

Evaluating the Large-Scale Mining Fiscal Regime in the Philippines

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Abstract

Economies that derive substantial government revenues from natural resources face the unique challenge of implementing fiscal regimes that deliver a fair share of rents without discouraging private investment in extractive sectors. However, designing progressive and non-distortionary fiscal tools requires an evaluation of the current fiscal regime and the extent to which it captures the resource rent – the surplus return above the value of capital, labor, and opportunity costs incurred to exploit the resource. To evaluate the efficiency of the Philippines' fiscal regime, we compare the resource rent to government revenues from mining activity. Then, we estimate the effective tax rates under the current fiscal regime and other combinations of fiscal tools. First, we look at aggregated tax payments of all large-scale mining companies over a ten-year period and compare them with the estimated resource rent. Second, we model the different tax regimes using firm-level data from a nickel mine. We propose a fiscal regime for the mining sector in the Philippines that is least distortionary while appropriate given the country's regulatory context and administrative capacity.

Keywords

extractive industries – mining – mining fiscal regime – optimal taxation – resource rent

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1 Introduction

The Philippines and other natural resource-rich economies are confronted with the policy challenge of implementing fiscal regimes that deliver a fair share of rents without discouraging private investment in the extractive sectors. As the owner of all resources on and under national surfaces, the state allows private agents to exploit its environment assets in order to generate economic rents. The state deploys a combination of fiscal tools to capture these rents.

In theory, fiscal tools designed to tax the resource rent are non-distortionary (Guj 2012).² Taxing the resource rent does not distort firms' investment decisions but ensures the maximum competitive returns to the asset. Thus, optimal fiscal regimes for extractive industries should be progressive with respect to resource rent.³

However, most governments fail to implement fiscal regimes that measure and capture the resource rent effectively (Lund 2009). Several features of the extractive sector hinder governments from designing appropriate fiscal tools. These include volatile prices, uncertainty in relation to technology and geology, high sunk costs and long periods of production, asymmetric information, market power, and risk preferences (Boadway and Keen 2010; Lund 2009).

This paper examines the Philippine government's mining fiscal regime and the extent to which it captures the resource rent. To provide a full picture of the fiscal regime, we carry out two exercises: First, we compare historical government revenues from large-scale metallic mining activity over a ten-year period to resource rents. Resource rents are estimated following a residual value method using gross production data from government.

Second, we simulate the mining revenues of mining projects to compare the efficiency of current and proposed fiscal tools. Using data on financial flows (revenues, operational costs, and capital costs) from the feasibility study of a large-scale nickel mine, we examine the tax take of the government under different fiscal regimes indicated by average effective tax rates (AETR) and the impact of the fiscal regime on investment through marginal effective tax rates (METR). Data from a large-scale nickel mine was used because nickel mines

² Resource rent is the portion of net investment proceeds that exceed the expected rate of return by the investor to undertake an investment. More specifically, resource rent is the net proceeds after deducting the operating cost and the expected rate of return of an investor from the value of gross output.

³ A progressive tax on resource rent increases as the resource rent increases. It is sensitive to the movement of mineral prices and real costs of operation.

are the largest mining operations in the Philippines. The country is one of the largest producers of nickel in the world.

A comparison of the resource rent at the firm level with the annual tax take of the government allows an assessment of the rent capture and the distribution of tax payments over the life of the mine. It also allows us to examine the effect of the fiscal regime on cash flows of the mining operation. We identify some fiscal policy reforms that can be considered by the government to improve the efficiency of capturing the resource rent and the progressiveness of the tax regime while considering the tax administration capacity of the government.

Large-scale mining companies are required to pay an additional amount for environmental rehabilitation, water use, and social contribution. These payments are excluded in the analysis. These payments are collected to compensate for negative externalities resulting from large-scale mining activities. Whether these social and environmental payments are sufficient compensation for the negative externalities warrants a separate study.

The paper is organized as follows: The first section describes the context of the large-scale metallic mining sector in the Philippines and the global trend with respect to mining regulation. The second section reviews the literature on mineral taxation. The third section provides an overview of the Philippine mining tax regime. The fourth section discusses the resource rent, the data and methods used to estimate the resource rent, and the comparison of the resource rent and the tax capture of the government from 2002 to 2012. Using firm level data, we simulate the effects of different tax regimes on a mining firm's operation by computing the average effective tax rates (AETRs) and marginal effective tax rates (METRs). The section also presents firm level resource rent and the efficiency of the different tax regimes in capturing the rent. We conclude by summarizing the key policy issues and identifying policy recommendations to improve resource taxation in the Philippines.

This paper intends to contribute to the policy debate on the efficiency of the current fiscal regime governing large-scale metallic mines and the different alternatives being proposed. We believe that this is the first type of study on the topic. It presents different approaches in evaluating fiscal regimes given limited information.⁴ The findings of this paper are aimed at helping government

4 It would have been better to test the models with more feasibility studies of mining companies (but they are not publicly available). We have to rely on MGB's statement that the feasibility study they provided us is a representative mine. It would also have been ideal to incorporate actual costs instead of estimated costs in the computation of resource rent but the government does not collect information on cost of operation so we have to estimate it when we computed the resource rent using the PSA methodology.

find design appropriate policies to maximize the value of non-renewable mineral resources.

2 Institutional Context: the Large-Scale Mineral Sector in the Philippines

The Philippines is one of the most mineral-rich countries in the world. The estimated value of the country’s mineral resources is around US\$840 billion (Minerals Development Council 2007). Globally, the Philippines ranks third in gold, fourth in copper, fifth in nickel, and sixth in chromite in terms of occurrence per unit area (Board of Investments 2011).

There were 43 large-scale metallic mining companies operating in the country in 2014 with one copper smelter and two processing plants each for gold and nickel. The sector’s contribution to Gross Domestic Product (GDP) remains at less than one percent with gross value added amounting to Php 90.7 billion in 2014 (MGB 2016). Figure 1 summarizes the country’s gross domestic product by sector from 2002 to 2016. Mining and quarrying has the lowest share to total output during this period with an average contribution of about 1 percent of total GDP.

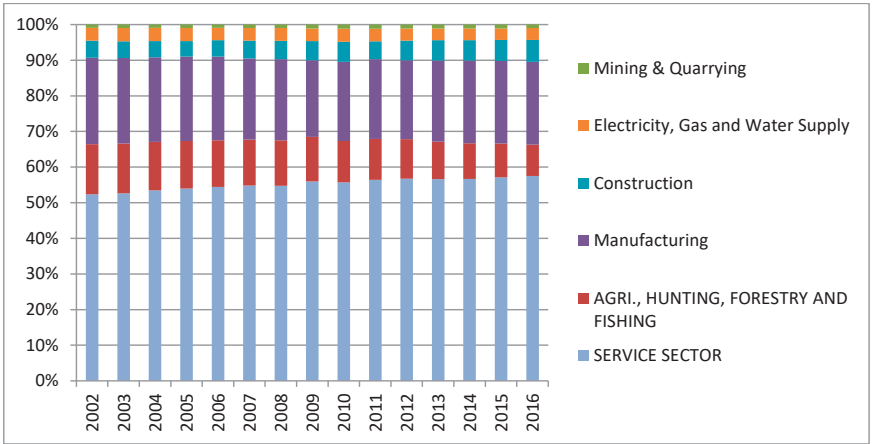


FIGURE 1 Gross domestic product by industrial origin (at constant 2000 prices) 2002–2016 percent distribution
* Only the Industry Sector was disaggregated to show the percentage contribution of mining to GDP.
SOURCE: PHILIPPINE STATISTICS AUTHORITY, NATIONAL ACCOUNTS, 2002–2016

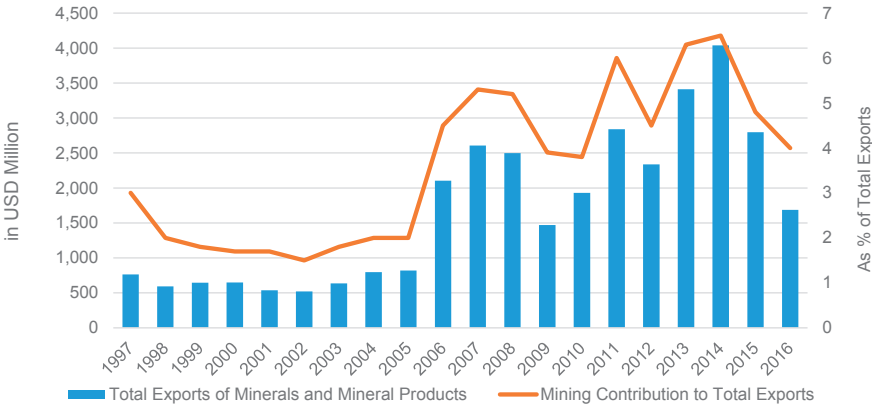


FIGURE 2 Exports of minerals and mineral products as percentage of total exports, 1997–2016
SOURCE: (MGB 2016)

Mineral exports persisted at around two percent of total exports from 1997 to 2005, peaking in 2013 and 2014 at around 6.2 percent. In 2016, mineral exports accounted for four percent of total exports in 2016, equivalent to 1.7 billion USD (See Figure 2).

The overall employment contribution of large scale mining is at 0.5 percent of total employment in the country (Mines and Geosciences Bureau 2018). In this regard, the most significant contribution of mining to the economy are revenues from taxes and fees, the amounts of which are affected by prices in the international market for minerals.

