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Review Article

The extractive industries and development: The resource curse at the micro, meso and macro levels

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ABSTRACT

The resource curse literature has necessarily evolved in a rather fragmented way. While economists, political economists and political scientists have largely focused on the role of mineral abundance in long-term growth with the analysis largely confined to the country (macro) or regional (meso) level, anthropologists, sociologists and other social scientists have explored the development impacts of extractive industries at the community (micro) level. While this has provided a rigorous and comprehensive exploration of extractive industries and their impacts, causal factors that bridge and/or leap-frog these levels tend not to be accounted for. In this paper we examine the evolution of the literature across disciplinary lines and different levels of scale to assess the current status of resource curse debates. In so doing, we aim to explore how an integration of the various multi-scale approaches can help address the persistent problem of the resource curse.

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1. Introduction

The interest of the scientific community in the 'resource curse' (i.e. the tendency of mineral rich economies to underperform in economic growth and other development outcomes) has critically evolved over the last two decades. A Google Scholar search shows

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that while there were only 13 scientific papers that referred to the so-called 'resource curse' in 1995, the number increased to 67 in 2000, 543 in 2005, 1890 in 2010 and 2420 in 2014. This level of academic focus combined with greater awareness through media reporting, civil action and improved outlets for dispute by indigenous populations and social movements, has led to better monitoring and regulation at the global level. Voluntary initiatives, such as the Extractive Industries Transparency Initiative (EITI) and the Global Mining Initiative, are just two of many examples that indicate how scientific research has influenced policy circles; yet, after 20 years of research and action, 'the curse' lingers as a very real global problem.

Identification within academic circles that something was drastically wrong with mineral-based development[2] followed the influential World Bank-funded study conducted by Gelb et al. (1988). The term 'resource curse' was itself first coined by Professor Richard Auty in 1993 in his seminal book, *Sustaining Development in Mineral Economies: The Resource Curse Thesis* (Auty, 1993). The response to these major studies saw a natural evolution of research on the extractive industries within economic and political spheres. In other disciplines a focus on the 'resource curse', which is, by definition and application, an economic theory and tool, was far slower and is, as a result, far smaller. Economic theory does not always translate well to other social sciences. Application of 'the resource curse' to understand complex and diverse localised social, political and economic conditions, as well as nuanced factors such as local accounts of the impacts of extractive industries, diverse processes of extraction, and the nature of the mineral itself have been found to be severely limiting in the social sciences (see especially Weszkalnys, 2011; also Lahiri-Dutt, 2006; Reyna and Behrends, 2008). For more micro-level scientific researchers, the 'resource curse' was a macro-level problem, and the impacts of extractive industries at the local/village/community level were, and are, examined in terms of social change and problems linked to processes of sustainable development.

Consequently, the multidisciplinary concern with the impact of extractives rarely translates into interdisciplinary research (for exceptions see Bebbington et al., 2008; Bebbington, 2010; Bebbington and Bebbington, 2011; Bebbington and Bury, 2009 and Berdeguéa et al., 2015 – these are some of the few attempts to provide a more holistic picture of the resource curse by looking at the community-extractive industries-government nexuses at different scales, particularly in the Latin American context). There are many reasons for this, but methodological diversity is key. Disciplines work in very different ways. Taking the two disciplinary extremes examined in this paper as an example, while an economist identifies a question and seeks to answer it, an anthropologist pursues questions to find meaning rather than provide answers. When a concern for the economic implications of 'the curse' emerged within policy circles in the 1980s, economists and political economists were the obvious choice for aiding policy development because their disciplinary methods provide quantitative data that can be understood and linked to clear action points. A broad examination of the vast literature on the resource curse, however, shows that while the mainstream economics and political economy literature (the micro, and the meso) provides invaluable insight into extractive industries, the micro level analyses that have followed provide a nuanced examination of its effects that is equally valuable. Combined, they can provide a much more comprehensive view of extractive industries and its impacts as fabricated at the global and the local level.

Our aim in this paper is to examine the ways in which different disciplinary focuses have shaped the resource curse literature. Moreover, we aim to examine disciplinary boundaries and the fragmentation of the resource curse debates across different levels of scale. The objective here is to show how these levels and the different disciplines that inhabit them, are critical to understanding the factors determining the resource curse for future policy development. As such, this paper is first and foremost a review of the resource literature. It also, however, identifies important linkages between an apparently disparate literature that could have a very real impact on defeating 'the curse'. This paper contributes to the literature by providing a first attempt at bridging the different fragments of research on the resource curse, which have been largely determined across disciplinary lines and across different levels of scale. To our knowledge this is the first dedicated endeavour to provide such a holistic framework under which the resource curse phenomenon should be analysed.

In Section 2 of the paper we discuss in more detail how the different streams of the resource curse literature have evolved separately. In particular, we pay special attention to the qualitatively different types of findings across these fragments of the resource curse literature. In Sections 3–7, we reflect on the implications of this fragmentation for the scientific analysis on development impacts in mineral rich countries, as well as for appropriate policy-making at various scales.

