

MINING TAXATION AND GLOBAL INVESTMENT: EVALUATING TRADE-OFFS BETWEEN “FAIR SHARE” OF RESOURCE RENTS AND MINING DEVELOPMENT

Katie Ballard, Robert Cline, Tom Neubig, and Andrew Phillips
Ernst & Young LLP

INTRODUCTION

BECAUSE MINING ACTIVITY CAN BE A SIGNIFICANT source of growth and a platform for foreign investment in developing economies, many countries and international organizations are focusing on mining taxes as an important source of public finances. Some economists have suggested that mining taxes could be increased significantly without adversely affecting a country’s economic development (KPMG Econtech, 2010). Although the trade-offs between a “fair share” of “rents” and sustainable economic development have been discussed extensively in the natural resources area, this issue is of growing importance in the general business taxation debate.

Although there is an extensive literature on mining taxation, it often is separate from the general public finance taxation literature. The natural resources industry has a number of unique features, but its general characteristics of site-specific factors, long-lived capital investments, cyclical factors, and political risk are shared by other global business activities in varying degrees. This paper highlights current issues in global mining taxation, discusses the varying design of mining taxes, the effect of mining taxes on mobile capital investment, and notes the applicability of mining tax analyses to business taxation in other industries.

CURRENT ISSUES IN GLOBAL MINING TAXATION

Mineral commodity prices tripled from 2003 to 2011, which has resulted in a significant increase in worldwide mining activity. High prices encourage business investment through exploration and development in countries where geographical or political difficulties previously made mining less attractive. Today, mining activity comprises a

significant share of many developing economies, as in Zambia and Guinea.

A 2012 International Monetary Fund (IMF) report states: “Generating employment in related activities, and addressing environmental impacts, can be significant concerns, but the revenue from Extractive Industries is often the main benefit to the host country.” The IMF statement contrasts with the conclusion in a recent International Council on Mining and Metals (ICMM) report: “The greatest benefit mining affords to these national economies is not government revenue, but rather the contribution to foreign direct investment.” These different views illustrate the potential trade-off between, and debate over, a “fair share” of resource rents and sustainable economic development from mining.

As shown in table 1, mineral commodity prices have experienced major cyclical fluctuations that have resulted in booms-and-busts in mining activity.

The commodity price cycle has also resulted in cyclical government policies toward mining. In many countries, mineral deposits are owned by the

Table 1
Selected percentage changes in mineral commodity prices, 1960 – September 2012

<i>Years</i>	<i>Percentage change in average annual prices</i>
1975 – 1980	82
1980 – 1982	-29
1982 – 1986	-7
1986 – 1988	88
1988 – 1993	-38
1993 – 2002	-1
2002 – 2007	258
2007 – 2009	-35
2009 – 2011	71
2011 – 2012	-15

Source: International Monetary Fund, 2012.

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state, rather than privately held, and the state leases the land and the right to extract the minerals to mining companies. Because the minerals themselves are not sold to the companies, governments use mining taxation and royalties as a way to recover a portion of the sales and profits from the government-owned mineral resources. The 2009-2011 increase in mineral prices has encouraged many countries to evaluate their mining policies in order to increase their share of mineral “economic” rents. A number of countries have increased ownership of mines, increased public participation in mining projects, increased taxes and royalties on mining activities, mandated private-sector investments in public infrastructure or in-country beneficiation, and/or required social program contributions. These actions are often referred to as “resource nationalism,” which has been the leading business issue for global mining companies for the past two years, according to Ernst & Young’s Global Mining & Metals Center (Ernst & Young LLP, 2011).

Resource nationalism can be described as the enactment of policies designed to increase the government’s share of the economic returns from mining and to increase their control over natural resources. These policies can either enhance or undermine the country’s broader socioeconomic development objectives. As noted in a recent South African report, “The call for nationalization is being driven by a sentiment that the distribution benefits of the mining industry are seen to be skewed and that there is little tangible benefit to the greater population” (South African Institute of Mining and Metallurgy, 2012; KPMG Econtech, 2010).