The international market for metals shows the commodity boom and bust cycle. Figure 3 shows that the average world price of gold increased from 2009 to 2012 and continued to decline from 2013 to 2015 but slightly increased in 2016. We can observe similar price cycles for copper and nickel. This period of significant increase in the price of processed minerals is referred to as the commodities super cycle.

The prices of minerals in the international market are driven by the demand of industrialized economies, particularly China which accounts for around half of global demand for base metals. The deceleration of economic growth particularly of China and the United States (US) resulted in downward demand side adjustments. In turn, investment, especially in high cost mines, also declined. Dampened investment is anticipated to reduce metal production eventually resulting to a rebound in metal price (IMF 2015). Policies implemented by a single country can also affect the supply and price of metals in the global market. National policies such as Indonesia's ban of export of raw ore resulted in a temporary increase in price of nickel in 2014 (Gayi 2015).

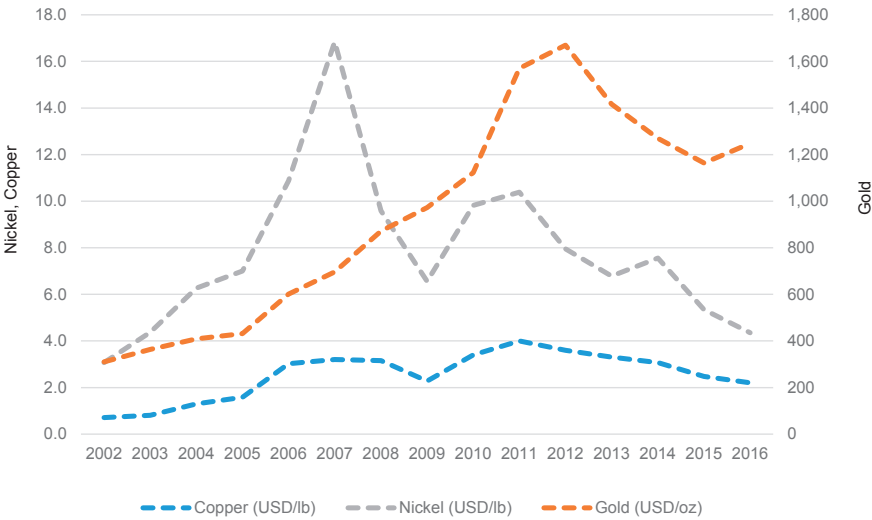


FIGURE 3 Average annual world prices of selected metals: 2002–2016
SOURCE: (MGB 2016)

Resource-dependent countries respond to the commodity super cycle by introducing new regulatory policies. In the recent decade, many governments felt that they were not getting a fair share from the windfall profits brought about by high prices.⁵ Among the policies include imposition of windfall taxes, mandatory downstream processing of raw minerals, and increased royalties, among others. However, some of these policies were repealed or not pursued

5 China increased the taxes on iron ore to 80 percent of the standard levy, from the previous 60 percent (Wildau et al. 2012). Ghana increased its corporate tax for mining companies from 25 to 35 percent (London Mining Network 2012). It also changed the mining royalty from a range of 3 to 6 percent to a fixed rate of 5 percent. In early 2014, the country was planning to impose a mining windfall tax of 10 percent. However, the proposal was put on hold until the deliberations in the 17th Congress. The Republic of Congo also plans to increase stakes and taxes on mining operations in the country to increase revenue from mining (Kavanagh 2012). Zambia curtailed the provision of tax incentives and increased the mining royalty rates in 2007. Mongolia imposed windfall taxes on gold and copper mining revenues. Venezuela, Bolivia and Ecuador are reforming the rules of equity participation and taxation to reduce foreign oil company interest (Land 2009).

In 2009, the Australian government sought to review returns of state mining royalties to communities in light of supra-normal profits experienced by the industry. In 2012, the government passed the Minerals Resource Rent Tax (MRRT) which levied 30 percent on profits of iron ore and coal mines. The mining industry and the government's conservative party opposed the bill on grounds that the complexity involved in the valuation procedures and calculation of liabilities, rates, and profits would impose compliance costs on the industry, dampening investment in the process. In 2014, the MRRT was successfully repealed (Critchlow 2012).

when the commodities super cycle ended because of strong lobbying efforts from the sector. Many resource-dependent countries were also cautious of the chilling effect of such policies on investment and mineral production.

3 Mineral Taxation: a Literature Review

Several unique characteristics of the mining sector make implementing and designing tax regimes challenging. Boadway and Keen (2010) describe firms in extractive industries as follows: they incur high sunk costs from exploration and development, experience long production periods, and face significant uncertainties with respect to the quality and quantity of mineral deposits, prices, and political environments. They also offer host governments the prospect of collecting substantial revenues from resource rents.

Collecting these rents is a complex task due to several reasons. First, contractors have more information on the geological and commercial circumstances of a project, resulting in information asymmetries between government and contractors. Second, aside from tax regimes in host countries, tax regimes in the home countries of investing mining firms can also influence the revenues and profitability of operations, including the behavior of investors (Boadway and Keen 2010). Third, the taxation of the sector is on a project basis rather than company basis.

Given the complexity of the industry, there are tax instruments that are uniquely imposed on the sector. One example are mineral royalties. Royalties vary in form; they can be imposed *ad valorem* or profit-based (Boadway and Keen 2010). Others impose a flat rate on different minerals or differentiate across commodity types. As payment for the state's minerals, they are generally imposed by nations when minerals belong to the state (Otto 2000), serving as compensation for the depletion of non-renewable resources.

Special mining taxes such as royalties are taxes imposed on top of general income taxes and other forms of taxation levied on all sectors of an economy (Guj 2012). Royalties allow governments to collect payments when mining profits are low or even nonexistent. Imposing high royalties can undermine project viability and deter investment. In some countries, royalties are negotiated on a per project basis (Otto et al. 2006). To ensure stability by reducing discretion and politics in negotiating contracts, some states define royalty rates as non-negotiable percentages of the minerals' value (Tadros and Svensson 2010).

Some countries follow hybrid systems which combine an *ad valorem* tax with a tax on resource rent (Guj 2012). Resource-rent taxes are designed to capture economic rents or additional revenues during commodity price

booms. This tax is normally tied to commodity prices (Tadros and Svensson 2010) and collected on top of regular taxes and royalties. Land (2009, p.162) describes resource rent taxes as collecting “only that portion of net investment proceeds as it exceeds the minimum rate of return required by the investor to undertake an investment”. Theoretically, such as tax does not affect the pre-tax merits of an investment and will not distort investment decisions.

According to Land (2009, 164) “the minimum return required by an investor to undertake an investment is not fixed but will vary in relation to the prevailing cost of capital and expectations about the financial outcome of exploiting different deposits. A compensatory return on capital consists of a basic return equivalent to the rate of interest on risk-free long-term borrowing plus whatever margin the investor considers necessary to compensate for the technical, commercial and political risks associated with investments.” In principle, the minimum return should be no higher than the returns of investors on comparable investments. Land (2009) points out that governments find it difficult to anticipate the minimum return that an investor considers acceptable given risks related to the industry.

While taxes and royalties may meet different objectives of government, the economic impact of taxes on mining firms with respect to profitability and cost of capital are similar (Boardway and Keen 2010). One measure of this impact are effective tax rates which are computed to evaluate and compare the impact of different taxes at the firm level. The average effective tax rate (AETR) describes the tax take of the government from the present value of the income generated by a project. The marginal effective tax rate (METR), on the other hand, captures the effect of taxes on the marginal costs faced by the mining operation (Boardway and Keen 2010).

In the literature, an ideal tax regime for the extractive sector is one that is neutral *and* progressive. Under a neutral regime, a mining project or action is financially viable before and after fiscal instruments are applied. In contrast, a fiscal regime that renders an initially profitable project unviable after taxes are applied is characterized as distortionary. Second, a regime is progressive if it is sensitive to the movement of output prices and the real costs of operation, unlike regressive regimes which tend to collect more tax as a project becomes more profitable. Progressive regimes can be more flexible when adjusting to shifts in the domestic and global environment.

Ideally, tax regimes should be neutral and progressive to maximize returns to government while avoiding the distortionary effects on investors.⁶ However,

⁶ Regimes can also take into account governments' other objectives and constraints. Government may also strive for tax regimes that achieve the following: allocative efficiency,

governments that value immediate and certain payments from natural resources tend to introduce non-neutral and regressive taxes like royalties that impose taxes regardless of project profitability (Wen 2018, 6–10). Maximizing rent capture in the extractive sector according to Wen (2018, 11) can be achieved by combining progressive instruments with regressive tax instruments that collect the portion of economic rent not captured by regressive components.

4 Overview of the Philippine Mining Tax Regime

The share of the government from mineral extraction depends on the type of contract it awards to a mining contractor. The 1995 Mining Act provides four types of contracts for large-scale mineral extraction. At present, almost all large-scale mining companies operate under the Mineral Production Sharing Agreement (MPSA). The government has awarded 340 MPSAs as of October 2017, of which forty are operating metallic mines (PH-EITI 2017). There are five effective Financial or Technical Assistance Agreement (FTAA) as of October 2017 but only two are commercially operating (PH-EITI 2017).⁷ These contracts are valid for 25 years and renewable for another 25 years.

