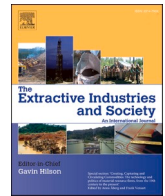




Contents lists available at ScienceDirect

The Extractive Industries and Society

journal homepage: www.elsevier.com/locate/exis

Original article

Beyond the resource curse: The redistributive challenge of sustainable resource-led development in Australia, Chile and Zambia

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ARTICLE INFO

Keywords:

Multinational enterprises (mnes)
Global production/financial networks (gps)
Extractive policy regimes
Resource peripheralization
Sustainable resource-led economic development

ABSTRACT

We outline the redistributive challenge (Eggert, 2001) associated with resource-led development posed by entrenched spatial divisions of labour (SDL) and absent or weakly aligned fiscal, industry and regional policies that undermine processes of strategic coupling in mining global production networks (GPNs). We illustrate this redistributive challenge of resource-led development with respect to copper mining communities in Australia, Chile and Zambia drawing lightly upon extant literature and secondary data. In conclusion we note how the framing and effects of redistributive policies might be better incorporated into economic geographical theory and the need for policy experimentation with regard to the redistributive challenge of resource led development.

1. Introduction

National development outcomes are a key justification for resource extraction undergirded by macroeconomic management and investment facilitation policies. However, while academic literature (Hayter et al., 2003) and policy initiatives (OECD, n.d.) acknowledge the diversity of resource-based developmental outcomes, extraction continues to take place in resource peripheries (Rehner et al., 2020) geographically distant from major population centres, and whose resource deposits, once extracted, are shipped to distant markets. Our contention is that resource peripheralization results from extant concentrations of economic activity in national city systems and missing or weak redistributive fiscal, industry and regional policies addressing the political and redistributive challenges associated with extraction (Eggert, 2001).

In this paper we set out a research agenda focused on the redistributive challenge of resource-led development. The presence and alignment of various redistributive fiscal, industrial and regional policies on mining communities is vital to attenuating processes of resource peripheralization and generating sustainable resource-led development – not least because uneven subnational economic development is as

much an input to, as and outcome from, resource-led national economic development. This challenge can properly be understood with respect both to national policy regimes and the multiscale reach of global production networks (GPNs).

In theoretical terms, the paper contributes by deepening the global production network (GPN) approach's multiscale perspective on the organization of economic activities (Henderson et al., 2002) and the potential for strategic coupling (Coe et al., 2008) between states and multinational enterprises (MNEs) by enriching analysis of the policy challenge of the subnational redistribution of the economic development effects of mining. The regional scale of analysis within GPN approaches (Henderson et al., 2002; Coe and Yeung, 2019, GPNs) remains underdeveloped both with respect to inertia in urban and regional spatial divisions of labour and non-trivial issues of policy coordination and geographical alignment. First, a recognition of extant spatial divisions of labour (Massey, 1984, SDL) that endure within the networks orchestrated by MNEs is critical to understanding why one thing may not automatically lead to another in the formation of local linkages (cf. Hirschman, 1981: 75; Morris et al., 2012) and that resource peripheries are instead cursed with a lack of local industrial development and

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Received 24 October 2021; Received in revised form 9 April 2022; Accepted 13 April 2022

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diversification. This ‘curse’ typically has been traced to national institutional and policy settings or regimes of resource-rich nations (Auty, 2001) which can also be traced to the political challenge of resource-led development (Eggert, 2001) manifest in the likes of rent seeking by political elites (Scholvin, 2021). Second, however, greater attention should be paid to absent, spatially inconsistent or indiscriminate fiscal, industry and regional policies as part of (national) extractive policy regimes as these affect resource peripheries. If the literature on mining-led local economic development is polarised into ‘bright’ or ‘dark’ side perspectives (Phelps et al., 2018), a focus on extant SDL and the geographical alignment of redistributive policies points up the

middling outcomes that are possible (Atienza et al., 2021; Phelps et al., 2015).

The paper is an exploratory and interpretative review of extant literature and inspection of available secondary data from official sources ahead of original empirical analysis (Fig. 1). While we are critical of the likelihood of resource extraction leading automatically to local, regional or national economic development, we adopt neither an extreme bright nor an extremely pessimistic interpretation of resource-led development (Phelps et al., 2018), pointing instead to the potential of redistributive policies to effect middling - more sustainable (diversified) - patterns of local economic development in particular.