2. The fragmentation of the resource curse literature

In this section we elaborate further on the fragmentation of the resource curse literature with respect to scale, as well as methodology and policy focus. Although there are naturally no strict demarcation lines, we try to establish some general patterns based on our observation of the divergent approaches that have been adopted so far. First we discuss the fragmentation of the literature with respect to the geographic level of analysis (macro-country level, meso-subnational level, micro-community level), as well as the types of impacts and mechanisms considered (e.g. economic, institutional, etc.). Then we proceed to discuss fragmentation along other lines, such as the type of methodological approach and the link to different policy questions over time vis-à-vis the mineral sector.

The discussion that follows has greatly benefited from earlier review articles on the resource curse that have summarised theories and empirical evidence linking the extractive industries (and natural resources more broadly) with several development outcomes. One of the earliest reviews of the literature (focusing primarily on political economy explanations of the resource curse) is the one conducted by Ross (1999). Two other early review papers by Gylfason (2001b) and Stevens (2003) primarily focused on the economic explanations of the curse. A subsequent review by Andrew Rosser (2009) critically reflected on the resource curse literature by devoting a separate discussion to the causes, consequences and remedies of the curse. Frankel (2010) provided a more comprehensive review of the economics literature on the resource curse, paying particular attention to the robustness of the empirical evidence. Ross (2014) recently provided a detailed overview of the literature on institutional explanations (theory and evidence) of the resource curse. The discussion that follows has built on the insights presented in these earlier review papers with an explicit intent to reflect on the fragmentation of the literature along several lines (scale and disciplinary and methodological approaches). Furthermore, the earlier review papers have paid only marginal attention to the more micro-scale studies on the impacts of the extractive industries on local communities. Our intention

[2] Mineral economies are defined as developing countries that generate 'at least 8% of their GDP and 40% of their export earnings from the mineral sector' (Auty, 1993: 3). They make up approximately one-fifth of developing countries (Auty and Mikesell, 1999).

has been to fill this gap and provide a more holistic picture of the different fragments of the resource curse literature.

3. The macro scale

Economists and other social scientists (e.g. political scientists, political economy scholars, institutional sociologists, geographers, etc.) have extensively probed into the macro-level impacts of mineral resources. Below we discuss the main streams of this macro-level research depending on the types of impacts and mechanisms considered (e.g. economic, institutional, etc.).

3.1. The macro scale (macroeconomics)

Economists have largely examined the role of mineral resources in influencing economic factors that can impact on long-term economic development. Some earlier development economists in the 50s and 60s (e.g. see the writings by Lewis, 1955; Innis, 1956; Rostow, 1960; Watkins, 1963) suggested that resource endowments could potentially alleviate credit constraints and result in economic expansion. In effect, at the time there was more anticipation of a resource blessing rather than a curse in terms of expected macroeconomic impacts – higher transportation costs made mineral availability seen as a prerequisite of successful industrial expansion and improvement in living standards. The majority of economic scholars, though, pointed to a causality of a different direction. Some economists contested the existence of positive spillovers from mineral extraction to the rest of the economy, suggesting that these are likely to be very localised, particularly in the presence of foreign multinationals (Hirschman, 1958; Baldwin, 1966; for some more recent evidence and discussion see Veltmeyer, 2013). Prebisch (1950) and Singer (1950) suggested that the terms of trade of resource-dependent economies deteriorate over time (i.e. the relative price of primary commodities vs. manufactured goods falls) which aggravates the income gap between the resource rich developing countries and the rest of the world (although the trend has been reversed in recent years as a result of the mineral commodities boom; see also the paper by Harvey et al., 2010 that provides evidence in support of the Prebisch-Singer hypothesis over a period of four centuries). As a consequence of these adverse terms of trade, mineral rich nations would need to export an increasingly larger amount of natural resources for any given level of imported manufactured commodities.

The Dutch Disease theory and its variants subsequently provided a more sophisticated framework to examine the macroeconomic effects of mineral abundance on trade patterns, and thereof on economic growth. In their basic Dutch Disease model, Corden and Neary (1982) separate the Dutch Disease mechanism into two effects (see also Corden, 1984). The first, called the Resource Movement Effect describes the shift of production factors (capital; labour) from manufacturing and other productive activities towards the primary sector as a result of changes in relative marginal productivities. In the case of labour shifts, this might be less of a concern for developing countries characterised by large labour surpluses (although skilled labour might be in shortage; see Ross, 2001 for a discussion). The second, called the Spending Effect, concentrates on the inflationary pressures induced as a result of the positive income shock (triggered by the increase in mineral wealth) that decreases the competitiveness of commodities outside the primary sector. Both effects result in a structural transformation that disadvantages the non-primary tradable sectors. Much of the literature has focused on the potential contraction of the manufacturing sector and subsequent repercussions for economic growth, as a result of the stronger learning-by-doing externalities of the sector (Aizenman and Lee, 2010; Krugman, 1987; Matsuyama, 1992; Papyrakis, 2011). The overall impact of a Dutch Disease on economic growth will depend on the relative learning-by-doing and spillover effects across sectors (see Torvik, 2001). Several country studies have provided support to the Dutch Disease hypothesis (Papyrakis and Raveh, 2014 for Canada; Auty and Evia, 2001 for Bolivia, Mikesell, 1997 for Venezuela and Peru; Pegg, 2010 for Botswana; Kutan and Wyzan, 2005 and Egert and Leonard, 2008 for Kazakhstan).

