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The 'Finance-Extraction-Transitions Nexus': Towards A Critical Research Agenda Exploring the Scramble for Transition Minerals

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Abstract

By exploring what we call the 'Finance-Extraction-Transitions Nexus', this article contributes to the academic literature in two distinct ways. Firstly, it contributes to the growing strand of critical literature studying the shift in development paradigm towards finance-led interventions in Global South countries. We argue that there is an urgent need to expand this literature to explore the role of finance capital in shaping dynamics of extractivism more generally and of mineral extraction in particular. Secondly, the article expands the critical literature on extractivism and transitions that has emerged from Latin American scholarship. By including the analysis of financialization into the conceptualization of extractive growth strategies in Andean countries, we provide a novel way to researching the way in which the subordinate position in global financial capitalism and the increased demand for transition minerals exacerbates existing and creates new dependencies. Exploring this finance-extraction-transition nexus helps to evaluate the interplay between finance capital, the extraction of 'green' metals and minerals, and the material and socio-economic implications of transitions.

Keywords: Finance, development, climate change, green transition, extractivism, minerals, Latin America

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1. Introduction

In the past years it has become increasingly evident that the world is facing multi-dimensional interlocking economic, ecological, and social crises. While on one hand, the supply chain disruptions following the COVID-19 pandemic and the war in Ukraine has led to inflation and economic recession in many Global North countries, extreme weather conditions and climate change, on the other, have had devastating effects across the world. The past 3 years have provided us a window into a grim future, where market fundamentalism and nationalist ideologies threaten social, economic, and environmental cohesion of many societies.

Given public proclamations of governments and the private sector signaling a changing tide in policy approaches to tackling economic crises and the climate emergency, there is an urgent need to study how climate mitigation and transitions away from fossil fuels is imagined within financial capitalism. In order to capture the full extent of this finance-driven transition, we develop what we call the 'finance-extraction-transitions nexus' to evaluate the interplay between finance capital, the extraction of 'green' metals and minerals, and the material and socio-economic implications of transitions. By framing efforts to tackle climate change through this nexus, we aim to make a theoretical contribution to debates on the links between finance and development (Dafermos et al., 2021; Gabor, 2021), on the wider dynamics and effects of financialization (Alami et al., 2022; Bonizzi et al., 2022; Koddenbrock et al., 2022), and on imperialism and dependency (Katz, 2022; Kvangraven, 2021; Palestini, 2021). As energy transitions rely on minerals such as lithium, copper, and cobalt, and given that the Andean region of Latin America is home to over half of the world's copper reserves and over 60 percent of globally identified lithium reserves, the region is going to play a central role in any future energy transitions. Hence, our research also aims to make a particular contribution to the critical literature on extractivism and transitions in Latin America (Ellner, 2021; Riofrancos, 2020; Svampa, 2019).

In order to lay out the importance of a research agenda centered upon the 'finance-extraction-transitions nexus', we begin by exploring the features of contemporary capitalism and how the mainstream literature frames natural resource extraction. We argue that recent transformations of capitalism and the demands of energy transitions cannot be adequately understood using conventional approaches in Economics or Political Science. We highlight how 'transitions' literatures emerging from Latin American scholarship can add explanatory value to our understanding of extractive capitalism. However, we also find that we need to go beyond existing frames and narratives and engage with a critical agenda attentive not only to uneven geographical development of capitalism but also to the role of financialization in shaping dynamics of extraction and transitions. This is the point of departure for exploring the 'finance-extraction-transitions nexus' along three different lines. Firstly, we lay the theoretical basis for how the green transition and new forms of extractivism are shaped by finance capital. Secondly, we explore the interplay between structural transformations of local financial systems and the financialization of extractivism with international financial subordination and the creation of new dependencies. Finally, we interrogate the production of extractive frontiers, both in geographical and ideological registers, arguing that the production of frontiers is simultaneously the production of territories and of human subjects we call ‘frontier subjects’. In developing this nexus, we offer a multifaceted approach to energy transitions that is attentive to the material transformations that underpin the shift away from fossil fuels to alternative energy systems and the socio-economic consequences of these transitions.

