UNIVERSITY OF CALGARY

THE SCHOOL OF PUBLIC POLICY

SPP Research Papers

Volume 6 • Issue 18 • May 2013

REPAIRING CANADA'S MINING-TAX SYSTEM TO BE LESS DISTORTING AND COMPLEX

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SUMMARY

The province of Ontario ended its most recent fiscal year with a $12 billion deficit and the Fraser Institute has calculated that the province is in worse financial shape than even the fiscally appalling state of California. One would think that a province so financially debilitated would want to avoid giving unnecessary and wasteful tax breaks to resource companies. Yet, a review of the mining-tax regimes across the country finds that Ontario's system — specifically its provincial resource allowance, which duplicates the allowances provided by Ottawa that shield miners from risk — is redundant, expensive and wasteful.

Ontario is not the only province requiring a modernization of its mining-tax regime. In every province except Nova Scotia and New Brunswick, mining firms enjoy a lower marginal rate for taxes and royalties than for non-resource companies. The inevitable result has been a distortion of investment toward mining projects that might otherwise be economically inefficient. That means that in major oil-producing provinces, such as Alberta, Saskatchewan and Newfoundland, mining investment benefits from larger tax incentives than oil and gas investment. The reasons for favouring the mining of metal over oil are at least unclear and certainly economically unjustifiable.

The federal government has already begun making several changes to its tax policies to scale back preferential and irrational inducements for mining investment, including, most recently, reducing accelerated depreciation allowances for certain mining assets and phasing out the corporate Mineral Exploration Tax Credit and the Atlantic Investment Tax Credit for resources. But Ottawa's efforts to modernize Canada's mining-tax structure can only go so far, when provinces continue to rely on what are often overly complex tax systems that have a distortionary effect on economic decisions being made by investors. The next step in modernizing Canada's mining-tax system requires provinces to start eliminating preferential and wasteful tax breaks for miners. Provincial treasuries certainly cannot afford these breaks, and neither can the Canadian economy as a whole.

[†] We wish to thank an anonymous referee and the editor, Ken McKenzie, for helpful comments.

UNIVERSITY OF CALGARY

THE SCHOOL OF PUBLIC POLICY
Documents de recherche de la SPP

Volume 6 • Numéro 18 • Mai 2013

SIMPLIFIER ET CORRIGER LE RÉGIME D'IMPÔT MINIER DU CANADA

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RÉSUMÉ

L'Ontario a terminé son tout dernier exercice financier avec un déficit de 12 milliards de dollars, et selon les calculs du Fraser Institute, la situation financière de la province est pire que celle, pourtant catastrophique, de la Californie. On pourrait croire qu'une province aussi mal en point sur le plan des finances souhaiterait éviter d'accorder des réductions d'impôt inutiles et coûteuses aux entreprises du secteur des ressources. Pourtant, en examinant les régimes d'impôt minier dans tout le pays, on se rend compte que celui de l'Ontario est redondant, coûte cher et engendre du gaspillage — en particulier dans la répartition provinciale des ressources qui a pour effet de dupliquer les allocations déjà consenties par Ottawa pour protéger les minières du risque.

L'Ontario n'est pas la seule province où la modernisation du régime d'impôt minier s'impose. Dans toutes les provinces, à l'exception de la Nouvelle-Écosse et du Nouveau-Brunswick, les entreprises minières disposent d'un taux marginal pour impôts et redevances plus faible que les sociétés de secteurs autres que les ressources. Inévitablement, il en a résulté une disproportion dans l'investissement favorable aux projets miniers, lesquels pourraient bien autrement ne pas être rentables économiquement. Ainsi, dans les principales provinces productrices de pétrole, c'est-à-dire l'Alberta, la Saskatchewan et Terre-Neuve, l'investissement dans les projets miniers est assorti d'avantages fiscaux plus substantiels que pour la production du pétrole et du gaz. Les raisons qui expliquent ce traitement de faveur accordé au métal par rapport au pétrole sont pour le moins obscures et certainement difficiles à justifier sur le plan économique.

Le gouvernement fédéral a déjà commencé à modifier ses politiques fiscales de façon à réduire ces incitatifs préférentiels et irrationnels à l'investissement minier, notamment par une mesure récente visant à diminuer la déduction pour amortissement accéléré pour certains actifs miniers, ainsi que par l'élimination progressive du crédit d'impôt pour l'exploration minière et du crédit d'impôt à l'investissement de l'Atlantique ayant trait aux ressources. Mais les efforts d'Ottawa pour moderniser la structure du régime d'impôt minier ont un effet limité si les provinces continuent de recourir à des systèmes d'imposition parfois beaucoup trop complexes qui ont pour effet d'orienter indûment les décisions économiques des investisseurs. Dans l'étape ultérieure de la modernisation du régime d'impôt minier du Canada, les provinces devront commencer à éliminer les coûteuses réductions d'impôt qui favorisent les minières. Les provinces n'ont certes pas les moyens d'accorder des réductions de ce type, pas plus que l'économie canadienne dans son ensemble.