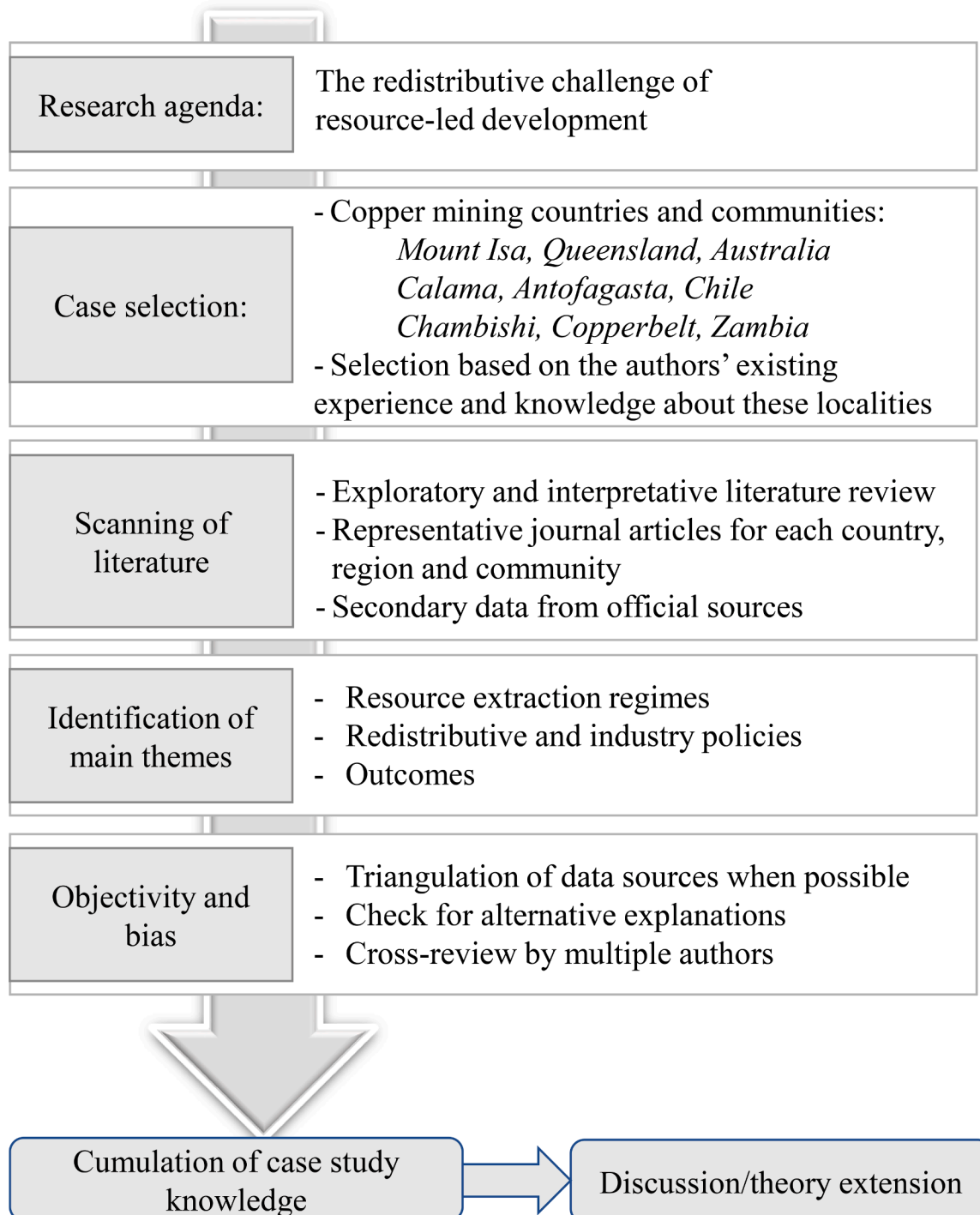


Fig. 1. Literature review method.

After outlining the agenda, we provide a comparative synthesis of literature on Australia, Chile and Zambia (the 6th, 1st and 8th largest copper producers worldwide, [ICSG, 2021](#)) and inland mining communities – Mount Isa in the Australian state of Queensland, Calama in the Antofagasta region of Chile, and Chambishi in the Zambian Copperbelt. This limited international comparison allows us to contrast the ways resource communities are woven into GPNs and in which extractive policy regimes moderate development outcomes at the local scale as summarized in [table 1](#) below. We conclude by noting the importance of research and policy agendas focused on the neglected redistributive challenge ([Eggert, 2001](#)) associated with resource-led development.

2. The redistributive Challenge: When one thing may not follow another

The soaring global demand for metals during the most recent commodities super-cycle (2000–2014) underscored many opportunities for local economies to benefit from the formation of vertical and horizontal linkages with mining MNEs when ‘one thing follows another’ ([Hirschman, 1981](#); [Morris et al., 2012](#)). However, remote resource-extraction regions (resource peripheries) have had diverse economic development experiences which underline the need for multiscale analyses ([Henderson et al., 2002](#); [Martinus et al., 2021](#)) capable of encompassing ‘bright’ and ‘dark’ side as well as middling economic development outcomes, which we summarise in [Fig. 2](#) ([Phelps et al., 2018](#)).

Many mining communities remain characterized by industry profiles that are highly skewed to mining or else products or services destined for final consumption (residential property development and retail sectors). Bifurcated local industrial structures are missing the intermediate (and, especially, knowledge-intensive) manufacturing and service industries so typical of large diversified and sustainable city economies ([Nilsen, 2019](#); [Scholvin, 2021](#)). Here a focus on the activities of MNEs within mining GPNs reveals both inertia and change in the loci of corporate decision-making, financing and sourcing of parts, services and direct labour such that the economic development effects of mining are refracted through evolving spatial divisions of labour.

Where GPN analysis emphasizes the prospects for the territorial embeddedness of MNEs and ‘strategic coupling’ as mutually constitutive processes based on cooperation between MNEs, states and other actors ([Yeung, 2009](#)), coupling is only one of several outcomes ([MacKinnon, 2017](#)). One reason for this is that national policies surrounding mining industries often fail to span the four - macroeconomic management, political, investment and distributional - challenges surrounding mining ([Eggert, 2001](#)). This is not to say that redistributive fiscal, industry or regional policies are entirely missing in many federal or unitary national state contexts, but that they fail to address the scale or complexity of the challenges to sustainable mining-led economic development as a result of being insufficiently targeted, inconsistent over time and spatially ‘blind’ or indiscriminate (OECD, n.d.).

In [Fig. 2](#) we therefore characterize copper mining GPNs as ones in which there remains significant hierarchy in value capture and only partial redistribution of revenues as a result of missing or weak redistributive policies.

2.1. Spatial divisions of labour (SDL) within global production networks (GPNs)

Spatial divisions of labour (SDL) or elements of corporate and city-system hierarchy endure within GPNs ([Thompson, 2000](#)) and indicate the likelihood of failures of mining communities to deepen and diversify their economies on the basis of upstream, downstream and horizontal linkages. Many of the processes underlying the geography and orchestration of GPNs are financial rather than productive ([Coe, Lai and Wójcik, 2014](#); [Phelps, 2017](#)). This is especially true in mining ([Bridge, 2008](#)) given the high costs associated with large-scale projects, including exploration, approvals, infrastructure (e.g. ports, railways),

and the concomitant risk resulting from exposure to movements in commodity prices ([Miao et al., 2022](#)). There remains, then, a need to understand how the financing of mining shapes the fortunes of resource peripheries ([Loginova et al., 2021](#)).