2. Neo-Extractivism and Transitions: A Lens from Latin America

Despite extractive activities being crucial in the historical evolution of global capitalism, colonialism, and imperialism (see Veltmeyer, 2013), their place within social science scholarship is less clear. For example, the conventional Economics literature tackling extractivism assumes a schizophrenic character. On the one hand, scholars influenced by the Ricardian notion of ‘comparative advantage’ have focused on ways in which new technologies can be introduced in the various stages of resource extraction and production to improve efficiency (Barbier, 2019). Such efficiency-driven understandings of extractivism, Bruna (2022) argues, have dominated discussions on natural resource extraction, particularly in sectoral analyses of energy and finance which treat extraction as an abstract rather than material process. From this standpoint, extractive activities are proclaimed an opportunity for development for countries of the Global South if undertaken efficiently by applying new technologies (see Barbier, 2019; Chagnon et al., 2022). On the other hand, mainstream institutionalist literature has concentrated on how the so-called resource curse has prevented natural resource-abundant countries to successfully use their endowments to achieve economic growth (see Gelb & Associates, 1989; Karl, 1997). Generally speaking, ‘[t]he resource curse might be defined as the adverse effects of a country’s natural resource wealth on its economic, social, or political well-being’ (Ross, 2015, p. 240). However, neither understanding of extractive activities and their impacts on socio-economic development within the mainstream literature is capable of adequately explaining the historical experiences of extractive-led development or providing a theoretically nuanced approach to studying extractivism that captures all the different moving socio-political, socio-economic, and socio-ecological parts at play.

The critical and heterodox literature looking at historical exchange relations between Global North and Global South countries argues that extractivism is the underlying reason for global uneven development and exploitation (Acosta, 2013; Amin, 1977; Bebbington, 2015). Scholars analyzing extractivism in Latin America frame the extraction, production, and exportation of natural resources through the lens of newly defined conditions of dependency (Acosta, 2017; Svampa, 2022; Svampa & Bertinat, 2022). Gudynas (2018, p. 62), for example, sees extractivism as the ‘appropriation of natural resources in large volumes and/or high intensity, where half or more are exported as raw materials, without industrial processing or with limited processing.' He argues that extractivism deepens Latin America's 'subordinate and functional role in inserting itself into commercial and financial globalization' and that '[t]erritorial fragmentation continues to advance, with relegated areas and extractive enclaves associated with global markets' (Gudynas, 2010, p. 13).

The debates on neo-extractivism have advanced discussions around alternatives to development present during the early years of the Latin America Pink Tide into discussions around energy transitions. However, whilst the Latin American Pink Tide captured the imagination of a generation of critical scholars in the region, the kernels of development alternatives contained in notions such as vivir bien/buen vivir/sumac kawsay/suma qamaña and plurainationalism were not realized in practice (see McNelly, 2020). This stymied critical debates on development and undermined real-world alternatives. Nonetheless, the ecological effects of neo-extractivism re-invigored scholarly debates around the political ecology of 'transitions' in the region, which Svampa (2022, p. 3) frames as 'a change of state, a way of being [*ser*] or being [*estar*].'[*] Hence, transitions are broader shifts in society and are 'understood as [processes] with a certain extension in time, which [include] stages and may refer to a change of social system (such as the transition from feudalism to capitalism), or political regime (such as the transition from dictatorship to democracy in Latin America, or the transition from communism to capitalism, in countries eastern Europe)' (Svampa, 2022, p. 3). As well as producing a diagnosis of the current conjuncture in Latin America and a set of principles that congeal into an alternative to the status quo, the lens of transition provides a theory of change and an evaluation of the rationale behind change (Bertinat, 2016, p. 3). This acts as a bulwark against the co-optation of alternatives and their transformation into empty political slogans, as the 'how' as well as the 'what' sits center stage in these debates.

In Latin America critical debates over socio-ecological and energy transitions are rooted in emancipatory struggles that are immanent to much of the radical scholarship in the region. Critical scholars in Latin America are not studying some geographically and socially far-removed problem, but are advancing research agendas with a wide range of interlocutors inside and outside the academy that have a strategic and prospective purpose (Leff, 2015). There is an urgency in Latin American debates around transitions precisely because they are embedded in socio-ecological, socio-territorial, and feminist movements in the region. Latin American scholars have therefore used 'energy transitions' to capture the social, political, economic, cultural, and ecological dimensions of recent capitalist development and to offer a counterweight to the hegemonic visions of transition emanating from the Global North (see Svampa & Bertinat, 2022). 'The popular energy transition', Bertinat

[*] Svampa's subtle distinction is difficult to capture in English. However, it is worth noting the temporal range implied using *estar* (more temporary) and *ser* (more permanent), as well as the affective register of *estar* capturing states of emotion and feelings.

and Argento (2022, p. 74) argue, 'emerges as a process of democratization, de-privatization, decentralization, de-concentration, de-fossilization, decolonization and de-patriarchization of thought, to build new social relations, congruent with human rights and those of nature'.