With the need for greater government revenue, a perception that the country is not receiving its “fair share,” the sharp spike in prices and increased local stakeholder pressures, there has been a recent surge in these policies, similar to past government policy changes during prior commodity price cycles. To illustrate how widespread the current trend is, table 2 shows selected resource nationalism changes during the past five years.

A significant development in global resource nationalism was the 2010 Australian proposal for a Resource Super Profits Tax (RSPT) on all mining activity, assessed in addition to the corporate income tax and provincial mining royalties. The proposal was intended to increase Australian’s “fair share” of mineral “rents,” distribute the financial benefits of the minerals more geographically across the different regions of Australia, and finance the

reduction of the corporate tax rate from 30 percent to 28 percent.¹

The Australian government justified the RSPT on the claim that a “rent tax” was taxing “immobile” minerals and mining investment and the tax would therefore have limited or no adverse economic effects (Commonwealth of Australia, 2010; KPMG Econtech, 2010). “Rent taxes” are detailed later in the report, but the RSPT was criticized for using the long-term government bond interest rate when trying to make deferred capital expenditures deduction economically equivalent to immediate expensing, a key feature of a theoretical “rent tax” (Cline & Neubig, 2010). After opposition to the RSPT proposal contributed to the resignation of the Australian prime minister, the proposal was limited to taxation of iron ore and coal at a reduced rate and the interest rate was increased to the government bond rate plus seven percentage points. The Mineral Resource Rent Tax (MRRT) took effect in July 2012 and is being considered by a number of other countries.

As shown in table 2, some countries have recently imposed additional costs on mining companies through additional non-tax requirements, such as mandated “beneficiation” (processing) of the minerals or spending on public infrastructure, that increase the cost of doing business in the country. As with taxes, the potential benefits from in-country beneficiation or other mandated contributions should ideally be factored into any economic analysis.

DESIGN OF MINING TAXES

When deciding on the appropriate level of mining taxation, countries are also revisiting the design of their taxation structure and the mix of revenue sources, balancing between royalties, income taxes, and “rent taxation.” In most countries, mining taxation consists of a combination of royalties on the sale of minerals plus corporate income taxation. Royalties have generally been regarded as easier to administer for countries without sophisticated tax administrations. Additionally, royalty taxation collects revenue as soon as production begins and applies whether or not the activity is profitable. When commodity prices and profits are high, royalty taxation can be perceived as applying a low tax rate. However, when prices are low and profit margins fall, royalty taxation can result in earlier mine closures or production stoppages due to higher variable costs.

Table 2
Selected resource nationalism changes, 2008 – 2012

<i>Year</i>	<i>Country</i>	<i>Type</i>	<i>Description</i>
2012	Argentina	Beneficiation	Regulation requiring local substitutes for imports
2012	Australia	Taxes	Mineral resource rent tax on iron ore & coal
2012	Bolivia	Gov't ownership	Nationalization
2012	Indonesia	Beneficiation	Adopts new export taxes
2011	Argentina	Taxes	Requires repatriation of export revenue
2011	Brazil	Taxes	Royalty rate increase
2011	Ghana	Taxes	Increases corporate tax rate & adopt new windfall profits tax
2011	Guinea	Gov't ownership	Adopts minimum 15% share
2011	Mongolia	Taxes	Windfall profits tax repealed
2011	Nevada/US	Taxes	Reduced allowed deductions
2011	Peru	Taxes	Adopts windfall profits tax plus new sliding scale income/royalty
2011	Venezuela	Gov't ownership	Nationalizes gold industry
2011	Zambia	Taxes	Increases royalty rates
2011	Zimbabwe	Social contribution	Requires funding of local development projects
2010	Australia	Taxes	Proposes Resource Super Profits Tax on all minerals
2010	Burkina Faso	Taxes	Indexes royalty rates to gold prices
2010	Chile	Taxes	Sliding scale income tax/royalty
2010	Ghana	Taxes	Sets flat 5% royalty rate
2009	Mongolia	Taxes	Adopts 68% windfall profits tax in lieu of 34% equity
2008	Liberia	Taxes	Adopts rent tax
2008	South Africa	Taxes	Adopts profit-based royalty
2008	Zambia	Taxes	Increases royalty, adopts windfall profit tax (repealed)

Source: Authors' analysis.

