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Tax provisioning by extractive industry multinational subsidiaries

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Abstract: Extractive industries are spread across mining of metal and minerals, oil and gas, among others. Multinationals in these sectors are confronted with different challenges ranging from corruption, political risk, economic uncertainty, sunk costs, and the long-gestation periods to execute projects. As a result, tax payment behaviour of subsidiaries in the extractive sector could be dependent not only on these factors, but also on the life cycle of the subsidiary, profitability, and holding structure. Furthermore, emerging economy multinationals in the extractive industries could be state-owned and may invest in foreign subsidiaries for strategic reasons. We examine tax provision in host countries by India's multinational subsidiaries in the extractive industry. Panel data analysis is carried out for the period 2010–20. It is found that tax provision remains lower in the initial years of subsidiary life and increases with the sustenance of subsidiary in the host country for a longer period. In addition, subsidiaries of public sector enterprises are found to have higher tax provisions than their private counterparts. When it comes to the determinants, economic policy uncertainty, corruption, and political stability are found to significantly affect tax provision.

Key words: extractive sector, tax provision, economic policy uncertainty, corruption, political stability, public sector

JEL classification: F23, H26, Q34

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1 Introduction

Extractive industries are unique in many ways. Not only are these industries important to meeting the metals, and energy, needs of growing economies but they are also characterized by many challenges, including those that lead to skewed profit generation and tax provision during specific phase of the subsidiary life cycle. They must also deal with corruption and political risk in some host countries, as well as geopolitical risk and economic uncertainty, all of which affect the bottom line of subsidiaries in these industries. The presence of state-owned enterprises together with investments by sovereign wealth funds in the extractive industries further complicates our understanding of them (Heller 2018). It has been argued that the circumstances of the extractive sector warrant a special theory of foreign direct investment (FDI) (Buckley 2008). Furthermore, negative shocks to the extractive sector can have negative productivity impacts on other tradable sectors especially manufacturing (Kilumelume et al. 2022).

Evidence suggests that a section of the multinationals of emerging economies has a resource-seeking motive (Kolstad and Wiig 2012; Das and Banik 2015). Previous research, which is not specific to extractive industry, suggests that private firms prefer to cheat on taxes during periods of uncertainty (Afzali et al. 2021). As profitability in extractive industries could be affected by all these factors, multinationals could adopt a skewed tax provision approach which can then impact on the revenue mobilization efforts of the host country governments. There is sparse evidence as regards the taxation and profitability of multinational subsidiaries in extractive industries (Kjaer et al. 2021; Das and Mahalik 2020). Related research involving extractive industry multinationals has dealt with political stability and foreign subsidiary survival (Lupton et al. 2021) and political processes and taxation (Kjaer et al. 2021).

In this paper tax provision and its determinants are examined. In particular, the impact of institutional variables and economic policy uncertainty in host countries, subsidiary age and the impact of subsidiary-specific factors are examined using a sample of Indian multinational subsidiaries in the sector. Institutional factors need to be factored in as these are argued to be incredibly influential in the study of FDI in extractive industry (Buckley 2008). Firm-level studies suggest that corruption disclosure could reduce profitability (Asare et al. 2021). Therefore, this suggests that tax provisioning could be lower in countries that score higher in corruption. However, there could be a fear factor which can prompt subsidiaries to make higher tax provision even in corrupt countries.

In the extractive industries, significant number of subsidiaries are based in countries with higher political and economic uncertainty. While higher uncertainty may lead to tax avoidance, the empirical evidence from the study of extractive industry subsidiaries can be insightful. International evidence suggests that authorities in developing countries tend to choose lower tax rates despite revenue needs (Johannesen et al. 2020). Preferential tax treatments in the extractive industry are provided in several countries which may lead to paying less taxes or paying later than they otherwise would (Kraal 2019). Such country differences could also have a bearing on tax provisioning. Further, the offshore financial centres' (OFC) linkage of subsidiaries could shape tax provision in host countries due to profit-shifting activities. Previous research suggests that OFCs are the preferred destination for outward investment by Indian multinationals (Das and Banik 2015; Chari and Acikgoz 2016; Vineeth and Nidheesh 2021) despite a low return from such investments (Chari and Dixit 2020). The incorporation of OFC entities in the oil and gas sector is considered to be an indicator of corruption risk in cross-country sample (Marcolongo and Zambiasi 2022). OFC linkage of subsidiaries in the extractive industry therefore needs to be recognised in any study of tax behaviour.

In this paper, the tax provision pattern is analysed using a sample of Indian multinational subsidiaries. Previous work is limited on tax provision by subsidiaries in host countries in the extractive sector, albeit there are several attempts to study the financial performance of subsidiaries in the extractive sector (Das and Mahalik 2020; Das 2022). The study of tax provision behaviour of extractive industry multinational subsidiaries could be insightful for both host country governments, and the multinational firms.

