Modes of Extraction in the Lithium Triangle: Mining Politics in Catamarca, Jujuy, and Salta

Lucas I. González* and Richard Snyder†

July 15, 2021

Abstract

Argentina is a major producer of lithium, a vital mineral for making a transition from fossil fuel to renewable energy. Mining is concentrated in three Northwestern provinces, Catamarca, Jujuy, and Salta. Despite their shared historical roots, cultural traditions, socioeconomic profiles, and political institutions as subnational units in a federal system, there is striking variation in how mining projects articulate with local indigenous communities. In some lithium mining projects, companies offered concessions that improved local socioeconomic indicators and mitigated environmental damage. In others, mining companies made minimal concessions, and in a third set they chose to halt projects, usually in response to local organized resistance. Why do lithium mining ventures result alternatively in negotiated, unnegotiated, or aborted extraction? The article proposes a new typology of modes of extraction together with an explanatory framework that centers on the strengths and strategies of communities and subnational governments in setting the terms of mining.

Lithium is a strategic mineral. Because of the high-charge density and long life of lithium carbonate, rechargeable lithium-ion batteries are widely and increasingly used not only in consumer electronic devices, like mobile phones and laptops, but also in electric vehicles and for storing wind and solar energy. Lithium is thus a vital element for making a successful global transition from fossil fuel to renewable energy. Together, Argentina, Bolivia and Chile account for about half the total lithium reserves in the world (US Geological Survey 2016). Of these three countries, Argentina is the only that allows exploitation freely through concessions, and this lack of regulation coupled with low taxes makes Argentina especially attractive to foreign investors. Argentina's exports of lithium carbonate were $356M in 2018, ranking second only to Chile, with exports of $1B.[1]

Production of lithium carbonate in Argentina started in 1998, with a boom beginning in 2010 and continuing through the rest of the decade. Mining is concentrated in three Northwestern provinces, Catamarca, Jujuy, and Salta, which together form the Argentine leg of the so-called "lithium triangle" that straddles parts of Argentina, Bolivia

* CONICET-UCA/UNSAM. UNSAM Campus Miguelete, 25 de Mayo y Francia (1650) San Martín, Argentina. +54-11-4006-1500. lgonzalez@unsam.edu.ar https://orcid.org/0000-0002-9512-6049.
† Brown University. 111 Thayer Street, 3rd floor, Providence, RI (02912), USA. +1-401-863-1578. Richard_Snyder@brown.edu https://orcid.org/0000-0003-4705-3655.

and Chile (see Map 1). The three provinces produced about 30,000 tons of lithium carbonate in 2016, or ~16% of total global production.[2] Although these provinces have shared historical roots, cultural traditions, socioeconomic profiles and political institutions as subnational units in a federal system, we observe striking variation both across and within them in *modes of lithium extraction*, that is, how mining projects articulate with local stakeholders, especially indigenous communities and the provincial state.

In some mining projects, lithium extraction was *unnegotiated*, with mining companies imposing their preferred terms and making few concessions, if any, to local stakeholders. In such instances, the economic benefits of mining to nearby communities were minimal, and the environmental impact was usually large and negative. In other cases, by contrast, companies had to negotiate with local communities and provincial state agencies for mining to proceed. In these instances of what we call *negotiated extraction*, companies offered concessions that improved some local socioeconomic indicators and mitigated environmental damage. Company concessions included providing a guaranteed number of jobs to local residents, monetary payments, investments in public goods, and environmental monitoring. A third outcome, *aborted extraction*, resulted when companies chose to halt a project and withdraw because of high current and projected costs stemming from organized resistance by local stakeholders. In these cases, conflict was intense, the socioeconomic benefits communities reaped from mining limited, and environmental damage minimal. Why do some mining ventures result in unnegotiated extraction whereas others result in negotiated or, alternatively, aborted extraction?

To address this question, we focus on five mining projects across the three Argentine provinces with the largest investments in lithium. Together, the five projects encompass a wide range of extraction outcomes: *Fénix*, a longstanding instance of unnegotiated extraction located in the Salar del Hombre Muerto in Catamarca; *Sales de Jujuy* and *Minera Exar*, two cases of negotiated extraction located in the Salar de Olaroz-Cauchari in Jujuy; *AIS*, a case of aborted extraction in Salinas Grandes-Guayatayoc, also in Jujuy; and, lastly, *ADY*, a case of unnegotiated extraction located in the Salar del Rincón in Salta.

The next section discusses existing theoretical perspectives on resource extraction, highlighting the value for explaining contrasting extraction outcomes of an integrated, multilevel framework that gets beyond the tendency of previous research to study communities, mining companies and subnational governments separately. We then describe the selected cases and our methodology, focusing on cross-province variation in the role of state institutions in regulating lithium mining and also in the multilevel linkages among mining projects, provincial governments, indigenous communities and transnational civil society. We propose a new typology of modes of extraction together with an explanatory framework that centers on the strengths and strategies of communities, companies and subnational governments in setting the terms of mining. The conclusion summarizes the findings and considers comparative implications of the study.

THE SUBNATIONAL POLITICAL ECONOMY OF MINERAL WEALTH

Comparative cross-national research finds that mineral wealth is mostly a curse, not only in the case of oil (Mahdavi 1970; Beblawi and Luciani 1987; Ross 2012) but also for minerals in general (Atkinson and Hamilton 2003; Bjorvatn et al. 2012; Boschini et al. 2013; Orihuela, 2013). In so-called "rentier states,"[3] mineral resources are expected to promote pathologies including poor macroeconomic performance, unstable growth, deindustrialization, and authoritarianism (Gylfason et al. 1999; Larsen 2006; Torvik 2001; Van der Ploeg 2011). In the case of lithium mining in South America, studies report vast negative effects of mining on traditional economic activities, including small-scale

agriculture, cattle husbandry and artisanal salt production, as well as on the local environment, because of the massive amounts of water required to extract lithium carbonate from brine pumped up from underneath salt flats (*salares*) (Argento and Zicari 2015, 42; Slipak 2015; Puente and Argento 2015; Fornillo 2015).

Still, recent studies of mineral extraction highlight the industry's beneficial consequences (Brunnschweiler 2008; Lederman and Maloney 2008), with new research on lithium mining arguing that it can spur innovation by opening opportunities for productivity-enhancing technological advances (López et al. 2018; Montenegro Bravo 2018; Barandarián 2019; inter alia). Other scholars show that resource wealth can have contrasting effects, acting alternatively as a curse or a blessing depending on mediating institutional factors (Snyder and Bhavnani 2005; Snyder 2006; Jones-Luong and Weinthal 2012; Díaz-Rioseco 2016).

The varied consequences of resource wealth are especially visible at subnational levels, inside countries, because mineral and other natural resources are rarely, if ever, distributed evenly within national territories. Recent research exploits subnational variation in the distribution of mineral wealth to test, refine and even challenge the national "resource curse" thesis (Arellano-Yanguas 2011; Arce 2014; Díaz-Rioseco 2016; Orihuela 2017; González 2018; González and Lodola 2019).[4] These studies show that the causal mechanisms proposed by the national level literature to explain the pernicious socioeconomic consequences of resource wealth either do not travel to subnational levels or require significant modifications when applied there (see, for example, Goldberg et al. 2008; Monteiro and Ferraz 2012).[5]

We build on these and other exemplars of "place- and institution-sensitive research" (Orihuela 2017, 2; Amengual 2018) by offering a new typology of modes of extraction and an integrated analytic framework that combines a focus on the role of federal and subnational political institutions, extensively analyzed in previous research, with a focus on the strengths and strategies of communities, mining companies and subnational governments, actors who have often been studied separately in previous work on lithium mining. We argue that lithium can be a curse or a blessing to provinces and local communities depending on the relative power of provincial governments, companies, and local organizations as well as the strategies these actors use to negotiate or impose their preferred outcomes over lithium extraction. Together, the typology and framework help explain subnational variation in the terms of lithium mining and its political, socioeconomic and environmental consequences.[6]

CASE SELECTION AND METHODS

We study five mining projects in three Argentine provinces: Fénix in Catamarca, Sales de Jujuy, Minera Exar, and AIS in Jujuy, and ADY in Salta. Argentine provinces offer an excellent setting for assessing the effects of lithium mining. First, modes of lithium extraction vary widely both across and within provinces, with different modes, in turn, hypothesized to have contrasting political, socioeconomic and environmental consequences. Second, Argentine provincial governments are constitutionally mandated to administer mineral wealth, authorized to levy their own royalties, and enjoy significant discretion both in regulating mining and using the revenues it generates. This discretion, which is evident in the strikingly different roles played by provincial government agencies in mining across provinces, provides an opportunity to explore how subnational variation in the degree of state regulation and intervention affects modes of extraction.