In some countries, a higher corporate income tax rate is applicable to mining income relative to general business income. The higher tax rates are justified as payment for the country's public minerals and typically are paid by foreign multinational corporations. Due to large up-front capital expenditures, income taxes, unlike royalties, are not paid until several years after production on successful mines due to tax loss carryforwards. Because of this, income taxes, unlike royalties, have less of an adverse effect on the closure of marginal mines. Income taxation is often viewed as more difficult to administer by emerging countries, since income taxation requires allocating income across countries, including transfer pricing.

Several countries (e.g., Chile and South Africa) have changed their royalty rates to increase with the profitability of mining companies.² Profit-based

royalty rates increase government revenues during periods of high profits while still collecting some revenue when prices and profits are lower (or profits are negative).

Rent Taxation

Mining and oil and gas extraction are the first industries that have been subject to "rent taxation." The concept of "rent taxation" dates back to Ross Garnaut who, with Anthony Clunies Ross in 1975, wrote that, conceptually, "rent taxes" only apply to the "economic rent" earned from monopoly profits, infra-marginal, or unexpected profits (Daniel et al., 2010, p.33). By definition, "economic rent" is the excess above the "normal" return minimally required for an investor to make the investment. Conceptually, up to 100 percent of the "economic rent" could be taxed by the government without

discouraging the investment. Thus, if the next best investment alternative on a risk-adjusted basis could earn a 15 percent return, then any return in excess of 15 percent could be taxed without discouraging that investment since it would still be the best available investment. Practically, a “rent tax” requires knowing what that next best alternative risk-adjusted return is.

The first form of “rent taxation” is the Browne tax. It is argued that the Browne tax, which includes immediate capital expensing, full immediate refundability of losses, and no interest deductions, removes the tax from the return on capital.³ Under this system, the government shares in the capital investment with the immediate refund of the capital investment and earns the same return as the private sector investment. In the mining context, this is similar to partial nationalization (as a passive investor) with the country paying for its share of the capital investment.

However, most countries are unwilling to provide immediate refunds of tax losses, since many mining exploration and development activities are not profitable until many years later when production begins, if at all. Economists have proposed an economic equivalent to the Browne tax that accumulates tax losses with interest instead of providing immediate refunds.⁴ However, unless the interest rate is set such that the mining company is indifferent to immediate expensing and future deductions, a “rent tax” could affect the company’s investment decision.⁵ Proponents of “rent taxes” argue that the government interest rate can be lower than the full rate of return on the investment, including economic rents, as long as it is at least equal to the “normal” return. The challenge is determining the “normal” return. To avoid discouraging investment, the interest rate needs to reflect each company’s best alternative investment including country- and project-specific risks, not simply a long-term government bond rate, as initially proposed by the Australian government and suggested as a measure of the “normal” return in a 2012 IMF report.

The importance of tax losses and non-income taxes are highlighted in the case of mining, because exploration investment is high-risk, exploration and development requires significant capital expenditures over many years, and production occurs during commodity cycles. Although mining may look extremely profitable at the peak of the commodity cycle, over the entire project the return on

investment could be average or even negative due to prior losses during exploration and development or when commodity prices are below average. Countries that adopt “rent taxes” will likely find them to be very volatile and unlikely to produce as much revenue as is predicted if applied to existing projects at the top of the commodity price cycle. Figure 1 shows an example of the economic rent for a mining project in production stage over the commodity cycle.

As shown in figure 1a, the mining project experiences different operating margins, as variable operating costs lag behind commodity prices. In figure 1b, the profits tax is the sum of a resource “rent tax” and a corporate income tax. Both the resource “rent tax” and corporate income taxes are modeled after Australia’s MRRT and corporate income tax.