(Neo)liberalization of international trade and investment policies since the 1980s, concentration of extraction in the hands of resource giants (e.g. Shell, BHP, Rio Tinto) and the rationalization, offshoring and outsourcing of inputs ([Contractor et al., 2010](#); [Phelps, 1993](#)) has further decoupled service provision from extraction with only partial decentralization of corporate command and control functions moderating the possibilities for one thing to follow another in the formation of localized linkages around mines. As information and communication technologies (ICTs) enabled greater centralisation of decision-making, resource periphery cities have often been reduced to little more than glorified camps. Corporate business service activities remain consolidated in world cities such as Singapore, Buenos Aires, Santiago, and Cape Town, which service regional hydrocarbon deposits respectively ([Scholvin et al., 2021](#)), though larger centres in regions associated with oil and gas (e.g. Houston, Edmonton, Kuala Lumpur), iron ore (e.g. Rio de Janeiro, Perth), and other national deposits gained influence as ‘gateway’ city locations for professional service activities tied to distant sites ([Breuil, 2020](#)) and ‘backdoor’ city transit points for FIFO labour associated with engineering services ([Atienza et al., 2021](#)).

The most notable outsourcing by mining MNEs has been of direct labour and specialized knowledge-intensive engineering services via the adoption of fly-in-fly-out (FIFO) practices. These practices have displaced economic development effects away from resource peripheries to regional cities with major ports, airports and/or MNE branch offices but also to cities nationally and internationally ([Atienza et al., 2020, 2021](#); [Perry and Rowe, 2015](#)).

2.2. National extractive policy regimes

The GPN literature broke from state-centric approaches to understanding international trade and production ([Horner, 2017](#)) but has come to emphasize policy facilitation by states in processes of ‘strategic coupling’ ([Coe and Yeung, 2019](#)). However, the policies of states exceed facilitation in ways that complicate expectations for coupling ([Horner, 2017](#); [MacKinnon, 2012](#)). Notions of strategic coupling centred on regional assets ([Coe and Yeung, 2019](#)) not only privilege facilitation but also overstate the likelihood of strategic coupling in the face of the political (i.e. territorial management) and redistributive challenges faced by states in the design and coordination of industrial and regional policies. Thus, in [Phelps and Wood's \(2006\)](#) analysis, mining represents the curious, underexamined, case of strong local dependence on the part of MNEs but little or no political engagement on the part of governments.

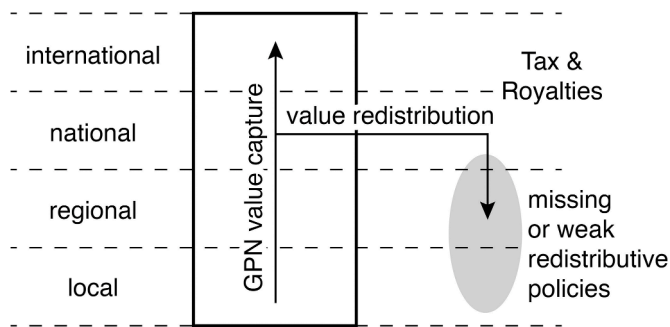
At the national scale, the combination of financing and sourcing by MNEs in mining GPNs and neoliberal extractive policy regimes means that mining cities and regions are characterised by ‘backwardness’ and underdevelopment by national standards. Mining output has boomed under (neo)liberalized national extractive policy regimes ([Bridge, 2004](#)). The literature on extractive policy regimes emphasizes the simultaneous *presence* of robust macroeconomic management and investment facilitation policies ([Camba et al., 2020](#)) and relative *absence* of redistributive, fiscal, industry and regional policies. (Neo)liberalized extractive policy regimes are more variegated than often appreciated not least as strategic coupling and development outcomes reflect how policies mesh with particular segments of the value chain ([Nilsson, 2019](#)).

Fiscal redistribution often sets the financial resource context for industry and regional policy design and implementation but also contributes to human capital formation which both industry and industry and regional policy seek to leverage. Industry-centred spillovers coupled with active industry and regional policies may enable peripheries – including resource peripheries – to emerge as semi-peripheries ([Phelps and Fuller, 2000](#)). In the case of some resource-based national

Table 1

Multiscale summary of copper mining GPN, national policy regime and redistributive policy effects in Australia, Chile and Zambia.

Scale of analysis	Mount Isa, Australia (Neoliberal state-led extractivism)	Calama, Chile (Originator of neoliberal extractivism)	Chambishi, Zambia (Between extractivism and developmentalism)
Spatial divisions of labour (SDL) within GPNs	Local contact office, HQs out of state in Sydney and Switzerland; sourcing of services and FIFO labour from elsewhere in Queensland.	HQs in Santiago de Chile and overseas; financing in Santiago; sourcing of services and FIFO labour from Santiago and overseas.	HQs overseas; financing in Beijing; sourcing of services and labour in Chambishi.
National (unitary or federal) policy regime	(a) Partial support for infrastructure development (b) No discernible state-MNE bargaining	(a) National producer CODELCO, but otherwise minimal regulation. (b) No discernible state-MNE bargaining	(a) Partial government share ownership but (b) State is silent partner in mining joint ventures
Regional (Provinces, administrative regions, States) policy regime	(a) Fiscal redistribution proportionate with regular municipal responsibilities but not with state revenue generation (b) Little or no exercise of competencies for industrial or regional policy and no decentralized state ministries (c) Consistent fiscal and industry policies that are spatially indiscriminate	(a) Fiscal redistribution less than needed to discharge municipal responsibilities let alone national revenue generation (b) All relevant mining ministries remain in the national capital. (c) Spatially indiscriminate cluster and supplier development policies	(a) Fiscal redistribution less than needed to discharge municipal responsibilities let alone national revenue generation (b) All relevant mining ministries remain in the national capital. (c) Inconsistent and spatially indiscriminate industrial and local content policies.
Local (municipalities)	Important percentages of services and FIFO labour sourced from within state; gateway urban economic function displaced to Brisbane and Gold Coast.	Small percentage of services and FIFO labour sourced from within region; backdoor urban economic function displaced to Antofagasta.	Small percentage of services but majority of direct labour sourced locally; lack of gateway or backdoor urban economic function for Chambishi or Lusaka.