As seen in Table 1, despite their spatial proximity, the three provinces differ in significant ways. First, the relative size of the indigenous population is far smaller in Catamarca. And while the level of lithium production is similar in Catamarca and Jujuy,

output in Salta is much smaller and still at the pilot-project level. Moreover, the economic profiles of each province, in which lithium forms just one piece, vary considerably. Catamarca's economy is heavily dependent on mining, especially copper and gold, whereas mining plays a far smaller role in the other two provinces.[7] Jujuy and Salta both have more diversified economies than Catamarca, with services comprising the leading sectors in each and with agriculture making a sizable contribution to Salta's GDP.[8]

To help control for bias caused by these observed differences, as well as by omitted variables, we adopt a "one region, three sub-provinces" strategy of comparative analysis that, as seen in Map 1, takes advantage of the adjacent location of each state's lithium-producing area in the same region, the Argentine Puna. The Puna, which spans the western parts of Jujuy and Salta as well as northern Catamarca, is a high desert ecoregion with a frigid climate and scarce precipitation. The few inhabitants are mostly Kolla-Atacama indigenous communities, who reside in small villages, surviving through subsistence herding of llamas, alpacas, and sheep. Focusing on this well-defined eco-region with similar demographic and sociocultural profiles that straddles the borders among Catamarca, Jujuy, and Salta approximates a more powerful "most similar system" design (Przeworski and Teune 1970) than does a province-level comparison.

We analyze the selected cases using primary data and official documents from the provincial and national governments together with first-hand observations in Jujuy by one of the authors carried out prior to the onset of the COVID-19 pandemic in March 2020, which made it impossible to carry out further fieldwork in the region. Moreover, we draw on secondary sources, including reports, documents, videos, Twitter and other social media posts by mining companies, local and transnational environmental NGOs, community organizations, and specialized international institutions, as well as information from local and provincial newspapers. The richness of these digital sources, as illustrated in the Appendixes, highlights how "remote ethnography" provides a feasible option for comparative social science research during a public health emergency when conventional fieldwork is not possible.[9] Finally, we conducted in-person and remote interviews with academic experts on lithium mining in Argentina. The period of analysis begins in 1998, with the launching in Catamarca of the first lithium mining project, but focuses on the period of expansion into new investments across all three provinces running from 2010 to 2021.

Table 1: Demographic and Socioeconomic Indicators in Catamarca, Jujuy, and Salta

Province	**Population (2010)** (a)	**Indigenous Population (share of total)** (a)	**Employment in Mining (% of total, 2013)** (b)	**Agriculture and Cattle Raising (% of GDP, 2006)** (c)	**All Mining (% of GDP, 2006)** (c)	**Royalties from All Mining (% of total revenue, 2019)** (d)	**Lithium Production, 2016 (tons)** (e)
Catamarca	362,307	6,927 (1.9%)	5.92%	1.97%	60.72%	1.2%	17,000
Jujuy	666,852	52,545 (7.9%)	3.74%	7.85%	1.50%	>0.05%	17,500
Salta	1,202,754	79,204 (6.60%)	1.56%	15.34%	6.62%	2.5%	n/d

Sources: a). INDEC. Censo Nacional de Población, Hogares y Viviendas 2010. b). Ministerio de Trabajo, Empleo y Seguridad Social, SIP
c). INDEC. Dirección Nacional de Cuentas Nacionales. d). Ministerio de Economía. Dirección Nacional de Asuntos Provinciales (DNAP)
2019. e). Ministerio de Energía y Minería, Mercado de Litio, 2017.

Map 1: The Puna Region of Argentina and Selected Lithium Mining Projects

LITHIUM MINING IN ARGENTINA: REGULATORY AND SOCIAL CONTEXTS

Extraction by transnational mining companies (TMCs) does not occur in a vacuum. Contemporary mining is nested in a complex set of multilevel rules and regulations designed to protect the environment and, especially, local communities. At the international level, these rules include legal instruments codified in international treaties and regimes intended to protect indigenous peoples and the environment from negative externalities of mining, for example Convention 169 of the International Labor Organization (1989), the United Nations (UN) Convention on Biological Diversity (1992), and the UN Declaration on the Rights of Indigenous Peoples (2007).

At the national level, most governments across the world, in addition to signing these international treaties and agreeing to abide by them, issue additional regulations, including setting tax and royalty rates on TMCs. In Argentina, the federal government deregulated mining in 1993 with a new law granting companies generous benefits for extracting and processing minerals, including "extensive tariff exemptions, tax relief schemes, 30 years of fiscal stability, and low provincial royalties" (Nacif 2014, n/p, quoted in Puente and Argento 2015, 122).[10] This law eliminated all municipal taxes and stamp duties, setting royalties at 3 per cent of the pithead price (Marchegiani et al. 2019, 10). The federal government during the period under study played a minimal regulatory role in extractive industries, mostly limited to environmental protection and the participation of indigenous communities in managing natural resources located in their territories (Puente and Argento 2015, 123). As a result, Argentina has had no federal regulatory framework for lithium mining.[11]

The Varied Roles of the Provincial State

Because the federal government of Argentina lacked a centralized strategy for lithium and the ownership of minerals was reserved for the provinces, provincial governments and their state agencies played important, if varied, roles across Catamarca, Jujuy and Salta. In Catamarca and Salta, the provincial state took a *laissez-faire* approach, letting private companies make investments and carry out mining activities with little oversight. In Jujuy, by contrast, the provincial state has taken a more active and interventionist role, even becoming a minority shareholder in lithium projects launched by private companies (Puente and Argento 2015, 123).

The first modern lithium project was launched in 1998 in Catamarca, near the border with Salta, as Project Fénix. Today, the US firm Livent (previously FMC Lithium) and the Australian firm Galaxy Resources Limited own the two main projects in Catamarca, which are both located in Salar del Hombre Muerto. The government of Catamarca created the state-owned company Catamarca Minera y Energética Sociedad Del Estado (CAMYEN S.E.) in 2012, which had a monopoly over extraction of rhodochrosite yet played no role in lithium.[12] Lithium mining in Salta is also run by private companies. Although the provincial government created the state-owned enterprise Recursos Energéticos y Mineros Salta (REMSA), this company has mostly limited its role to attracting private investment in lithium (Slipak 2015, 98). Like Catamarca, Salta thus opted for a business-led approach dependent on private companies for extraction and processing of lithium. The main production sites in Salta are Salar del Rincón, operated by the Australian firm Argosy Minerals Ltd. (ADY), Salar de Ratones and Salar Centerario, where the French company Eramet invested. In Jujuy, by contrast, the provincial state plays a far more active role in regulating lithium extraction and processing. In early 2011, the provincial government declared lithium a "strategic resource" and created a Committee of Experts in charge of overseeing lithium mining projects (Informe Paralelo CDESC 2011, 4, quoted in Puente and Argento 2015, 123).[13]

The main site for lithium extraction in Jujuy is the Salar de Olaroz-Cachauri in the department of Susques, at 4,500 meters above sea level and 60 km from the Jama pass to Chile. Sales de Jujuy and Minera Exar are the main projects. The Argentine subsidiary of the Australian mining company Orocobre Limited and the Japanese automaker Toyota Tsusho are responsible for operations in Sales de Jujuy. The Chinese company Ganfeng and the Canadian company Lithium Americas Corporation run Minera Exar in a 50/50 joint venture (Marchegiani et al. 2019, 21).

After declaring lithium a strategic resource, the government of Jujuy created the state-owned enterprise Jujuy Energy and Mining State Society (Jujuy Energía y Minería Sociedad del Estado, JEMSE) in 2011.[14] JEMSE got 8.5% of the shares of Sales de Jujuy, while the remaining 91.5% stayed in the hands of the private companies Orocobre (66.5%) and Toyota (25%).[15] In a parallel arrangement, JEMSE also got 8.5% of the shares of Minera Exar (Marchegiani et al. 2019, 22). A second important site for lithium mining in Jujuy is Salinas Grandes-Laguna Guayatayoc, where, as discussed below, the Canadian firm, A.I.S. Resources, ceased operations after facing sustained resistance from local indigenous communities.

These differences in provincial state regulations and involvement, while important, cannot explain the variation across the three provinces in modes of extraction, socioeconomic impact, and levels of conflict associated with lithium mining. First, within a single province, Jujuy, where the role of the provincial state does not vary, we nevertheless see sharply contrasting outcomes, with high levels of conflict resulting in aborted extraction in one area (Salinas Grandes and Laguna Guayatayoc) whereas in

another area (Salar de Olaroz-Cachauri) low levels of conflict and negotiated extraction led, in turn, to modest improvements in employment opportunities and local public services. Second, while we might expect more conflict in Catamarca and Salta, where the state gave private mining companies free rein, lithium extraction proceeded in the former case for more than two decades without resistance and continued to face no resistance in the latter. Lastly, the recent emergence of protests against lithium mining in Catamarca after more than twenty years of quiescence, and without any notable change in the role played by the provincial state, further highlights the inability of provincial state regulations alone to explain the socioeconomic consequences of lithium mining.