The recent critical Latin American scholarship on extractivism and transitions certainly helps to conceptually engage with new forms of state-led accumulation models centered on natural resources and the 'Commodities Consensus' that has overdetermined all realms of economic activity in Latin America in the early twenty-first century (Svampa, 2015). However, despite these insightful contributions, there is an opportunity to expand this literature. We argue that marrying the debates over neo-extractivism and transitions with broader debates among critical and heterodox political economists about recent transformations in capitalism will highlight the implications for Latin America of global energy transitions and the increased demand for 'green' resources.

3. Financialization and Recent Transformations of Capitalism

Two recent developments of contemporary capitalism have had lasting impacts on the global economy and on the current scramble for natural resources. First, the policy responses to the 2007/09 Global Financial Crisis (GFC) and the COVID-19 pandemic have placed finance firmly at the center of development policies (Stevano et al., 2021). Finance has always been an important feature of capitalism. In Volume III of Capital, Marx (1990) noted how finance played an important role in mediating the contradiction between the production and realization of surplus value (see also D. Harvey, 2006), and recent scholarship on the colonial legacies of finance demonstrate its significance in facilitating the triangle trade and the rise of European colonial empires (Gilbert, 2018; Patnaik & Patnaik, 2021). Increasingly, however, finance is playing a principal role in directing the creation, transfer, and storage of value, particularly in the Global South (see Bonizzi, 2013; Coe & Yeung, 2019). As well as increasing the financialization of global capitalism, this trend also makes finance the key player in development, with far-reaching implications for global uneven development. As Bonizzi et al. (2022, p. 654) argue, the main implication of 'this latest stage of mature capitalism is the subordinate integration of the periphery into the world economy'.

Secondly, framing the green transition as a remedy for the current environmental crisis has led to an increased demand for natural resources used in the production of green technologies and renewable energy. This is only the beginning, and analysts are predicting an explosion of demand for the metals and minerals that underpin any future energy transition (Jenkins & Hopkins, 2019; War on Want, 2021; World Bank, 2020). As such, the current scramble for resources needs to be understood in the context of the green energy transition and efforts to mitigate the climate crisis. The green transition and climate change policies (and their implications for development) call for us to go beyond the mainstream foci on technological innovations, efficiency-oriented extractivism, and the resource curse. As climate change and contemporary capitalism are entwined – reproducing uneven global development (see Stevano et al., 2021) – the new dynamics of extractivism need to be understood as part and parcel of the intersection between climate change policies and the way in which financialized capitalism shape emerging social, economic, and ecological relations.

The critical green finance literature is still relatively 'young', as the paradigm shift towards finance-based development solutions and green policies was only mainstreamed in the latter 2010s (Bracking, 2019; de los Reyes, 2022; Elsner et al., 2022). The increased importance of finance for development in the context of economic recovery from the COVID-19 crisis and the ongoing climate emergency rightfully calls for closer analytical attention to be paid to the nexus between finance, development, and climate change responses (see Dafermos et al., 2021). However, scholarly contributions to this literature have thus far primarily focused on the way in which public and private actors engage in de-risking strategies for green investments, the role of multilateral development banks in enhancing credits of project bonds, or how Public Private Partnerships (PPPs) securitize infrastructure investments (see Bayliss & van Waeyenberge, 2018; Dafermos et al., 2021; Gabor, 2021).

Gabor (2021), for example, analyses how the paradigm of development finance has penetrated climate policies via the Sustainable Development Goals (SDGs). So-called SDG bonds are one vehicle through which international financial institutions, development banks, and the private sector aim to mobilize capital for climate adaptation and mitigation policies. By leveraging public sector finance, SDG bonds aim to channel blended finance to achieve clean energy transitions. However, only a limited number of studies have analyzed the financialization of extractive activities. While some scholars look at financialized extractivism of food crops, timber, and gold (see Bracking 2019; de los Reyes, 2021), there is a gap in the financialization literature studying the materials needed for the green transition, such as lithium, copper, or cobalt.

These commodities – so-called 'transition minerals' (see Voskoboynik & Andreucci, 2022) ¬– have witnessed a substantial increase in economic demand and political interests over the past years (see Deetman et al., 2018). Given the importance of lithium, copper, and cobalt in producing technologies crucial for climate change adaption and mitigation strategies, these transition minerals are going to be at the forefront of the next commodity supercycle (World Bank, 2017). The estimated mineral intensity of the green transition suggests that demand for these transition minerals could increase by almost 500% until 2050 (World Bank, 2020).