**Fig. 2.** GPNs, national policy regimes and the redistributive challenge.

economies this has taken the form of ‘gateway’ (Breul, 2020) and ‘backdoor’ (Atienza et al., 2021) cities which have concentrated some of the local economic development opportunities associated with changes in the organization of mining, including (out)sourcing of services and FIFO labour and the import and export of materials.

Much may depend on the spatial alignment (the targeting and consistency) of fiscal, industry and regional policies on mining communities. However, as we depict in Fig. 3, the policies that most shape the prospects of mining communities may only partially align to effect local economic development.¹

2.2.1. The framing, consistency and spatial specificity of redistributive policies

One feature common to extractive policy regimes is the centralized receipt and management but limited redistribution of mining revenues alongside weak industrial and regional policies. Current fiscal algorithms in most national extractive policy regimes focus on horizontal (cross-State) equalisation (Lecours and Béland 2013). Yet mining localities are often viewed as ‘resource banks’ rather than spaces for reinvestment (O’Faircheallaigh 2012). Fiscal transfers and policies are often framed in ways that neglect (Tonts et al., 2013) or consciously ‘sacrifice’ (Shade, 2015) resource peripheries (though neglect may be less in federations where states collect or share revenues with central governments).

¹ Fig. 3 depicts one among many possible scenarios in which fiscal, industry and regional policy coincide only imperfectly at the scale of a mining city.

Consistency and specificity of policy determine credibility in the eyes of MNEs (Phelps and Fuller, 2001). However, industry and regional policies in the form of local content, labour market and growth pole and cluster policies often are pursued inconsistently and in spatially indiscriminate ways. States have struggled to effect processes of subnational linkage formation with local content and supplier development policies, due to a lack of focus on the local (Nwapi, 2015), including developing local capabilities (Anzolin and Pietrobelli, 2021), locally formed enterprises (White, 2017), including Indigenous-owned and operated enterprises specifically (Esteves and Barclay, 2011). Failures to attune national labour market regulatory and educational and training policies to local conditions have also been apparent (Fuller and Phelps, 2004). Geography figures ambiguously in growth pole and cluster theory and policy (Martin and Sunley, 2000). Two further complications arise here since policies must seek to act on industry-specific and urban externality fields that evolve over time (Phelps, 2009) and on resource peripheries where one or a limited number of mining companies mean that corporate capture of policies can undermine sustainable local economic development (Phelps, 2008).

While the regional scale (i.e. subnational regions in unitary states and states in federations) is often not the scale at which the problems associated with mining-led development arise (OECD, n.d.: 2), it may be critical as this is where policy can moderate erstwhile processes of resource peripheralization. However, with the exception of a few nations, competencies and resources have rarely been decentralised or devolved to regions (Keating, 1997) or responsible central ministries or agencies relocated (Massey et al., 2003) in ways that might promote the formation of regional government-corporate headquarters-business services complexes. The problems are acute in unitary states where policies directed at assisted regions have failed to alleviate regional inequalities (Phelps, 2009).

2.3. Local outcomes

The wealth produced in resource peripheries contrasts with the physical appearance of many mining towns, yet the resource curse is understood primarily in national terms. That wealth gaps between national averages and resource peripheries widen during mining booms (Bebbington and Bury 2009; Bainton 2020) suggests that the relationship between national and local economic development outcomes and redistributive fiscal, industry and regional policies is a complex one in which the value of local resource-led development to national economic development continues to be underappreciated.

Mining towns and cities often resemble enclaves rather than urban

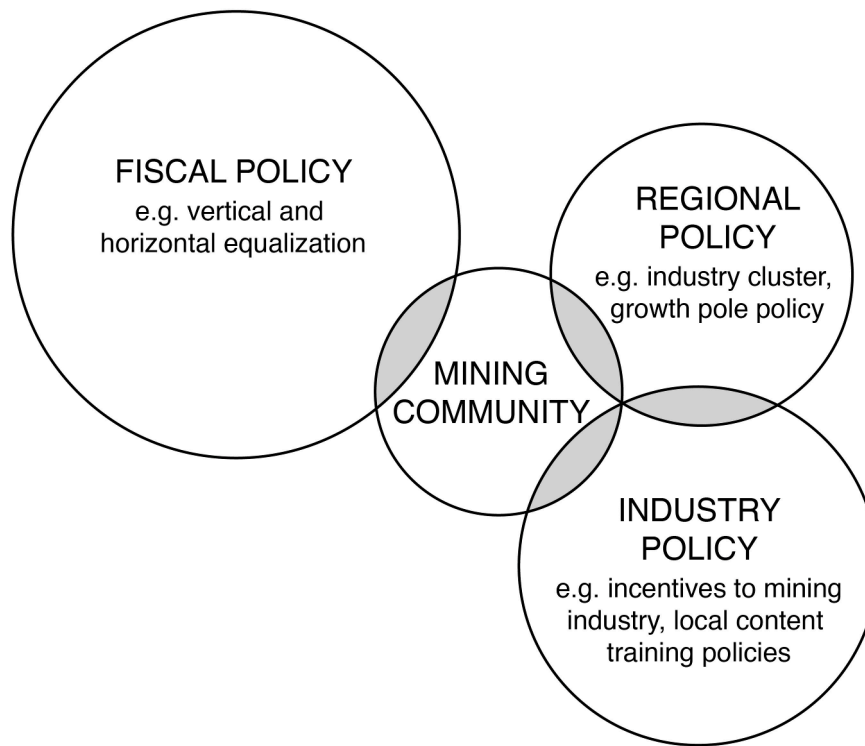


Fig. 3. Spatial alignment of redistributive policies on mining communities.

agglomerations (Phelps et al., 2015) and the economic logic of the enclaves defines the peculiarly difficult challenges surrounding sustainable resource-led development including industrial diversification. The nature of mining enclaves has changed from one of self-contained company towns to camps for outsourced workers, with many of the indirect and induced (income) multiplier effects that drive sustainable urbanization displaced to cities elsewhere in national and international urban systems (Atienza et al., 2021; Breul, 2021; Phelps et al., 2015).