Community Stakeholders

In addition to its nesting in a multilevel array of international, national, and provincial rules and regulations, extraction also occurs in a local context, defined by community stakeholders whose interests are directly affected by externalities, often harmful, of mining.[16] Community organization and mobilization may help explain the level of local conflict and the degree of redistribution of mineral wealth (Puente and Argento 2015; Argento and Zicari 2015).

Depending on their cohesion, organizational strength and access to responsive state and government authorities and other key allies, communities vary in their abilities to defend their interests, including by appealing to international, and perhaps national, rules and regulations designed to protect them. Moreover, communities can hold divided and evolving preferences about the desirability of mining, which, especially in remote areas, may represent both a welcome source of employment and, under the rubrics of "Corporate Social Responsibility" (CSR) and "Environmental, Social and Governance" (ESG) Investing, a provider of scarce public goods, such as schools and basic infrastructure where the national and provincial state is unable or unwilling to provide them (Amengual 2018). This is especially true in situations of extreme poverty where "the only thing worse than being exploited is *not* being exploited." Communities may thus face a difficult tradeoff between negative public health and environmental consequences, on one hand, and positive economic and infrastructural benefits, on the other. This tradeoff can give TMCs a strategic opportunity to offer selective incentives, such as jobs and targeted benefits, that produce support among some locals, undermining community solidarity in the process and thus weakening the capacity to resist mining projects (Amengual 2018).

Modes of Extraction:
How Companies, Communities, and Governments Set the Terms of Mining

At the most general level, three modes of extraction can result from TMCs looking to extract minerals: unnegotiated extraction, negotiated extraction, and aborted extraction. *Unnegotiated* extraction occurs when TMCs make few, if any, concessions to local stakeholders, although the companies may still abide by national regulations and share revenues as stipulated by such regulations. *Negotiated* extraction occurs when local community stakeholders, often in collaboration with subnational governments, are able to influence the terms of extraction, for example by getting the company to provide a guaranteed number of jobs, investments in public goods, or monetary payments. Negotiated extraction generally involves a "social license" and the creation of new institutions for governance and monitoring of TMC activities in which communities and local government participate jointly. Depending on the balance of power among local communities, subnational governments, and TMCs, negotiated extraction can be *symmetrical*, with communities and provincial governments enjoying significant influence over TMC behavior, or, as is probably more common, *asymmetrical*, with communities

and provincial governments having a weak influence. A third outcome is *aborted extraction*, which occurs when TMCs are deterred from investing in the first place, perhaps because of a stalemated negotiation where TMCs and local communities fail to reach an agreement over the terms of extraction, anticipated social conflicts or prohibitively costly regulatory burdens. Aborted extraction can also result when TMC's choose to exit from a production site, calculating that the cost of future investments outweighs the sum of any anticipated profits and "sunk costs," perhaps because of a slump in international mineral markets or an increase in the strength of resistance by local stakeholders.

As seen in Table 2, TMCs, local communities and provincial governments have different preferences over modes of extraction.[17] Among communities it helps to distinguish two groups defined by their strategic postures: *maximalists* are unconditionally opposed to mining whereas *moderates* welcome mining as long as it is governed by a "social license" with acceptable and enforceable terms.[18] The maximalist preference for aborted extraction can be seen in this statement by Verónica Chavez, the president of the *Santuario Tres Pozos* indigenous community of Jujuy's Salinas Grandes region: "For us, Salinas Grandes is like a sacred mother. We must respect her because she takes care of me, my family and my children….There is no place for lithium mining" [*no hay lugar para la explotación del litio*].[19] A more succinct formulation of the maximalist position was prominently visible in graffiti along the sole highway that crosses Salinas Grandes: "Mining=Death=Treason. No to Lithium Mining, Yes to the Pachamama" (see Appendix A.1 for further evidence of maximalist preferences).[20]

By contrast, moderates are supportive of mining as long as the terms of extraction are symmetrical, as evident in this statement by Clemente Flores, a spokesperson for the *El Angosto* indigenous community of the Salinas Grandes region: "We are not opposed to mining, but we want our voice to be respected. We say no to lithium if a prior, free and informed consultation is not made" (Appendix A.2).[21] A further example of the moderate position, and the tensions between it and the maximalist standpoint, can be seen in the high-visibility participation by some indigenous community members and leaders in an annual celebration each August honoring Pachamama that not only was sponsored by the Sales de Jujuy company but was also held at its mining facilities (Orocobre 2019, see also Appendix X).[22] It is hard to imagine how anyone endorsing the maximalist equation that "Mining=Death=Treason," or even adopting the less extreme position, as articulated by Veronica Chavez, that mining poses an existential threat to sacred "mother earth," could ever participate in a mine-sponsored event celebrating the Pachamama.

Turning to the preferences of TMCs, the growing importance of norms and practices of "corporate responsibility" in the global mining industry has transformed how companies behave. This is evident in the annual "sustainability reports" routinely published by large mining companies, together with copious supplementary material on company websites, documenting community investments. These materials typically present vivid photographic and video illustrations and highlight how the company's community investments align with the UN Sustainable Development Goals (SDG), the UN Global Compact, and other international standards of good corporate conduct. For example, Orocobre's website offers attractive e-pamphlets presenting case studies of the company's "community investment strategy" anchored by the principal of "shared value," including a baccalaureate program for the company's local workforce, an artisan development project that provides training and equipment to female indigenous weavers, and a community infrastructure program with projects formulated "through collaborative discussions with community members" (Appendix X).[23] Together, such activities could be interpreted as evidence that TMC's prefer negotiated extraction.

Still, TMC's are fundamentally profit-driven, and the imperative to maximize the

value of the "bottom line" produces a strong and, we argue, overriding preference for negotiated over unnegotiated extraction. This can be seen in the annual survey by the global consulting firm Ernst and Young (EY) of more than 130 TMC executives. In 2020, for the third year in a row, respondents identified social "license to operate," which entails negotiations with community and other host country stakeholders, as the biggest source of business risk for mining companies.[24] The negative risk assessment by mining executives of negotiating a social license is also evident in the rankings of Argentina's mining provinces by the Policy Perception Index (PPI) published by Canada's Fraser Institute. The PPI, which is based on an annual worldwide survey of executives and senior managers of mining companies, ranks countries, states and provinces according to the extent that public policies encourage or discourage mining investment (Stedman, Yunis, and Aliakbari 2019, 2). Salta, where, as we shall see, an absence of organized community stakeholders together with the provincial government's laissez-faire posture toward TMCs made *unnegotiated* lithium extraction feasible, earned the highest average score (72.6) of the ten Argentine provinces included in the PPI between 2015 and 2019. By contrast, Jujuy, where organized community stakeholders and an interventionist provincial government made negotiated extraction the only viable option for lithium mining, ranked seventh, with an average PPI score (49.7) that was far lower than Salta's. Combined, the evidence provided by these surveys with mining executives suggests that TMCs prefer unnegotiated extraction, followed, in turn, by asymmetrical, symmetrical and aborted extraction.

The preferences of provincial governments over extraction outcomes depend on whether the government is market-friendly or interventionist. The former claim that resource-rich regions in underdeveloped countries should specialize in their comparative advantages by exporting unprocessed primary materials to developed countries with industrial processing capacities (López et al. 2018 call them "liberals"). These governments are also supportive of business and foreign capital investments, which are expected to spur job formation in mining. Interventionist provincial governments, by contrast, support state participation in mining, not only to regulate it and raise more revenue, but also to add value to primary goods by building industrial capacity to produce manufactured products such as lithium batteries (López et al. 2018 call these governments "industrialists" or "developmentalists"). Unlike national governments, which can potentially make credible threats to nationalize TMC assets, subnational interventionist governments generally lack this cudgel and may thus enjoy less bargaining power. The preferences of market-friendly governments mirror those of TMCs whereas the preferences of interventionist governments mostly mirror those of moderate community groups, although they may prefer unnegotiated over aborted extraction, because the former promises at least some revenue to the government.[25]