Both contracts require the payment of excise tax for mining operation but only the FTAA has a provision requiring additional payments if the basic government share is less than 50 percent the “Net Mining Revenue” of the company.⁸ For the MPSAs, the two percent excise tax and the additional five percent royalty from companies operating in mineral reservations represent the government shares in output. The government share under an FTAA is collected after the contractor has fully recovered its pre-operating, exploration and development expenditures. Maximum recovery period is five years from the date of commercial operation (Mining Act of the Philippines 1995).

Local governments also collect taxes and fees from large-scale mining companies which include the business tax and real property tax. The business tax is computed based on the gross sales or receipts for the preceding calendar year. Local councils can adopt different schedules of graduated tax rates according to the cap set by the Local Government Code of 1991. For real property taxes, cities within Metro Manila collect a maximum of two percent of the

equity, transparency, stability (also means able to withstand political pressures for renegotiation), and administrative efficiency (Guj 2012; Gayi 2015).

7 The two operational FTAAs are Oceana Gold Philippines and FCF Minerals Corporation.

8 For FTAAs, the government considers all payments and fees made by the company as basic government share.

assessed value of the real property while provinces and cities outside Metro Manila are allowed to collect a maximum of one percent of the assessed value of the real property. Local governments collect an additional one percent of the assessed value of the real property for Special Education Fund Tax which is collected from all property owners in a local government unit (LGU) (The Local Government Code 1991).

Local governments also collect occupation fees from mining operators. Contractors outside mineral reservations are required to pay seventy-five pesos (Php 75.00) per hectare or fraction thereof per annum while contractors inside mineral reservation areas are required to pay one hundred pesos (Php 100.00) per hectare or fraction thereof per annum. The use of this fee has not been specified by law (Department of Environment and Natural Resources 2005).

Some local governments also enacted ordinances imposing additional taxes and fees on large-scale mining companies. Some examples include environmental enhancement, soil depletion, hazard mitigation, transport and hauling fees, tax on mining operations, among others (Philippine EITI 2014).

The Investment Code of the Philippines also provides several incentives to mining contractors. These include income tax holidays which they can avail of upon registration and compliance with the requirements of the Board of Investments (BOI). The BOI suspended the grant of income tax holidays for new mining projects in 2012. Incentives are now limited to zero duty on importation of capital equipment, spare parts, and accessories (Philippine EITI 2014). The incentives granted by the BOI to large-scale mining companies also exempt them from paying business taxes to local governments.

Lastly, mining contractors operating in ancestral domains are required to pay a royalty of at least one percent of the value of gross production to the indigenous communities owning the Certificate of Ancestral Domain Title (CADT).

5 Resource Rent Estimation: Data Sources and Methods

This section describes data sources used in estimating the resource rent associated with gold, copper, and nickel minerals extracted by active large-scale mines from 2002 to 2012. We primarily draw from data available from the Mines and Geosciences Bureau (MGB) and the national accounts of the Philippine Statistics Authority (PSA). Being the primary mineral regulatory agency, the MGB monitors the performance and production of mining companies. Actual production value and tax payments are based on the information collected by the MGB from large scale mining companies. The MGB publishes annual

aggregated data on mineral production and tax payments of large scale metallic mines but this study uses disaggregated firm level data from the bureau. The PSA, on the other hand, conducts regular surveys of firms to construct the national accounts. Using the data from the PSA national accounts circumvents the limitations posed by the lack of information on actual costs incurred by large-scale mining operations.

Firm-level data on gross production value and tax payments are obtained from the MGB. Table 1 provides a compressed version of the mineral production profiles of companies. Table 2 shows a sample of the sectoral input-output tables of the mineral sectors from the PSA.

Using mineral production data and national accounts, we estimate historical resource rents and compare rents to gross production value and tax payments on mineral production which represent government revenues from mining activity. The tax payments include all the taxes paid by the operating companies to the national and local governments.

TABLE 1 MGB mineral production profiles, 2002–2012, sample dataset

Firm	Commodity	Year	Primary gross production volume (kg, MT)	Primary gross production value (Php)
Adnama Mining Resources Incorporated	Nickel	2011	438,931	471,273,536
Adnama Mining Resources Incorporated	Nickel	2012	2,361,793	2,913,329,783
APEX Mining Company Inc.	Gold	2010	778	1,379,439,973
APEX Mining Company Inc.	Gold	2011	819	1,788,303,273
APEX Mining Company Inc.	Gold	2012	744	1,680,707,463
Benguet Corporation	Gold	2010	99	176,333,587

SOURCE: MINING AND GEOSCIENCES BUREAU (MGB-DENR)

TABLE 2 2012 PSA input-output table

Description		Sector 1	Sector 2	Sector 3	Sector 4	Total intermediate demand
		Gold mining	Copper mining	Chromite mining	Nickel mining	
Sector 1	Gold mining	0.00001	0.00001	0.00000	0.00000	0.00180
Sector 2	Copper mining	0.00001	0.00001	0.00000	0.00000	0.00122
Sector 3	Chromite mining	0.00000	0.00000	0.00000	0.00000	0.00001
Sector 4	Nickel mining	0.00001	0.00001	0.00001	0.00000	0.00021
IC	Total	0.17871	0.21682	0.29644	0.33261	0.50757
	Intermediate Consumption					
CE	Compensation of Employees	0.12438	0.09717	0.16934	0.06468	0.17338
CFC	Consumption of Fixed Capital	0.35328	0.26837	0.05785	0.11312	0.04350
T-S	Taxes less Subsidies on Production	0.02054	0.01004	0.09186	0.00816	0.01961
OS	Operating Surplus	0.32309	0.40760	0.38451	0.48143	0.25593
TPI	Total Primary Inputs	0.82129	0.78318	0.70356	0.66739	0.49243
TI	Total Inputs	1.00000	1.00000	1.00000	1.00000	1.00000

SOURCE: PHILIPPINE STATISTICS AUTHORITY (PSA), 2012

Figure 4 summarizes the number of operating mines during the period.

The goal is to evaluate how efficiently the fiscal regime captures the resource rent. To estimate historical resource rents, we apply the residual value method, a general approach for the valuation of resource stocks, following guidelines in the 2012 System of Environmental-Economic Accounting Central Framework (United Nations 2014).⁹ In this approach, resource rent is determined by deducting user costs of produced assets from gross operating surplus after adjustments for specific subsidies and taxes. Data to construct operating costs

9 See Annex A5.1 in the SEEA 2012 Central Framework.

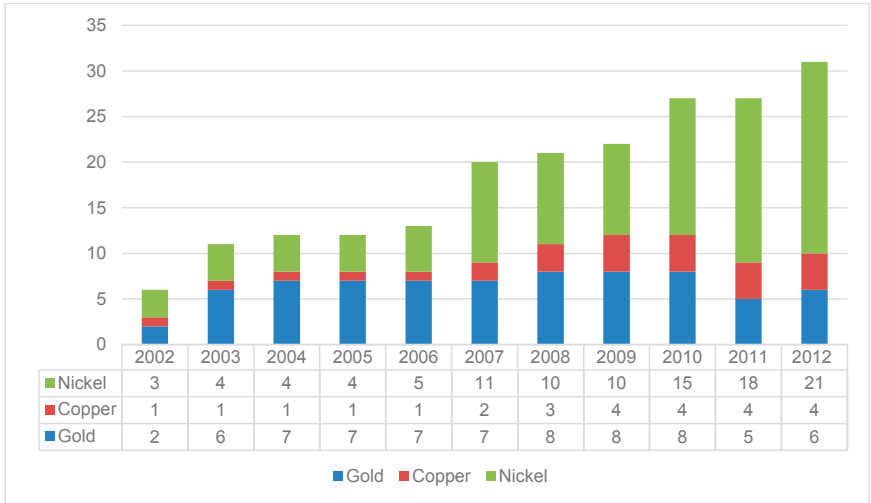


FIGURE 4 Number of operating gold, copper and nickel mines, 2002–2012
SOURCE: (MGB 2016)

and specific subsidies and taxes are culled from the 2012 Input-Output tables of 65-Sector Technical Coefficients. User costs of produced assets are composed of the consumption of fixed capital of produced assets, i.e. depreciation, and the normal return on produced assets (Philippine Statistics Authority 2017a).¹⁰ Such a definition does not take into account exploration costs.

Resource rent

$$R_{it} = N_{it} - \pi_{it} - \gamma_{it} \tag{1}$$

Net operating surplus

$$N_{it} = G_{it} - \delta_{it} \tag{2}$$

Gross operating surplus

$$G_{it} = V_{it}(p_{it}, q_{it}) - c_{it} - x_{it} \tag{3}$$

10 The Philippine Statistics Authority (PSA) also conducted an estimation of the resource rent for minerals extracted from large-scale metallic mines from 2002 to 2012 (Philippine Statistics Authority 2017b). The PSA was also guided by the 2012 SEEA framework in estimating unit resource rents per commodity.