The extreme specialization, capital intensity, vertical integration and importation of technology and labour associated with mining enclaves (Phelps et al., 2015) contribute to a lack of local linkage formation and industry diversification. Intermediate manufacturing and business services are commonly absent from the industrial structure of mining cities – leaving them dependant solely on incomes derived directly from mining and exposed to associated booms and busts in final consumption sectors such as housing, hospitality and retail (Miao et al., 2022). The few large enterprises that dominate mining towns typically abdicate responsibility for the natural and urban environment (Phelps et al., 2015).

In what follows, we discuss the themes of our literature review and Fig. 1 as they apply to our case study countries and mining cities, summarizing the most salient points in table 1

3. SDL within copper mining GPNs in Australia, Chile and Zambia

The fortunes of these copper mining nations are linked with commodity trading which is centred on both regional commercial hubs such as Santiago and Sydney, as well as global financial centres such as London and Beijing. Otherwise, the three countries are woven differentially into GPNs, partly a result of openness to Chinese investment in mining in Chile and Zambia and in mining and ancillary processing and production in Zambia (Töpfer, 2018) when compared to Australia. Chile and Australia have national champion mining corporations (privately owned in BHP and state-owned in CODELCO, respectively) when compared to Zambia, whose national government holds minority

interests in mines owned and operated by overseas MNEs. However, while the respective national champions - BHP Billiton in Australia and CODELCO in Chile – have differential effects on the degree to which GPNs are internationalized, both centralize corporate decision-making away from mining cities.

3.1. Australia

MNEs (BHP, Rio Tinto, Fortescue Metals, Newcrest Mining) benefit from the deregulated foreign direct investment (FDI) environment and government assistance to the mining industry (Bayari, 2016). Most MNEs invest in Australia to access abundant raw materials and sell unprocessed and unrefined minerals on the global market or to their affiliates for further processing. At the same time, there are numerous medium (mid-tiers) and small-scale (juniors) Australian-owned mining companies that operate mines domestically and internationally (Nunez-Picado et al., 2021). Australia's BHP Billiton has an established position as a global corporate strategist, including in the sourcing of finance, services and development of policies for local supplier development and CSR in the mining sector (Argus and Samson, 2021). However, it typically has run its proprietary programs in parallel to government policies which seek to harness economic development benefits across a range of mining MNEs and their suppliers. The Australian Securities Exchange (ASX) based outside the State (Queensland) in Sydney is a major mechanism for financing capital-intensive resource projects (Parker et al., 2018).

3.2. Chile

Since its formation, the Chilean nation state featured a highly centralized organization of economic and political life in the capital city of Santiago (Argent, 2017; Atienza et al., 2021). Chilean centralism and foreign participation in mining GPNs have consolidated the extreme concentration of value captured within the country in Santiago (Atienza et al., 2021). Nationalization of copper extraction in Chile took place with the formation of CODELCO in 1976 and the company remains the

dominant controller of reserves and producer of copper. Paradoxically, the national footprint of CODELCO reinforces centralization and internationalization in spatial divisions of labour within the copper GPN: CODELCO's corporate control, research and development and sales and marketing activities remain perhaps more centralized in Chile than overseas MNEs that have to overcome some of the 'liability of foreignness' while at the same time it seeks to modernize by emulating aspects of globally-orientated best practices exemplified by the likes of BHP.

3.3. Zambia

Zambia's extractive and mining history dates back to the 1920s (Fraser and Lungu, 2007) under colonial rule with the country richly endowed with mineral deposits including gold, uranium, gemstones and coal (Adam and Simpasa, 2009). Currently Zambia's mining sector is dominated by private investment, almost entirely international in character (Bebbington et al., 2018) with the Zambian government maintaining a stake (of approximately 10–20 percent) in the various mines, acting as a silent partner (Kabamba, 2014). In the absence of a copper mining national champion company, local policy advocacy and leadership has been assumed by Chinese mining and allied industry and real estate MNEs.

4. Extractive policy regimes compared

All three countries have varieties of neoliberal extractive policy regimes but vary in the redistribution of mining revenues, devolved and decentralized government, and consistency and targeting of industry and regional policies (table 1). Reports that Australia and Chile have overcome the resource curse (OECD 2009) are contradicted by the weight of other evidence. Chile continues to suffer from extreme wealth inequality. Australian fiscal redistributive systems have favoured extraction rather than diversification (Tonts et al., 2013), while the mining industry's engagement with indigenous communities remains fraught. Zambia, more so than Australia and Chile, has suffered the extremes of booms and busts associated with movements in copper prices. Such inequalities are not simply an effect of, but an input to, mining-led economic development since they can undermine economic performance at national and sub-national levels (OECD, n.d.: 7).

4.1. Australia: Neoliberal state-led extractivism

Australia's Federal system means that both the national (Commonwealth) and sub-national (State) governments play a role in the development of industrial policy. Although the Commonwealth government is nominally charged with foreign affairs and macroeconomic development, neoliberal policy settings encourage State governments to increasingly assume this role. As a result, investment in the resource sector is strongly facilitated at both scales of government. For the Commonwealth Government, the economic value of resources centres on helping to finance Australia's public services. The mining industry is economically significant for States and Territories since royalties in Australia accrue to them. With mining generating 7% of the gross state product and employing 60,000 directly and 180,000 people indirectly, Queensland is heavily reliant on mining royalties and employment. State governments provide assistance to the mining sector, with Queensland providing by far the largest assistance amongst other Australian states and territories (on average over US\$ 1 billion a year, largely for the coal industry) (Peel et al., 2014).