Resistance to financialized green capitalism emerges alongside the 'vertiginous expansion of the borders of exploitation to new territories, which were previously considered unproductive or not valued by capital' (Svampa, 2019, pp. 6–

7), particularly in the Global South. With scant attention paid to the various political implications of the green economy transition, we agree with Voskoboynik and Andreucci (2022, p. 788), who argue that the relationship between resource extraction and climate change 'will likely become a central focus of interest… as part of a broader, emerging research agenda'.

As such, we contend that we require new ways to theoretically and methodologically engage with extractivism in the age of financialized capitalism and energy transitions. Arboleda (2020a, p. 118) argues that extractivism should be conceptualized as 'value in process or in transformation', passing through a productive circuit of extraction, a commodity circuit of extraction and a monetary circuit of extraction. We use Arboleda's provocation to center the relationship between the productive processes mining natural resources, natural commodities' movement through space and the financial flows associated with natural resource extraction. This enables us to evaluate what we call the 'finance-extraction-transitions nexus' within recent transformations of global capitalism and in particular the context of energy transitions away from fossil fuels.

4. The Finance-Extraction-Transitions Nexus

We argue that the finance-extraction-transitions nexus offers a novel approach that can add explanatory value to our understanding of the current conjuncture in global capitalism, and development in Latin America in particular. We explore this nexus along three different lines: (1) how finance in general, and bond and stock markets in particular, direct the speed, depth and shape of new forms of extractivism and green energy transitions; (2) how the financialization of extractivism, including structural transformations of local financial systems, interact with international financial subordination and the creation of new dependencies; and (3) the way in which financialization of energy transitions and extractivism shape extractive landscapes, create new extraction frontiers, and affect the lives of the population inhabiting mineral-abundant territories.

4.1 Financial Capitalism and Green Extractivism: Finance taking over Climate Policies

Several academic studies and reports by financial institutions find that climate change and the mitigation efforts it provokes are likely to destabilize financial systems (Aglietta & Espagne, 2016; Scott et al., 2017). Private financial institutions and central banks have recently stepped up their focus on these climate-related financial risks to secure against them, which reflects a broader trend towards financialized green capitalism. Central banks and financial institutions call on investors to align 'financial flows with those required for a low carbon transition' and avoid a 'rapid system-wide adjustment that threatens financial stability' (Scott et al., 2017, pp. 103–104).

Critical finance research on development considers these trends as one aspect in the move from the 'Washington Consensus' towards the 'Wall Street

Consensus', which Gabor (2021) describes as paradigm shift in development policy that introduces the logics of bankability into development logics across the global economy and, more generally, contributes to a financialization of development cooperation (Gabor, 2021). These tendencies are particularly visible at the energy-development nexus (Baltruszewicz et al., 2021; Dafermos et al., 2021). Like previous development paradigms, the Wall Street Consensus is heavily promoted by the International Financial Institutions (IFI) including the World Bank, the International Monetary Fund (IMF) or Multilateral Development Banks (MDBs). However, while there have been some important contributions to the literature studying the effects of this paradigm shift on understandings of development, how this shift impacts mineral extraction and development strategies in resource-rich economies in the Global South has been overlooked until now.

Recent IFI reports introducing the finance-led logic of the Wall Street Consensus to mining and mineral extraction underscore the need for a timely and critical intervention into this debate. The World Bank (2020, p. 31), for example, argues that increased demand for strategic minerals provides 'opportunities for resource-rich developing countries and enable them to meaningfully contribute to the clean energy transition'. While advising that the 'increasing extractive and processing activities *could* have serious environmental and social implications *if* these activities are not managed responsibly' (World Bank, 2020, p. 31, original emphasis), the Bank provides a set of measures for governments and investors to mitigate these risks. Through the adaption of so-called 'Climate-Smart Mining practices' developed to align with the SDGs (World Bank, 2020), the Bank aims to mitigate negative impacts on 'already vulnerable communities in developing countries, as well as the environment in which they operate' (World Bank, 2020, p. 101). Climate-Smart Mining practices, the Bank argues, would allow public and private actors to 'support the low-carbon transition through a holistic approach…[that] would enable the mining sector to transform its current practices – through innovation and new partnerships' (World Bank, 2020, p. 31).

A central pillar of the Climate-Smart Mining approach is the creation of market opportunities (see Figure 1). Here, the report provides ideas on how to attract investment for the extraction of transition minerals by upstream financial companies. Firstly, market opportunities for private sector capital should be created through leveraging carbon finance instruments. Secondly, the other tool the World Bank (2020) report sees the de-risking of investments as integral in its Climate-Smart Mining approach. While de-risking practices have become more popular in financing climate technology, the World Bank includes market-creating tools to enable the extraction of transition minerals (Figure 1). De-risking is thus not only central in shaping the financialization of energy transitions, but also investment patterns in and extractive processes mining transition minerals.