Where:

R_{it}	Resource rent, of commodity i at time t
N_{it}	Net operating surplus, of commodity i at time t
π_{it}	Return to produced assets, of commodity i at time t
γ_{it}	Interest expenses, of commodity i at time t
G_{it}	Gross operating surplus, of commodity i at time t
δ_{it}	Consumption of fixed capital (depreciation), of commodity i at time t
$V_{it}(p_{it}, q_{it})$	Gross production value, of commodity i at time t , given prices p and volume of production q
c_{it}	Compensation of employees, of commodity i at time t
x_{it}	Other taxes on production less subsidies on production, of commodity i at time t
t	Year, $t = 2002 \dots 2012$
i	Commodity, $i =$ copper, nickel, gold

SOURCE: (PHILIPPINE STATISTICS AUTHORITY 2017B)

5.1 *Gross Output and Gross Production Value*

Gross output (See Equation 4) is obtained from the ratio of gross production value and the gross value-added ratio (GVAR). The MGB collects data on gross production value and volume of operating firms, allowing a firm-level estimation of revenues.¹¹

$$O_{it} = \frac{V_{it}(p_{it}, q_{it})}{r_i} \tag{4}$$

5.2 *Operating Costs*

Operating costs are obtained from the product of Gross Output and sector technical coefficients in the 2012 Input-Output tables.

$$c_{it} = O_{it} * I_i^c \tag{5.1}$$

$$x_{it} = O_{it} * I_i^x \tag{5.2}$$

$$\delta_{it} = O_{it} * I_i^\delta \tag{5.3}$$

11 Starting 2012, the data was verified by PH-EITI. Gross production volume and value was obtained from MGB data collected and cleaned by PSA.

Where:

O_{it}	Gross Output, of commodity i at time t
r_i	Gross Value-Added Ratio (GVAR), of commodity i ^a
c_{it}	Compensation of employees, of commodity i at time t
I_i^c	65-Sector Technical Coefficient, Compensation of Employees (CE), of commodity i
x_{it}	Other taxes on production, of commodity i at time t
I_i^x	65-Sector Technical Coefficient, Taxes less Subsidies on Production (T-S), of commodity i
δ_{it}	Consumption of fixed capital (depreciation), of commodity i at time t
I_i^δ	65-Sector Technical Coefficient, Consumption of Fixed Capital (CFC), of commodity i

a GVA ratio is computed by subtracting Intermediate Consumption (IC) from Total Inputs (TI).

SOURCES: (PHILIPPINE STATISTICS AUTHORITY 2017B, 2017A)

Return to produced assets

$$\pi_t = d_t * k_t$$

(6)

Derived value of produced assets

$$d_{it} = O_t * \frac{b}{u}$$

(7)

Where:

π_t	Return to produced assets, at time t
d_t	Derived value of produced assets, at time t
k_t	Opportunity cost of capital (normal return to profit)
EQN	Ratio of book value of fixed capital b to revenue u

SOURCE:(PHILIPPINE STATISTICS AUTHORITY 2017B)

5.3 *Opportunity Cost of Capital*

According to Land (2009, 164) “the minimum return required by an investor to undertake an investment is not fixed but will vary in relation to the prevailing cost of capital and expectations about the financial outcome of exploiting different deposits. A compensatory return on capital consists of a basic return equivalent to the rate of interest on risk-free long-term borrowing plus whatever margin the investor considers necessary to compensate for the technical, commercial and political risks associated with investments.” Land stated that it is difficult for governments to anticipate the minimum return that an investor will find acceptable given the risk related to the industry. In principle, the minimum return should be no higher than the returns of investors on comparable investments. This minimum required return on capital, termed “normal profit”, compensates investors for foregoing the next best alternative investment opportunities, as well as for the timing and risk of the uncertain cash flows expected from the project. Instead of using the T-bill rate for the opportunity cost of capital as was done by the PSA, we set the opportunity cost of capital at 7.5%. This is the sum of the 2017 risk free rate of a 20-year Philippine treasury bond (Bangko Sentral ng Pilipinas undated) which is 5.25% and the country risk premium which is at 2.19% based on the computation of Damodaran (2018).

5.4 *Mining Tax Payments*

Government revenues for each type of mineral are represented by tax payments of large-scale mining companies recorded by the DENR-MGB and collected by various government agencies. Tax payments were computed following the payments included in the PH-EITI 2014 report. These include corporation income tax, excise tax on minerals, withholding tax for foreign shareholder dividends, withholding tax for royalties to claim owners, customs duties, VAT on imported materials and equipment, local business tax, real property tax, royalty on mineral reservation, and royalty for IPs. Actual tax payments of the operating mines were recorded by the DENR-MGB.

Firms that mine a commodity may also produce a secondary commodity over the lifetime of a mine. Because of the geology of gold mines, most firms that produce gold also produce copper as a by-product. As a result, tax records of such a firm are associated with multiple commodities. To circumvent measurement issues that result from double-counting tax payments, we disentangle tax payments associated with their respective products by generating tax payments associated with the primary commodity (e.g. gold) and a separate payment associated with the by-product commodity (e.g. copper). The share

of the primary commodity's value in total value (e.g. ratio of gold production gross value to total value) and a share of the by-product commodity value to total value (value of copper production to total value) are multiplied to the firm's total tax payment to obtain a payment associated with the primary commodity and by-product, respectively.

5.5 *Caveats*

There are important caveats that should be noted when interpreting the findings from aggregate data on revenues, production and tax payments obtained from multiple sources. Data limitations preclude an accurate comparison of the actual tax payment data and the resource rent. The costs used in estimating the resource rent were based on the input-output table and not on the actual operating costs of the companies.

The timing of the extraction and actual sale of the minerals may vary. Mineral sales value on which excise taxes are based may not necessarily equal the value of gross output of extracted minerals (mine-mouth value) in a given reporting period. Similarly, corporate income tax payments are not solely based on income from mining activity and can be overestimated when compared to rents and gross values. Because mining products are generally sold abroad, the pricing structure depends on a number of unobservable parameters that are shaped by contracts between buyers and sellers on the world market. In addition, when world prices are low, firms tend to stockpile minerals depending on their grades, especially low-grade minerals. Thus, implementing an appropriate price benchmarks is not straightforward for most commodities.

6 **Analysis 1: Historical Resource Rents vs. Tax Revenues**

The following figures summarize the gross value of production, resource rent, the related tax payments and the global market price of the commodity. Despite volatility in global commodity prices, annual resource rents have generally been increasing over time. A significant portion of the total rent is received from nickel production (43.7 percent), followed by gold (30.0 percent), then copper (26.3 percent).

As resource rent is a function of commodity prices and thus affected by the global demand of commodities, the drop in 2009 may be attributed to the 2008–2009 global financial crisis. Prices of minerals declined for copper and nickel but price for gold increased over the period. However, resource rent recovered and even increased by more than a third the following year. As resource rent is also a function of production volume, changes are also affected by the production levels of mining firms in the Philippines.

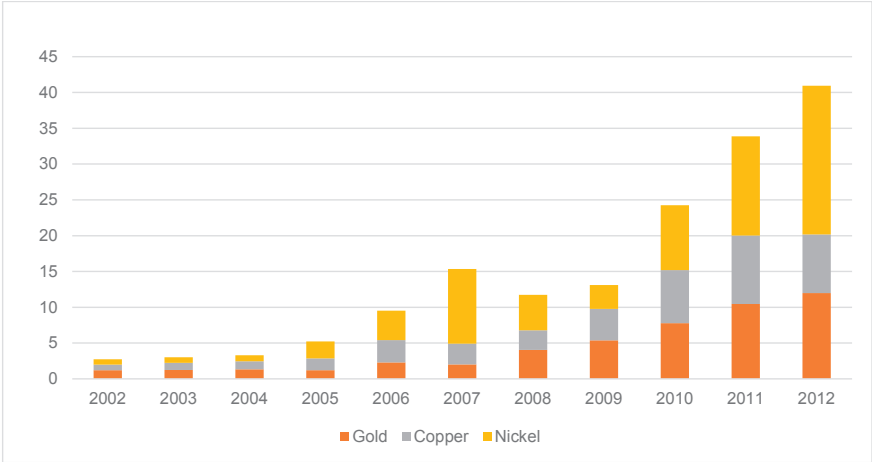


FIGURE 5 Total resource rent per commodity, 2002–2012 (in Php billion)
SOURCE: AUTHORS’ OWN CALCULATIONS USING PSA/MGB-DENR DATA

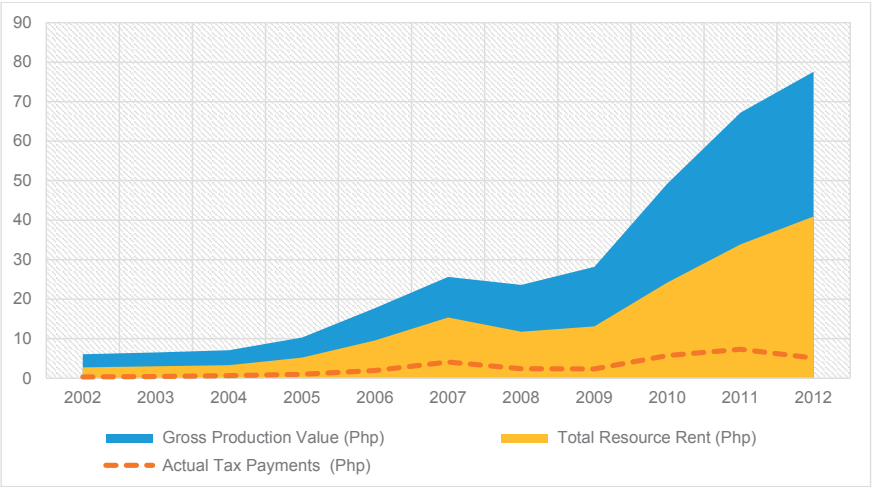


FIGURE 6 Total production value, total resource rent and total tax payments (2002–2012), (in Php Billion)
SOURCE: AUTHORS’ OWN CALCULATIONS USING PSA/MGB-DENR DATA

Figure 6 compares the total production value, total resource rent, and total tax payments for gold, copper, and nickel from 2002 to 2012. Over the period, resource rent is about 51.1 percent of total production value while tax payments are about 9.7 percent of the total value of production. Overall, tax payments are around 19.1 percent of the resource rent, suggesting that the current fiscal regime is inefficient in capturing the resource rent.