† Nous désirons remercier un lecteur anonyme et l'éditeur, Ken McKenzie, pour leurs commentaires utiles.

INTRODUCTION

The ultimate purpose of taxation and royalty regimes is to raise government revenues to fund public goods and services. Such regimes should also aim to minimize as much as possible economic, compliance and administrative costs.

With respect to non-renewable resources, royalties are payments by private producers who are invited by governments to extract resources that are publicly owned. Governments maximize their payments by assessing a levy on the rents earned by the industry, — rents being the surplus of revenues over the economic costs of production.[1] In the presence of a rent-based royalty,[2] the producer will invest in projects until the return on exploration, development and extraction activities is equal to the economic cost of using labour and capital resources (when such returns are below costs, the producer will not take on additional production). At the margin, where returns are equal to costs, the mining firm earns no rents and therefore should, in principle, pay no rent-based royalties. Thus, royalties that fall on rents distort as little as possible the economic decisions made by resource producers.

As for the corporate income tax, governments do best by levying it evenly across business activities on a broad base so it is neutral toward business activities and sectors, and by setting it according to internationally competitive tax rates.[3] A level playing field in corporate taxation results in the best allocation of capital resources in the economy when businesses make determinations on economic, rather than tax, criteria.

Both approaches to setting royalties and corporate taxes would also be "fair" in that various business activities would be similarly treated (with non-renewable resource rents being collected by the government under royalty regimes).

Canada's mining levies — including provincial mining-tax regimes and federal-provincial corporate income tax systems — are a long way from achieving the most efficient royalty and tax systems, resulting in economic losses and unreasonable complexity. Provincial mining-tax structures are particularly distortive and unduly complex, even though they enable the government to share, to various degrees, returns, investment costs and risks, through cost allowances and the loss deductions.[4]

Many provincial mining tax (royalty) regimes provide for the immediate expensing of capital expenditures; in some cases excessive deductions or credits are given for exploration and processing. Typically, mining-tax regimes provide an indefinite carry-forward of unused deductions, with some adjustment for the time value of money by indexing the carry-forwards at a financing rate.

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1 See Jack Mintz and Duanjie Chen, "Capturing Economic Rents from Resources through Royalties and Taxes," *SPP Research Papers* 5,30 (October 2012).

2 We use the term royalty as a payment for the extraction of resources that are owned by the government. Taxes refer to other levies on resource companies such as the corporate income tax, production taxes and sales taxes that are not viewed as explicit payments for the extraction of government-owned resources. In Canada, mining royalties are often referred to as mining taxes by the Provinces and we shall do so as well.

3 Neutrality and internationally competitive tax rates were proposed as principles for corporate income taxation by the Technical Committee of Business Taxation in 1998 (see: Report, Finance Canada, 1997).

4 PriceWaterhouseCoopers, *Digging Deeper – Canadian Mining Taxation*, 2011, www.pwc.com/ca/canminingtax.

Under the corporate income tax, relatively generous write-offs are provided for certain investment expenditures including those for exploration, development and processing mining assets. Loss carryover rules are provided under the corporate income tax, such as provisions for the carry-back of losses for three years, and the carry-forward of losses for 20 years, as well as an indefinite carry-forward of exploration and development expenditures (although not indexed at an interest rate).

With these basic features, there is wide diversity across the three major mining provinces — British Columbia, Ontario and Quebec — in their corporate income tax systems. The existing system thus results in substantial economic distortions, as well as administrative and compliance costs, borne by governments and taxpayers respectively.

Governments have only recently started to address these failings in the tax and royalty regimes that target the mining industry. In the past decade, corporate tax reform initiated by the federal government has aimed at reducing the economic distortions and complexity arising from the non-neutral treatment of investment expenditures for resource companies. This reform has included unifying the income tax rates of resource and non-resource sectors (initiated in the 2004 federal budget); replacing the previous resource allowance with deductibility for provincial mining taxes (2004 budget); eliminating the corporate Mineral Exploration Tax Credit (2012 budget); and disallowing the Atlantic Investment Tax Credit (AITC) for the resource industry in Atlantic Canada (2012 budget). In its 2013 budget, the federal government announced its plan to reduce accelerated depreciation for certain mining assets.

These various reform measures have generally helped in simplifying the tax structure for mining and have improved neutrality of the overall business-tax system. To achieve greater tax efficiency and transparency for the mining industry, however, further tax reform is required. In particular, provincial mining-tax systems need to be fundamentally modernized in an orderly manner.

In this research paper, we conduct a comparative analysis across provinces to identify, as of 2012, the variation in royalty and tax structures applied to mining. We also provide a cross-industry comparison by province to determine how both tax and royalty systems impact on investment and the allocation of capital among industries and assets. We then turn to tax reform, particularly focusing on a rent-based model, to improve the existing mining-tax structure across the provinces. Based on these analyses, we conclude that most existing provincial mining taxes based on net profits should be transformed into a rent-based cash-flow tax similar to the British Columbia mining tax, while avoiding excessively generous capital-cost deductions and tax credits.