Table 2: Preferences of Actors over Modes of Extraction

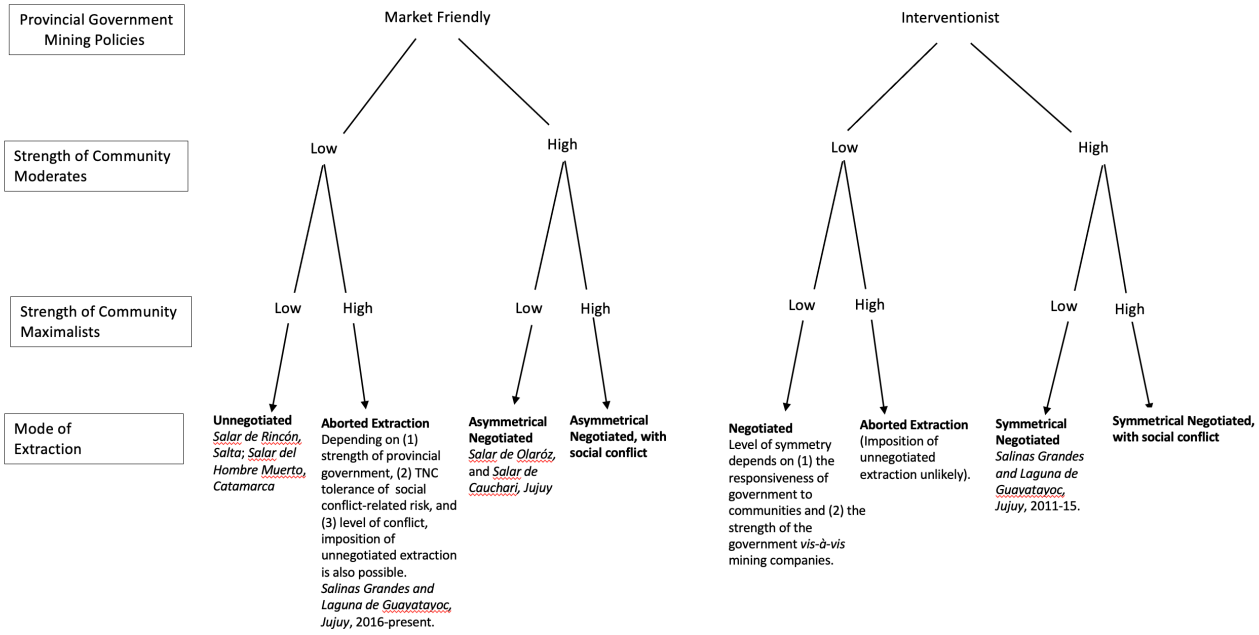
	Preferences over Modes of Extraction				
Modes of Extraction	**Mining Companies**	**Community Maximalists**	**Community Moderates**	**Market-Friendly Governments**	**Developmentalist Governments**
Unnegotiated	1	4	4	1	3
Asymmetrical	2	3	2	2	2
Symmetrical	3	2	1	3	1
Aborted	4	1	3	4	4

Given these preferences of companies, communities, and governments, the resulting mode of extraction depends on their relative resources, strengths and strategies. Local communities may have organizational resources that can be deployed to defend their interests through mobilization and protest. Market-friendly provincial and local governments can use police repression and the judiciary to deter and demobilize community organizing. Interventionist governments, by contrast, will likely use their legal power to try to compel mining companies to negotiate. Mining companies, in turn, can distribute jobs, infrastructure and money among communities and other stakeholders, including politicians, in exchange for extraction. The ability of companies to influence the outcome depends on the value of their sunk costs and other fixed investments in relation to projected profits from the mine: *Ceteris paribus*, TMCs with low sunk costs and modest anticipated profits will have more leverage in negotiating the terms of extraction than companies with high sunk costs and large projected profits.

Negotiations among community organizations, local governments and mining companies occur in both formal and informal arenas. When a local municipal council serves as the venue for negotiations, any resulting agreements may be relatively institutionalized, especially when municipal and provincial authorities participate. Alternatively, bargaining among local communities and TMCs can occur informally and depend on ad hoc agreements, usually between companies and community leaders.

As seen in Figure 1, *unnegotiated extraction* is the predicted outcome when moderates and maximalists are weak, as is likely when communities are dispersed, geographically isolated and disconnected from external civil society organizations and networks. Moreover, when communities are weak, collusion is more likely among mining companies and provincial and local governments officials, especially if these officials are market-friendly and pro-mining. Collusive government officials may rely on police repression as well as cooptation and manipulation of the judiciary to deter and suppress any community resistance to mining. The likelihood of company-government collusion decreases when governments are interventionist. *Aborted extraction* is the predicted outcome when (1) communities are strongly organized, (2) maximalists are the dominant force, and (3) communities are integrated into national and international activist networks. Lastly, *negotiated extraction* is the hypothesized outcome when the balance of power among communities and provincial governments is more equal, and if moderates are the dominant force. Under these conditions, companies will face strong incentives to offer corporate social investments and take steps to mitigate environmental damage caused by mining. Negotiated extraction, in turn, will be more or less symmetrical depending on the strength of moderate community forces and also on whether the provincial government is market-friendly or interventionist. Market-friendly governments will promote asymmetrical bargains that tend to favor TMCs over local communities as a strategy to attract investment and generate jobs, whereas interventionist governments will push for more symmetrical agreements that regulate and tax mining in order to raise revenue, foster corporate social investments in local communities, and protect the environment.

Figure 1: Provincial Government Policy Orientation, Strength of Community Moderates and Maximalists, and Resulting Mode of Extraction



MODES OF LITHIUM EXTRACTION IN CATAMARCA, JUJUY, AND SALTA

We deploy the explanatory framework by focusing on lithium mining projects in *salares* (salt flats) across the three Argentine provinces with the largest investments in lithium: Catamarca, Jujuy, and Salta. By studying projects with divergent extraction outcomes in the same province (i.e., Jujuy) and region (i.e., Puna), we exploit a "most similar systems" design that holds constant federal as well as provincial-level factors, including the type of government and the provincial regulatory framework. In turn, by exploring cases with similar extraction outcomes *across* provinces we draw on a "most different systems" design that illuminates how similar causal mechanisms - the strengths and strategies of companies, communities and governments - operate across distinct institutional, political and socioeconomic contexts.

Jujuy: Aborted Extraction in the East and Negotiated Extraction in the West

In Jujuy, the lithium "white goldrush" began in 2010 with a wave of foreign investment aiming to mine brine deposits beneath the province's multiple *salares*. Sharply contrasting outcomes occurred on the eastern and western sides of the Puna Jujeña.[26]

Aborted Extraction after a Failed Attempt at Symmetrical Extraction in the Eastern Puna Jujeña In Salinas Grandes and Laguna de Guayatayoc, Orocobre and other TMCs faced strong resistance from indigenous communities who mobilized successfully to halt their mining projects. Before the arrival of the companies, the sparsely populated and geographically dispersed Kolla and Atacama settlements were weakly interconnected. The entry of the companies in 2010 triggered a process of organizing that rapidly resulted in a confederation encompassing 33 indigenous communities across the region (*33 Comunidades de la Cuenca de las Salinas Grandes y la Laguna de Guayatayoc*). While not unconditionally opposed to mining, the 33 Communities demanded that any extraction be carried out not only with their consent but also on their terms. With support from local environmental lawyers and a national environmental NGO, *Fundación Ambiente y Recursos Naturales* (FARN), which helped publicize their struggle internationally, these

indigenous communities drew effectively on international treaties and allies, forming a strong Transnational Action Network (TAN) (Keck and Sikkink 1999). In 2010, the communities filed an injunction against the provincial governments of Jujuy and Salta demanding that companies respect their right to prior, free and informed consultation to lithium mining in accordance with International Labor Organization (ILO) Convention 169, which Argentina had ratified in 1992. Not only were the communities successful in bringing their case before the Argentine Supreme Court, they also managed to get the Inter-American Court of Human Rights (CIDH), based in San José, Costa Rica, to review the case (Roth 2019). The communities also solicited successfully an endorsement and visit in 2011 by the UN Special Rapporteur for Indigenous Rights, James Anaya.

The 33 Communities launched an intensive, multi-year deliberative process that resulted in a remarkable document, *Kachi Yupi* ("Footsteps in the Salt") (2015), which presented a community-approved protocol by which mining companies could gain their consent. The protocol, which would have enabled symmetrical negotiated extraction, was submitted to the provincial government for ratification into law by executive decree. While the interventionist administration of the *Partido Justicialista* (PJ) governor, Eduardo Fellner (2011-15), would likely have been amenable to their proposal, the newly elected pro-business and market-friendly government of Gerardo Morales (2015-present) delayed review of the community-generated protocol for three years, finally rejecting it in 2018. The provincial government's refusal to endorse the *Kachi Yupi* protocol and codify it into law marked the failure of the initiative to achieve symmetrical negotiated extraction.