Similar comparisons were made based on disaggregated appropriations of resource rent per commodity. For each commodity, movements in gross production value and resource rent respond to fluctuations in world prices but the total tax take of the government does not suggest a regressive tax regime.

6.1 Gold

In the gold sector, the government is only capturing on average 17.9 percent of total resource rent. Annual tax payments from gold production as a percentage of resource rent ranges from 10.8 percent (in 2012) to 29.0 percent (in 2007) with a standard deviation of 5.5 percent. While total resource rent has kept pace with the increase in production value, tax payments have not always increased in proportion to production value (See Figure 7). Because the appropriate share of rent that flows to the government should be close to a hundred percent, this suggests that the government has room to improve the way its fiscal regime taxes gold production without discouraging private investment.

Figure 8 shows that the gap between the tax payments and resource rent expressed as percentages of production value. Total tax payments and resource rent is on average 6.45 percent and 36.1 percent of gross value, respectively. This indicates that the mining tax payments does not capture a significant portion of the resource rent.

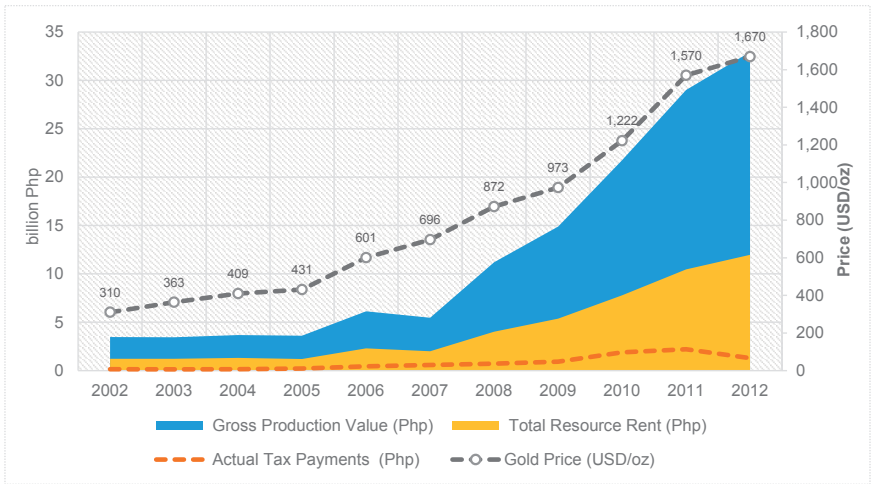


FIGURE 7 Gold—gross production value, resource rent, total tax payments: 2002–2012, (in Php billion)
SOURCE: AUTHORS' OWN CALCULATIONS USING PSA/MGB-DENR DATA

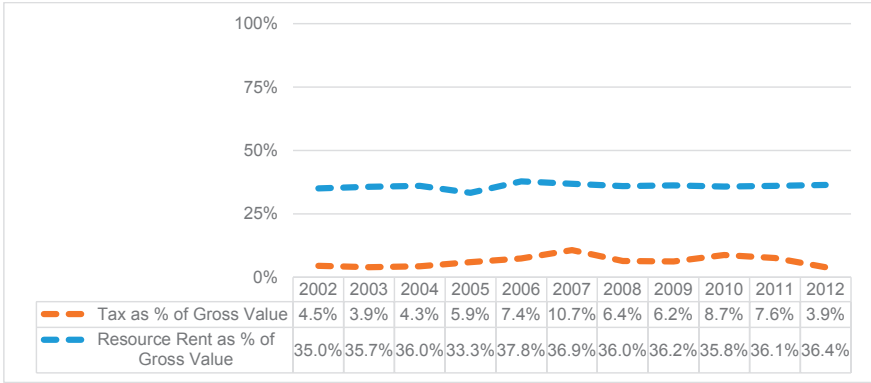


FIGURE 8 Gold—tax payment and resource rent as percentage of gross production value
SOURCE: AUTHORS' OWN CALCULATIONS USING PSA/MGB-DENR DATA

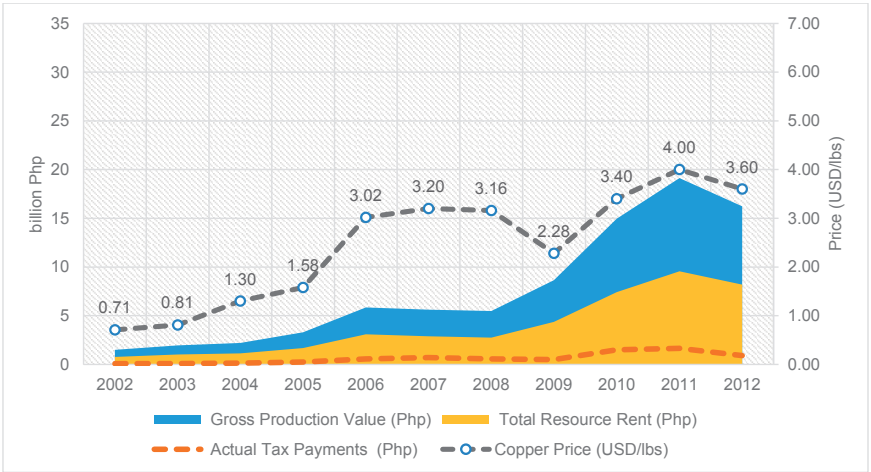


FIGURE 9 Copper—gross production value, resource rent, total tax payments: 2002–2012 (in Php billion)
SOURCE: AUTHORS' OWN CALCULATIONS USING PSA/MGB-DENR DATA

6.2 Copper

Over the covered period, tax payments from copper production accounted for over a third of the resource rent at 16.2 percent, around 1.7 percentage points higher than gold's (See Figure 9). This suggests that the fiscal regime is not capturing a substantial portion of the mineral rents for the country, consistent with the observation in the gold sector. The trend exhibits more variation with annual estimates ranging from 9.4 percent (in 2003) to 24.5 percent (in 2007)

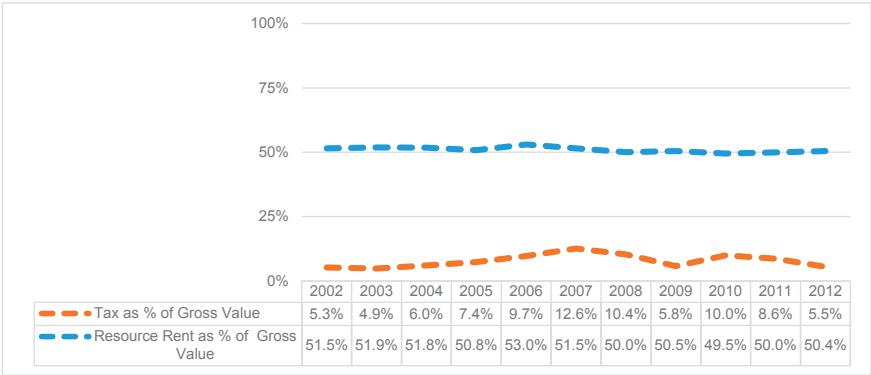


FIGURE 10 Copper—tax payment and resource rent as percentage of gross production value
SOURCE: AUTHORS' OWN CALCULATIONS USING PSA/MGB-DENR DATA

and a standard deviation of 4.86 percent. Gross value and resource rent also keep pace with world prices.

Figure 10 shows that gap between the tax payments and resource rent expressed as percentages of production value. Resource rent as a percentage of total production value is around 50.5 percent with annual estimates ranging from 49.5 percent to 53.0 percent. Tax payments as a percentage of total production value is, on average, about 8.18 percent and ranges from 4.9 to 12.6 percent. The extent of the gap between mineral revenues and rents is relatively stable over time. Similar to gold, tax payments for copper extraction are only a small fraction of gross value and are not as large as rents, suggesting a wide latitude to increase the taxes on these minerals without affecting investment in the sector.

6.3 Nickel

The data shows that tax payments as percentage of resource rent is on average, about 21.6 percent, with annual estimates ranging from 10.0 percent (in 2002) to 38.5 percent (in 2004) with a standard deviation of 7.03 percent. Relative to copper and gold estimates, gross value and resource rent trends are punctuated by sharp upturns and downturns due to fluctuations in world prices. In 2007, world prices rose and quickly declined in 2009. While the price of nickel declined in 2012, gross value of production increased suggesting an increase in the volume of nickel extraction. Notwithstanding the price volatility, the fiscal regime is capturing a higher share of mineral revenues from nickel mining compared to gold and copper.