Specifically, the rent-based cash-flow mining tax would include the following features:

- Rents should be measured as the difference between sales revenues and current and capital expenditures (with no deduction for interest expense or depreciation). A presumptive deduction should be given for overhead costs based on a percentage of costs, similar to the treatment in Alberta (Table 1).
- The elimination of any super allowances or special tax credits for exploration, in favour of allowing the expensing of both successful and unsuccessful exploration costs.
- The elimination of processing allowances in favour of allowing the expensing of all depreciable assets, including processing asset expenditures, under mining taxes.

- Allowing the carry-forward of all unused deductions (losses) at an appropriate uplift factor reflecting the government's share of risk (while no longer allowing excessive uplift factors or investment allowances to carry forward unused deductions).
- Protecting the revenue base by levying a minimum tax on net sales (i.e., the selling price net of transportation and distribution costs), which should be creditable against the rent-based tax (no holidays from the mining tax would need to be provided).
- The provincial mining tax would be assessed on mining rent at a rate compatible with provincial policy-makers' judgment of their fiscal conditions and other policy concerns, such as competitiveness.

Since the existing provincial mining-tax systems already possess some features of a rent-based cash-flow tax (e.g., full expensing of most asset expenditures while disallowing financing cost), we believe transforming the system from the existing provincial mining levies in Canada to a rent-based mining-tax (royalty) system can be done with little harmful impact on mining capital investment in Canada.

As for the corporate income tax, the mining-tax base should better reflect shareholder income, similar to the approach for other industries, with the aim of assessing similar corporate tax burdens across industries. Assets should be depreciated according to their economic life, given the deductibility of interest expense from the tax base. Credits and accelerated deductions should be avoided. Exploration costs should be treated similarly to research costs to encourage discovery.

For descriptive convenience, our analysis of mining taxation is focused on metallic mining. But the analysis and related conclusions can be similarly applied to taxation on other mining products.

TAXATION OF METALLIC MINING: CROSS-PROVINCE COMPARATIVE ANALYSIS

In this section, we first summarize the existing provincial fiscal regimes for the metallic-mining industry by province, and then provide a cross-province comparison of the tax impact on capital investment, as measured by the marginal effective tax and royalty rate (METRR) for the industry. Our measure enables us to focus on tax distortions, not the share of rents earned by public and private interests that would include the overall taxes and rents earned by the industry.

Our calculation of the marginal effective tax and royalty rate (METRR) takes into account both the tax and royalty structures that impact on capital investment. It is based on the economic concept that firms in mining or other industries will keep investing until the return on investment is equal to the cost of capital invested. If we break down the cost of capital into tax and royalty cost and net-of-tax-and-royalty cost of capital, which is also the net-of-tax-and-royalty return to capital at the margin, then METRR is the proportional gap between the gross-of-tax-and-royalty rate of return to capital and the net-of-tax-and-royalty rate of return to capital.

For example, if at the margin, the net-of-tax-and-royalty rate of return to capital is six per cent, and the gross-of-tax-and-royalty rate of return in a given province for mining industry is eight per cent, then the METRR for the mining industry in this given province is 25 per cent (= (8% - 6%) / 8%). Then, another province with *identical* mining resources but a lower (or higher) overall level of tax and royalty levies may provide the same mining investor a more (or less) attractive tax regime implied by a METRR below (or above) 25 per cent. The same logic applies within the same province if tax and royalty provisions vary among mining and non-mining industries. The appendix to this paper provides a technical discussion for interested readers.

As shown in Table 1, except for British Columbia, Ontario and Quebec, the provincial corporate income tax structures applied to mining are consistent with their federal counterpart. On the other hand, there is considerable variation in provincial mining-tax regimes across Canada, ranging from a kind of "cash-flow" royalty system in British Columbia, to "mining-profit" royalty systems in Ontario and Quebec.

In the 2012 federal budget, two important changes were made with respect to the taxation of mining and petroleum industries in Canada: the phasing out of the Atlantic Investment Tax Credit by 2016 for non-renewable resource investments, and the elimination of the corporate Mineral Exploration Tax Credit by 2015.[5] The recent 2013 federal budget takes further aim at mining-tax incentives by phasing out accelerated depreciation for new mine assets and reclassifying pre-production development assets from exploration costs (that is, expensed) to development (i.e., written off at 30 per cent, on a declining-balance basis). These are significant steps that will help improve tax neutrality between mining and non-mining industries. Our analysis shows, however, that more needs to be done to the provincial mining-tax structures so as to further improve tax neutrality between mining and non-mining industries.