[Figure 1 about here]

There are several impacts on extractive activities the shift to the Wall Street Consensus implies. As finance capital is the driving force towards a low-carbon economy, this not only reduces the possibility of state-led initiatives such as the Green New Deal (see Pettifor, 2019), it also brings public finances further into the realm of financialized capitalism. A recent IMF staff note on the de-risking strategy of climate-related investments is illustrative of these trends. It presents 'potential ways to mobilize domestic and foreign private sector capital in climate finance…by mitigating relevant risks and constraints through public-private partnerships involving multilateral, regional, and national development banks' (IMF, 2022, p. 1). The IMF identifies several market failures that could prevent private finance capital from investing in climate-related extraction or production initiatives in Global South countries. These market failures arise from different uncertainties around climate risks, the lack of bankable projects, long investment time frames, high upfront capital and transaction costs, country risks, lack of robust local financial markets, and an uncertain governance landscape (see IMF, 2022). The note stresses that '[b]lending public and private sector finance is useful to de-risk…investments for private sector capital in general' (IMF, 2022, p. 2).

Such blended finance strategies include green bonds, SDG bonds, green, social, sustainability and sustainability-linked (GSSS) bonds, sustainability-linked bonds (SLBs), sustainability-linked loans (SLLs), venture capital investments, multi-sovereign guarantees to achieve higher leverage ratios, and PPPs that provide public equity capital to underwrite investments and to lower borrowing costs. Moreover – and in line with broader Wall Street Consensus ideas – IFIs and MDBs should support the development of local financial markets and local bond market infrastructure to deepen local capital markets and their liquidity (see IMF, 2022). This includes directly financing through debt or equity, intermediated finance through local financial and non-financial intermediaries, and large-scale PPPs. Hence, the strategy to mobilize private climate finance for Global South countries not only involves the de-risking of climate-friendly infrastructure projects or green technologies, but also importantly calls for support from transnational capital in the development of capability in managing large mineral endowments and in reforming local financial markets.

Exploring de-risking initiatives of public governance agencies, private financial companies, and IFIs as well as studying the role of these actors in shaping the mechanisms, direction, and depth of financing the extraction of minerals is the conceptual first pillar in our finance-extraction-transitions nexus. This will help to understand how the paradigm shift in development cooperation towards the Wall Street Consensus impacts investment strategies into resource-rich economies in the Global South and to unpack policy initiatives countries where transition minerals are extracted.

4.2 International Financial Subordination and Mineral Extractivism: New Dependencies

Another aspect central to unpacking the finance-extraction-transition nexus is studying different dependencies within global financialized accumulation regimes centered on the extraction and export of natural resources. As the critical literature on extractivism in Latin America rightly points out, extraction activities are at the core of global uneven development, asymmetric and unequal exchange relations, and global division of labor (Acosta, 2013; Gudynas, 2010). Hence, there is an urgent need to explore how the role of finance capital in the extraction of transition minerals and the financialization of extractivism more generally expands existing and creates new dependencies. The high capital intensity of extractive operations and infrastructures means the mining industry has become dependent 'upon the mediations of a complex network of financial actors, practices, and instruments' (Arboleda, 2020a, p. 122). To grapple with the significance of these dependencies, we need to explore financial dynamics of value creation in, and value extraction from, Latin American countries.

Studying the subordinate position of Latin American countries in financial capitalism, for example, brings about new insights into structural value transfer from their economies to the Global North. Here, we draw on the understanding of global finance capitalism put forward by Ilami et al. (2022) and Bonizzi et al. (2022) who highlight the subordinate position of Global South countries internationally inherent to their role in global capitalism, something that shapes their agency in and experiences of extractive processes. From this perspective, the agency of Global South countries is 'circumscribed by their position in global capitalism… [and shaped by] an uneven hierarchy of classes and nation-states' (Bonizzi et al., 2022, p. 654). Through structurally modifying models of capital accumulation across the globe, finance capital has been central in accelerating the transfer of value produced in Global South countries to the Global North.

This systemic function of finance in facilitating the transfer, storage, and realization of value unfolds along several lines. Global South countries embedded into global networks of natural resource extraction are pressured into adapting dollar-based financing systems and a generalized US-model of market-based finance. This pressure is largely applied by financial players in London, Washington, or New York (Fichtner et al., 2017; Gabor, 2018; Gowan, 2009). This hinders the deepening of financial markets in Global South countries and amplifies pressure on non-financial corporations in the energy and mining sectors to borrow in US Dollars from international financial markets, reinforcing the financial and monetary subordination of Global South countries even further (Bonizzi et al., 2022). Besides the obvious limitations on monetary policy decisions, Dollar dependence creates balance sheet vulnerabilities, as it makes firms dependent on liquidity cycles of global financial markets and policy decisions made by financial institutions and central banks in the Global North.