Soon after the provincial government's rebuff of *Kachi Yupi*, a new company, the Canadian firm A.I.S., together with local investors from the neighboring province of Salta, moved with the government of Jujuy's approval to end the 8-year moratorium on lithium mining in the Guayatayoc area by starting exploratory drilling without community consent. This step toward unnegotiated extraction provoked protests and highway closings by the 33 Communities in February 2019. Having failed to achieve symmetrical negotiated extraction because of the lack of provincial government support, and in the face of efforts by mining companies to proceed without community consent, the preferences of community members shifted toward a maximalist position favoring no extraction over unnegotiated extraction. The companies responded to this hardened community resistance by pursuing a "divide and conquer" strategy of negotiating individually with communities that they believed could be persuaded to defect from the no extraction position. Meanwhile, in a move signaling a continued disregard for the demands of indigenous communities, the government of Jujuy issued a tender for new lithium projects in the Salinas Grandes and Laguna de Guayatayoc regions in early 2019.

In sum, the bitter experience of the failed effort to achieve symmetrical negotiated extraction, combined with the unresponsiveness of the provincial government to their demands for prior consultation, drove the indigenous communities of the Eastern Puna to pivot from a moderate to a maximalist position of unconditional opposition to mining, as signaled by their newly-adopted protest slogan, "no al litio, si al agua y la vida" ["no to lithium, yes to water and life"]. As a result, the Salinas Grandes and Laguna de Guayatayoc region has yet to produce any lithium.

Asymmetrical Negotiated Extraction in the Western Puna Jujeña On the other side of the puna Jujeña, a mere 50 miles to the west, events took a different course. In Olaroz, *Sales de Jujuy*, a consortium led by Orocobre, initially faced resistance from a maximalist indigenous organization, *La Apacheta*, which opposed mining altogether. *La Apacheta*'s resistance signaled to the company the urgency of building community support in Olaroz in order to weaken pressures for symmetrical negotiated extraction or, worse, aborted extraction, as had occurred in Salinas Grandes-Guayatayoc. Orocobre enlisted a local

geologist and also benefited from the support of the provincial government. The company soon reached a set of agreements negotiated on a case-by-case basis with indigenous communities that guaranteed jobs, annual monetary payments, and modest public works, such as a new school and an Internet access center. These negotiated concessions enabled Orocobre to start mining in 2015, making it the second company to mine lithium in Argentina.

Following on the heels of the success of *Sales de Jujuy*, other international mining companies soon launched a cluster of new lithium projects that have transformed western Jujuy into a profitable lithium mining district.[27] One new entrant advertises its locational advantage in what the company's online promotional material tellingly describes as "a well-established, pro-mining business jurisdiction [that] minimizes the project's risk profile." Moreover, the placement of the project in the "prolific lithium mining district" with a strong foundation of services and infrastructure is presented as an asset that strengthens the company's "prospect of a fast-track to production."[28] Negotiated extraction thus opened the way for the Olaroz-Cauchari region to emerge as a dynamic lithium mining hub.

In assessing the conditions that made negotiated extraction possible in the western Puna Jujeña, it bears emphasis that the maximalist organization, *La Apacheta*, was far weaker than its counterpart to the east, that is, the 33 Communities. Not only did *La Apacheta* have a far more circumscribed territorial reach, it also lacked the transnational ties and support from an internationally funded national NGO (i.e., FARN) enjoyed by the 33 Communities. Had *La Apacheta* posed a stronger threat, a more symmetrical negotiated outcome may have been possible.

Finally, the asymmetrical nature of negotiated extraction in the Western Puna is evident in the mounting frustration among community members in response to the increasingly apparent negative environmental and health consequences of Sales de Jujuy. According to Marcelo Sticco, a hydrogeologist from the University of Buenos Aires who toured the Olaroz plant in February 2019 with community members, the company's production methods involve an "environmental sacrifice" (Roth 2019). Local inhabitants are increasingly forced to move far away because of shortages of water suitable for human and animal consumption. Indeed, Sticco finds that community members regret having approved the Olaroz project.

Salta: Unnegotiated Extraction

In stark contrast to Jujuy, no detectable community resistance to lithium mining has emerged in Salta. The absence of resistance stems from three main factors. First, the the mines are located in a sparsely populated area: Salar del Rincón, in addition to its high-altitude position 3,900 meters above sea level, is located150 km from the nearest town (San Antonio de los Cobres) and has few roads connecting it with the provincial capital. The Department of La Poma, where Salar del Rincón is situated, is one of the least densely populated in Salta, with a capital city populated by department only 600 inhabitants and located more than 3.5 hours by car from the Salar. Moreover, Salar del Rincón has practically no linkages to the more socially mobilized Salinas Grandes Basin (Puente and Argento 2015, 126). Second, whereas in the eastern Puna of Jujuy, where indigenous salt cooperatives saw lithium mining as a direct threat to their livelihoods and culture (Argento and Zícari 2018, 13-14), in Salta lithium does not stand in conflict with local economic activities (Slipak 2015, 107). Third, the absence of resistance reflects the general weakness of indigenous social movements in Salta. The Government of Salta has neither recognized indigenous communities near the *salares* nor granted them land titles. This lack of recognition of indigenous rights, or even the "right to have rights," is evident in the

provincial government's refusal to send a delegate to the Supreme Court during the hearing of the case filed in 2010 by the 33 Communities of Salinas Grandes and Laguna de Guayatayoc, despite the fact that some of the communities involved in the case were located in Salta.[29] In addition to weakly organized community stakeholders, Salta's consistently market-friendly and pro-business provincial governments further explains why unnegotiated extraction is the outcome.

The perceptions of international mining executives validate Salta's status as a "mining friendly" province. According to one foreign executive of a large international company with investments in Salta's Taca Taca copper mine, "On a relative basis to other parts of the world the permitting process [in Salta] is transparent." Noting that a precedent had been set in Salta by the company Mansfield Minerals, which won an environmental permit from the provincial government for a leachable gold porphyry deposit, the executive observed, "You hear about horror stories in various provinces of Argentina, yet here we have a mine [Mansfield's] that is going to be built as an open pit and it's going to use heap-leach and cyanide. Its EIA [Environmental Impact Analysis] was approved in a reasonable period of time." Whereas some Argentine provinces, for example Chubut and Río Negro, have banned the use of cyanide, in other provinces, such as San Juan and Santa Cruz, mining proceeds unhindered. "Salta is in that happy camp," the executive noted, "It's a pro-mining space…this is a great province to be in."[30]

This view of Salta as a mining-friendly jurisdiction is widely shared among international mining companies, as evidenced by the province earning the highest average score of the ten Argentine provinces ranked by mining executives in the Fraser Institute's Policy Perception Index (PPI) (Appendix X). The PPI is based on survey responses concerning policy factors that affect investment decisions, including uncertainty over the administration of regulations, environmental regulations, regulatory duplication, the legal and taxation systems, uncertainty involving protected areas and disputed land claims, socioeconomic and community development conditions, labor regulations and skills availability, infrastructure, trade barriers, political stability and security. The PPI thus aims to offer "a 'report card' to governments on the attractiveness of their mining policies" (Stedman, Yunis, and Aliakbari 2019, 2).

Still, Salta poses puzzles. According to a report of the Argentine Mining Geological Service (SEGEMAR), 31 of the 53 exploratory lithium projects carried out by TMCs are located in Salta (Argento and Zícari 2018, 10). If mining conditions in Salta are so propitious because of the lack of community opposition and favorable investment climate, why have none of the lithium projects actually started producing lithium (beyond small-scale pilot production output) whereas Orocobre, despite operating in the social minefields of Jujuy, has been producing steadily since 2015? Salar del Rincón has the largest deposits of lithium in Argentina (Argento and Zícari 2018, 7), and while the project seems far along, employing more than 100 workers from nearby localities, with considerable investments by the company in building facilities, and carrying out pumping tests and pilot production runs, it is still not in regular production. This delay likely has less to do with local factors than with global market conditions for lithium, as well as the imperative to create an appearance of steady progress to satisfy company shareholders and raise further investment capital. In the absence of community resistance, or even communities, companies may prefer to stand pat on their reserves, which allows them to raise capital from investors based on estimated future profits without actually mining anything. This logic, in turn, may help explain the flurry of new and in-development lithium mining projects, more than 50 across northwestern Argentine, including many with sophisticated prospecting studies exploring the quality and size of deposits, yet with only two (Sales de Jujuy; Fenix) actually producing significant lithium output.[31]

Catamarca: Contestation after Two Decades of Unnegotiated Extraction

In contrast to mining-friendly Salta, where weak indigenous movements and a market-friendly provincial government allowed mining to proceed unnegotiated, in neighboring Catamarca mining has, over the last two decades, met strong resistance from powerful grassroots movements, especially in Andalgalá and Tinogasta (Christel 2015). Despite the contentious context for mining gold and copper in Catamarca, lithium has, until recently, faced no organized resistance. This allowed unnegotiated extraction to proceed for more than twenty years, since the Fenix project, owned initially by the US company FMC and subsequently by its spin-off Livent, first began producing in 1998. Why, until late 2019, did lithium prove an exception to the contentious pattern in mining in Catamarca?