TABLE 1: CORPORATE INCOME TAX AND METALLIC-MINING ROYALTY PROVISIONS IN 2012 BY PROVINCE [1]

	BC	AB	SK	MB	ON	PQ	NB	NS	N&L
CORPORATE INCOME TAX PROVISIONS: **Common features: federal tax rate** = 15 per cent; CEE (Canadian exploration expenditure) is fully expensed, except for in B.C. and Quebec where additional tax credit is provided, varying according to certain criteria; CDE (Canadian development expenditure) is depreciable at 30 per cent on declining balance, except for in Quebec where CDE is fully expensed; there is a capital-cost allowance (being phased out with the 2013 federal budget) for post-production mining assets, categorized as classes 41 and 41a, with a minimum 25-per-cent capital-cost allowance (CCA) rate and up to 100 per cent for pre-production expenditures and mine expansions in excess of five per cent of sales, and this is also ring-fenced; there is an allowance for mining tax/royalty but no resource allowance, except for in Ontario where a 25-per-cent resource allowance is provided in lieu of a mining-tax allowance. There is also a tax incentive provided through flow-through shares[2] that benefit junior resource companies, which is excluded in this study, which focuses only on large corporations.									
Provincial Rate	10% [3]	10%	12%	12%	11.5%	11.9%	10% [5]	16%	14%
Special Provincial Provisions	METC: 20% (30% in pine-beetle areas) – refundable for E&D expenditure.				- Resource Allowance of 25% of profits - minimum tax.	- CDE fully expensed, - Refundable ITC of 15% to 38.75% for Quebec exploration expenditure.			

Notes:

1. *Tax rates used are those legislated by 2012 to be adopted by 2013. Recently, Quebec announced a new royalty regime which is not described here.*
2. *Flow-through shares enable exploration and development deductions to be transferred to shareholders. A federal investment tax credit is provided equal to 15 per cent of exploration expenditures. Credit rates by province are B.C. (20 per cent), Manitoba (20 per cent or 30 per cent), Ontario (five per cent) and Saskatchewan (10 per cent). Credits reduce available exploration deductions.*

[5] Refer to Budget 2012, Annex 4: Tax Measures, Business Income Tax Measures, available at http://www.budget.gc.ca/2012/plan/anx4-eng.html#BITM.

	BC	AB	SK	MB	ON	PQ	NB	NS	N&L
MININING ROYALTY/TAX PROVISIONS:									
Tax rate – First Tier (mostly based on net revenue except for N&L)	2% on net current proceeds (fully credited against the second-tier tax).	1% of pre-payout sales.	N/A	N/A	N/A	N/A	2% on revenue net of processing and transport costs (exemption for the first 2 years).	2% of net revenue if greater than 15% of net income.	15% of profit net of a royalty allowance equal to the greater of 20% of profit and the non-Crown royalties.
Tax rate – Second Tier (mostly based on profit except for N&L)	13%	12% on revenues net of accumulated costs.	10% (5% on sales up to 1m oz for precious metals or 1m mt for base metals).	Up to 17% (through a multi-tier rate schedule).	10% (5% in remote areas).	16%	16% on net profits exceeding $100k.	15% of net income if greater than 2% of net revenue.	20% on the total royalty allowance net of royalties actually paid.
Exploration	Expensed	Expensed	150%	Expensed, but 150% for off-site exploration exceeding the 3-year average.	Expensed	Expensed (125% for the north)	150% (except mineral rights that are expensed).	100% for the first 3 years, then 30%.	Expensed
Development Expenses	Expensed	Expensed	150%	20%	Expensed	Expensed	Expensed	100% for the first 3 years, then 30%.	Over life of mine.
Depreciation[4]	Super allowance of 133% for new mine expansion until 2016.	15% S.L.	100%	20%	30% S.L. or 100% of new mine assets. Processing assets: 15% S.L.	30%	Minimum of 5% to 100% for new mines or mine expansion, and 33% for other assets.	100% for the first 3 years, then 30%.	25% (100% for new mine or expansion) with the half-year convention.
Processing Allowance (in addition to depreciation allowance for processing assets)	None	None	None	20% of original cost of assets (milling, smelting and refining) Up to 65% of profits.	Asset original cost - 8% milling - 12% smelting - 16% refining - 20% North Ont. Up to 65% of profit.	Asset original cost - 7% milling - 13% smelting - 13% refining Up to 55% of profit.	Asset original cost - 8% milling - 15% smelting - 15% refining Up to 65% of profit.	Asset original cost - 8% milling - 10% smelting - 8% refining Up to 65% of profit.	Asset original cost - 8% milling - 15% smelting - 8% refining Up to 65% of profit.
Financing Allowance for carry-forwards	125% of bank rate to Cumulative Expenditure Account balance.	None	None	None	None	None	8% of un-depreciated base	None	None
Reclamation contributions	Deductible	Deductible	Deductible	Deductible	Deductible	Deductible	Deductible	N/A	Deductible
Other Provisions		10% allowance in lieu of overheads.	10-yr holiday; 150% of pre-production expenses recovered before royalties paid.	New mine holiday until payback is achieved.	No tax for first 3 years or $10 million (10 years for remote locations.	Mine-by-mine approach for duties. Refundable tax credit for losses.	15% R and D tax credit.		Max $2M/yr credit for 10 years.