There are several other macro-scale resource curse theories that focus on economic variables. For example, it has been shown that mineral resource abundance is associated with reduced savings and investment rates, given that capital accumulation becomes less important for sustaining future income levels (Papyrakis and Gerlagh, 2006). Gylfason and Zoega (2006) also provide evidence of a negative link between resource dependence and the rate of national savings in GDP as well as the maturity of the financial system (hampering hence a more efficient allocation of capital across sectors and firms). Any accumulated savings should also be channelled into the domestic economy to the extent that there is shortage of physical capital and the economy is far below its full employment level (Venables, 2010). The macro resource curse may also be related to a debt overhang, with mineral rich states using their reserves as collateral for debt in international markets (see Manzano and Rigobon, 2001; Sarr et al., 2011). Usui (1997) case study on two oil-rich countries (Indonesia and Mexico) provides evidence on how such "boom-based borrowing" often results in debt crises (in 1975 and 1982 in Indonesia and Mexico respectively). The volatile swings of world resource prices are also likely to result in a macroeconomic see-saw effect for mineral rich economies, as well as create uncertainty for domestic and foreign investors (see van der Ploeg and Poelhekke, 2010). It also makes it difficult for governments to impose fiscal discipline (due to the volatility in government revenues; see Auty, 1998). The direction of causality can go both ways and a prudent fiscal policy itself is an important shielding mechanism against the degree of exposure of the domestic economy to an external resource price shock (Pieschacón, 2012). The volatility effect is also likely to be further accentuated by the lack of diversification in the economy, both as a result of the aforementioned Dutch Disease effect, as well as a lack of far-sighted industrial competitive policies (see Auty, 1994; Auty and Pontara, 2008; Murshed and Serino, 2011). The poor record of mineral-rich economies in terms of diversifying economic activities and limiting overreliance on primary exports was already well documented since the late 70s (Eden, 1979; Kubursi, 1984) – this tendency largely persists today with a few notable exceptions (e.g. Tunisia, Chile, United Arab Emirates; for a discussion see Farooki and Kaplinsky, 2014; Gelb, 2010; Wiig and Kolstad, 2012).

Economists have largely focused on the aforementioned mechanisms in order to explain the negative observed correlation between mineral resources and long-term economic growth (normally over a period of 3–4 decades). There have been several growth econometrics (cross-country) studies that have explored the links between minerals and improvements in GDP per capita over time (e.g. Brunnschweiler, 2008; Murshed and Serino, 2011; Papyrakis and Gerlagh, 2004; Papyrakis and Gerlagh, 2007; Sachs and Warner, 2001; Williams, 2011). Some other cross-country econometric studies linked mineral resources with the observed variation in income (GDP per capita) levels rather than growth patterns (Arezki and van der Ploeg, 2008, 2011; Carmignani and Chowdhury, 2012). A few papers have also focused on broader human development indicators as the dependent variable of their econometric analysis. For example, Bulte et al. (2005) concentrate on the negative correlation between mineral resource abundance and the Human Development Index (HDI) – in the same study, the authors also examine how populations in mineral rich states suffer

proportionately more from limited access to safe water and undernourishment. Some environmental economists have also linked mineral wealth to low scores of sustainable development indicators (such as the genuine savings and genuine income measurements that calculate net savings and income taking into account the rate of mineral depletion; see Atkinson, 2003; Dietz et al., 2007; Neumayer, 2004). It is important to note that the observed negative correlation between these aforementioned human development/welfare indicators and resource abundance holds even when one controls for the level of economic development (in other words, results are not driven by the GDP per capita level of mineral-rich economies).

3.2. The macro scale (political economy/institutional analysis)

A large segment of the macro-level resource curse literature (where other social scientists, e.g. political scientists and institutional sociologists, have been particularly active) primarily focuses on the relationship between extractive industries and non-economic variables. This literature has largely looked at how mineral resources influence or interact with institutional dimensions (e.g. government efficiency, rule of law, corruption), democracy and conflict. Below we discuss the different branches belonging to this literature, although one needs to acknowledge that often these different streams overlap to some extent.