Furthermore, the US model of market-based finance heavily relies on derivatives (see Gabor, 2021), which are highly volatile and create political as well as market uncertainties. Hence, aside from physical trade between producers, traders and manufacturers in the commodity markets, financial trade in commodity derivatives is fundamental as it ‘determines who retains what value and who bears the risks in the context of volatile prices’ (Wojewska, 2022). As the regulation and investment strategies that influence price-setting are made by financial actors in the Global North, this can increase subordination and reduce the policy space available to Global South. The deepening of excising dependencies and the creation of dependencies on global finance and markets, increases the Global South’s exposure to the vicissitudes of global financial and money markets.

Another important factor perpetuating the subordinate finance position of Global South countries is the extraction and export of value from the Global South. Most of the profits of transnational companies are either repatriated to the Global North (where most of these firms have their headquarters) or channeled into tax havens, where profits are reinvested into speculative financial instruments and ventures (Levy & Bustamante, 2019). With current accounts of commodity producers negatively affected by the repatriation of natural resource rents, resource-abundant Global South countries become dependent on balancing their sheets through loans from international financial corporations, which further perpetuate dependencies and financial subordination (see Franz, 2021). Furthermore, financialization and financial subordination are accentuated by the increased participation of non-financial corporations in shareholder value-oriented activities (dividends, share buybacks, mergers and acquisitions), financial operations (insurance and credit; setting up banks, hedge funds and brokerage firms), and financial investment (see van Huellen & Abubakar, 2021). Through these activities, value created in Global South countries can easily be extracted and transferred to investors and institutions located in the Global North (Bonizzi et al., 2022; Patnaik & Patnaik, 2021).

Financialization also has profound effects on the incorporation of land into circuits of capital, particularly due to the way in which it affects existing labor regimes, property rights, and social relations that govern the use of and access to land (see Sosa Varrotti & Gras, 2021). However, much of the current understandings of the financialization of rural transformations have focused on developments within the food and agricultural sectors. While some studies exist on financialization processes in the extractive sectors (Borras et al., 2012; Gago & Mezzadra, 2017), the literature thus far has had relatively limited engagement with extractivism and transition materials. This is surprising, not only as mining has been the focus of speculative investments for some time now, but also because mining is a land-based activity heavily dependent on the commodification of land, the (forced) acquisition of rights, and the reallocation of labor and means of production for the purpose of value creation and extraction.

With the increased investments into mining of transition minerals, we will likely see similar developments, albeit playing out in different territories and at different scales due to the nature of transition mineral extraction. Exploring the finance-extraction-transition nexus thus requires looking at the link between financialized regimes of capital accumulation and the extractive economy, but also between green transitions and new frontiers of dependencies. Unpacking this second pilar of the finance-extraction-transition nexus helps to understand how mechanisms of value creation in and transfer from resource-abundant Andean countries affects relations of dependencies.

4.3 Spatial Expansion of Capital and Life along new Extractive Frontiers

The financialization of both energy transitions and extractivism shapes extractive landscapes, creates new extraction frontiers, and transforms the lives of the population inhabiting mineral-abundant territories. There are several important wider effects of these tendencies that we wish to underscore here. Firstly, because surplus value produced by extractive activities cannot always be absorbed by the circuits of extraction outlined above, these circuits expand outwards. This 'expanded reproduction' of circuits is prone to crises of overaccumulation, which require the opening of new spaces for the realization of value elsewhere (see D. Harvey, 2006). In other words, there is a tendency within capitalism to open new geographies of extraction to overcome the crisis tendencies within circuits of capital (Franz, 2021). The overaccumulation of capital not only expands extractive frontiers – the production sites of extractive commodities – but spills over into the built urban environment and physical infrastructures (D. Harvey, 2006).

In Latin America, the expansion of extractive frontiers has also been accompanied by construction booms in urban centers – this is the geographical form of Arboleda's (2020b) 'planetary mine'. The commodity circuit of extraction is comprised of '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' (Arboleda, 2020b, p. 7). However, infrastructures are always more than their material form, and produce an assemblage of social relations through their construction and continued use (Castán Broto, 2019; P. Harvey, 2014). Whilst infrastructures have an intended function for capital, they also have social effects that spread far beyond their specified roles, dividing communities and habitats, and acting as conduits for unexpected users and social maladies such as the trafficking of drugs and people (Tsing, 2005, p. 38). Moreover, infrastructures embody the promise of a better world, evoking an affective attachment from those they encounter (Appel et al., 2018; Larkin, 2013), even as they spark conflicts over displacement and dispossession (Khalili, 2021).