Figure 12 describes the relationship between tax payments and resource rent expressed as percentages of production value. Resource rent as

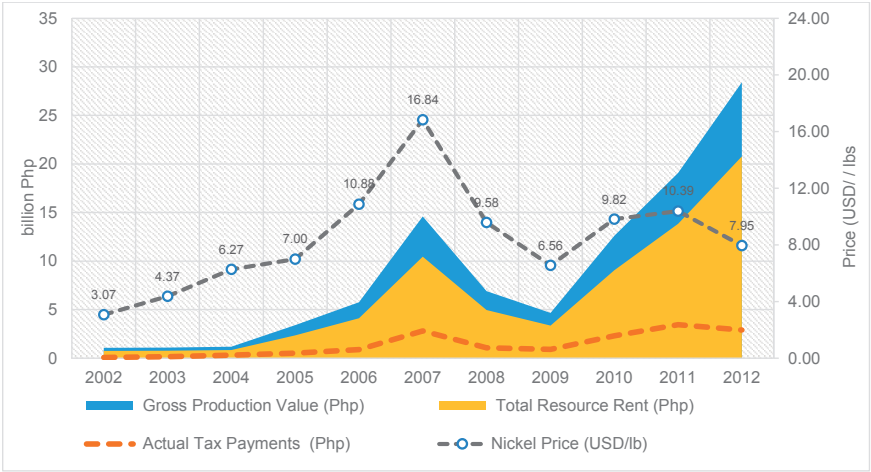


FIGURE 11 Nickel—projected sales value, total resource rent, total mining revenue: 2002–2012 (in Php million)
SOURCE: AUTHORS’ OWN CALCULATIONS USING PSA/MGB-DENR DATA

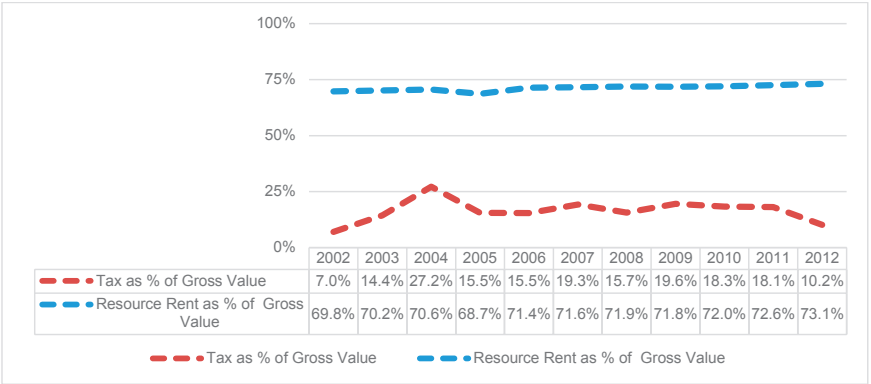


FIGURE 12 Nickel—tax payment and resource rent as percentage of gross production value
SOURCE: AUTHORS’ OWN CALCULATIONS USING PSA/MGB-DENR DATA

a percentage of total production value is, on average, about 72.1 percent with annual estimates ranging from 68.7 percent to 73.1 percent. On the other hand, tax payments as a percentage of total production value is, on average, about 15.62 percent and ranges from 7.0 to 27.2 percent. The size of the gap between rents and tax payments is narrower relative to gold and copper, indicating a larger capture of the rents. This can be explained by the additional 5 percent royalty most large scale nickel mines pay as they operate in mineral reservations.

The comparison of the historical tax payments of mining companies and our estimated resource rents show the ineffectiveness of the mining tax regime in capturing resource rent. It also indicates the regressive nature of the tax regime as it fails to capture a larger share for the government when the prices of minerals are higher. It clearly supports the need to reform the tax regime so that the government can capture a substantial portion of the proceeds from the extraction of the mineral resources. In the next section, we validate the findings of this section using firm level data.

7 Analysis 2: Fiscal Regime Simulation with Estimates of Average Effective Tax Rates (AETRs), Marginal Effective Tax Rates (METRs) and Resource Rents

The second analysis of the fiscal regime simulates government revenues from the feasibility study of an actual nickel mining project. The estimated project cash flows were used to estimate the AETR and the METR under the current and alternative tax regimes. We also compared the tax takes under the different regimes with the estimated resource rent of the project. This section has four goals: (1) examine the effect of the fiscal regime on year-on-year project cash flows of the firm; (2) look at the potential tax take of the government as a percentage of profit before tax (AETR); (3) estimate the marginal cost to investment of the different tax regimes (METR); and (4) evaluate the efficiency of the tax regimes in capturing resource rent.

7.1 *Measuring Neutrality of Fiscal Regimes Using Forward-Looking Effective Tax Rates*

When deciding where and how much to invest in a location, investors evaluate the extent to which fiscal instruments impact all stages of project activities. A fiscal regime can be characterized as neutral if a project or action is financially viable before and after fiscal instruments are applied. In contrast, a fiscal regime that renders an initially profitable project unviable after taxes are applied is characterized as distortionary.

Two widely-used measures that indicate the neutrality of a fiscal regime are: the AETR and the METR (Daniel et al. 2010).

7.1.1 Average Effective Tax Rate (AETR)

The AETR – the government take from net cash flow – is defined as the ratio of the NPV of all taxes paid to the government to the NPV of the project's before-tax cash flow (See Equation 8). It indicates the share of income before tax that government receives from a project.

$$\text{AETR}_t = \frac{\sum_{t=0}^T X_t}{\sum_{t=0}^T R_t - C_t - K_t} \quad (8)$$

Where:

X_t	expected annual taxes paid to government (from all sources)
R_t	expected annual gross revenue from the sale of each product, determined using the expected product price taken times the expected tonnage, grade, and appropriate recovery factors necessary for the metallurgy employed
C_t	expected annual operating costs associated with the sale of product produced and sold
K_t	opportunity cost of capital expenditure (normal profit on capital)
t	the year from the base year (measurement of time)

SOURCE: (OTTO ET AL. 2006)

7.1.2 Marginal Effective Tax Rate (METR)

Investors look at the marginal effective tax rate (METR), the ratio of the difference between the pre- and post-tax rate of return to the pre-tax rate of return of a project (See Equation 9).¹² The METR indicates the extent to which the fiscal regime distorts firms' decision making. It is referred to as marginal because the METR describes how much the tax system raises the marginal cost of various behaviors – spending on exploration, capital investment in developing identified deposits, and extraction (Boardway and Keen 2010, 46). The difference between the pre- and post-tax rate of return (the tax wedge) is affected by the rate of tax on profit, the tax treatment of the firm financing and tax depreciation provisions.

For this analysis, we compute the METR on all capital investment and extraction, excluding exploration costs because of data limitations.

$$\text{METR}_t = \frac{R_t^P - R_t^E}{R_t^P} \quad (9)$$

12 In other words, it measures the proportion of the pre-tax return on an activity which leaves the firm just breaking even that goes to the government, so capturing the size of the tax distortion to that decision.

Where:

R_t^P	Rate of return post-tax
R_t^E	Rate of return pre-tax
t	the year from the base year (measurement of time)

SOURCE: (BOARDWAY AND KEEN 2010, 46).

7.2 *Data Sources and Assumptions*

7.2.1 Project Sash Flows: Gross Volume of Production, Gross Revenues and Commodity Price Scenarios

A project’s gross mining revenue, defined as the product of gross output (volume of production) and an assumed constant price (See Equation 10), follows the pattern of its production profile. Data on forecasted production profiles and extraction rates over the life of the mine are culled from the project feasibility studies.¹³ For the nickel mining project, volume of production peaks at the early stage of the project (Year 2 to Year 5) with a subsequent decline in production at Year 5. From then on, production stays at a constant level.

$$V_t(p_t, q_t) = p_t q_t \qquad (10)$$

Ultimately, the profitability of the project (and the amount of government revenues) relies on global prices. To ensure that flows are sensitive to price volatility, we model the annual gross revenues under three price scenarios – a low, middle, and high price scenario. The three price scenarios (low, middle, high) are generated from 16-year historical prices (2000–2016).¹⁴ The median of the historical commodity price range (2000–2016) determine the middle case price scenario. The midpoints between the historical minimum and average price, and the maximum and average price determine the low case and high case price scenario, respectively (See Equation 11).

13 Contracts are required by law to submit feasibility studies of their projects to the MGB as part of the approval process of their mining permits. Feasibility studies include a financial statement and indicators of profitability (ROI) and risk.

14 Historical gold and copper prices were obtained from UNCTAD data. Nickel prices for direct shipping limonite were obtained from the model nickel mine’s feasibility study. It notes that historical limonite prices cannot be determined as it is a relatively new commodity without a well-established pricing scheme. New technology has allowed limonite, which was previously considered a waste to be converted to ore.

$$p_t = \begin{cases} \text{midpoint}(\text{maximum}, \text{median}) & \text{if high case} \\ \text{median}(p) & \text{if middle case} \\ \text{midpoint}(\text{minimum}, \text{median}) & \text{if low case} \end{cases} \quad (11)$$

7.2.2 Project Cash Flows: Operating (Production) Costs and Opportunity Cost of Capital

Operating costs refer to any costs incurred in the production of the mineral and generally includes direct and indirect mining costs, refining charges, road maintenance, site preparation, sampling and assaying, and decommissioning costs. For the calculation of the resource rent, the relevant production cost figure excludes taxes and royalties (which are simulated later on using fiscal regime assumptions) and social and environmental payments, adding depreciation and interest expenses and an opportunity cost of capital. Firm production costs were culled from operating and sustaining cost items in its feasibility studies.

Similar to the previous computation of resource rent, the opportunity cost of capital is defined as rate of return on the next best investment opportunity available for the investor. We used the same rate as in section 5 for the opportunity cost of capital. We deduct the opportunity cost of capital from gross revenue. Note that in our firm level analysis, we use the data on costs from the mining feasibility study as opposed to before where we used the input-output table to estimate the costs of operation.