3.2.1. Institutions (as dependent variable)

Over the last decade, much attention has been drawn to the so-called institutional explanations of the resource curse. Several papers suggest that mineral resources hamper the development of a good institutional framework, e.g. by breeding corruption and rent-seeking (Baggio and Papyrakis, 2010; Bulte et al., 2005; Isham et al., 2005; Leite and Weidmann, 2002; Torvik, 2002). Several papers have associated mineral resources with rent-seeking by focusing on the role of (mineral-rent distorted) incentives. Mineral-induced rent-seeking often involves allocating resources (effort, funds, etc.) on political lobbying to increase one's share of existing wealth without creating any added value to the economy (the term 'rent-seeking' was coined by Krueger, 1974). Mineral wealth is often contested by numerous firms of individuals who are likely to exert their influence so that they can receive a larger share of the 'prize'. For example, mining companies may pay bribes to governments to receive access to sites and individuals may attempt to influence governments (e.g. by means of striking, selective voting, etc.) to redistribute a larger share of public revenues accruing from mining. A resource boom increases the incentive to lobby/rent-seek and hence diverts attention and resources from productive activities (e.g. see the papers by Baland and Francois, 2000; Boschini et al., 2007; Lane and Tornell, 1999; Torvik, 2002). Politicians may themselves willingly redistribute mineral rents in the form of direct transfers, subsidies or public goods in exchange for electoral support (see Robinson and Torvik, 2005; Vergne, 2009). Of course the extent of rent-seeking depends on other opportunity costs in the economy (e.g. the return from other economic activities) and the appropriability of the mineral rents (e.g. their geographic concentration, number of contestants, etc.; see Wick and Bulte, 2006; Dejardin, 2011).

Politicians can of course also rent-seek, manipulate institutions and distort policies, so that they gain direct access to the rents (Orogun, 2010; Ross, 2001). Overreliance on mineral revenues can limit good governance; public revenues become inefficiently allocated (based on rent-seeking rather than expected returns) often with lower-quality politicians in public office (Brollo et al., 2013), governments adopt short-sighted policies given the volatility of prices and revenues and there are limited controls that encourage transparency and rule of law, limit expropriation and guarantee an efficient bureaucracy (Karl, 1997; Kolstad and Wiig, 2009; Stevens and Dietsche, 2008). There have been several empirical cross-country analyses (using regression analysis) demonstrating a strong negative correlation between mineral resources and several institutional variables (e.g. for corruption, see Arezki and Brückner, 2011; Leite and Weidmann, 2002, for rule of law, see Kolstad, 2009; Norman, 2009; Sala-i-Martin and Subramanian, 2012; for quality of bureaucracy, see Brunnschweiler and Bulte, 2008, Isham et al., 2005; for property rights protection see Baggio and Papyrakis, 2010; Brunnschweiler, 2008, for transparency see Williams, 2011).

3.2.2. Institutions (as mediating variable)

The second body of literature on institutions and the resource curse does not treat institutions as an endogenous variable that is dependent on the abundance of mineral rents. Rather than trying to explain any variability in institutions as a result of mineral abundance, it instead emphasises the mediating role of good institutions in preventing the resource curse (Boschini et al., 2007; Kolstad, 2009; Mehlum et al., 2006; Sarmidi et al., 2014). The preventive role of good institutions against rent-seeking is, for example, discussed by Tornell and Lane (1999), who show how weak institutions interacting with a mineral boom can induce a 'voracity effect' with numerous interest groups competing for the rents (see also Boschini et al., 2007 who link the appropriability of mineral rents, and hence the incentive to rent-seek, on institutional quality proxied by the extent of property rights protection). Mehlum et al. (2006) also develop theoretical and empirical models to show how 'grabber-friendly' institutions that encourage corruption constrain growth in a mineral-rich environment. El Ansashy and Katsaiti (2013) find that low corruption and better governance improve windfall management leading to higher growth rates. The core message of the papers belonging to this substream of the resource curse literature is that sound institutions (e.g. secure property rights, efficient bureaucracies, low corruption) can turn the 'resource curse' into a 'resource blessing'. A good institutional framework can naturally benefit the country at multiple levels; e.g. from the very macro level in terms of channelling resource rents into productive growth-promoting investments and shielding against macroeconomic instability (e.g. Dutch Disease effects) to the very micro level by encouraging public expenditure management systems that ensure an equitable distribution of mineral rents, compensation of negatively affected communities and an improvement of local livelihoods.

3.2.3. Democracy

Several papers have concentrated their attention on a particular institutional dimension; i.e. the tendency of mineral rents (and oil in particular) to hinder a transition to democracy. Cross-country statistical analysis has verified the link between mineral resources and limited government democratic accountability (Andersen and Ross, 2014; Aslaksen, 2010; Ross, 2001; Tsui, 2011). Mineral rents are often misused by authoritarian rulers for the purpose of prolonging their stay in power (see Andersen and Aslaksen, 2013; Cuaresma et al., 2010). For example, authoritarian regimes in mineral-rich states can rely much more on mineral rents than tax revenues, which correspondingly reduces public demand for democratic accountability (McFerson, 2010; Ross, 2001, 2009; see also the book by Jill Crystal (1990) on oil politics in Kuwait and Qatar). Spending on patronage fuelled by the abundance of mineral rents may have a similar effect (Auty, 2005; Vandewalle, 1998). Mineral rents concentrated in the hands of authoritarian rulers may also suppress democratic aspirations either in the form of excessive spending in internal security (this is what Michael Ross (2001) coins the 'repression effect'; see also Sandbakken, 2006; Tsui, 2010; Gause, 1995) or obstruction of free information (Dutta