The remote location of the lithium *salares* in Catamarca, near the border with quiescent Salta, partly explains the absence of social conflict. In both Salta and Catamarca, local communities are further away from lithium extraction sites than in Jujuy. Moreover, unlike gold, silver and copper mining, lithium mining from brine requires neither a large open pit nor dangerous toxic pollutants, such as cyanide, which have visible and immediate human and environmental consequences (for comparative evidence, see Haslam and Nasser 2016). Instead, lithium extraction in the Argentine Puna produces a slow-moving and initially hidden, yet in an arid region like the Puna, ultimately devastating negative externality: gradual depletion of aquifers. Because the Fenix project in Catamarca was Argentina's first modern lithium mine, preceding the others by more than a decade, knowledge among local communities about the mine's creeping and pernicious hydraulic effects probably did not exist. The gradual drying up in recent years of the Trapiche River, the Fenix mine's main source of water for processing lithium brine, may very well have been the first visible sign to local residents about the mine's harmful impact.

Contesting Unnegotiated Extraction: New Community Demands for a Social License After more than two decades, community quiescence in Catamarca's lithium industry ended abruptly in October 2019, when members of an indigenous family were beaten and arrested for opposing the removal of a livestock fence on what they claimed as their ancestral property. The fence had been dismantled so that a road bypass could be opened for mining company vehicles to build a new, 30km-long aqueduct to carry fresh water from the Río Los Patos for lithium processing by Livent and two start-up companies. The provincial and municipal governments allied with the mining companies by declaring that the disputed land did not, in fact, belong to the indigenous family. During the same period, local indigenous people comprising the Atacameños del Altiplano communities, together with anti-mining ecological activists affiliated with the NGO Pucará based in the town of Antofagasta de la Sierra, started mobilizing against the new aqueduct. They accused the aqueduct project of violating ILO Convention 169 because it had not been presented for prior consultation and community approval for a social license. Local residents, who depend on the rivers to sustain their livestock husbandry in the Puna's harsh and arid climate, blamed the mining companies for causing the Trapiche River to dry up and were galvanized to prevent a similar fate for the Los Patos River.

Livent and the other companies showed no signs of wavering from the position of unnegotiated lithium extraction enjoyed in Catamarca since 1998. Protests against the mining companies were met with a level of repression not seen in Jujuy, with community members beaten and arrested by provincial police.[32] Moreover, the mining companies provided vehicles to transport provincial police to protect the construction of the aqueduct.[33] Provincial government officials, notably the Judge for Mining (*Juez Electoral y de Mina*) and the Minister of Mines, were unresponsive to petitions from indigenous

communities to halt the construction of the aqueduct, with the Judge reportedly stating that his court is "pro-mining."

Despite the affiliations of both the current (Raúl Jalil, 2019-) and prior governors (Lucía Corpacci, 2011-19) with the populist faction of the PJ, the *Frente para la Victoria* (FPV), the provincial government and its police forces, together with the provincial judiciary, have been responsive not to the communities but to the mining companies. In mining, at least, Catamarca's provincial governments have behaved like market-friendly not interventionist ones. This pro-mining, market-friendly inclination likely reflects the dominant role of mining in Catamarca's economy, with more than 60 percent of the province's GDP based in mining (see Table 1). While the communities near the lithium mines are supported by several new organizations, including *Pucará: Pueblos Catamarqueños en Resistencia y Autodeterminación* and *Antofagasta Resiste*, they have yet to achieve the international, or even national, visibility of their counterparts in Jujuy. This low profile may reflect the more remote location of the mines in Catamarca, more than 10 hours by car from the provincial capital. Moreover, the communities opposed to lithium mining in Catamarca faced a far more tenacious and formidable adversary. In contrast to the eastern Puna of Jujuy, where the communities aimed to prevent mining companies from entering in the first place, in Catamarca the communities confronted a longstanding and entrenched mining venture with more than 20 years in operation. Not only did this company have a large amount of fixed capital investments in the area, it also had forged strong ties with provincial and local government officials, as evidenced by the ability to deploy units of the provincial police as a private security force to protect the company's investments.

In further contrast with the lithium projects in the eastern Puna of Jujuy and most of the more than 50 other recent lithium ventures in Argentina, the profitability of Livent's operations depended not on a speculative promise of *future* production, as signaled by a concession over proven lithium deposits, but on its ability to produce lithium now. To sustain its profitable extraction, Livent was driven to expand the territorial scope of its operations. Because the company's previous source of fresh water, the Trapiche River, was depleted, it needed a new way to get the large quantities of water required to extract lithium concentrate from lithium brine. In the arid Puna, the Los Patos offered one of the few water sources, and, with the provincial government's approval, the company began building its new aqueduct, a move that awakened organized resistance by indigenous communities after more than two decades of quiescence.

The communities in Catamarca have taken a maximalist position demanding the cessation of lithium mining. Yet they are in a weak position. First, they lack the national and international visibility and support enjoyed by their counterparts in the eastern Puna of Jujuy. This is compounded by a geographically unfavorable location in a remote region with no major transportation arteries vulnerable to a blockade by a small number of activists. In Jujuy, the proximity of the 33 Communities to a vital international highway linking northern Argentina and Chile served as an effective basis for making credible threats to inflict heavy collateral economic damage on interests far beyond the lithium industry. The indigenous communities in Catamarca, by contrast, have no comparable source of leverage.

In Salta, where lithium mining faced no organized resistance, unnegotiated extraction was feasible without repression. And in Jujuy, neither the companies nor the government were willing to deploy the force that would likely have been necessary to impose unnegotiated extraction. In Catamarca, by contrast, where an actively producing, profitable, and entrenched mining project was involved, both the company and the provincial government, despite its affiliation with the populist faction of the Peronist party,

were willing to use repression to sustain unnegotiated extraction.

CONCLUSION

Modes of lithium extraction vary widely across provinces in Argentina. In Salta and, until recently, in Catamarca, extraction was unnegotiated, with mining companies imposing conditions and making few concessions to local communities or provincial governments. In the western Puna of Jujuy, by contrast, companies negotiated with local stakeholders, including the provincial government, and offered some benefits. And in the eastern Puna of Jujuy, the companies withdrew in the face of organized opposition, and extraction was aborted.

Although federal and provincial institutional factors may have an impact on modes of extraction, they are far from decisive. The case of Jujuy, where we observe sharply contrasting outcomes across subregions, is difficult to explain with a focus on federal or provincial institutions because they do not vary inside the province. Likewise, provincial-level institutions that have not changed over time cannot satisfactorily explain the dramatic shift from quiescence to contention in Catamarca. Other, more dynamic province-level political factors likely play a stronger role, including alternation between governors of different parties and with distinct coalitions of support and leadership styles. For example, the shift in Jujuy from an interventionist PJ governor (Fellner), more responsive to grassroots pressures, to a market-friendly and pro-business governor (Morales) may have foreclosed the possibility of a negotiated outcome in the eastern Puna. Still, the partisan affiliations of governors are not a reliable predictor of the modes of mineral extraction they promote: Catamarca, like Jujuy under Fellner, was governed over the last decade by leaders affiliated with an interventionist PJ faction, yet this resulted not in a negotiated outcome but in state-company collusion against indigenous communities, with the provincial police and judiciary acting in the company's service.

Local factors are crucial for explaining modes of extraction. These include the location of mines, the capacity of communities to mobilize, and linkages among local, national, and international activist organizations and networks. Local conflicts are more likely to emerge and escalate when mining threatens well-organized communities near vital transportation routes that can be easily occupied and closed. The potential for escalation is amplified when the communities are also connected to national and international activist networks.[34] Under such conditions, mining companies are more likely to negotiate and offer concessions. This, in turn, may improve the local socioeconomic impact of mining and mitigate its ecological damage. On the other hand, if local communities are weakly organized and marginally connected to external, especially transnational, civil society networks, companies will have few incentives to negotiate. Instead, as seen in Catamarca, mining companies may be prone not only to collude with local government but also to respond to resistance with repression.

References

Amengual, Matthew. 2018. Buying stability: The distributive outcomes of private politics in the Bolivian mining industry. *World Development* 104: 31-45.

Aragón, Fernando and Juan Pablo Rud. 2009. The Blessing of Natural Resources: Evidence from a Peruvian Gold Mine. *Banco Central de Peru Working Paper Series* 15.

Arce, Moisés. 2014. *Resource Extraction and Protest in Peru*. University of Pittsburgh Press.

Arellano-Yanguas, Javier. 2011. Aggravating the Resource Curse:

Decentralisation, Mining and Conflict in Peru, *The Journal of Development Studies* 47, 4: 617-638.