We use dynamic panel data models to estimate the impact of economic policy uncertainty, corruption, political risk and subsidiary-specific variables on tax provision by subsidiaries. The study period is 2010–20. The sample contains subsidiaries of both private and public sector enterprises from the extractive industries. Subsidiary-specific data are sourced from the annual reports of parent corporations whereas host country-specific variables are collected from policyuncertainty.com (Baker et al. 2016), World Governance Indicators, and Extractive Industries Transparency Initiative (EITI) (see Table 2). The results suggest that economic policy uncertainty in the host country leads to lower tax provision. The impact of corruption on tax provision could also be found in the empirical analysis. Further, political stability tends to promote higher tax provision. The subsidiaries of public sector enterprises are found to make higher tax provision compared to their private sector counterparts.

The rest of the paper is organised as follows. A brief review of the literature relating to factors impacting tax behaviour of subsidiaries is provided in section 2. We discuss the methodology of the study and data sources in section 3. Results and discussion are presented in section 4. The paper's contribution to the policy debate and conclusions are provided at the end.

2 Tax behaviour of multinational firms in host countries: a brief review

In this section we review past research pertaining to the impact of host country conditions, and subsidiary characteristics on multinational behaviour in general and tax behaviour in particular.

2.1 Economic policy uncertainty

Economic policy uncertainty has affected a variety of decisions such as bankruptcy filing (Fedorova et al. 2022), short-term financing (D'Mello and Toscano 2020), and cross-border merger and acquisitions (Li et al. 2022). Uncertainty could also affect the investment response to policy changes (Guceri and Albinowski 2021). When it comes to taxation issues, Afzali et al. (2021) report that under economic uncertainty private firms tend to cheat on taxes while public firms choose to 'grease the wheel' by resorting to bribery. They used firm-level data from the World Bank's Enterprise Survey. However, examination of such relationships in the case of international firms has remained limited due to data scarcity. Benkraiem et al. (2022) report that tax avoidance reduces the value of excess cash particularly in countries with strong investor protection. However, under economic uncertainty investors may not discount the value of excess cash held by tax-avoiding firms, which may have an impact on reputation. More studies are warranted as far as the impact of economic uncertainty on taxation issues is concerned. In industries with a longer commodity cycle and higher gestation period, such as extractives, the link between economic policy uncertainty and taxation could provide important implications for policy and practice.

2.2 Corruption

Corruption is found to be rampant in the areas of taxation and government contracts especially in developing countries (Gauthier et al. 2021). Such corruption could be either demand or supply

driven, where demand comes from officials and supply originates from firms. In the context of multinational firms, corruption has been a subject of intense debate from many vantage points. Corruption could affect the mode of entry into foreign markets (Straub 2008) and corruption distance between home and host country could deter cross border investment. However, corruption distance is not found to be a serious deterrent of outward FDI by firms from more-corrupt countries as it is by firms from less-corrupt countries (Wu 2006).

Corruption is a frequent phenomenon in the extractive industries as there could be both a demand and supply of bribery. The establishment of complex, multinational corporate structures in the extractive industries and the involvement of OFCs could harbour corruption (Teichmann et al. 2020). Depending on the level of corruption in the host country and differences in home-host corruption environment, multinational firms are found to decide FDI (Brada et al. 2019). While the impact of corruption could be felt at various levels, its impact on tax revenues is crucial for both host governments and society at large.

2.3 Political stability

Tax provision could also be affected by political stability. Political stability should be associated with higher tax provision, which may reflect opportunistic behaviour of multinational firms during political instability. Research suggests that political stability is more important than tax incentives for attracting mining investment (Coulibaly and Camara 2022). Further, the political environment is an important determinant of tax effort in hydrocarbon-dependent countries. In particular, political stability can lead to greater tax effort and revenues (Elbahnasawy 2020). It has also been found that in the presence of competitive elections, the absence of powerful domestic firms, along with widespread voter expectations of natural resource prosperity in the future, countries could adopt effective steps to tax and regulate multinational companies in the extractive sector (Kjær et al. 2021). Lupton et al. (2021) has dealt with the political stability and foreign subsidiary survival of Japanese multinationals in the primary sector. Their findings suggest a slight curvilinear relationship between political stability with subsidiary survival in the sector such that subsidiary survival rate is higher at both the low and high end of stability and reduced survival rate at moderate levels of stability. This means that multinational enterprises can influence policy and avoid compliance in less stable political environments in comparison to more stringent policies in the home country. Avoidance of compliance reduces the cost of operating in primary industries in the host countries.

Political environment or stability is therefore likely to be an important predictor of tax behaviour of multinational subsidiaries in the host-countries.