7.2.3 Current Period Estimates: Discount Rate and Life of the Mine

To obtain current-period estimates, we apply a discount rate, assumed at 10 percent, to the expected stream of gross revenues, projected tax payments and resource rents. The discount rate represents the preference of the contractor or the government to receive returns in the present rather than in the future. A higher discount rate means a stronger preference for earlier returns from owning an asset. The firm's assumptions on the life of the mine are adapted. We compute the NPV of gross revenues, tax payments and resource rent at the given discount rate.

To illustrate, the rents over the life of the mine is estimated as the present value of annual rents over mine life. Thus, the economic value of a mineral asset is calculated as the discounted stream of net benefits which the mineral stock is expected to generate over its lifetime. For given discount rate r_t and resource lifetime τ , the net present value at time t is:

$$NPV(R_t) = \sum_{\tau=1}^{\tau} \frac{R_{t+\tau}}{(1+r_t)^\tau} \quad (12)$$

7.2.4 Government Revenues from Mining (Tax Payments)

According to the report of the Philippine EITI (2017), the excise tax, mineral reservation royalty, IP royalty, and the corporate income tax account for 77 percent of the total payment of the mining companies. We focused on these taxes in our analysis.

To estimate the government revenue stream from the mining project, we generate the net present value of the tax payments using the net revenues computed from difference between gross revenues and operating costs.

We developed six fiscal regime scenarios based on existing laws, proposed modifications of the tax regime in Congress and a regime patterned after the Botswana fiscal regime.

The following are the five scenarios:

1. Regime 1 is patterned after the original terms under Republic Act 7942 or the 1995 Mining Act for MPSAs;¹⁵
2. Regime 2 factors in the increase of the excise tax rate to 4 percent under Republic Act 10963;
3. Regime 3 considers the possible lowering of the corporate income tax rate to 20 percent under the second package of tax reforms (*TRAIN 2*);
4. Regime 4 looks at the possible imposition of a 10% export tax on all exported commodities to discourage the export of raw ore;
5. Regime 5 is similar to the terms of the FTAA which includes a provision that pegs the share of the government from the net mining revenue at 50 percent and;
6. Regime 6 is a combination of production based taxes and a profit-based tax through a sliding corporate income tax patterned after the Botswana governments' mineral tax regime. Regime 6A has all the production based taxes except the export tax and regime 6B does not have the export tax and the 5 percent royalty.

15 The original terms in Republic Act No. 7942 (The Philippine Mining Act of 1995) and Section 151(a) of the National Internal Revenue Code are as follows: a 2 percent excise tax on actual market value of gross output, a 1 percent royalty on actual market value of gross output of mines in ancestral lands, a 5 percent royalty on mines in mineral reservations and a 30 percent corporate income tax on net taxable income.

Regime 5 is also the proposed regime of a bill filed in both Houses of Congress and endorsed by the Department of Finance. It imposes an additional tax that is triggered when the total direct taxes, royalties and fees is less than 50 percent of the net mining revenue. The amount of the additional tax, referred to as the additional government share, is the difference between 50 percent of the net mining revenue and the basic government share. This provision guarantees that the government will always obtain at least 50 percent of the net mining revenue.

Regime 6 stipulates a minimum corporate tax rate of 22 percent and applies a sliding corporate income tax rate depending on the profitability of the firm. As the income tax rate is a linear function of profitability (See Equation 13), a higher profitability ratio results in a higher income tax rate. Thus, more profitable mines are taxed more.¹⁶

$$CIT_t(X_t) = 0.7 - 1.5 \left(\frac{1}{X_t} \right) \tag{13}$$

Where:

<i>CIT</i>	Corporate income tax rate
<i>X</i>	Profitability ratio (Taxable income, Profit before tax divided by gross revenue)
<i>t</i>	the year from the base year (measurement of time)
	Note: the choice of intercepts and slope of linear equation 13 depends on the sensitivity of firms' profit to changes in world price. This is different across countries.

Across all regimes, the main sources of government revenue would be the corporate income (CIT), the royalty on mineral reservations, the excise tax and export tax (if applicable).

16 In the unlikely event that a firm is a hundred percent profitable (a profitability ratio of 1), the maximum CIT rate is 55 percent. The income tax rate floor of 22 percent is applied to firms whose profitability ratio falls below 32 percent. As a result, substantially unprofitable firms will continue to be taxed at a rate of 22 percent, regardless of their profitability level.

Table 3 summarizes these different scenarios.

TABLE 3 Terms of the simulated fiscal regime scenarios

Fiscal Tools	Rate (%)						
	<i>Regime 1</i> <i>RA 7942</i> <i>(MPSA)</i>	<i>Regime 2</i> <i>RA 10963</i>	<i>Regime 3</i> <i>TRAIN 2</i>	<i>Regime 4</i> <i>TRAIN 2 +</i> <i>Export tax</i>	<i>Regime 5</i> <i>FTAA</i> <i>model</i>	<i>Regime 6A:</i> <i>Regime 2 +</i> <i>Botswana</i> <i>CIT</i>	<i>Regime 6B:</i> <i>Regime 6A</i> <i>without</i> <i>royalty</i>
Excise tax	2%	4%	4%	4%	4%	4%	4%
IP Royalty	1%	1%	1%	1%	1%	1%	1%
Royalty on mineral reservations	5%	5%	5%	5%	5%	5%	0%
Export Tax	0%	0%	0%	10%	0%	0%	0%
Corporate Income Tax	30%	30%	20%	20%	20%	22%–55%	22%–55%
Windfall provision					additional payments of total payment is less than 50% of net mining revenue		

SOURCE: (“MINING ACT OF THE PHILIPPINES” 1995; “TAX REFORM FOR ACCELARATION AND INCLUSION (TRAIN)” 2017; “HOUSE BILL 7994” 2018; “HOUSE BILL 7458 (TRAIN 2)” 2018; EYGM 2014)

7.2.5 Caveats

A firm-level analysis of the fiscal regime using firm financial statements and asset valuations poses several disadvantages. By relying on valuations determined in the accounts of mining firms, assumptions regarding unpredictable parameters such as the rate of future extraction and costs of extraction are required.

Compared to estimates derived from national accounts, net present value estimates are more sensitive to price forecasts, extraction rates and cost projections and thus are subject to a high degree of uncertainty. Mining companies

generally assume past and current extraction rates will continue unless more complete information becomes available over operation life.

In addition, there is a limitation in the generalizability of our model. The financial information of one nickel firm may not be a representative of the sector. However, the analysis in this section remains useful as it validates findings from the historical analysis of the resource rent and tax payments of mining companies. It also demonstrates the possible impact of the different tax regimes.

The study does not incorporate the exploration costs in the analysis because of data limitations. To take into account the cost of exploration, we recommend that the government continue permitting the reimbursement of exploration cost during the first five years of mining operations.

7.3 *Results and Discussion*

Tables 4 and 5 summarize the average and marginal effective tax rates for the nickel mine under the different regimes and price scenarios. All results, including revenue and rates of return are measured in nominal terms unless otherwise noted.

First, for regimes 1 to 4, the more profitable a project due to higher prices, the lower the AETR and the METR, suggesting these regimes are regressive. Except for the corporate income tax, the taxes in these regimes are production-based taxes and royalties that comprise the bulk of the fiscal tools, which collect revenues as a percentage of resource value extracted. As a result, the fiscal regime is a greater burden for companies when prices are low. This is consistent with IMF estimates (Sunley et al. 2012).

Regime 5, on the other hand, is generally neutral, with AETR falling slightly as the profitability increases. The additional government share based on the post-tax margins (difference between 50 percent of the net mining revenue and all other taxes, royalties and fees) ensures at least a 50 percent tax take regardless of the price.

Second, doubling excise tax rates (Regime 1 to Regime 2) and imposing an export tax (Regime 3 to 4) increases the AETR and METR. The effective tax rate of Regime 1 across all price scenarios was 45.99 percent. The additional 2 percent increase in excise tax increases AETR to 49.96 percent while the export tax substantially increases AETR to 64.78 percent.

Third, lowering the corporate income tax rate decreases the AETR and METR (Regime 2 to Regime 3). On average, lowering the CIT rate from 30 to 20 percent pulls the AETR and METR by around ten percentage points.

Regime 6 or the introduction of a sliding corporate income tax makes the tax regime progressive. The tax take of the government is increasing as the price of minerals increases. However, the progressiveness depends on balancing

production based taxes and the profit based tax. We can see that Regime 6A is less progressive than Regime 6B, the regime without the 5 percent royalty. The AETR increases as price increases under Regime 6B. METR is also increasing as price increases under Regime 6B.

With respect to tax payments as percentage of resource rent, we can see that Regime 4 gives us the highest tax take when prices are low. When prices are high, the Regime 6, the one with the sliding CIT, captures the highest percentage of rent. The FTAA formula (Regime 5) consistently captures around 50 percent of the estimated resource rent.