4.1.1. The framing and alignment of redistributive policies

However, states also stand accused of failing to redistribute mining revenues with underinvestment in services, infrastructure and facilities (Langton and Mazel, 2012: 31). While consistent in their facilitation of mining investment, industry and regional policies lack the spatial specificity that might ensure sustained urban industrialization at mining towns such as Mount Isa. The forms of assistance range from direct cash payments to concessions and direct support to infrastructure projects that benefit the mining industry such as port and mineral processing facilities. The Queensland Government has actively promoted the development of copper by investing in exploration programs and upgrading existing projects. In the context of activist industrial policy, the State Government changed environmental legislation and provided 'one-off' incentives for the upgrading of copper smelting and refinery operations, signalling its support to a range of new exploration projects.

4.2. Chile: Originator of neoliberal extractivism

Some of the centralization of Chilean political and economic life was challenged during the 1960's and 1970's by social-democrat and socialist governments. However, the Pinochet military dictatorship severed these processes and implemented the first neoliberal model worldwide (Arias-Loyola, 2021). During this period, the Chilean state reinforced Santiago as the political and economic core, while also rolling-out neoliberal policies for which the country has become infamous under Pinochet's political constitution of 1980. The neoliberal extractivist regime was actually deepened during the return to representative democracy in 1990 (Barton, 2002), being reified colloquially as 'the model' composed of the entrenchment of a technocracy, deepening of privatisation reforms, incentives to private enterprise and defence of private property and an ideology based on individualism, consumerism and competition (Arias-Loyola, 2021).

The growth rates achieved under Chile's neoliberal extractive regime have drawn praise from international institutions (ECLAC, 2001) but they shroud extreme socioeconomic and territorial income inequalities. Chile has some of the greatest income inequalities amongst OECD countries and all nations (OECD, 2020). Environmental conditions and urban services in resource peripheries are extremely poor. These inequalities ultimately led to a social outburst in October 2019 and the replacement of Pinochet's constitution and the writing of a new one by elected constituents (Arias-Loyola, 2021; Somma et al., 2020) with expectations for the unravelling of many aspects of 'the model'.

4.2.1. The framing and alignment of redistributive policies

Since the return to democracy, the Chilean state promoted several spatially indiscriminate public policies aimed to foster national economic development (Atienza et al., 2021; Bravo-Ortega and Muñoz, 2021). These policies focused on developing and strengthening the mining industry's linkages nationally with assumptions of trickle-down multiplier effects linked to Porter's notions of industry clusters (Arias et al., 2014; Atienza et al., 2021; Bravo-Ortega and Muñoz, 2021). The National Cluster Program, based on the National Innovation Strategy of 2005, shifted the focus from subnational considerations to increasing national growth rates and competitiveness (Bravo-Ortega and Muñoz, 2021). This gave rise to the World Class Mining Suppliers Program (WCMSPP), initially led by BHP Billiton in 2008 and then jointly with state-owned CODELCO since 2010, aimed at encouraging the rise of globally competitive specialized domestic suppliers (Atienza et al., 2021). While innovative in serving the interests of large mining operators, the program could not be scaled up in ways that generated an internationally competitive domestic base of suppliers (Navarro, 2018).

After the failure of the WCMSF, the Alta Ley national mining program was established in 2015, which incorporates elements from the previous initiatives, while aiming to promote an open innovation system based on Chile's specialization in mining (Bravo-Ortega and Muñoz, 2021). The spatially-blind character of Chilean mining policies is further illustrated in the Chilean mining development strategy (Fundación Chile 2016), which has virtually no mention of cities, regions and territories. Extractive regions have regional strategies for development but these are outdated, have not been evaluated and are ignored by politically-elected representatives.

4.3. Zambia: Between neoliberal extractivism and developmentalism

Zambia's political economy remains highly centralized at national level with recent adoption of neoliberal macroeconomic management principles (Fraser and Larmer, 2010). These have been overlain with unimplemented developmental policies (Carmody et al., 2012) reflecting changes over three periods since independence – nationalization, privatization and the commodity price boom from 2003 to 2008 and its after-effects.

When Zambia became independent in 1964 mines owned by private investors contributed over 50 percent of government revenue (Kruger, 2013) and initially the Copperbelt province was transformed into a vibrant urban and industrial community and Zambia a middle-income country. Nevertheless, by 1970 Zambia was mineral dependant, generating from copper 90% of exports, 60% of tax revenue, half of its GDP and 20% of formal employment (Aron, 1999; Werner, 2016). In 1973 Zambia's copper mines were nationalized (Fraser and Lungu 2007) and later consolidated through Zambia Consolidated Copper Mines (ZCCM), with the majority shareholding by the Zambian government (60.3 per cent), and a minority share owned by AngloAmerican Corporation (27.3 per cent) (Fessehaie, 2012). Revenues from the copper industry were largely used to subsidise social sectors (Lungu, 2008), while at the same time mines were like small local governments with their own schools, hospitals, sports facilities, roads, and other amenities for employees (Fraser and Lungu 2007; Werner, 2016).

The fall of global copper prices in the 1980s-1990s and geopolitical conditions served to undermine prudent management of the mining sector (Adam and Simpasa, 2009). Limited re-investment by the government-owned producer led to copper output dropping significantly (Fessehaie, 2012). Political change in 1991 brought with it new thinking about the role of the state in macroeconomic and natural resources management (Shakespeare and Mtapuri (2017). Through the structural adjustment programmes of the World Bank and International Monetary Fund, the Zambian government privatized mines as a requirement for external borrowing (Kabamba, 2014). During this period, the Zambia privatised most of the government assets including all the mines, housing and social amenities that were initially under the management of the mines (Fraser and Lungu, 2007). In the 2000s, investment and output were revived and there was also a change in mining policy with development agreements (DAs) negotiated between the government and individual MNEs specifying the conditions and responsibilities for the operating of mines (Werner, 2016).