2.4 Government-owned multinational firms

Many governments provide strong support to their companies in making outward FDI with the objective of enhancing access to energy resources and lowering their cost (Koyama and Krane 2021). In a domestic context, past research finds that listed firms (Brune et al. 2019), and government-owned firms avoid tax (Mafrolla 2019). The implementation of corporate social responsibility by central public sector units is fraught with bureaucratic hurdles and limited stakeholder analysis, among other challenges (Subramaniam et al. 2017). However, in the international investment context there is limited evidence, so far, as to the comparative tax behaviour of public sector and private sector subsidiaries.

There are complexities associated with tax transparency and the costs and benefits of it are not well understood: Oats and Tuck (2019) argue that there can be dysfunctional consequences of greater transparency that need to be considered before changing policies requiring more

transparency. Nevertheless, transparency initiatives in the extractives sector are viewed as a mechanism to promote accountability in resource management. However, in the early phase of implementing a transparency initiative, a country may not perform better in improving governance and economic development outcomes, and progress may be slow (López-Cazar et al. 2021; Sovacool et al. 2016). But, in several cases such initiatives have led to a better outcome eventually (Villar and Papyrakis 2017; Yanuardi et al. 2021; Okada and Shinkuma 2022).

2.5 Tax havens

Tax provision is likely to be affected by the tax structure of the host country. In the extractive industries, declared profits are found to be inversely related to tax levels (Bertinelli et al. 2022). To circumvent the tax structure of the host country, multinationals tend to organize subsidiary location through offshore financial centres. The organization of subsidiaries through offshore financial centres has been recognized in the tax avoidance literature (Marcolongo and Zambiasi 2022; Das 2022; Jansky and Kokes 2016). While industry level evidence of taxation and profit-shifting is limited to developed country multinationals (Jansky 2020), the study of developing country multinationals should be useful for tax authorities aiming to increase tax compliance, and this paper provides evidence for India.

3 Methodology and data

In order to analyse the determinants of tax behaviour of extractive industry multinational subsidiaries a panel dataset has been constructed. The dataset contains host country- and subsidiary-specific variables which can have an impact on tax provision. In particular, tax provision by subsidiaries is examined in relation to economic policy uncertainty, corruption, political stability, subsidiary age, ownership and other variable pertaining to both host country and the subsidiaries. The panel units are the subsidiaries located in different host countries. It is expected that economic uncertainty, corruption, and political risk could affect tax provision. Further, the tax provisioning can be positively impacted by profitability and size of the subsidiary. Nevertheless, the impact of subsidiary age could be of interest in industries that require a longer commitment of resources.

Dynamic panel data analysis has been carried out since tax provisioning can be path dependent. Other variables that may affect tax provisioning are included as exogeneous variables. These could be the organization of subsidiaries through offshore OFCs, EITI standards (Lujala 2018), among others. In the empirical model, subsidiary tax provision is regressed on profitability, size, age, and host country-specific economic policy uncertainty and institutional variables. Economic policy uncertainty has become ever more important in the contemporary interconnected world. A review of the impact of economic policy uncertainty on corporations and economies (Al-Thaqeb and Algharabali 2019) suggests that policy uncertainty has a significant impact on financial policies of firms. It could therefore be considered as an important variable in the study of tax provision by multinational subsidiaries. While corruption and political risk are important institutional variables to consider in relation to extractive industries (Marcolongo and Zambiasi 2022), economic variables such as economic policy uncertainty have been used in the empirical model. The purpose is to capture country risk in relation to institutional and economic policy dimensions as the tax provision could be impacted by these variables. There could be sub-sectoral differences within the extractive sector, e.g. metals, mining etc., which can be analysed within the same framework of analysis.

3.1 Model

The following dynamic panel data model is specified:

$$tax\_pbt_{it} = \alpha\, tax\_pbt_{i,t-1} + x'_{it}\beta + \varepsilon_{it}$$

$$\varepsilon_{it} = \mu_i + v_{it}$$

Where *tax_pbt* is the tax provision by the overseas subsidiary as a share of profit before tax. A lag of the dependent variable is present in a dynamic panel model. The vector x includes predetermined and exogenous variables. The vector included both subsidiary-specific and host country variables. The host country variables include economic policy uncertainty, control of corruption, political stability, and a time varying dummy variable (*eiti*). The subsidiary-specific variables are subsidiary age, size, and profit before tax as share of total assets, and a dummy for surviving subsidiaries. The list of variables is provided in Table 2.

We use system GMM estimator since the data contains small T and large N (Arellano and Bond 1991). The method makes finite-sample correction to the reported standard errors in two-step estimation (Roodman 2009). Time dummies are used to remove universal time-related shocks from the error. We also control for the organization of subsidiaries through offshore financial centres. Following previous work, we create dummies to control for the offshore financial centre linkages (Das 2022). Subsidiaries are categorised into three types namely, direct subsidiaries in the host country, subsidiaries established in the host country via one or more offshore financial centers, and subsidiaries established in the host country via one or more non-offshore financial centre countries. The subsidiaries present in the offshore financial centres are treated as the benchmark category.