Notes (cnt'd):

3. *The corporate tax rate in B.C. is increased to 11 per cent in 2013 as announced in the 2013 budget.*
4. *S.L. signifies straight-line depreciation. Otherwise, declining balance depreciation is applied.*
5. *New Brunswick is raising its corporate income tax rate to 12 per cent as of July 1, 2013 as announced in the 2013 budget.*

Based on the statutory tax/royalty provisions summarized in Table 1, Table 2 (on page 10) presents our calculation of marginal effective tax and royalty rates (METRR) for 2012 on mining capital investment by province for four scenarios:

A. The base case that represents the current tax and royalty structure by province;

B. Excluding the provincial sales tax so as to compare only the impact of the income and mining taxes across provinces (this affects British Columbia, Saskatchewan and Manitoba);

C. Including only the corporate income taxes; and

D. Including only the provincial mining royalty and/or mining taxes.

Note that the estimates below do not include the 2013 budgetary changes (we shall publish an updated 2013 table at a later time). The following are our observations, by province, drawn from this four-scenario METRR presentation with reference to the statutory tax/royalty provisions summarized in Table 1.

British Columbia

British Columbia, with its marginal effective tax rate (METRR) of -9.0 per cent for the base case, imposes the lowest effective tax rate on mining investment among the nine provinces. This can be attributed to two main factors: (1) the 20-per-cent investment tax credit under the provincial income tax for exploration and development, which, combined with the already generous federal corporate income tax features for mining, contribute to a negative tax rate of about seven percentage points (Case C), and (2) the super allowance (133 per cent) for depreciable assets under the provincial mining tax, which contribute to an additional negative tax rate of 21 percentage points (Case D).[6]

We include the former provincial sales tax in the base case since it will be reintroduced by April 2013. It is noteworthy that the provincial sales tax would offset the impact of the excessive tax credit and allowances noted above by about 14 percentage points, which can be seen by comparing Case B to the Base Case A. Note that this very high sales-tax impact is accentuated by the excessively low METRR. By excluding the generous tax preferences such as the 133-per-cent capital cost allowance for depreciable assets under the provincial income tax, the sales-tax impact in B.C. would be lower (i.e., about nine percentage points).

It is noteworthy that, unlike corporate income tax that is based on profit generated from capital inputs, the provincial sales tax is a direct tax on capital inputs used for generating income. For every dollar amount of capital input, the applicable provincial sales tax is a direct addition to the cost of capital, while the income tax is a tax on profit net of the income tax allowances (e.g., interest deduction and depreciation allowance). Therefore, sales tax on capital purchases has a significant impact on METRR despite the government's selective exemption for many types of machinery and equipment from provincial sales tax. We see this impact by comparing METRRs between Case B and the Base Case A for British Columbia, and will see it again below for Manitoba and Saskatchewan. Also note that the sales-tax rates in our METRR model are not statutory but are the effective tax rates by class of depreciable assets, which are based on government statistics on provincial-sales-tax revenue collected from purchases of capital goods.

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[6] The implication of a negative effective tax rate is that the investments have tax losses for marginal investments. Tax losses can be used to shelter income from infra-marginal investments or to reduce taxes or royalties in other periods.

Alberta

Metallic mining in Alberta is taxed at the second-highest level among all provinces. This is mainly due to Alberta's one-per-cent revenue-based tax, which contributes over 20 per cent (or three percentage points) to its overall METRR (12.5 per cent), and the smallest provincial allowance (15 per cent, straight-line based) for depreciable assets under the mining tax. Changing the latter to 100 per cent under the mining tax, as many other provinces do, would cut the METRR by more than 30 per cent, or almost four percentage points, to 8.7 per cent.

The most noteworthy feature of Alberta's mining fiscal regime is that it does not provide any tax credit and/or special allowances that are typically found in other provinces. Alberta has the simplest mining-tax structure, which can be easily converted to a rent-based tax by fully expensing capital expenditures (see above).

Saskatchewan

Saskatchewan has the third-highest METRR (11 per cent) among the nine provinces, despite having the lowest mining-tax rate (10 per cent) and the most generous mining-tax allowance (150 per cent) for Canadian exploration expenditure, or CEE, and Canadian development expenditure, or CDE. The main contributor to this relatively high provincial METRR is the provincial sales tax. By excluding PST, the METRR would be less than four percentage points (Case B), a combined result of the aforementioned favourable mining-tax provisions that result in a negative METRR of 2.3 per cent (Case D) and the income tax benefits in general that result in a METRR of 4.6 per cent (Case C).