Arellano-Yanguas, Javier. 2016. Extractive Industries and Regional Development: Lessons from Peru on the Limitations of Fiscal Transfers to Producing Regions, Unpublished paper.

Argento, Melisa, and Julián Zícari. 2017. Las Disputas por el Litio en la Argentina: ¿Materia Prima, Recurso Estratégico o Bien Común? *Prácticas de Oficio* 1,19: 36-48.

Argento, Melisa, and Julián Zícari. 2018. Políticas Públicas y Conflictos Territoriales en torno a la Explotación del Litio en Salta: El Caso de Salinas Grandes *Andes, Antropología e Historia* 1,29: 1-36.

Atkinson, Giles, and Kirk Hamilton. 2003. Savings, growth and the resource curse hypothesis. *World Development* 31,11: 1793–1807.

Beblawi, Hazem, and Giacomo Luciani. 1987. *The Rentier State, Nation, State, and Integration in the Arab World*. London: Croom Helm.

Bjorvatn, Kjetil, Mohammad Reza Farzanegan, and Friedrich Schneider. 2012. Resource Curse and Power Balance: Evidence from Oil-Rich Countries. *World Development* 40, 7: 1308–1316.

Boschini, Anne, Jan Pettersson, and Jesper Roine. 2013. The Resource Curse and its Potential Reversal. *World Development* 43(C): 19–41.

Brunnschweiler, Christa Noel. 2008. Cursing the Blessings? Natural Resource Abundance, Institutions, and Economic Growth. *World Development* 36, 3: 399–419.

Caselli, Francesco, and Guy Michaels. 2013. Do Oil Windfalls Improve Living Standards? Evidence from Brazil. *American Economic Journal: Applied Economics* 5, 1: 208-38.

Christel, Lucas. 2015. Resistencias Sociales y Legislaciones Mineras en las Provincias Argentinas: Los Casos de Mendoza, Córdoba, Catamarca y San Juan (2003-2009), Ph.D. Thesis, Escuela de Política y Gobierno, UNSAM.

Díaz-Rioseco, Diego. 2016. Blessing and Curse. Oil and Subnational Politics in the Argentine Provinces. *Comparative Political Studies* 49, 14: 1930-1964.

Fornillo, Bruno. 2015. *Geopolítica del Litio, Industria, Ciencia y Energía en Argentina*. Buenos Aires: CLACSO-El Colectivo.

Giraudy, Agustina, Eduardo Moncada, and Richard Snyder. 2019. *Inside Countries: Subnational Research in Comparative Politics*. Cambridge: Cambridge University Press.

Goldberg, Ellis, Erik Wibbels, and Eric Mvukiyehe. 2008. Lessons from Strange Cases: Democracy, Development, and the Resource Curse in the US States. *Comparative Political Studies* 41, 4-5: 477-514.

González, Lucas. 2018. Oil Rents and Patronage: The Fiscal Effects of Oil Booms in the Argentine Provinces, *Comparative Politics* 51, 1: 101-126.

González, Lucas and Germán Lodola. 2019. The Impact of Oil Rents on Subnational Development: Evidence from Argentina. *Studies in Comparative International Development* 54, 4: 550-570.

Gylfason, Thorvaldur, Tryggvi Herbertsson, and Gylfi Zoega. 1999. A Mixed Blessing: Natural Resources and Economic Growth. *Macroeconomic Dynamics* 3, 2: 204-225.

Haslam, Paul Alexander and Nasser Ary Tanimoune. 2016. The Determinants of Social Conflict in the Latin American Mining Sector: New Evidence with Quantitative Data, *World Development* 78: 401–419.

Keck, Margaret E., and Kathryn Sikkink. 1999. Transnational Advocacy Networks in International and Regional Politics. *International Social Science Journal* 51,159: 89-

101.

Krause, Peter, Ora Szekely, Mia Bloom, Christia Fotini, Sarah Zuckerman Daly, Chappell Lawson, Zoe Marks, Aidan Milliff, Kacie Miura, Richard Neilsen, William Reno, Emil Aslan Souleimanov, and Aliyu Zakayo. 2021. COVID-19 and Fieldwork: Challenges and Solutions. *PS: Political Science & Politics* 54, 2: 264-269.

Larsen, Erling. 2006. Escaping the Resource Curse and the Dutch Disease? When and Why Norway Caught Up With and Forged Ahead of its Neighbors. *American Journal of Economics and Sociology* 65, 3: 605-640.

Lederman, Daniel, and William Maloney. 2008. In Search of the Resource Curse [with Comments]. *Economía* 9, 1: 1-58.

López, Andrés, Martín Obaya, and Paulo Pascuini. 2018. Las Oportunidades del Litio: Más Allá de la Batería, *Alquimias Económicas*, December 2018.

Luong, Pauline Jones, and Erika Weinthal. 2012. *Oil is not a Curse: Ownership Structure and Institutions in Soviet Successor States*. Cambridge: Cambridge University Press.

Mahdavy, Hossein. 1970. The Patterns and Problems of Economic Development in Rentier States: The Case of Iran. In: Cook MA, editor. *Studies in Economic History of the Middle East*. London: Oxford University Press, 37-61.

Marchegiani, Pía, Jasmín Höglund Hellgren, and Leandro Gómez. 2019. *Lithium Extraction in Argentina: A Case Study on the Social and Environmental Impacts*, Buenos Aires: FARN.

Marchegiani, Pia, Elisa Morgera, and Louisa Parks. Indigenous Peoples' Rights to Natural Resources in Argentina: The Challenges of Impact Assessment, Consent and Fair and Equitable Benefit-Sharing in Cases of Lithium Mining. *The International Journal of Human Rights* 24, 2-3: 224-240.

Monteiro, Joana and Claudio Ferraz. 2012. Learning to Select: Resource Windfalls and Political Accountability in Brazil. Mimeo FGV, 2012.

Montenegro Bravo, Juan Carlos. 2018. El Modelo de Industrialización del Litio en Bolivia. *Revista de Ciencias Sociales* 10, 34: 69-82.

Orocobre Limited, 2019. Video corporativo 2019. https://www.youtube.com/watch?v=XGYQbpMU99I. Accessed July 15, 2021.

Orihuela, José Carlos. 2013. How do ''Mineral-States" Learn? Path-dependence, Networks, and Policy Change in the Development of Economic Institutions. *World Development* 43, C: 138-148.

Orihuela, José Carlos. 2017. Institutions and Place: Bringing Context Back into the Study of the Resource Curse. *Journal of Institutional Economics* 14, 1: 157-180.

Postali, Fernando Antonio Slaibe. 2009. Petroleum Royalties and Regional Development in Brazil: The Economic Growth of Recipient Towns. *Resources Policy* 34, 4: 205-213.

Pragier, Deborah. 2019. Comunidades Indígenas frente a la Explotación de Litio en sus Territorios: Contextos Similares, Respuestas Distintas. *Polis* 52.

Przeworski, Adam, and Henry Teune. 1970. *The Logic of Comparative Social Inquiry*. New York: Wiley-Interscience.

Puente, Florencia and Melisa Argento. 2015. Conflictos Territoriales y Construcción Identitaria en los Salares del Noroeste Argentino. En: Bruno Fornillo (coordinador). *Geopolítica del Litio, Industria, Ciencia y Energía en Argentina*. Buenos Aires: CLACSO-El Colectivo.

Riofrancos, Thea. 2017. Scaling Democracy: Participation and Resource Extraction in Latin America. *Perspectives on Politics* 15,3: 678.

Ross. Michael 2012. *The Oil Curse: How Petroleum Wealth Shapes the*

Development of Nations. New Haven: Princeton University Press.

Roth, Sabrina. 2019. Communities Challenge Lithium Production in Argentina, *Diálogo Chino*, March 2019.

Slipak, Ariel. 2015. La Extracción del Litio en la Argentina y el Debate sobre la 'Riqueza Natural.' En: Bruno Fornillo (coordinador). *Geopolítica del Litio, Industria, Ciencia y Energía en Argentina*. Buenos Aires: CLACSO-El Colectivo.

Snyder, Richard. 2006. Does Lootable Wealth Breed Disorder? A Political Economy of Extraction Framework. *Comparative Political Studies* 39, 8: 943-968.

Snyder, Richard and Ravi Bhavnani. 2005. Diamonds, Blood, and Taxes: A Revenue-Centered Framework for Explaining Political Order. *Journal of Conflict Resolution* 49, 4: 563-597.

Torvik, Ragnar. 2001. Learning by Doing and the Dutch Disease. *European Economic Review* 45, 2: 285-306.

US Geological Survey. *2016 Minerals Yearbook*. Washington, DC: US Department of the Interior.