3.2 Data

Data pertaining to tax provision by overseas subsidiaries in the extractive industry has been employed. Subsidiary-specific information is collected from the annual reports of Indian multinationals. Tax provision by subsidiaries in the host countries is studied over the period 2010–20. Data on tax provision has been sourced from section 212(8) and section 129(3) of the annual reports (various years) of Indian multinationals. Previous studies have used such data to examine the performance of overseas subsidiaries of Indian multinationals in the extractive sector (Das and Mahalik 2020; Das 2022) and software services (Das 2021).

The host country-specific variables such as corruption and political stability are collected from World Governance Indicators. Measures of economic policy uncertainty (EPU) are available for selected countries from policyuncertainty.com (Baker et al. 2016). The EPU measure has been used in previous research primarily to explain stock market and sectoral volatility (Yuan et al. 2022; Ziadat et al. 2022; Belcaid and Ghini 2019; Ambatipudi and Kumar 2022). The measure reflects the relative frequency of the country's newspaper articles that contain terms about the economy, uncertainty, and policy-related difficulties. The uncertainty constituents are policy-related economic uncertainty, the number of federal tax code provisions set to expire in future years, and a measure of disagreement among economic forecasters over future federal government purchases and consumer price inflation. It is proportional to the average share of newspaper articles dealing with economic policy uncertainty on a monthly basis.[1] Since we deal with annual tax provision, we have used a 12-monthly average to arrive at a measure of yearly economic policy uncertainty index. In studies with quarterly data, quarterly average of economic uncertainty is used (Dang et al. 2019; Shen et al. 2021). End of the year values are also used as robustness check. The measure of EPU is available for 22 countries (see note under Table 4). The control of corruption score is used as

[1] There are alternate measures of economic policy uncertainty such as the World Uncertainty Index (Ahir et al. 2022), NVIX (Manela and Moreira 2017), FEARS index (Da et al. 2014). See Al-Thaqeb and Algharabali (2019) for a review.

the proxy for corruption environment of the host country, which is collected from World Governance Indicators. It captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption. Political stability is included as an alternative institutional variable. Additional data pertaining to host countries are sourced from World Development Indicators, World Governance Indicators, Extractive Industries Transparency Initiative, and UNCTADstat.

3.3 Characteristics of Indian multinationals in the extractive sector

India succeeded in developing pockets of excellence in several sectors under an import substituting, inward-looking policy orientation, which existed prior to the economic liberation that began in 1991 and a new outward policy orientation introduced subsequently (Narula 2018). Extractive industries developed during the protectionism were primarily state-led and the industry encompassed a variety of sectors. These sectors include coal, metals and mining, and oil & gas. Although India is reliant on imports of resources, e.g. coal, oil & gas, but there is export capacity in some of the extractive sectors. India is one of the world's top producers of iron ore and bauxite. The mining industry accounted for 2.5 per cent of India's GDP in 2017.

Private sector firms in the extractive sectors were limited in number during the pre-liberalization period. With the advent of liberalization, the private sector participation in the extractive sector has increased considerably. The state-owned and private sector firms co-exist as many projects within the country have been executed with public–private partnership. The latter set of companies is also engaged in providing complementary services (e.g. drilling, oilfield services, offshore services, refining and marketing) required in the mining and extraction of natural resources. While state-owned companies continue to have a lion's share in some of the extractive sectors, the growth of private sector is noticeable. Furthermore, private participation in the mining industry is desirable since the productivity levels of private firms are found to be significantly higher than that of state-owned firms in metallic, non-metallic and coal mining sectors (Das 2012). It may be noted that the ownership of public sector companies is either with the federal government or the state government or both. The federal government has disinvested, or in the process of disinvesting, stake in some of the public sector companies (e.g. BALCO and Hindustan Zinc were sold to Sterlite Industries, now part of Vedanta Group) to raise government revenue, to reduce political interference in managerial decision-making, and to promote efficiency through private sector.

Furthermore, ever since the introduction of Foreign Exchange Management Act in 2000, India has gradually liberalised outward FDI policies. Outward FDI limits were increased several times. Indian companies are permitted to invest up to 400 per cent of net worth in overseas projects since 2007–08. Following the policy changes the extractive industry firms, both state-owned and private, have made overseas investment in several resource-rich countries. Such resources are required to meet the need of a growing economy. It has been argued that the India companies have invested in mining overseas for domestic resource needs (Oskarsson and Lahiri-Dutt 2019).

A list of major Indian companies in extractive sectors is presented in Table 1. These companies are spread across mining, metals, and oil and gas. The presence of both state-owned and private companies can be visualised. Most of these companies have annual revenue in billions of dollars. It may also be noted that the number of foreign subsidiaries of these multinationals varies from a few to over hundreds depending on their focus on international expansion. For instance, in the year 2020, Coal India (1) and National Mineral Development Corporation (2) had a few international subsidiaries whereas ONGC Videsh (28), Hindalco Industries (35), and Tata Steel (166) had many foreign subsidiaries. The numbers in the parentheses exclude foreign associates and joint ventures.