Manitoba

Manitoba mining is the most heavily taxed among all provinces. The provincial sales tax is again largely responsible for this, accounting for over seven percentage points in the METRR calculation (comparing Case A with Case B) — a situation similar to that in Saskatchewan. The other contributors to its relatively high METRR include its 17-per-cent mining tax, the highest of all of the provinces, and its relatively low depreciation allowance (20 per cent), for both development expenditures, and depreciable capital under the mining tax. Also, its seemingly generous 150-per-cent allowance for exploration is actually provided at an effective rate of only 104 per cent because it applies only to incremental investment based on a three-year moving average. Coupled with the highest mining-tax rate in the country and a relatively high corporate income tax rate, Manitoba's mining-tax regime is among the least efficient in Canada. Ironically, Manitoba also provides a mining-tax holiday for new mines and some relief for lower-profit operators through a three-tier mining-tax rate scheme. However, we excluded such selective tax incentives from our analysis.

Ontario

Ontario has the second-lowest level of provincial taxes on the mining industry, behind British Columbia. The main feature of its tax regime is the provincial resource allowance, which more than doubles the mining-tax deduction under the federal income tax. This feature complicates income tax administration and compliance for a tax savings of about two percentage points at the margin for investors. As mentioned earlier, without any additional tax preferences, the income tax system already provides sufficient tax support to shield the risk in mining investment; additional write-offs for the mining industry are therefore not only unnecessary but also wasteful, particularly given Ontario's present financial constraints.

Quebec

In 2012 Quebec has the third-lowest METRR (4.6 per cent) for mining, despite its statutory mining-tax rate (16 per cent) being the second-highest among the provinces. The main contributor to its rather low METRR is a generous provincial investment tax credit for exploration expenditures ranging from 15 per cent (which is applied in our METRR calculation) to 38.75 per cent, depending on the corporation's status, the type of resource, and the location of the expenditures. Considering only the corporate income tax provisions in conjunction with this tax credit for exploration, the METRR would be a negative 1.2 per cent (Case C). On the other hand, including only the provincial mining-tax provisions, the METRR in Quebec would be close to seven per cent (Case D). The province has recently introduced in its 2012 November budget a 10-year tax holiday for qualifying large projects, with the amount of income eligible for the holiday limited to 15 per cent of invested capital.[7] Again, we exclude such conditional tax concessions from our METRR calculation and analysis. A new highly complex royalty regime has been announced recently that intends to raise revenue but in a highly inefficient manner.

New Brunswick, Nova Scotia and Newfoundland and Labrador

These three Atlantic provinces share the middle ground of METRRs among the nine mining provinces, with a range of seven to nine per cent.[8] However, they do not share much similarity in their mining-tax provisions except that all provide some fine-tuned processing allowances under the profit-based mining tax.

New Brunswick, with the highest METRR (8.6 per cent) among the three Atlantic provinces, collects a two-per-cent royalty based on revenue and a 16-per-cent mining tax on profit, with the former being deductible for the purpose of calculating the latter. Excluding the super allowance (150 per cent) for Canadian exploration expenses and the processing allowance provided under the mining-tax regime, while making the two-per-cent royalty creditable against the 16-per-cent mining tax, the METRR would drop from nine per cent (the base case) to below seven per cent.

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[7] When the limit is effective, the tax holiday is equivalent to a 15-per-cent investment allowance. As discussed in the literature, tax holidays are a very expensive method of encouraging investment compared to other policies (see J. Mintz and T. Tsiopolous, "The Effectiveness of Corporate Tax Incentives for Foreign Investment in the Presence of Tax Crediting," *Journal of Public Economics* 55, 2 (1994): 233-255).

[8] Note that we excluded the Atlantic Investment Tax Credit in our METRR calculation since it will be phased out by 2016 for resource sectors. By including the full AITC, the METRRs for these three provinces are around negative 30 per cent, indicating substantial tax support.

In Newfoundland and Labrador, the mining tax is two-tiered: a 15-per-cent-of-profit tax, net of a royalty allowance that is equal to the greater of 20 per cent of profit and the non-Crown royalties, and a 20-per-cent tax on the total royalty allowance net of royalties actually paid. Combining these two levies, and ignoring the non-Crown royalties,[9] the effective mining-tax rate is 16 per cent (= 15% x 80% + 20% x 20%), which is similar to that of New Brunswick. Unlike New Brunswick, Newfoundland and Labrador does not collect a revenue-based royalty and hence incurs a slightly lower METRR (8.4 per cent) given its higher corporate income tax rate (14 per cent) compared to New Brunswick (10 per cent).

The mining-tax regime in Nova Scotia differs from those in both New Brunswick and Newfoundland and Labrador in that the two-per-cent royalty is imposed like a minimum tax. That is, miners are subject to either the two-per-cent royalty based on net revenue, or 15 per cent of net profit, whichever is greater. Applying only the 15-per-cent mining tax, the METRR in Nova Scotia (7.1 per cent) is the lowest among the three Atlantic provinces despite its corporate income tax rate (16 per cent) being the highest among them.