At the heart of the expansive geographies of extraction lie frontiers. These frontiers are both extractive and financial and are simultaneously geographical and ideational. On the one hand, the notion of the 'frontier' captures the 'dynamics in territorialization as a result of the arrival of new forms of extraction' (Luning, 2018, p. 282), freeing up land for extractive production and circulation, destroying communities and lifeworlds of pre-existing communities, and producing nature as enclosable, compartmentalizable, and commodifiable (Smith, 2008). Extractive frontiers are spaces where metal and mineral deposits are found, fixed geographical locations determined by the geological composition of the earth's crust. On the other hand, however, frontiers are more than simply geographical. They are ideational 'projects… making geographical and temporal experience… Frontiers energize old fantasies, even as they embody their impossibilities' (Tsing, 2005, p. 28–32).

The social construction of frontiers is as true of financial frontiers as it is of extractive frontiers. Whereas extractive frontiers are imagined as empty, wild places to be tamed by capital and as dispensable zones to be sacrificed on the altar of capital accumulation in the name of 'development', 'progress' and 'modernity' (see Lerner, 2012), financial frontiers are framed as 'risky', 'unstable', 'irrational' areas. They are 'a space where boundaries are drawn… display[ing] a mixture of progress, development, emergence, inclusion, and therefore lucrative opportunity, but also backwardness, unruliness, and danger' (Alami & Guermond, 2022, p. 3). As concrete manifestations of the abstract ordering of capitalist societies in space, financial frontiers are produced by a combination of financial mechanisms, tools and frameworks, many of which we have already mentioned above. These mechanisms are far from neutral and embed racial capitalism into global money and financial markets (Tilley, 2021). The construction of global hierarchies within markets rest upon racial hierarchies that produce the ideal financial subjects – 'the entrepreneurial poor and the well-governed developing state' – through universalizing western historical experience and the white, land, property owning *homo economicus* (Alami & Guermond, 2022, p. 14).

This points to centrality of frontiers in producing 'human subjects as well as natural objects' (Tsing, 2005, p. 30). These are racialized subjects, a construction that allows a subordinate insertion into global financial markets and the appropriation of their land for more 'rational' pursuits. However, the dynamics producing frontiers and their subjects are complex and multifaceted. Rather than appropriation and dispossession always happening directly and through violence, Li (2014) and Castañón Ballivián (2022) argue that it is the introduction of capitalist social relations themselves – a phenomenon that accompanies the establishment of resource enclaves and infrastructure projects – that dispossess peasants and indigenous people of their land. For example, switching to cash crops for sale on the market internally differentiates communities and creates situations where the 'winners' of cash crop cultivation can buy the land of the 'losers'. As such, capitalist competition between small scale producers drives microprocesses of dispossession and land ownership concentration, even as these processes are driven by the expansion of industrial agriculture and monocrop production on a global scale.

Interestingly, Castañón Ballivián (2022) argues against any direct relationship between race and class, as accumulation from below is often marked by stratification *within* different groups on the micro level. The production of frontier subjects is thus fraught and may appear contradictory at different spatial scales. Frontier subjects are undoubtedly forged by race, class, and gender, but the relationship between these categories is not always clear, neither is the relationship between these frontier subjects and the spaces of extraction. Whilst on a macro-scale, the circuits of extraction deepen capitalist relations and expand processes of indebtedness and dispossession, these dynamics are experienced unevenly, producing internal differentiation within communities of frontier subjects, as well as inserting frontier subjects as a group into global hierarchies of race, class and gender that are concretely experienced through financial and economic subordination.

We suggest that greater attention needs to be paid to how global processes captured by the finance-extraction-transition nexus play out on micro-scales at frontier zones. Interrogating how these dynamics operate 'on the ground' will give us a richer and more fine-grained understanding of how energy transitions are playing out, uncovering the contradictions involved in any attempt to tackle anthropogenic climate change.

4. Conclusions: Towards the Construction of the Finance-Extraction-Transitions Nexus

Any financialized energy transition driven by the like-for-like replacement of fossil fuel technologies by their 'green' equivalents is going to rely on transition minerals like copper, lithium, and cobalt – substances that are found in large quantities in the Andean region of Latin America. Throughout the course of this paper, we have drawn on recent critical debates on extractivism and transitions, financialization and international financial subordination, and the production of extractive and financial frontiers in order to build explore what we called the 'finance-extraction-transition nexus'. This is the theoretical approach that will enable us to evaluate the wider social, geo-economic, and geo-political realities of financialized energy transitions and the processes of extractivism they rest upon in Latin America. Our discussions point to the different ways in which financialization is shaping energy transitions, through de-risking, blended finance strategies including SDG bonds, GSSS bonds, SLBs, SLLs, venture capital investments and multi-sovereign guarantees, and PPPs.