Table 1: Major Indian firms in the extractive sectors, ownership, and revenue

Sector	Major firms	Ownership (state-owned/private)	Revenue USD mn (March 2010)	Revenue USD mn (March 2020)
Mining	National Mineral Dev. Corporation	Central PSU	1,382.16	1,551.83
	Coal India	Central PSU	139.62	137.10
	National Aluminium Company	Central PSU	1,200.73	1,126.32
	Hindustan Zinc	Private + State	1,869.71	2,462.00
	Hindustan Copper	Central PSU	318.93	107.39
	Bharat Aluminium Company	Private + State	807.45	1,176.01
	NLC India	Central PSU	916.83	1,168.22
	Hind Aluminium Industries Ltd	Private	40.67	51.58
	Hindalco Industries	Private	4,557.59	5,339.44
Metals	Steel Authority of India (SAIL)	Central PSU	9,760.68	8,132.31
	Tata Steel	Private	5,927.69	8,016.44
	Jindal Steel & Power	Private	1,749.13	3,476.14
	Adani Enterprises	Private	2,532.89	2,149.86
Oil & gas	Oil and Natural Gas Corporation (ONGC)	Central PSU	13,836.70	13,014.62
	ONGC Videsh	ONGC subsidiary	1,089.36	1,649.11
	Hindustan Petroleum Corporation Ltd.	ONGC subsidiary	25,708.89	38,435.52
	Indian Oil Corporation Ltd.	Central-PSU	64,551.29	76,657.83
	Oil India	Central PSU	2,135.42	1,608.77
	Bharat Petroleum Corporation Ltd.	Central-PSU	29,131.53	43,451.49
	Gas Authority of India Ltd.	Central PSU	5,621.58	9,535.17
	Reliance Industries	Private	44,395.17	48,360.13
	GOCL Corporation Ltd.	Private	236.71	13.61

Note: Indian rupees (INR) figures are converted to USD using end-of-period exchange rate: INR45.15 per USD in March 2010, and INR75.39 per USD in March 2020.

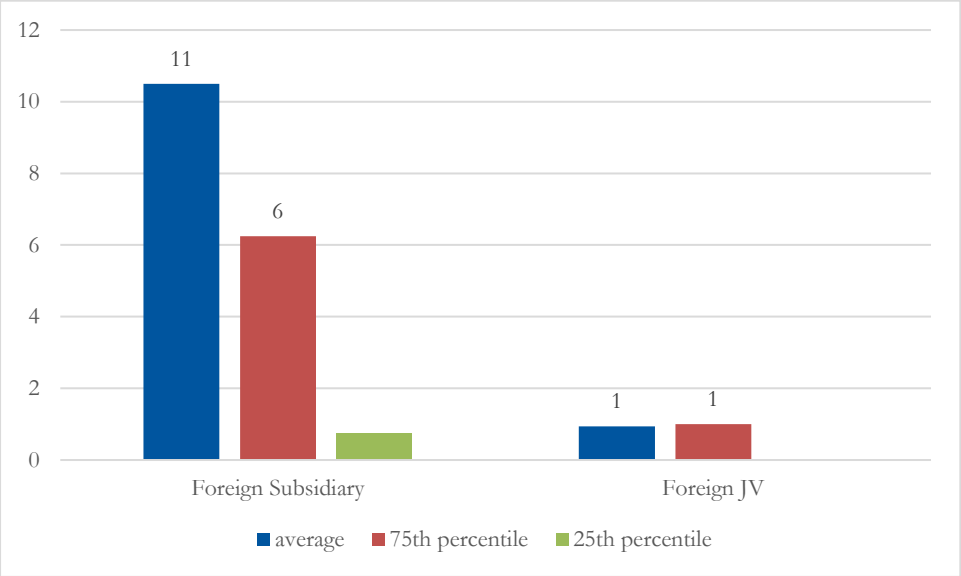
Source: author's compilation from National Stock Exchange and Centre for Monitoring Indian Economy.

4 Results and discussion

We selected 50 multinationals in the resource extractive industry. A descriptive analysis of the foreign subsidiaries and joint ventures (JV) of these multinationals reveals that subsidiary structure has been the dominant mode of entry into foreign markets in comparison to JV and other contractual modes. The average number of wholly-owned subsidiaries (WOS) in the financial year 2019–20 was 11 (Figure 1), whereas the average number of foreign joint venture stood at one. This suggests that subsidiaries are the dominant mode of internationalisation of extractive industry multinationals. However, contractual modes such as the joint venture are prominent in countries where foreign players are required to collaborate with local firms. Besides joint ventures, the sector is also dominated by contract and part ownership of mining, exploration and production assets. Due to data limitations on joint ventures we focus on subsidiaries in the subsequent analysis.