4.3.1. The framing and alignment of redistributive policies

Fessehaie (2018) notes the inconsistency and non-implementation of Zambia's top-down policy framework. Creating linkages from the mining sector has been high on the agenda for many governments in Sub-Saharan Africa but promotion of, and fiscal and non-fiscal incentives for, mining FDI on their own are seen as sufficient to support downstream employment effects (Werner, 2016; Fessehaie, 2018). There is almost no mention of subnational spaces in the FDI policy. The Zambia Development Agency (ZDA) Act introduced Multi-Facility Economic Zones (MFEZs) from which developers, operators and tenants would benefit from fiscal and non-fiscal allowances (ZDA, 2016). The MFEZs are meant to have physical and administrative infrastructure designed to

attract international investment. At present there are six MFEZs in the country - Chambishi MFEZ being one. These aim at supporting the emergence of clusters of firms that both deepen and diversify local industry structures (Lombe, 2020).

5. Local outcomes

According to the OECD (n.d.: 5), 'there is increasing recognition that the extraction of natural resources needs to generate improved and sustainable well-being for mineral and energy producing regions and cities'. The poor urban amenity encountered in Calama and Chambishi in particular simply serve to underline the lack of any deepening (backward and forward linkage formation) or widening (diversification) of mining-led development there. In Calama, industry parks have basic paved roads and little else – being suitable for fabrication of basic structure and storage of vehicles and equipment. The original mining town adjacent to the Chuquicamata mine has vanished as the pit has been enlarged with the distribution of remaining mineral deposits calling into question the future of Calama itself.

Mining incomes generate familiar booms and busts for final consumption industries (OECD, n.d.). Salaries are channelled into hospitality which can be numerous in mining towns and more numerous in national capitals (Lusaka in Zambia and Santiago in Chile) and regional gateway (Brisbane) or backdoor (Antofagasta) cities. They also may fuel residential construction booms and house price inflation. While evidence suggests that commodity and housing price cycles may be related (Rehner et al., 2020), exploratory research suggests that the most significant house price inflation is displaced to gateway or backdoor cities (Miao et al., 2022) which host regional command and control functions, the export of mining products, or airports for FIFO workers.²

5.1. Mount Isa

For the Commonwealth and State Governments, mining is considered to catalyse spillovers into complementary industries and services supporting jobs outside capital cities. However, Australia's resource peripheries have not reaped nearly the same benefits as State capital and other cities that accumulate and benefit from mining royalties and taxes. In Australia corporate offices are spatially decentralised in state capital cities such as Brisbane. In Queensland, Brisbane hosts headquarters of mining firms as well as specialised services subcontractors and together with high-amenity coastal regions provide a pool of FIFO labour resident away from the mines. According to O'Connor and Kershaw (1999), outsourcing has led to greater development in large cities such as Sydney and Perth as local operators withdraw from mining regions. As resource companies become more specialised with respect to new minerals, technologies, their concentration tends more to large urban agglomerations rather than maintaining staff in 'regions'.

Profits are extracted from resource peripheries and rarely reinvested, compromising liveability. FIFO arrangements leave local residents behind in job opportunities (Perry and Rowe, 2015). Mining brings significant costs to local governments (Drew et al., 2018). In Queensland, local governments are responsible for supplying local services to properties but are funded solely by property taxes, fees and charges. The breadth, depth and time-horizons of local economic development strategies are constrained by limited resources available. In times of mining downturns, mining towns place people at risk of homelessness and other vulnerabilities, due to lack of support services (Warren et al., 2017). In times of commodity booms, services and housing lag large

² Ongoing analysis of time-series house price data for mining towns and the State capital Perth in Western Australia suggest that there are partial links to commodity price cycles and that these are largest for Perth (<https://research.unimelb.edu.au/research-at-melbourne/multidisciplinary-research/hallmark-research-initiatives/affordable-housing#projects>).

influxes of workers and their families. This lack of financial investment in resource regions has been termed the 'resource-return mismatch' (de Souza et al., 2018).

Large disparities between metropolitan areas and regions are due to 50 years of inconsistent regional policy in Australia associated with changes in the Federal Governments (Haslam McKenzie, 2019). The Commonwealth assumes that regional development is the States' responsibility and at the same time dictates the overarching regional policy regime through fiscal dominance. Its neoliberal policies of facilitation have generated desires for more regional autonomy in economic development with sporadic 'new' regional development initiatives, promoting Regional Development Committees and tailored solutions. However, these programs have been disjointed and inadequately funded (Collits, 2012).

The Queensland Government's *Royalties for the Regions* program (2012–2016, US\$ 370 million) assisted regional councils to build infrastructure, roads and to improve liveability, amenity and economic resilience of regional communities but with only one of four funds targeted at resource local government areas specifically. The program was found to offer poor value for public money (QAO, 2016) and was replaced in 2016 by the *Building Our Regions Program* (US\$ 250 million) promoting project-specific funding to address regional needs.

The Queensland Government actively regulates overreliance on FIFO workforces through its Strong and Sustainable Resource Communities Act 2017 (Queensland Government, 2017). However, the geographical concentration of royalties, resources and decision-making results in the missing middle, in that the 'regions' often have little more than extractive operations (e.g. mine sites, railways) and a basic level of supporting mining and public services (e.g. schools, supermarkets). Data from the Australian Bureau of Statistics suggests that Mount Isa had a location quotient for mining employment of 18.0 in 2016 (ABS, 2021). In Australia, there is evidence to suggest that productive linkages emanating from mining have remained constant when compared to Chile but are distributed unevenly even at the regional scale. Fleming and Measham's (2014) econometric analysis of job spillovers of mining across sectors in Australia suggests that there are significant indirect employment impacts for local services (e.g., transport, rental and accommodation services), but insignificant impacts on the tradable goods sectors (e.g., manufacturing, agriculture etc.). These induced multipliers (from expenditures) are distributed widely across Queensland including in remote towns but the main effects on productive activities are found in urbanized Southeast Queensland (Rolfe et al., 2011). An Australian Mining Cities Alliance including Mount Isa as a member was established in the last decade to lobby on policy matters as these shape local outcomes.³

Mount Isa's economic development strategy is currently under review. The local plan recognizes that the long-term sustainability of the city is reliant on mining. Infrastructure and housing affordability are emphasized in the plan which notes that 'the City's ability to sustain additional mining and resource related development, ancillary industry activities and supporting community services and facilities will depend on the management and timely provision of essential infrastructure, and the availability and affordability of residential land and housing.' (City of Mount Isa, 2020: 13).