and Roy, 2009; Egorov et al., 2009; Williams, 2011). The appropriability of the mineral rents by the rulers in power (which for example might increase when mineral industries are nationalised) naturally mediates the resource-democracy relationship (Ross, 2012; Snyder and Bhavnani, 2005). There is also evidence suggesting that it is the extent of mineral wealth that matters for democratic accountability rather than any shorter term changes in mineral affluence (e.g. a short-term income windfall induced by price fluctuations; see Haber and Menaldo, 2010; Wacziarg, 2012; Wright et al., 2015; Andersen and Ross, 2014). Some studies have also treated democracy as a mediating (rather than dependent) variable upon which the materialisation of resource curse phenomena depends. For example, Arezki and Brückner (2010, 2012) find that mineral price booms lead to excessive government spending and sovereign bond spreads (a measure of macroeconomic uncertainty) in the presence of autocratic rulers.

3.2.4. Conflict

Another important branch of the resource curse literature has linked the presence of mineral resources with violent conflict. Several papers have verified a positive relationship between mineral resources and the onset of civil war (Collier and Hoeffler, 2005; Dixon, 2009; Dunning, 2005; Humphreys, 2005; Ross, 2006; Welsch, 2008). Some of them have looked at particular types of resources; e.g. see Le Billon (2008), Lujala et al. (2005), Olsson (2006, 2007) and Ross (2006) for alluvial diamonds and Lujala et al. (2007) and Lujala (2010) for oil. The effect is also non-monotonic; while initial increases in mineral resources raises the probability of violent conflict, the latter falls for sufficiently high levels of mineral wealth (possibly via an income stabilising effect; see Collier and Hoeffler, 1998; Collier et al., 2009).

Several studies suggest that the effect of mineral resources on conflict is conditional on a range of variables. For example, the location of the resource might matter. Onshore oil is more conducive to civil conflict (Lujala, 2010), as is oil extraction in regions with much lower income per capita than the national average (Østby et al., 2009). Countries that are more ethnically homogenous are more likely to avoid conflict in the presence of mineral resources (Bjorvatn and Naghavi, 2011; Brunnschweiler and Bulte, 2009; Esteban et al., 2012; Herbst, 2000; Hodler, 2006). The presence of mineral resources is not only associated with the onset of conflict but also with its duration (Ballantine, 2003; Buhaug et al., 2009; Lujala et al., 2005; Fearon, 2004 for the case of secessionist wars) and severity (e.g. extent of casualties per initial population).

3.3. Other variables

Finally, some of the macro resource curse literature focuses on how mineral resources influence some *non-economic* and *non-institutional* variables. *Educational* measures (such as the share of public expenditure in GDP or school enrolment rates) have been found to correlate negatively with proxies of mineral abundance (Gylfason, 2001a relates this to the fact that extractive industries are often less human capital intensive; see also Birdsall et al., 2001; Papyrakis and Gerlagh, 2004; Shao and Yang, 2014). Ross (2007) finds that oil dependence correlates with *gender inequality* (in the domain of labour force participation and political representation), while Daniele (2011) and de Soysa and Gizelis (2013) claim that mineral rich countries underperform in *health* indicators (e.g. proxied by child mortality and HIV infection rates).

4. The meso scale

In the last decade the scale of the resource curse analysis has also been lowered to an intermediate level, looking at differences between mineral-rich and mineral-poor *regions* within sovereign countries. This meso-scale resource curse literature examines whether some of the aforementioned resource curse mechanisms found across countries may also hold at the regional level. This nascent literature has so far provided interesting insights on a regional resource curse for a wide range of countries. Papyrakis and Gerlagh (2007), for example, verified that resource-rich US states lagged behind in long-term growth (as a result of reduced investment, lower educational attainments and trade openness and higher corruption; James and Aadland (2011) find similar evidence at the more disaggregated county level). Zhang et al. (2008) find similar differences in consumption per capita growth across Chinese provinces that partly explain the disparities in living standards observed between coastal and inland regions (see also Shao and Qi, 2009, for a similar analysis on income per capita growth). Yuxiang and Chen (2011) further showed that mineral rich regions in China suffer from a slower pace of financial development. Papyrakis and Raveh (2014) examined the Dutch Disease at the regional level across Canadian provinces and found that mineral-rich provinces suffer from inflationary pressures and reduced competitiveness. Angrist and Kugler (2008) find that dependence on coca production and associated rent-seeking explains differences in the extent of civil conflict across Colombian regions. Within-region income inequality can also be associated with regional oil and gas abundance (see the empirical analysis across Russian regions by Buccellato and Mickiewitz, 2009). Deaton and Niman (2012) make use of county data from the Appalachian region to show how mineral dependence increases poverty rates in the longer term (although it tends to have the opposite effect in the short term).

