussion on urban extractivism, and which also bears important implications for the notion of circuits of extraction that this article proposes, is the question of new and increasingly variegated practices of rent-appropriation that reverberate in a wider array of conflicts over the distribution of value. And, in fact, as Andreucci et al. (2017) have recently argued, the last few decades have witnessed a shift from the production of surplus value via the mobilization and exploitation of labor, toward an increasing emphasis on the circulation of money and profit through rent appropriation—a process that they term “value grabbing.”

Going into the various nuances and intricacies of rent theory is beyond the scope of this paper. Nevertheless, it should suffice to say that new directions in rent theory illuminate the mediating role that rent performs within the circulation of capital both within and across the three circuits outlined by Marx. Although rentier capitalism has long figured as an essential preoccupation of studies of extractivism—especially considering the role of the state qua ultimate landlord—recent studies have begun to address the active role that rentiers perform in the production of spatial configurations to the built and unbuilt environment (Labban 2008; Parenti 2016; Purcell and Martínez 2018; Birch 2019). Rent, in other words, should not be understood exclusively in its Ricardian guise as a category of distribution between classes and fractions of class with antagonistic interests and rights—as is usually the case in most of the literature on both liberal and critical political economy. A
further innovation in rent theory has therefore consisted not only in transcending a “distributional” understanding of rent, but also in rethinking processes of rent-appropriation beyond the land (Ward and Aalbers 2016; Birch 2019), to also include questions about scientific and technological innovation, finance, and digital economies.

Understanding rent as a dynamic force that mediates and shapes the expanded reproduction of capital should therefore set the basis for an enlarged conception of extractivism that is adequately positioned to explore the imprint of natural resource economies on urban space, but also on financial, logistical, and technoscientific landscapes. This is of particular relevance insofar as Harvey (1985) explains that crises of overaccumulation are also circumvented by channeling investment flows towards a “tertiary circuit,” which comprises scientific and technological innovation, as well as institutional and cultural arrangements for the “cooptation, integration, and repression of the labor force by ideological, military, and other means” (1985, 8). The mobilization of property regimes (patents, paywalls, licenses) within these forms of circulation, namely in the guise of “technoscience rents” (Birch 2019) or of “technological rents” (Mandel 1980, 192), coordinate the valorization of capital within and beyond the three circuits of extraction. As Zeller’s (2008) study demonstrates, the expansion of intellectual property monopolies in recent decades—via the rent mechanism—has led to new forms of interdependence between knowledge producers, the financial system, and resource economies. Political controversies over the Trans-Pacific Partnership (TPP-11) international agreement, for instance, are strongly indicative of the ways in which new international regimes for intellectual property (particularly in terms of seeds and machinery) entail direct repercussions for the territorial organization of capitalist agriculture and of mineral extraction across signatory economies.

Moreover, processes of capital switching from resource-based industries towards a tertiary circuit—in Harvey’s formulation—reveal how the productive circuit of extraction also extends outwards to directly shape general research on social science, natural science, investment banking, and public policy broadly considered. John Urry (2014), for example, documents the elaborate switching dynamics that fossil fuel companies set into motion in order to reorient profits towards tax havens, thus giving momentum to the “chains of concealment” that, in the author’s view, lie at the heart of the transnational financial system. As Oreskes and Conway’s (2011) landmark work shows, the fossil fuel industry has also funded the think-tanks and scientists that have been notorious for casting doubt on the scientific evidence of climate change with unsubstantiated research and information. Endowments and donations from resource extraction firms to prestigious universities have also spurred concerns over the potential loss of scholarly autonomy and independence. The multimillion dollar agreement to rename the International
Studies Department at the University of Toronto after Peter Munk—Barrick Gold’s founder and former CEO—is of course an important case in point (see Engler 2016), and mirrors similar “philanthropic” endeavors taking place in Canada and beyond. In Chile, Leiva (2015) shows that the Luksic Group—one of the major business conglomerates in the national mining industry—has systematically sought to gain political, ideological, and cultural influence by channeling parts of its revenues to fund political parties, research institutions, universities, and intellectuals of the center-left.

The Value of Extractivism

The notion of extractivism is often mobilized as a slogan and rallying cry against evolving forms of enclosure and dispossession taking place in primary commodity frontiers, and also recently in urban, financial, and digital realms of social life. Gago, Mezzadra, and Neilson thus deserve much credit for expanding the concept in novel directions and for indicating new and more complex ways of addressing this problem in scholarly research. However, this paper has intended to demonstrate that, if an expanded conception of extractivism is to gain further analytical traction, it needs to develop substantive engagements with the question of value. Gago and Mezzadra (2017) are right to suggest that extractivism tends to be framed narrowly as a shorthand for dispossession, and that this obfuscates the equally relevant role that labor exploitation performs in the extractive operations of capital. The focus on labor exploitation, however, is not enough. The production of commodities through the exertion of living labor is but one among various other metamorphoses in the lifecycle of capital, itself a variegated process of sociometabolic mediation in which production, circulation, exchange, and distribution become amalgamated into a complex whole. A critical theorization of the circulation of capital is therefore crucial to grasping the ways in which these various moments interact, enter into conflict, and co-produce each other in historically and geographically specific ways.

By framing the organization of resource-based industries in terms of three distinct yet overlapping circulatory systems—i.e. the productive circuit of extraction, the commodity circuit of extraction, and the money circuit of extraction—I have intended to shed light into the magnitude and dynamism at which resource economies are reconfiguring the financial system, knowledge production, scientific and technological innovation, sociopolitical mobilization, and planetary urban landscapes. A wide array of infrastructural developments has been put into place in order to reduce the turnover times of capital, as well as to seamlessly integrate resource extraction with the port and transport industries under the aegis of a logistics revolution. But more than just a question of mere movement of raw materials in space, an analysis of the extractive industries through the standpoint of
circulation also hints at how surplus capitals produced in the primary sector are being systematically projected or “switched” outwards, thereby giving rise to speculative booms and new forms of enclosure across the wider urban system. As Christophers (2011) has rightly argued, however, analyzing the dynamics of capital switching demands robust, empirical explorations of the concrete reality in which investment flows across circuits develop, are reproduced and become institutionalized. In this sense the present article is but a preliminary attempt at mapping new directions of research that explore natural resource economies through their circulation in social and economic space.

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