5.2. Calama

Economic enclaves in the form of mining company towns have been part of the history of Chile's north from the 1800s (Arias et al., 2014). The local outcome of such enclave-like production is that the city of Calama has a location quotient for mining employment of 9.8⁴ in 2017, almost two times greater than that reported for the city of Antofagasta

by Atienza et al. (2021). However, despite this specialization in a key national sector, the Antofagasta region and mining towns such as Calama do not receive a proportionate share of revenues derived from mining. Due to the extreme centralism noted above, most of the value circulating within copper GPNs that is retained in Chile stays in Santiago (Atienza et al., 2021). Funds are redistributed to the rest of the country in the form of 'regional funds for promoting development' from which the Antofagasta Region has received an average of 7% during the past decade, even though it is the second most important regional contributor to the national GDP. Between 2009 and 2018, the metropolitan region concentrated 76% of the total mining revenues compared to Antofagasta's 12% (Atienza et al., 2021).

Atienza et al. (2021) provide evidence that the national proportion of subcontracted workers in Chilean mining industries increased from 12% in the early 1990s to 68% in 2015. While this has resulted in over 2500 new firms, there is little evidence to suggest that this is associated with increased levels of local sourcing and exports. More than 90% of the domestic purchases of mining companies are with suppliers in the Metropolitan Region, while only 5.5% in all mining regions (Atienza et al., 2021). Indeed, at a national level as well as in all mining regions, backward and forward linkages had decreased between 1995 and 2011 (Atienza et al., 2020).

Medium and long-term planning at the national, regional and urban levels is extremely weak in Chile, leading mining companies to take a lead in providing basic industrial infrastructure and improving the planning and amenity of mining towns as part of corporate social responsibility (CSR) initiatives. The most notorious have been aimed at improving urban quality of life like Calama Plus (led by CODELCO) and CREO Antofagasta (led by BHP Billiton). Such private-public efforts have used public funding for implementing their projects but have had limited social acceptance and contributions to sustainability. It is too early to tell whether the recent implementation of elected Regional Governors - an effort to decentralise the discussions on policies and planning - will improve local economic development in resource peripheries.

5.3. Chambishi

Mining municipalities in Zambia have no direct control on the collection of mining taxes such as Mineral Royalty Tax, weakening their city-level development capacity. Their jurisdiction at the subnational level in transfer of revenues from mining firms is only through fees paid by extractive companies in terms of property taxes and several annual business fees (Oxfam, 2021). However, local Governments can borrow from central government to fund longer term capital investments in infrastructure and city level developments using intergovernmental transfers. In mining communities, CSR contributions can also be made in cash or in kind through construction and management of health, school, road infrastructure and projects related to the promotion of agriculture (Zambia EITI, 2020).

Despite a long history of mining, spillovers from FDI to local enterprises, including technology transfer, have been limited and critical linkages missing between policies which could provide opportunities to strengthen local development and industrialization (Fessehaie, 2016). Policies for increasing local content and generating natural-resources led industrialization have only emerged since 2018 (Lombe, 2020). Spatial planning approaches that focus on mining (and other industries and growth poles) are still not well established in Zambia (World Bank, 2016).

The Chambishi MFEZ is open to both foreign and domestic investors with primary industries including mining, engineering and equipment assembly. With speculative factory units it appears likely to house manufacturing and service activities of greater value added than in the case of La Negra in Antofagasta. In terms of industry linkages, the expected benefits of the MFEZs include: enhancing skills in local communities, increased income via employment but also enhance local

³ <https://amca.org.au/> (accessed, 12 October 2021)

⁴ Calculated using the CASEN 2017 database.

business opportunities. According to one recent report, the Chambishi MFEZ had 48 mostly Chinese-owned firms operational with accumulated investments of US\$1.3 billion in 2016 (Zeng, 2016) but generating little or no local value-added or linkages locally. Xu and Wang (2020) suggest that the MFEZ has struggled to be recognized as a specialised and distinctive industrial centre attracting industries and has instead, in a context of poor local land use planning and enforcement, contributed to spatially-fragmented informal patterns of urbanization rather than an orderly high-amenity extension of existing settlement.

6. Conclusion

This paper seeks to expand on the redistributive challenge (Eggert, 2001) likely to impede processes of strategic coupling within mining GPNs as a result of extant city system economic development, or spatial divisions of labour within GPNs and some of the misalignments of fiscal, industry and regional policies on mining communities. By the same token, this redistributive challenge draws attention to some of the untapped possibilities for policies to contribute positively to economic development in resource peripheries – deepening and broadening local industry structures in erstwhile resource peripheries.

There are no easy policy recipes for the sustainable economic development of resource peripheries that flow from our analysis. There is a finite window of opportunity in which policies might be able to exert an effect on local economic development outcomes and experiences are indicative of the experimentation with policy repertoires needed to tackle perhaps the most difficult of local economic development challenges. In this regard, while the extant academic literature provides little guidance on how to coordinate stakeholders in industrial policy formation (Page and Tarp 2017) it is clear that ‘voice’ within policymaking extends from governments and major mining enterprises to a variety of local mining community (including Indigenous) interests (Bainton 2020; Langton and Mazel 2012). International comparisons could generate an inventory of existing policy initiatives and their success given the sorts of constraints on local economic development and reveal some of the potential pathways by which resource peripheries might take to semi-peripheral status: pathways that resonate with mining communities and recent initiatives of international organizations.⁵

There are important empirical and theoretical agendas that flow from a focus on the redistributive challenge of resource-led development. Research could usefully elaborate how the organization of mining into GPNs inhibits or enables policy experimentation within national extractive policy regimes and how, in turn, these regimes frame the terms of the debate regarding better alignments of fiscal, industry and regional policies on mining communities in ways that might moderate the worst of resource peripheralization.

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⁵ See, for example, the OECD's Mining Regions and Cities initiative. <https://www.oecd.org/regional/mining-regions-project.htm> (accessed 12 October 2021)

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