While “rent taxes” might apply a zero effective tax rate on the “normal” return at the margin of a domestic capital investment, the public finance literature has begun to recognize that average tax rates matter on marginal decisions about the location of investment across jurisdictions (Cline & Neubig, 2010; Devereux, 2002). Thus, statutory income tax rates, “rent taxes,” and indirect taxes all affect a country’s average tax rate on potential capital investments. Multinational companies assess the effect of all taxes on the potential return on investment across potential projects in different countries, so “rent taxes” are not neutral with respect to location decisions. In many cases, non-income taxes are more important than income taxes in affecting companies’ after-tax rate of return, as illustrated in the effective tax rates, by tax type, in selected countries on an illustrative gold mine, shown in table 3.

It should be noted that “rent taxes” and indirect taxes can also affect the relative after-tax rate of return across industries, discouraging mining relative to other economic activity. For example, if a “rent tax” applies to minerals but not to manufacturing, then the country would need to administer tax rules to prevent tax arbitrage between mineral production and mineral processing. In some countries, mining taxes involve “ring-fencing” where tax losses from one mine cannot be used against current taxable income in another related mine. The issue of “rent taxes” has been limited to natural resource industry, but the theory of taxing “excess rents” more heavily could be applicable to any industry. The Australian government contractor report identified banking and brewing as two

Figure 1a: Hypothetical example of the revenue, operating costs, and gross margin of a mining project in the production stage, reflecting stable production and the commodity price cycle

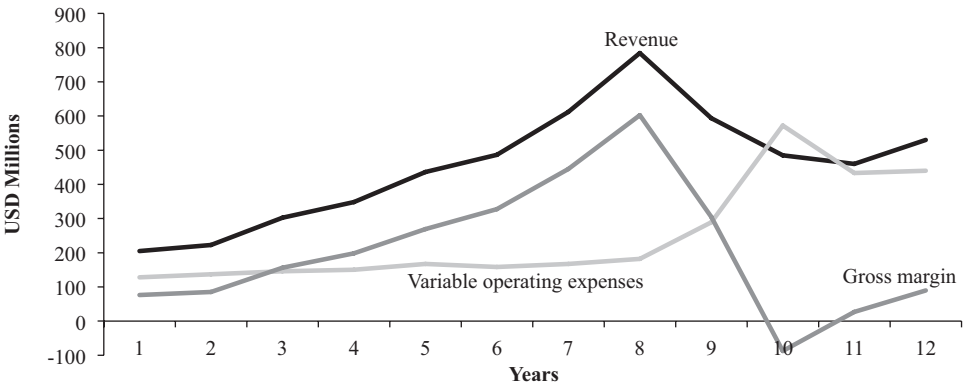
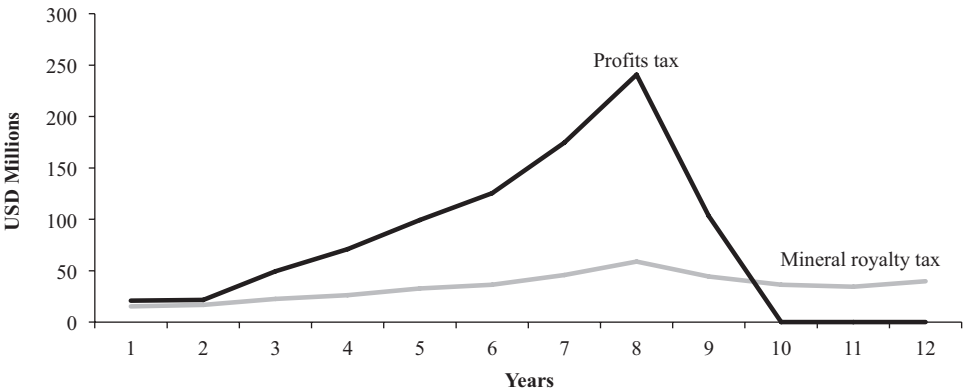


Figure 1b: Hypothetical example of tax collections from the mining project under profit-based taxes and sales-based royalty



Source: Authors' analysis.

other industries that had “excess profits” (KPMG Econtech, 2010, p.17).