Van der Ploeg, Frederick. 2011. Natural Resources: Curse or Blessing? *Journal of Economic Literature* 49, 2: 366-420.

Weitz-Shapiro, Rebecca. 2012. What Wins Votes: Why Some Politicians Opt Out of Clientelism, *American Journal of Political Science* 56, 3: 568-583.

Notes

[1]https://oec.world/en/profile/hs92/6283691/#:~:text=Lithium%20carbonates%20are%20the%20world's,and%20Germany%20(%2446.2M)

[2] Jujuy was responsible for about 12,000 tons with the remaining output coming mostly from Catamarca and, to a far smaller degree, Salta. The companies in the three provinces estimate they can extract about 145,500 total tons by 2022 (Ministerio de Energía y Minería 2017). Although there are some projects in other provinces, such as San Luis and Córdoba, these mines are not yet in operation.

[3] In rentier states, defined as countries that "receive on a regular basis substantial amounts of external rent," (Mahdavi 1970, 428), only a few people generate the rent, the majority is involved only in its distribution or utilization, and the government is the principal recipient of it (Beblawi and Luciani 1987).

[4] On the advantages of subnational analysis for studying natural resource extraction and other key substantive issues in comparative politics see Giraudy, Moncada and Snyder (2019).

[5] Regarding the local economic and environmental impact of mineral and oil production, Caselli and Michaels (2013) and Postali and Slaibe (2009) find limited positive spillovers of oil rents on local economic activity in Brazilian municipalities. Aragón and Rud (2009) find that the Yanacocha gold mine in Peru has only modest positive effects on local income and household welfare. Similarly, Arellano-Yanguas (2016) shows that mineral rents transferred to producing regions in Peru have a small positive effect on economic growth but are also associated with higher poverty levels.

[6] Lithium mining is generally smaller in magnitude, both in the scale of investments and the amount of revenue generated, than extraction associated with minerals like oil or kimberlite diamonds, the conventional source of wealth for classic rentier states.
[7] Royalties from mining are marginal in the three provinces. They are higher in Salta because official figures on royalties include those from mining and from oil and gas extraction (DNAP). Salta produced 3.7 percent of the natural gas in the country in 2019. Oil production is marginal (.72 percent of the total) (Sistema SESCO).
[8] The combined share of the provincial GDP produced by agriculture, cattle raising, and mining gross is 63% in Catamarca, 21% in Salta, and only about 10% for Jujuy (See Table 1). The service sector represents 65% of GDP in Jujuy, 59% in Salta, and 29% in Catamarca.
[9] On techniques for doing remote fieldwork during the COVID-19 pandemic, see Krause et al. (2021).
[10] *Código Minero*, Law 24,196, adopted in 1993. The Constitutional Reform of 1994, in Article 124 states, "The provinces have the original domain of all natural resources in their territory," which implies that provinces set their own rules in mining matters (Puente and Argento 2015, 123).
[11] Add a note about the recent steps by the Fernandez administration to forge a national strategy, including the launching in July 2021 of PYF's lithium enterprise….
[12] https://www.elancasti.com.ar/opinion/2018/1/29/litio-est-camyen-360239.html The government of Catamarca created a longstanding state company, Yacimiento Mineros Agua de Dionisio (YMAD) in 1958. It formed a temporary joint venture with Minera Alumbrera Limited (M.I.M. Holdings Ltd. of Australia, North Limited of Australia, and Rio Algom Ltd. of Canada) to mine copper, gold and molybdenum. This company does not have any role in lithium.
[13] The Committee includes geologists and other experts from the National Scientific and Technical Research Council (CONICET) and the National University of Jujuy, who are nominated by the provincial legislature, the Environmental Management Agency and the provincial mining department (Marchegiani et al. 2019, 15). The Committee of Experts was recently dissolved by the current governor through executive decree (Decree-Agreement No. 9194, July 17, 2019).
[14] Decree No. 7626 of the provincial executive created the state-owned company JEMSE in 2011. The decree grants the company broad authority in areas ranging from exploration of deposits to the generation, commercialization, industrialization, and transportation of mineral wealth (Puente and Argento 2015, 123).
[15] Because JEMSE lacked the necessary funds to contribute capital to the joint venture, Orocobre loaned the state-owned company the money it needed to cover its share. JEMSE agreed to pay back the loan by transferring to Orocobre 33.33% of its shareholder dividends after the project began to turn a profit (Slipak 2015, 97; Argento and Zicari 2015, 41-42).
[16] The varied nature, and visibility, of the "threat" posed by mining to communities also merits consideration. In contrast to open-pit mines, which are highly visible and may rely heavily on toxic chemicals like cyanide, the most widespread and harmful negative externality of lithium mining in Argentina is the gradual depletion of water supplies. In addition to emerging slowly, these negative effects may be more difficult to verify scientifically, especially when the companies themselves are in charge of geological surveys and environmental impact assessments, as is often the case in the Argentine Puna. Moreover, in contrast to gold and alluvial diamonds, where the technical and capital barriers to entry can be modest, lithium mining is not feasible with small-scale, artisanal

extraction, which means that TMCs will likely not face conflicts with cooperatives of small-scale lithium miners.

[17] There may be periods when aborted extraction is preferable to negotiated extraction, as suggested by the advantages TMCs can gain in raising capital by merely holding reserves of lithium, even if they are not being mined. In this scenario, the present value of reserves should be discounted by the expected future cost of any negotiations with local stakeholders that will be required for extraction to proceed.

[18] Sabrina Roth, "Communities Challenge Lithium Production in Argentina," *Diálogo Chino*, March 12, 2019): https://dialogochino.net/en/extractive-industries/24733-communities-challenge-lithium-production-in-argentina/

[19] https://www.bbc.com/mundo/noticias-5008246.

[20] Tellingly, the graffiti had been defaced by a second layer which transmitted the opposite message, replacing the "yes" with a "no", and vice versa, to read "Yes to Lithium Mining. No to the Pachamama." Author's observation, Jujuy, August 2019.

[21] Sabrina Roth, "Communities Challenge Lithium Production in Argentina," Diálogo Chino, March 12, 2019): https://dialogochino.net/en/extractive-industries/24733-communities-challenge-lithium-production-in-argentina/

[22]http://www.concienciaminera.com.ar/2019/08/sales-de-jujuy-rindio-culto-a-la-pachamama/

[23] https://www.orocobre.com/wp/?mdocs-file=7295

[24] 44% of respondents ranked social license to operate as the top risk, above other factors including the future of the workforce, rising costs, and cyber security. https://www.ey.com/en_gl/mining-metals/10-business-risks-facing-mining-and-metals; https://www.boreal-is.com/blog/social-licence-to-operate/.

[25] Raising revenue is, according to Riofrancos in her extensive ethnographic work in Ecuador (2017, 681), one of the main incentives of public administrations.

[26] See Pragier (2019) and Marchegiani, Morgera and Parks (2019) for helpful studies of the divergent outcomes across the Puna in Jujuy.

[27] In the Cauchari *salar*, adjacent to Olaroz, the Chinese company Ganfeng and the Canadian company Lithium Americas Corporation launched the Exar joint venture, which seems to have emulated successfully Sales de Jujuy's strategy of asymmetrical negotiated extraction. Having cut a series of community-by-community deals, Exar is now poised to become Argentina's third lithium-producing company. Orocobre itself expanded its footprint in lithium mining in the region through a new 25/75 joint venture with the Canadian firm Advantage Lithium Corp. to develop the Cauchari JV project located adjacent to the Sales de Jujuy facility. A fourth venture, Cauchari East, led by the Canadian mining company Millenial Lithium, is also in development.

[28] https://www.millenniallithium.com/projects/cauchari-east-lithium-project/

[29] To the degree that organized indigenous resistance and mobilization occurs in contemporary Salta, it seems concentrated in the northern part of the state among the Wichí people and near the eastern border with Chaco and Formosa provinces. There are no lithium mining activities in any of these areas.

[30] https://www.northernminer.com/news/taca-taca-gets-bigger-and-better/1000750981/

[31] The case of the French company, Eramet, with some $150 million invested in the Centenario and Ratones Salares of Salta offers an instance of aborted extraction, not because of resistance from affected communities as occurred in the eastern Puna of Jujuy, but because of the Covid-19 pandemic and its negative impact on global demand for lithium. Eramet announced recently that it was abandoning its Salta facilities and project.

[32] The provincial government of Catamarca had relied previously on police brutality to counter anti-mining protests, both in Tinogasta and Andalgalá, with an especially high level of repression in the latter case in 2010. Lithium is not mined in either of these areas, however.
[33] Darío Aranda, "Litio: Denuncia contra una minera en Antofagasta de la Sierra," *Página 12*, March 23, 2020.
[34] Arellano-Yanguas (2011, 629) reached similar conclusions for mining in Peru.