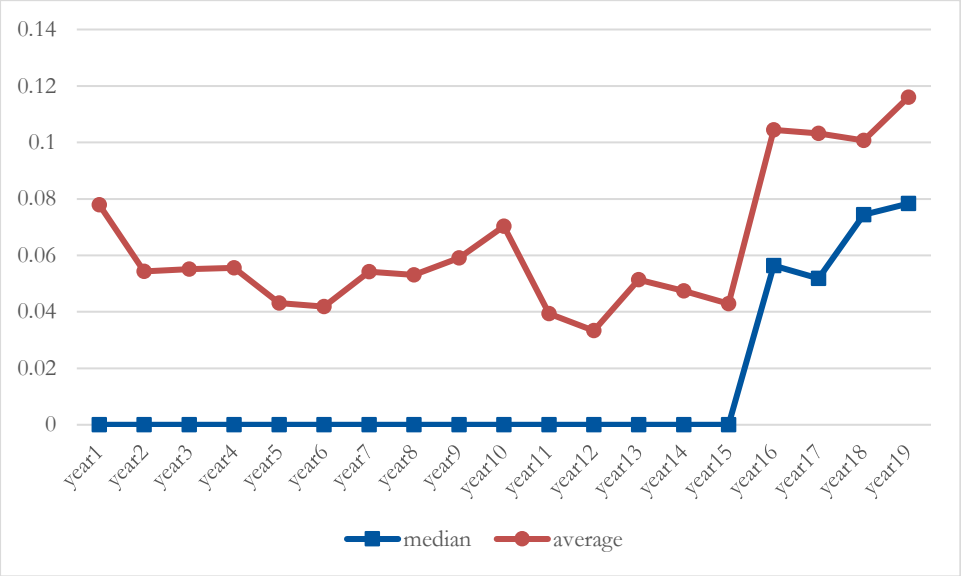
Tax provision as a share of profit before tax is plotted over subsidiary age (Figure 2). The plot suggests that tax provision tends to remain lower in the initial years of subsidiary operation. An increase in tax provision can be seen only after spending a significant number of years in the host country. We also plotted the tax provision by subsidiaries of both public and private sector multinationals. The sample contains subsidiaries of central public sector units. Out of 59 subsidiaries of central public sector units, 54 subsidiaries are in the oil and gas sector. Similar to Figure 2, even by ownership, tax provision increases when the subsidiary turns older. However, subsidiaries of public sector enterprises are found to make higher tax provisions compared to private sector counterparts with the increase in subsidiary age (Figure 3). Further, the increase was higher for public sector multinational subsidiaries compared to the private sector ones.

Figure 1: Number of foreign joint ventures and wholly-owned subsidiaries of the sample parent firms, year 2020



Source: author's compilation from annual reports of the sample companies for the year 2020

Figure 2: Tax provision as share of profit before tax by age of subsidiary



Source: author's calculation from annual reports of sample companies (various issues)

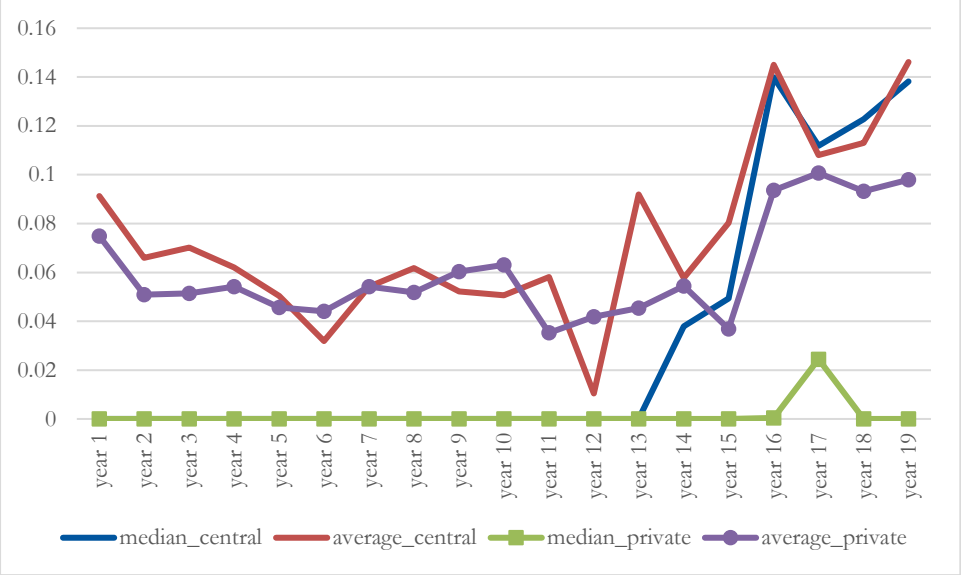
Variables used in the analysis are described in Table 2. Furthermore, the table contains source of data for each variable and the expected sign of the coefficients associated with major explanatory variables. The descriptive statistics of the variables are presented in Table 3. The mean value of tax provision is 8.6 per cent of profit before tax. The average value of profit before tax as a share of total assets is in the negative territory indicating a loss-making scenario. The average value of subsidiary assets is Indian Rupees 1603 million. The average age of the sample subsidiaries is 7.29 years. The sample contains 20.7 per cent subsidiaries of central government public sector enterprises.