TABLE 4 Average effective tax rates (AETR) across regimes and price scenarios – nickel

Regime	Low	Medium	High	Average
Regime 1 (Mining Act)	50.30%	44.77%	42.90%	45.99%
Regime 2 (Train 1)	55.33%	48.44%	46.11%	49.96%
Regime 3 (Train 2)	45.27%	38.41%	36.09%	39.92%
Regime 4 (Export tax)	70.42%	56.75%	52.12%	59.76%
Regime 5 (FTAA)	51.87%	50.16%	50.12%	50.72%
Regime 6A (Sliding CIT, with royalty)	61.74%	61.06%	62.15%	61.65%
Regime 6B (Sliding CIT, without royalty)	49.16%	51.89%	54.13%	51.73%

SOURCE: AUTHORS’ OWN CALCULATIONS

TABLE 5 Marginal effective tax rates (METR) across regimes and price scenarios – nickel

Regime	Low	Medium	High	Average
Regime 1 (Mining Act)	49.71%	44.45%	42.67%	45.61%
Regime 2 (Train 1)	54.73%	48.11%	45.87%	49.57%
Regime 3 (Train 2)	44.68%	38.08%	35.85%	39.54%
Regime 4 (Export tax)	66.40%	56.43%	51.89%	58.24%
Regime 5 (FTAA)	51.28%	49.84%	49.88%	50.33%
Regime 6A (Sliding CIT, with royalty)	61.15%	60.73%	61.91%	61.26%
Regime 6B (Sliding CIT, without royalty)	48.57%	51.56%	53.89%	51.34%

SOURCE: AUTHORS’ OWN CALCULATIONS

TABLE 6 Tax payments as % of resource rent across regimes and price scenarios – nickel

Regime	Low	Medium	High	Average
Regime 1 (Mining Act)	50.09%	44.67%	42.83%	50.09%
Regime 2 (Train 1)	55.10%	48.33%	46.03%	55.10%
Regime 3 (Train 2)	45.08%	38.32%	36.03%	45.08%
Regime 4 (Export tax)	70.13%	56.62%	52.04%	70.13%
Regime 5 (FTAA)	51.66%	50.05%	50.04%	51.66%
Regime 6A (Sliding CIT, with royalty)	69.30%	64.96%	64.97%	66.41%
Regime 6B (Sliding CIT, without royalty)	55.19%	55.20%	56.59%	55.66%

SOURCE: AUTHORS' OWN CALCULATIONS

We find that the capture of rent under Regime 1 is much higher (at 50 percent, on average) compared to the results of our first analysis on the capture of resource rent and actual tax payments of companies from 2002–2012 (Based on Figures 6 to 12). The significant difference in the extent of capture of resource rent can be explained by tax holidays granted by the government, tax administration inefficiency and weak monitoring of mining operations. Mining companies benefited from tax holidays awarded by the Board of Investments. There is also weak monitoring of tax and royalty payments of companies; the government is not able to audit the actual production and sale of minerals. Weak monitoring of mining operations can also result in bloated cost of operations which may reduce tax liability.

Figures 13, 14 and 15 show the year-on-year AETR of the different tax regimes under the three price scenarios. Again, we can see the progressivity of Regime 6. Tax burden is highest during the most profitable years of the mine, years 1 to 5. The tax burden is reduced when the production of the mine declines. The tax burden of Regime 5 is almost constant over the life of the mine, but it has a regressive effect when mineral prices are low. The other regimes (Regimes 1 to 4) are generally regressive. The tax take of the government is lowest when the mine is most profitable and highest when the production of the mine has declined.

8 Policy Implications

While the mining tax regime of the country is stable, the country generally relies on regressive production-based tax instruments to collect taxes

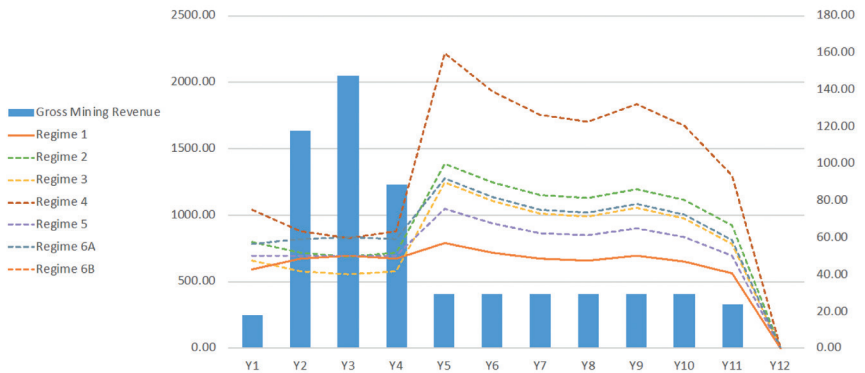


FIGURE 13 Gross mining revenue and AETR, low prices, year 1 to 12

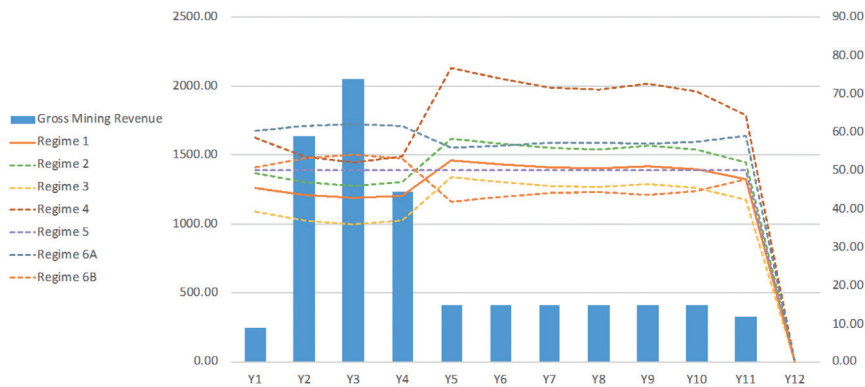


FIGURE 14 Gross mining revenue and AETR, mid prices, year 1 to 12

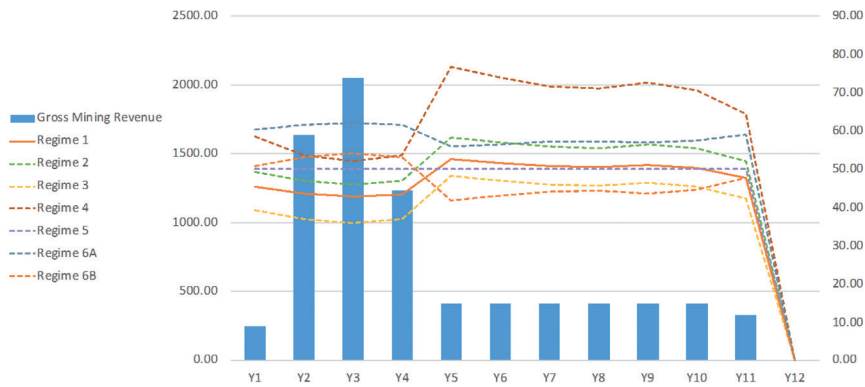


FIGURE 15 Gross mining revenue and AETR, high prices, year 1 to 12

from large-scale metallic mines. The reason for this is clear: tax administration has always been a challenge for the Philippine government. Because complex resource rent taxes are difficult to implement and monitor, the government collects revenues from the extraction of mineral resources by imposing production-based taxes. Aside from being regressive, the current tax regime does not fully capture the resource rent. Based on historical data, the government only captures an average of 26 to 44 percent of the resource rent.

The firm-level analysis shows that increasing the excise tax from two percent to four percent increases the AETR and METR by four percentage points, indicating a regressive tax regime. Lowering the corporate income tax rate to 20 percent, however, brings the tax rate to levels that are even lower than the original regime under the Mining Act of 1995 (Regime 1). While we assume a royalty rate of five percent, in reality, not all mining operations pay the five percent royalty. Government must be able to enforce payments of mineral royalties to ensure a more consistent and uniform regime.

If the corporate income tax is lowered, another profit-based instrument has to be adopted to increase the share of government and capture a larger share of the resource rent, ensuring the progressivity of the tax regime. We find that the imposition of a ten percent export tax rate increases government share to levels higher than the current regime (Regime 2). However, it does not address the regressive nature of the regime because of the export tax is essentially production-based.

If the export tax is not implemented, the current proposal of the Department of Finance to collect additional payments from mining companies with tax contributions less than 50 percent of net mining revenue will improve the tax take of the government, guaranteeing collections of at least 50 percent of net mining revenue. We find the proposal is not sufficiently progressive, and in fact, remains regressive as tax take reaches more than 50 percent in scenarios when commodity prices are low. However, this is a significant improvement compared to previous regimes.

We tested the impact of introducing a sliding profit-based tax using the formula implemented by the Botswana government for its corporate income tax. The CIT rate is sensitive to the profitability of the mine (EYGM 2014) and thus, we find that the regime significantly improves in terms of progressivity. Average effective tax rates are highest when the mine is most profitable. However, this formula is complex to administer compared to production-based taxes. Nevertheless, it improves the total tax take of the government from highly profitable mines and creates a less distortionary effect on less profitable mines.

Overall, policy makers must recognize the need to review and amend the mining tax regime because of its shortcomings: the current regime is regressive and does not fully capture the resource rent. A progressive regime that is sensitive to global commodity prices and profitability of the mining operations serves the interest of both industry and government. Ultimately, a balance between production-based taxes and profit-based taxes has to be struck to achieve a progressive tax regime.¹⁷

Further studies can be done on modelling fiscal regime using dynamic prices, incorporating the social and environmental costs of mining in a cost-benefit analysis to inform fiscal policies, and incorporating real costs of mining operations in estimating resource rent.

Note on the Contributors and Acknowledgments

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¹⁷ Identifying an exact formula for the sliding corporate tax rate applicable and appropriate to the Philippines will require further research.

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