Further decomposition shows that New Brunswick appears to have the lowest METRR in 2012 associated with only income tax provisions (4.1 per cent, Case C) and the highest METRR associated with only the provincial mining tax (two per cent in Case D, still a very low rate), compared to the other two Atlantic provinces.

[9] Non-Crown royalty is not common given that "the mineral rights on more than 90% of Canada's land are currently owned by governments," according to Natural Resources Canada (http://www.nrcan.gc.ca/minerals-metals/policy/legislation-regulations/3707).

TABLE 2: EFFECTIVE TAX AND ROYALTY RATE FOR METAL MINING BY PROVINCE AND BY TYPE OF ASSETS, 2012

	BC	AB	SK	MB	ON	PQ	NB	NS	NF
A. Base Case									
Depreciable assets	4.6	19.0	27.9	42.7	4.7	22.9	7.5	10.6	13.4
Land	13.0	12.8	13.3	15.4	10.3	15.0	13.9	17.3	16.3
Inventory	13.5	13.2	13.8	15.9	10.8	15.6	14.4	17.8	16.9
Aggregate/excl. E&D	7.5	17.3	24.1	36.6	6.6	20.8	9.7	12.9	14.5
CEE	-32.8	4.5	-7.9	-3.3	-6.1	-24.3	3.0	-2.8	-2.6
CDE	-24.2	10.3	-0.8	7.9	0.8	2.1	16.9	5.3	7.8
Aggregate	**-9.0**	**12.5**	**11.0**	**20.6**	**2.0**	**4.6**	**8.6**	**7.1**	**8.4**
B. Excluding PST									
Depreciable assets	-38.1	19.0	10.0	25.8	4.7	22.9	7.5	10.6	13.4
Land	13.0	12.8	13.3	15.4	10.3	15.0	13.9	17.3	16.3
Inventory	13.5	13.2	13.8	15.9	10.8	15.6	14.4	17.8	16.9
Aggregate/excl. E&D	-17.0	17.3	11.2	23.1	6.6	20.8	9.7	12.9	14.5
CEE	-32.8	4.5	-7.9	-3.3	-6.1	-24.3	3.0	-2.8	-2.6
CDE	-24.2	10.3	-0.8	7.9	0.8	2.1	16.9	5.3	7.8
Aggregate	**-22.8**	**12.5**	**3.7**	**13.0**	**2.0**	**4.6**	**8.6**	**7.1**	**8.4**
C. Including only corporate income taxes									
Depreciable assets	6.7	6.7	7.5	7.5	3.9	7.5	6.7	9.5	8.5
Land	9.8	9.8	10.7	10.7	6.8	10.7	9.8	12.8	11.7
Inventory	10.2	10.2	11.2	11.2	7.2	11.2	10.2	13.3	12.2
Aggregate/excl. E&D	7.8	7.8	8.7	8.7	4.9	8.6	7.8	10.7	9.6
Canadian Exploration Expense	-27.8	-2.3	-2.5	-2.5	-5.7	-20.5	-2.3	-2.8	-2.6
Canadian Development Expense	-20.8	3.4	3.7	3.7	0.1	1.6	3.4	4.4	4.1
Aggregate	**-6.9**	**4.1**	**4.6**	**4.6**	**1.0**	**-1.2**	**4.1**	**5.7**	**5.1**
D. Including only provincial mining taxes									
Depreciable assets	-64.2	12.8	0.0	20.1	-1.5	16.2	-3.7	-4.3	1.3
Land	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inventory	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aggregate/excl. E&D	-37.6	9.3	0.0	14.9	-1.0	11.9	-2.6	-3.0	0.9
Canadian Exploration Expense	0.0	6.7	-5.2	-0.9	0.0	0.0	5.3	0.0	0.0
Canadian Development Expense	0.0	6.7	-5.5	3.9	0.6	0.0	13.3	0.0	3.5
Aggregate	**-21.1**	**8.1**	**-2.3**	**8.6**	**-0.5**	**6.7**	**2.0**	**-1.7**	**1.0**

Looking at the overall picture, the main findings from Table 2 are the following.

First, the fiscal regime for mining, including both corporate income tax and provincial mining taxes, heavily distorts investment and production decisions due to the differential treatment of expenditures (mainly exploration, development and post-production capital assets), as demonstrated by the great variation in METRR among different types of assets (base case).

When only the corporate income tax is included (Case C), the upfront expensing of the majority of the depreciable mining assets (class 41a) results in a rather low METRR for depreciable assets (i.e., around seven per cent for most provinces). However, the METRR for development expenditures is even lower — around three to four per cent, except for British Columbia, Ontario and Quebec, where the counterpart METRRs are well below three per cent due to additional tax support — because of the fast write-off (30 per cent) for development expenses. The METRR for exploration is negative due to full expensing.