Differences between resource rich and resource scarce regions can also extend to the institutional dimension. Subnational studies have shown that oil rents assist elected officials to prolong their stay in power through generous redistribution (irrespective of the quality of the services they provide; see Goldberg et al., 2008, for the US and Gervasoni, 2010a, 2010b for Argentina). This is in line with Paler (2013) who uses experimental data from 1863 villagers (from the Blora district in Indonesia) to show how resource windfalls reduce public pressure in terms of holding politicians accountable for their actions. Libman (2013) finds that mineral rents encourage economic growth in Russian regions with efficient and transparent bureaucracies (although not necessarily with democratic political systems). Similarly, subnational data from Peru show how bureaucratic capacity can reduce rent-seeking and prevent localised social conflict in mineral-rich areas (Ponce and McClintock, 2014). Vicente (2010) provides evidence of a subnational causal link between perceived corruption and oil discovery using household data from São Tomé and Príncipe.

5. The micro scale

In parallel, although quite independently and often quite covertly (i.e. more often under the banner of 'development', see Weszkalnys, 2010), a separate substream of the resource curse literature, dominated by anthropologists but also including other social scientists, has probed into the development impacts of the extractive industries at the *micro* or *community* level. This micro resource curse literature, as a result of the scholarly prevalence by non-economists, has examined more closely the broader development outcomes and impacts of extractive industries on individual agency and community relationships, as well as the cultural characteristics that drive action and determine outcomes. These studies examine how and why processes of resource extraction provoke certain kinds of reaction. For example, why is poverty exacerbated in mineral contexts (e.g. Hilson, 2010, 2012)? How does mineral wealth stimulate gender inequalities and social

fragmentation (e.g. Macintyre, 2003)? How do specific social worlds determine response and action (Banks, 2009)?

There is general agreement within the micro level literature that the very basic level of cultural difference (based on conflicting and incompatible social, political and economic forms of organisation) creates very basic human problems – conflict, social fragmentation and dislocation, poverty and inequality. Indigenous (or 'non-Western') populations with non-market, transitional or recently hybridised economic systems of organisation accommodate the peculiarities associated with mineral extraction in line with their own social, economic and political idioms. Anthropologists, for example, have argued that market transactions are, by their very nature, incompatible with locally embedded systems dominated by principles of delayed reciprocity and obligation (e.g. Filer, 1990, 1998; Biersack, 1999; Crook, 2007; Golub, 2007; Bainton, 2008).

Unfamiliarity combined with incompatibility can lead to a lack of engagement with the market structures that ultimately engender economic growth, and are thus likely to constrain the ability of local communities to transform their proximity to mineral extraction into a 'blessing'. The difference in the organisational character between a market (mineral-driven) economy and a subsistence/transitional (rural-based) one can be crucial to understanding how the activities associated with mineral extraction do or do not benefit local communities on the one hand, and are interpreted and acted on by them on the other.

At the heart of the conflict are the principles guiding exchange and connectivity to place and kin that ensures social and economic security for all (Gilberthorpe and Sillitoe, 2009), and the imposed capitalist principles that are individualising, solitary and dependent on colonial principles of state ownership and a hierarchical structure modelled on principles of core and periphery. This opposition can generate tensions between the state/corporate sector and indigenous communities, and can lead to violent and non-violent conflict (see examples in Watts, 2008; Behrends et al., 2011; Thorp et al., 2012). On the flip side of this is the opportunities mineral wealth can provide and the social relationships that develop as a result of mine occupation. Golub's 2014 exploration of gold mining in Papua New Guinea, for example, chronicles in rich ethnographic detail the individual relationships that evolve out of local/mine negotiations and the problems that emerge as a result. Golub's work highlights the political processes entwined in resource extraction at the local level and, in so doing, underlines the forces of inequality, social dislocation and conflict that can form the basis of a resource curse (see also Watts, 2001; Banks, 2009; Arellano-Yanguas, 2011).

Like Golub, other anthropologists have examined the emerging political issues accelerated by extractive industries, in particular social movements and concepts of indigeneity, how these become politicised and what that means for social fragmentation. Suzanne Sawyer's book (2004), for example, chronicles the emergence of indigenous movements in Ecuador in a stand against multinational oil companies and the Ecuadorian state (see also Bebbington et al., 2010). Sawyer and others (Caneiro da Cunha, 2009; Warnaars and Bebbington, 2014) demonstrate the growing relevance of *indigeneity* in political discourse around national belonging and ownership of land and resources in extractive industry contexts. In Latin America in particular, indigenous groups are taking the process of *resource-based development* into their own hands and making demands that fit their own (dynamic) cultural condition.

It is perhaps the covert association in the anthropological literature with 'the resource curse' proper (due to its roots in economic theory and a greater disciplinary concern with processes of social change) that separates it theoretically from the macro and meso level studies discussed above. Yet many of these studies could make vital contributions to adapting the assumptions currently embedded in mineral policy (such as the assumption that infrastructure and cash are vehicles for development and conduits of 'self-development'). The complexities and dynamics of social organisation and interaction at all levels contribute to the resource curse; be this in a so-called 'developing' country, such as Papua New Guinea (e.g. Golub, 2014; Gilberthorpe, 2007) or in what are more often termed 'developed states' (see for example Trigger, 1997, and Langton and Mazel, 2008 for Australia; Gilberthorpe et al., 2014 for Qatar). Regardless of scale, nuanced sociocultural factors of kinship, descent and exchange have a critical influence on local responses to *mineral-based development*, but still remain absent from policy planning (Banks, 2009; Gilberthorpe and Banks, 2012).