Table 2: Description of variables

Variable	Description of independent variables	Data source	Hypothesis
tax_pbt	Tax provision as a share of profit before tax	Annual Reports (various issues)	
epu	Economic Policy Uncertainty	Baker et al. (2016) https://www.policyuncertainty.com/all_country_data.html	<0
coc	Control of corruption estimate. higher (lower) score indicates better (poor) control over corruption.	World Governance Indicators	<0
pols	Political stability estimate.	World Governance Indicators	>0
psu	Dummy for public sector subsidiaries	Constructed by author	>0
eiti	Dummy for EITI member	EITI website	>0
surv	Dummy for surviving/closed subsidiaries	Annual Reports (various issues)	
pbt_asset	Profit before tax (share of assets)	Calculated using data from Annual Report (various issues)	
l_asset	Size i.e. log of total asset	Calculated using data from Annual Reports (various issues)	
sage	Subsidiary age (year minus the year of establishment)	Annual report of parent firms (various issues)	>0

Source: author's compilation; see text.

Figure 3: Tax provision as share of profit before tax by public vs. private subsidiaries



Source: author's calculation from annual reports (various issues).

The results of dynamic panel data estimation are reported in Table 4. We first estimate the model using subsidiary-specific variables (Model 1). The introduction of host country variables reduces the sample as the EPU index is available for twenty-one host countries, excluding India (Model 2 and Model 3). With the reduced sample the impact of economic policy uncertainty is estimated. In the final model, both subsidiary-specific and host country variables are included (Model 4 and Model 5). The difference between Model 4 and Model 5 is that control of corruption (*coc*) is used in the former and political stability (*pols*) is used in the latter. In all the models, we control for *psu*, *eiti*, and *surv* as exogenous variables.

Table 3: Descriptive statistics, 2010–20

Variable	Mean	Standard deviation	Observations	No. of subsidiaries
tax_pbt	0.086	0.525	1050	132
pbt_asset	-512.329	15930.75	1050	132
l_asset	7.380	3.302	1050	132
Sage	7.293	4.024	1050	132
coc	1.488	0.930	1050	132
pols	0.718	0.672	1050	132
epu	164.549	79.835	1050	132
Psu	0.207	0.405	1050	132
eiti	0.108	0.310	1050	132
surv	0.995	0.069	1050	132
d_direct	0.205	0.404	1050	132
d_ofc	0.398	0.490	1050	132
d_viaofc	0.368	0.482	1050	132
d_vianonofc	0.018	0.133	1050	132

Source: author's calculation.

The results of dynamic panel estimation suggest that the lag-dependent variable is statistically significant. The model properties are satisfied in terms of significant Wald test, significant AR(1), insignificant AR(2) test, and insignificant Sargan and Hansen tests.

We find negative and significant impacts of economic policy uncertainty (*epu*) on tax provision. Subsidiaries in the extractive industry are found to make lower tax provision in the periods when economic policy uncertainty is higher. The result is consistent with the international tax avoidance literature in which investors could underestimate the negative effects of corporate tax avoidance practices during economic and policy uncertainty (Benkraiem et al. 2022). This therefore suggests that host countries need to focus on reducing economic policy uncertainty to garner more tax revenue from multinational subsidiaries.

Table 4: Dynamic panel data estimation, two-step system GMM, 2010–20 ependent variable *tax_pbt*)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
tax_pbt$_{t-1}$	-0.392***	-0.136***	-0.167***	-0.157***	-0.164***
	(0.008)	(0.004)	(0.006)	(0.007)	(0.008)
pbt_asset	1.76e-07	-	-	7.12e-07**	4.44e-07
	(2.63e-07)			(3.56e-07)	(2.44e-07)
l_asset	-0.008***	-	-	0.012***	0.010***
	(0.001)			(0.002)	(0.001)
sage	0.041***	-	-	0.060***	0.041***
	(0.003)			(0.004)	(0.004)
coc	-	-0.633***	-	-0.284***	-
		(0.022)		(0.031)	
pols	-	-	0.244***	-	0.170***
			(0.017)		(0.018)
epu	-	-0.001***	-0.0002***	-0.001***	-0.001***
		(0.00003)	(0.00001)	(0.0001)	(0.0001)
psu	0.070***	0.118***	0.245***	0.089***	0.166***
	(0.011)	(0.018)	(0.016)	(0.029)	(0.025)
eiti	-	0.446***	0.610***	0.647***	0.703***
		(0.018)	(0.021)	(0.032)	(0.037)
surv	0.671**	0.159***	0.214***	-0.189	-0.237
	(0.285)	(0.005)	(0.007)	(0.143)	(0.142)
constant	-0.962***	-0.189***	-0.557***	-0.335**	-0.338**
	(0.290)	(0.018)	(0.027)	(0.135)	(0.154)
OFC link dummies	Yes	Yes	Yes	Yes	Yes
Time dummy	Yes	Yes	Yes	Yes	Yes
Wald	32724.68***	119632.71***	209951.5***	33597.74***	5662.7***
Observation	1861	945	945	902	902