MOBILITY OF MINING INVESTMENT

The optimal tax literature recommends that tax rates be lower on factors of production that are more elastically-supplied (or more geographically mobile), while tax rates can be higher without significant adverse effects on factors of production that are inelastically-supplied (or less geographically mobile). Thus, there is an increasing focus on “site-specific” rents, such as “natural resource”

rents. A number of developing countries have suggested that “site-specific rents” include their low-cost labor force and their large consumer markets, thus arguing for more income allocated to their countries in transfer pricing studies. Conversely, there is a focus on lower tax rates on highly-mobile activity, such as patents, research, and development including tax credits and “innovation boxes” with lower tax rates on future income.

In the case of natural resources, it is important to understand the production function associated with mining production. The minerals in the ground are critical, but so are the resources necessary to

Table 3
Total effective tax rate on a representative open pit gold mine in six countries
Percent

<i>Open pit gold mine</i>	<i>Australia</i>	<i>Canada</i>	<i>Colombia</i>	<i>Indonesia</i>	<i>Peru*</i>	<i>S. Africa</i>
Corporate income tax	28.9	10.7	10.1	14.7	18.0	14.4
Mineral royalties	8.4	17.2	10.8	12.6	4.7	2.7
Payroll taxes	2.1	4.8	15.2	4.0	3.5	0.4
Dividend withholding	0.0	3.0	0.0	6.7	3.0	8.4
Import tax	0.0	0.0	4.4	2.2	0.0	2.2
Land rent fee	n/a	0.7	0.1	0.0	0.1	n/a
Equity tax	n/a	n/a	0.3	n/a	4.2	n/a
Other taxes & fees	n/a	n/a	9.7	n/a	7.3	n/a
Total effective tax rate	39.5	36.4	50.6	40.2	40.7	28.1

*Assuming 2011 stabilization agreement applies.

Note: Figures may not appear to sum due to rounding.

Source: Ernst & Young LLP. *Análisis comparativo de la participación estatal par alas minas de oro y carbón en Colombia, 2012.*

find, extract, and commercialize the minerals. It is very rare that a mining operation does not require extensive capital investment, specialized machinery and equipment, and specialized mining human capital and management. Minerals are sold in global markets at world prices, so site-specific taxes reduce the return to the factors of production in the country in the form of lower land prices, lower wages, or lower returns to equity capital (since debt capital is also global). Thus, although the minerals are immobile, the mining activity is global in nature and mobile with respect to new incremental investment. Further, there is a time dimension to mobility, since previous fixed capital investments are highly immobile, but new investment and new extraction is mobile. Confirmed mineral deposits can remain undeveloped to be mined in the future, when prices or fiscal regimes are more favorable. Thus, mining activity is elastic with respect to both geography and time.

After examining a number of empirical studies of the effect of taxes on foreign direct investment (FDI), the Organization for Economic Cooperation and Development (OECD) reports that the average elasticity of FDI with respect to differences in tax rates is -0.75, i.e., a 10 percent increase in a country's business income tax rate (relative to other countries) reduces FDI by 7.5 percent (OECD, 2007). The average is based on a number of studies using different time periods, measures

of investment, country groupings, and estimation methodologies. The most recent elasticity studies find that investment flows are becoming more responsive to differences in effective tax rates. This conclusion is consistent with the perspective of increased global competition for FDI.

As explained earlier, it cannot be assumed that "rent taxes" do not affect investment decisions. The OECD study notes that the magnitude of the tax responsiveness is affected by a number of factors, including economic and political characteristics of the host country and the level of profits that are site-specific or due to resource rents. If capital is scarce, mining companies will compare the level of after-tax profits across multiple jurisdictions. The capital needed for mining exploration, development, production, and reclamation generally will flow to the location with the highest expected net after-tax profits (adjusted for investment risks). In a competitive global environment, any tax increase that reduces the after-tax rate of return below the next best alternative can reduce FDI flows into a country.