One particular area where micro level researchers have been vocal, is in their critiques of extractive industries. Some have argued that corporate rhetoric of 'sustainability' (e.g. 'sustainable mining') and discourses associated with 'corporate social responsibility' have been employed by the extractive industries to legitimise activity, mitigate local concern for bad practice, appease local hostilities, and ultimately facilitate production in the midst of environmental devastation and social disruption. Anthropologists Benson and Kirsch, for example, argue that a rhetoric of 'sustainability' is employed to benefit the corporate sector over and above local communities (Benson and Kirsch, 2010; also Kirsch, 2010; Gilberthorpe and Banks, 2012; O'Faircheallaigh and Ali, 2008). In a similar vein Rajak (2012) examines 'corporate virtue' (under the banner of corporate social responsibility) as a condition of late capitalism to show how the merger between corporate (extractive) activity and development (especially *social* development) reproduces a culture of dependency and power in which the indigenous 'impacted communities' remain powerless players on the periphery of capitalist discourse and contemporary notions of market discipline (also Gilberthorpe, 2013). The critical view is perhaps best summed up by Weszkalnys, however, who sees the resource curse as "less the invention of economic theorists or a possible doomed future than a continuation of business-as-usual under slightly altered rules" (2011: 366). Insights such as these are vital components in our understanding of how (or whether) a resource curse exists in diverse social, economic and political contexts.

6. Fragmentation along other lines

It is not only the scale of the analysis and types of impacts/mechanisms considered that fragment the resource curse literature. Several other lines of fragmentation exist. Different *research methodologies* have been utilised to examine the resource curse depending on the disciplinary background of the researcher(s). While it is not surprising that different social scientists adopt a diverse range of methodological approaches, this naturally conditions the insights that can be gained. Many economists and several political scientists (especially those working at the macro level of the resource curse) apply cross-country regression analysis to examine the link between mineral resources and some development outcomes (e.g. economic growth, investment, institutional quality, conflict, etc.), as well as identify other factors that mediate this relationship.

The purpose of such a methodological approach is to identify general trends (i.e. rules of thumb) and broad differences between mineral rich and scarce nations. Quite often this type of empirical work aims at testing some predefined theory (e.g. a Dutch Disease, the Prebisch-Singer hypothesis, a growth theoretical model, a rent-seeking conceptual argument, etc.). Several papers even develop their own theoretical frameworks and then subsequently test them (e.g. see Mehlum et al., 2006; Olsson, 2007). On the other hand, anthropologists and some other social scientists typically carry out qualitative research that does not necessarily aim at testing

theories and their general applicability. The focus instead is on an in-depth understanding of particular cases (or comparison of few of them) – this allows them to extract more detailed case-specific information on the development effects of the extractive industries without necessarily striving for a generalisation of the insights gained (see Golub, 2014; Rajak, 2012). Naturally, both approaches have merits and should complement each other – in many cases this is unfortunately not the case. For example, micro-qualitative evidence should ideally be compared to the more macro-quantitative evidence with an accompanied critical reflection in case of a deviation in findings between the two approaches.

This *methodological fragmentation* is to a large extent explained by how (and when) different disciplines engaged with the 'resource curse' paradox and its repercussions. Since the seminal work by Gelb et al. (1988) and Auty (1993), the initial research/policy question that predominantly attracted attention was the reasons behind the poor economic performance of mineral-rich countries and the ill-shaped macroeconomic programmes chosen by their policy-makers and governments. Naturally, it was the more macro-level economists, political economy specialists and political scientists that primarily engaged with this question and its variants. As a result, the initial methodology employed to examine the macro-perspective of the resource curse was largely monopolised by the methodological tools typically used by economics, political economy and political science (i.e. cross-country regression analysis, country comparisons, governance political-economy theories, etc.). This type of analysis also appeals more to stakeholders (with an interest in the macro-perspective of the resource curse), since it allows for broader generalisation (and applicability of findings) and often an easier interpretation, without the complex specificities that an ethnographic/anthropological perspective of a community-based resource curse analysis would entail. Hence, the initial policy and research focus of the 'resource curse' on macro-level development impacts and responses also created (at least at the beginning) less enthusiasm from other micro-level scholars (often anthropologists and sociologists, but also micro-development economists) to engage with the question at the more micro/community level. Gradually (as it often happens with any nascent research literature) new research concerns arose that related more closely to the micro-impacts of mineral-based development on local communities and their interaction with the state and the extractive sector. This was a natural evolution of thinking, with scholars with a more micro focus realising that extractive projects do not only influence the macro-economy but also produce more localised (social/environmental) effects that directly impact on local communities and their livelihoods.