Subsidiaries	290	130	130	129	129
AR(1)	-2.31**	-2.08**	-2.06**	-2.06**	-2.04**
AR(2)	-2.47**	-1.72	-1.92	-1.80	-1.54
Sargan overid. test	74.98	77.13	76.00	73.15	72.07
Hansen test gmm	84.95	67.33	72.05	65.10	63.65

Note: ***<0.01, **<0.05. Figures in the parentheses are standard errors. FDI stock (% of GDP) is sourced from UNCTADstat and used as exogenous instrument. Host countries with EPU data: Australia, Brazil, Canada, Chile, China, Colombia, France, Germany, Greece, India, Ireland, Italy, Japan, Korea, Netherlands, Russia, Spain, Singapore, UK, USA, Sweden, Mexico.

Source: author's calculation.

The impact of corruption (*coc*) is significant with a negative sign. This implies that tax provision is lower in countries where control of corruption is better. A low-corruption environment protects subsidiaries from potentially corrupt practices of officials in the host country, which could be the reason behind lower tax provision in low-corruption environments. On the other hand, in corrupt countries (lower *coc* score) the tax provision is higher, supporting the fear factor from the tax authorities. Furthermore, political stability positively contributed to tax provision. The finding is consistent with previous research (Elbahnasawy 2020). The results indicate that political stability is vital from the point of view of tax revenue generation from extractive industries.

Another significant finding relates to the *psu*. The tax provision by subsidiaries of public sector enterprises is higher than the private sector ones. This suggests that subsidiaries of public sector enterprises may not be motivated to avoid tax in the host country relative to the subsidiaries of private sector enterprises. Their primary objective seems to be to ensure supplies.

The transparency variable (*eiti*) has a positive sign and significance. This suggests that subsidiaries in EITI countries are better at making higher tax provision. Although the percentage of sample subsidiaries in EITI countries was 10.8, this bears significance in the promotion of transparency initiatives in the extractive industries. The positive impact of EITI is consistent with the finding of recent studies (Okada and Shinkuma 2022).

Among the subsidiary-specific variables, the impact of subsidiary age (*sage*) is positive and significant. This is expected in the extractive industry as the subsidiaries in the sector could take longer time to develop projects. The other subsidiary-specific variables have the expected sign and significance.

5 Conclusion and contribution to the policy debate

This study identifies tax provision behaviour of emerging multinationals in the extractive industry in relation to subsidiary-level and host country factors. The impact of economic policy uncertainty and institutional factors such as corruption and political stability in shaping tax provision could be seen from the results, which provide policy implications for host countries attempting to mobilize tax revenue from the extractive sector. Higher uncertainty is detrimental in the taxation front. Therefore, countries desirous of mobilizing tax revenue from multinational subsidiaries in extractive sectors need to pay attention to economic policy uncertainty. Better control of corruption could provide comfort to the firms in the tax provision front. On the other hand, countries where control of corruption has not improved, firms tend to avoid taxation lapses to distance themselves from government authorities. The importance of political stability can be seen from the results. Politically stable countries are expected to mobilize tax revenues better. The distinct tax provision behaviour of public and private sector subsidiaries is another noticeable

finding as the primary objective of the former is to ensure supplies rather than tax avoidance. Further, the impact of subsidiary age on tax provision could be found.

The study improves our understanding of tax provision in the extractive industries. The results provide insights as regards the international tax provision and tax avoidance behaviour of emerging economy multinationals in the extractive industry and some of the measures to discourage such behaviour. The insights obtained from the study could be helpful for both the tax authorities of host countries and the emerging multinationals in the industry. The host countries may focus on reducing economic policy uncertainty to increase tax contribution from multinational subsidiaries in the extractive sector. While multinationals react to the corruption environment in the host country by adjusting tax provision, transparency initiatives could bring better results in terms of both reducing corruption and increasing tax revenue. Host governments could encourage long-term investments by multinationals in the extractive industry by adopting unambiguous and transparent economic policies. Such policies are expected to not only increase subsidiary's life but also benefit the host country through higher tax revenue contribution from the extractive sector. The adoption of unambiguous and transparent economic policies, especially on the part of resource-rich developing countries, could be a challenge but it can be tackled by gradual embracing of international standards that are best fit in the host country context.

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