In addition to the reduction in after-tax income caused by direct taxes on mining operations, additional resource nationalism components may reduce after-tax income indirectly by increasing the cost of operating in a country. These include unfunded partial nationalizations, mandated infrastructure, required beneficiation projects, and

other social contributions. Differentials in these additional costs across countries will have impacts on FDI similar to responses to tax differences. Additional research and more data are needed to estimate the responsive of mining FDI to taxes and other resource nationalism policies.

Given the lengthy exploration and development stages required for most mining projects, and the significant fixed capital invested in existing projects, it is not easy to empirically estimate the elasticity of mining activity. Measures of FDI do not separate mergers and acquisitions from real capital flows. Further, resource nationalism policies include many different types of country-specific costs, in addition to taxes, as table 2 previously showed. Taxes are only one aspect of a country’s mining policy, and the interaction with other non-tax mining policies can affect their effectiveness. While two countries may enact the same non-tax resource nationalism policy, these policies could have significantly different results due to the specific institutions, governance, and other policies in the countries. For example, while the countries may collect the same amount of mining tax revenue, one country may spend the revenue on more productive investments and see greater social and economic returns. Further, partial public equity participation could strengthen the development objectives of both the government and the mining company in one country while political interference in another country could be detrimental to economic development.

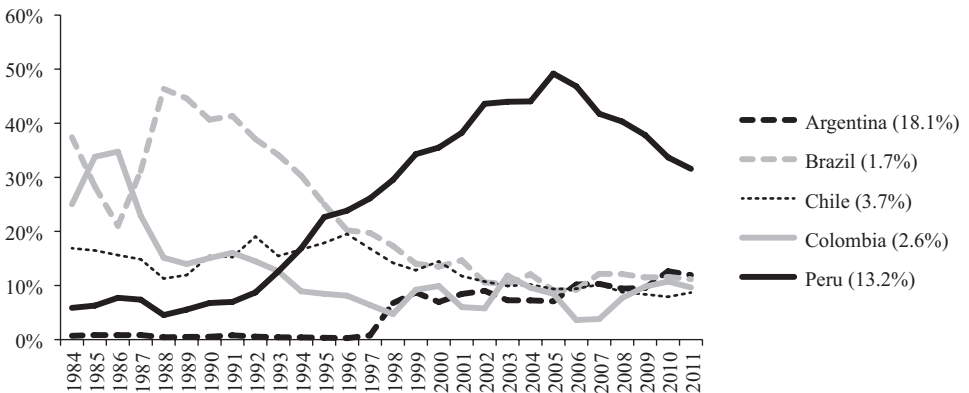
Changes in the Countries’ Mining Production Share Across Regions

Existing production activity is less likely than exploration or new mine development to be quickly and significantly affected by resource nationalism changes. However, the location of production changes over time as exploration and development is affected and as mine closures are accelerated. Figure 2 shows the change in the share of mine production for gold in Latin America from 1984 through 2011.

Figure 2 provides a clear example of the shifting shares of production among countries in Latin America. Over the 1984 to 2011 period, Peru’s share of total Latin America gold production increased from 6 percent to 32 percent, a compound annual growth rate in production of over 13 percent, even though its share decreased since its 2005 peak. In contrast, Brazil’s share of gold production fell from 37 percent to 11 percent from 1984 to 2011. Actual production increased in Brazil, but at a compound growth rate of only 1.7 percent. As a region, Latin America’s share of production jumped from 7 percent to 20 percent of world gold production.

This comparison of production in Peru and Brazil shows that, in addition to changes in the level of overall production in a region, there can be substantial changes in the distribution of mining activities within a region. These shifts in production are also associated with substantial changes in capital investments, employment, and supplier

Figure 2: Share of Latin American gold production, 1984 - 2011
Compound annual growth rates in parentheses



Source: Authors’ analysis based on Raw Materials Group production data.