As evident from the earlier discussion in this chapter, the resource curse literature has been fragmented with respect to the *dependent variables* it aims to explain (e.g. variation in economic growth, institutions, democracy, trade, conflict, educational attainments, health standards, etc.). An aspect that often, though, receives less attention is the choice of the *independent variable* that is meant to capture resource richness or wealth. Since the seminal work by Brunnschweiler and Bulte (2008), it is customary to distinguish between '*resource dependence*' vs. '*resource abundance*' indices, with the former measuring the value of natural resources as a share of economic activity (e.g. GDP, exports, etc.) and the latter in terms of population (or land; i.e. a rather exogenous variable less likely to be influenced by natural resources should appear at the denominator). Studies often found that the resource curse evidence disappears when one uses indices of resource value in per capita (land) terms rather than as a share of overall economic activity (e.g. see Brunnschweiler and Bulte, 2008; Cavalcanti et al., 2011; Stijns, 2005, 2006).

There is also much variation in terms of the *type of natural resources* considered. The resource curse literature typically distinguishes between *point* and *diffuse* resources – the former relate to natural resources that are usually geographically concentrated and expropriated by a smaller share of the population (as in the case of mineral resources), while the latter relate to resources that are more widely dispersed (as in the case of agriculture). Most scholars nowadays agree that it is typically the extractive industries (rather than the diffuse resources) that contribute to resource curse types of phenomena (Bulte et al., 2005; Isham et al., 2005; Lederman and Maloney, 2007) – although there is also some evidence of a more localised non-mineral resource curse, as in the case of cocoa leaf production in Colombia (Angrist and Kugler, 2008). Earlier studies often failed to look separately at the differentiated effects of the two types of resources (e.g. see Sachs and Warner, 1995, 1997; Gylfason et al., 1999; Kronenberg, 2004).

7. Concluding remarks: a need for a multi-scale approach

In this paper we have attempted to exemplify the fragmentation of research on the resource curse across disciplinary lines and across different levels of scale. The macro and meso resource curse literature that focuses on cross-country and cross-regional comparisons is largely dominated by the work of macroeconomists, political economists and political scientists. On the other hand, the micro resource curse literature that examines the links between mineral extraction and development at the local level mainly comprises of the work of anthropologists and other social scientists.

Multiple reasons justify the need for a unified framework of analysis that bridges different scales. The macro resource curse evidence (e.g. in the form of reduced economic growth as a result of the distortionary impacts of a mineral boom) suggests that, on average, individuals in a mineral-rich country receive less income over time. The micro perspective is required in order to grasp how this macro resource curse burden is distributed (for example, due to elitism, social disintegration, and corruption). If the resource curse holds both at the more macro as well as micro level, this would suggest that local communities in mineral rich areas will be disproportionately more affected. They are likely to suffer both as a result of the more general poor macroeconomic performance, as well as the more localised adverse effects, e.g. in the form of erosion of social capital or environmental degradation. Naturally, while the economy might suffer as a whole, and local indigenous communities may suffer the most, it might not necessarily be the case that *everyone* in the economy suffers. If mineral revenues (e.g. directly or indirectly via redistribution through the public budget) primarily benefit local urban elites, one needs to design policies that redistribute financial resources to the local communities in the mining areas *and* to understanding how those resources will be integrated and interpreted. Obviously, this is not always easy to implement given the intrinsic interests and resistance of the urban elites to alter the status quo. Perhaps a solution (that could become more institutionalised) would be for environmental and social impact assessments to become a standard norm and also incorporate an analysis on the social dimensions of impacts to local communities (see Banks, 2013). It is not the aim of this paper to devise solutions to an issue of such complexity, but rather explicate the necessity to simultaneously approach the resource curse within a country from multiple scales.

Keeping sight of the meso scale is also equally important. Mineral resources are often geographically concentrated and have the potential to trigger frictions or even civil conflict particularly for countries that are largely ethnically or religiously fragmented. A meso resource curse, where mineral rich provinces/regions are more adversely affected by the resource curse in comparison with

their mineral scarce counterparts (as a result of regional resource curse impacts, e.g. in the form of intensified rent-seeking or a regional Dutch Disease), is likely to create a sense of injustice that could transform in the long run into political discord, violent conflict and even economic contraction for the whole country (in other words, a meso resource curse can set the foundations for a more macro resource curse). At the more micro level, communities in mineral rich regions are likely to be affected more, given their proximity to the contestable resources.

There is an additional reason justifying the need for a more holistic cross-scale framework of analysis. The scale of fragmentation of research on the resource curse largely overlaps with a disciplinary bias. The macro and meso resource curse is mainly dominated by economists and political scientists, while the micro resource curse literature mainly comprises of the work of other social scientists, often with a large anthropological focus. As a result, the more macro-scale approach has focused more on economic impacts (e.g. in terms of changes in income per capita) and the macro institutional environment, while the more micro-scale work has looked at broader development outcomes that are often difficult to quantify in a standardised numerical manner (e.g. effects on community trust and social cohesion). The insights from all these different disciplinary approaches are naturally invaluable to understanding how the resource curse might (or might not) materialise at different levels, as well as how it might spill across scales. In short, there is a need to approach the resource curse from a more collaborative interdisciplinary angle, which will permit the defragmentation of the literature both across scale and disciplinary lines and foster the development of more socially aware mineral policy that shows commitment to sound macroeconomic performance as well as the safeguarding of social and cultural capital at the more local level.

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