The 'finance-extraction-transition nexus' can provide a useful lens to critically unpack how parallel processes of financialization shape mining processes in mineral-abundant countries, what effects this has on wider dependencies, and how this shapes extractive frontiers and financial frontiers. It is the interplay between these concomitant processes that we contend remains understudied and that will be central to a nuanced understanding of the multifaceted outcomes of energy transitions. A research agenda for mineral extraction and development in Latin America that centers around this nexus is particularly useful as it expands the critical and decolonial literature on transitions, highlighting the deepening of existing and the creation of new dependencies.

Empirically studying market-making and financial activities and how they interact with extraction and reshape transition frontiers across the Andean region will throw up new challenges and unveil a variety of dynamics that will help us in further developing our theoretical frame. This will offer opportunities to refine the explored nexus, flesh out the pieces that remain underdeveloped, and hone the parts that do not match with the micro-empirical realities, particularly when working with communities directly affected by transition mineral mining and its infrastructures. This inductive research on the way in which finance (re)produces dynamics of extractivism and (re)shapes transitions in the Andean region will help to empirically understand arising forms of dependencies around the extraction of minerals such as lithium, copper, and cobalt. If these center around old relations between the North Atlantic capitalist core and Latin America or whether they showcase new power struggles over the rules of commodities trade and the distribution of value with China playing an important role is yet to be seen. We contend, however, that exploring the finance-extraction-transition nexus will be crucial in grasping a complete understanding of the multifaceted processes unfolding in contemporary financialized green capitalism.

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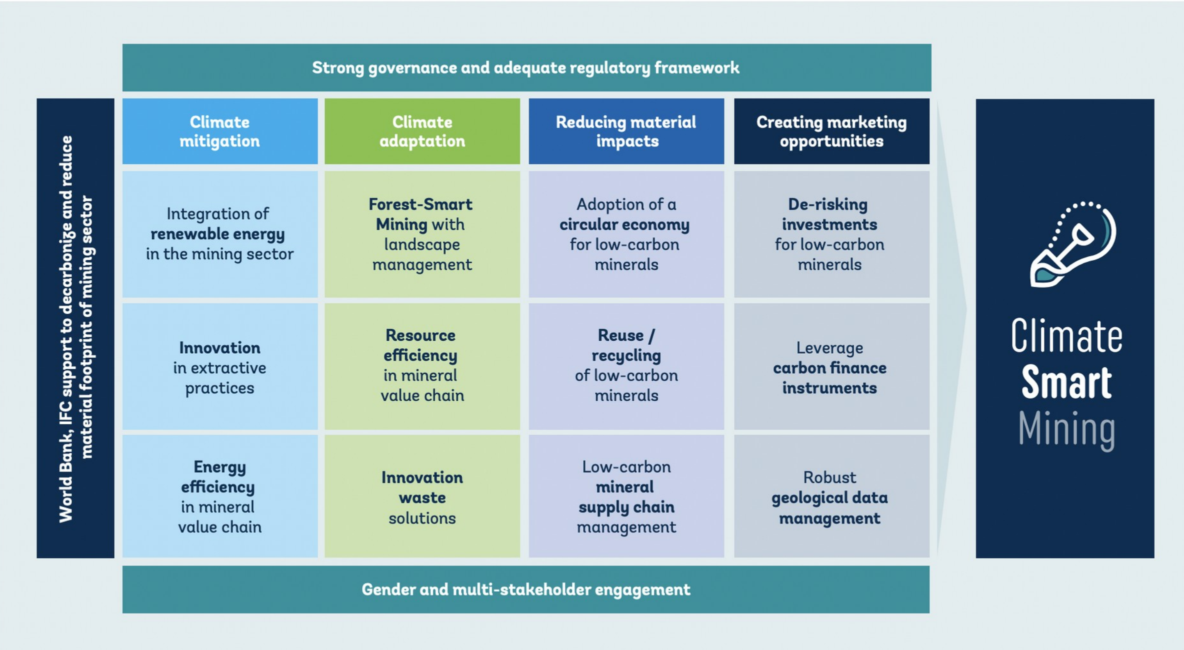
Figure 1: World Bank's Climate-Smart Mining Approach



Source: World Bank (2020)