Table 4
Selected case studies of aggregate economic measures before and after resource nationalism events

Country (Year)	Average mining* value-added to GDP		Average real GDP growth rate		Average in-bound FDI as percent of GDP	
	5 years prior	5 years after	5 years prior	5 years after	5 years prior	5 years after
<i>Panel A. Favorable resource development changes</i>						
Chile (1983)	3%	5%	3%	5%	1%	2%
Ghana (1983)	-5%	10%	-1%	6%	0%	0%
Mongolia (1997)	0%	3%	0%	3%	1%	4%
Tanzania (1998)	4%	9%	4%	6%	2%	4%
Zambia (2000)	-15%	10%	2%	5%	4%	6%
<i>Panel B. Recent resource nationalism increased tax and equity participation changes</i>						
Peru (2004)	6%	5%	3%	7%	3%	4%
Mongolia (2006)*	8%	3%	7%	6%	6%	16%

*Mining value added data includes utilities. Data goes through 2010, so 2006 Mongolia change includes prior and subsequent four years.

Source: United Nations Conference on Trade and Development (UNCTAD) statistics.

economic activity within each country. Changes in the level of production at a single mine can have substantial impacts on local residents' income, capital investments, and government revenues.

Analysis of Mining Value Added, GDP Growth, and Inbound FDI Around Select Resource Nationalism Events

Several case studies using aggregate data around mining legislation in five countries suggest that mining development policies can have favorable effects on the mining industry's contribution to a country's value-added, to average real GDP growth, and to total in-bound FDI.

Analysis of national economic measures five years preceding and five years subsequent to national mining legislation provides some empirical quantification of effects related to resource nationalism. The analysis, however, does not hold "everything else constant," and could be refined and supplemented in a number of ways. The analysis summarized in table 4, panel A, examines the following legislative changes designed to promote economic development: 1) Chile's 1983 new mining code restoring property rights and incentives

for private investment, 2) Ghana's announcement of the initial privatization intention and relaxing of regulations in 1983, 3) Mongolia's Minerals Law of 1997 privatized state-owned mines, 4) Tanzania's easing of investment and tax codes to attract foreign mining investment in 1987 and 1988, and 5) Zambia's re-privatization of mines started taking hold in the early 2000s.

Panel B of table 4 shows the before and after growth rates around two recent resource nationalism changes: 1) Peru's enacted tax increases on mining companies in 2004 and again in 2006 and 2) Mongolia's Minerals Act of 2007 that included funded equity participation in mining projects and a reduction in royalty payments, but also a 34 percent ownership of strategic mineral deposits. Both of the mining-specific measures declined, while the economy-wide measures improved in three of the four metrics.

CONCLUSION

As commodity prices rose over the past eight years, many countries (both emerging and developed economies) have looked to the mining

industry as an important part of their economic development and public finance strategies. Mining taxation analysis has developed somewhat separately from other public finance analyses, given its specific industry characteristics and industry-specific taxes. Mining taxation, however, is not unique, and its analysis has relevance to other industry tax issues. The trade-offs between non-income and income taxes, the potential taxation of “economic rents,” and the geographic mobility of different types of capital are important issues for mining taxation and emerging countries’ economic development, as well as for developed countries and other industries.

Notes

- ¹ The corporate income tax rate reduction was proposed as a way to offset some of the effects of a stronger Australian currency from increased mining exports.
- ² More generally, a number of countries have been moving in the direction of “progressive” mining tax systems that impose increasing effective tax rates as profits increase.
- ³ While the Browne tax is discussed extensively in the resource literature, immediate expensing of capital equipment and no deduction for interest expense is a well-known feature of a consumption-style, valued-added business tax base. A “rent tax,” unlike most VATs, is origin-based rather than destination based.
- ⁴ Discussed in the chapter titled *Theoretical perspectives on resource tax design* in Daniel et al., 2010, p. 74.
- ⁵ *Ibid.*

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