Provincial mining-tax systems add further tax distortions among different types of expenditures (Case D). The most noticeable impact here is the highly negative METRR (-64 per cent) for depreciable assets in British Columbia, which is due to the 133-per-cent super allowance, and the negative METRR of five per cent for both exploration and development in Saskatchewan, which is attributable to its 150-per-cent super allowance for these two expenditures. To a lesser degree, all of the other provinces display uneven METRRs among their different asset expenditures. For example, Alberta, Manitoba and Quebec all incur a relatively high mining-tax cost for their depreciable assets as they disallow a full write-off for these assets under the mining-tax provisions.

Second, provincial sales taxes that are not harmonized with the federal GST, such as those in British Columbia, Saskatchewan and Manitoba, are counterproductive with respect to the excessive tax support for mining investment (Case B compared to the base case). As pointed out earlier, the overall tax cost associated with PST amounts to over seven percentage points of the overall METR in Saskatchewan and Manitoba and 14 percentage points in B.C. In other words, harmonizing PST with GST in these provinces can provide substantial room for reducing preferential tax treatment for mining investment without increasing the tax cost for the mining sector from its existing level as measured by the METRR.

Third, the federal income tax system provides sufficient tax support for exploration, which is justifiable on risk-sharing grounds. On the other hand, the depreciation allowance for less-risky development expenditures is too generous since deductions are taken before income is earned; expensing for the majority of depreciable mining assets introduces an additional tax preference that does not seem justified. Against this baseline, additional tax preferences such as the investment tax credit in British Columbia and Quebec and resource allowance in Ontario provide excessive tax support to mining as reflected by the highly negative METRR for Canadian exploration expenses (Case C). Such additional tax support is an unnecessary drain on public revenue.

Finally, the provincial mining tax varies widely across provinces (Case D) from providing overblown support to mining investment (e.g., British Columbia and, to a lesser degree Saskatchewan, Nova Scotia and Ontario) to less support among the other provinces. In Quebec, the relatively high METRR associated with its mining-tax provisions is largely offset by the generous tax credit for income tax purposes (see above); the result is the relatively low overall METRR of 4.6 per cent (base case) in 2012.

TAX IMPACT ON COST OF CAPITAL: METALLIC MINING VERSUS OTHER INDUSTRIES

The above analysis shows that the diverse set of provincial mining-tax regimes work against tax neutrality across different asset expenditures and provinces. Moreover, relative to other sectors, the mining industry is, in general, favourably treated both by provincial mining-taxes and under the corporate income tax system. Table 3 provides METRR comparisons by asset type and by province across three sectors: metallic mining, oil and gas, and non-resource industries as a whole.

TABLE 3: EFFECTIVE TAX AND ROYALTY RATES FOR METAL MINING BY PROVINCE AND BY TYPE OF ASSETS IN COMPARISON WITH THOSE FOR OIL AND GAS AND NON-RESOURCE INDUSTRIES, 2012

	BC	AB	SK	MB	ON	PQ	NB	NS	NF
Metallic Mining*									
Depreciable	4.6	19.0	27.9	42.7	4.7	22.9	7.5	10.6	13.4
Land	13.0	12.8	13.3	15.4	10.3	15.0	13.9	17.3	16.3
Inventory	13.5	13.2	13.8	15.9	10.8	15.6	14.4	17.8	16.9
Aggregate/excl. E&D	7.5	17.3	24.1	36.6	6.6	20.8	9.7	12.9	14.5
Canadian Exploration Expense	-32.8	4.5	-7.9	-3.3	-6.1	-24.3	3.0	-2.8	-2.6
Canadian Development Expense	-24.2	10.3	-0.8	7.9	0.8	2.1	16.9	5.3	7.8
Aggregate	**-9.0**	**12.5**	**11.0**	**20.6**	**2.0**	**4.6**	**8.6**	**7.1**	**8.4**
Oil and Gas**									
Depreciable	29.5	21.9	33.7	NA	NA	NA	NA	34.5	67.5
Inventory	23.2	23.2	26.4	NA	NA	NA	NA	32.1	32.1
Aggregate/excl. E&D	29.1	22.0	33.2	NA	NA	NA	NA	34.5	67.5
Canadian Exploration Expense	27.7	48.4	36.7	NA	NA	NA	NA	-6.9	6.4
Canadian Development Expense	32.5	51.8	41.2	NA	NA	NA	NA	-16.5	-3.3
Aggregate	**30.0**	**40.3**	**37.1**	**NA**	**NA**	**NA**	**NA**	**0.9**	**12.9**
Non-Resource Industries***									
Depreciable	31.1	18.1	27.3	29.9	20.4	16.0	-1.1	0.5	8.3
Land	9.8	9.8	10.6	10.7	10.3	10.7	9.8	12.7	10.8
Inventory	22.4	22.3	23.5	24.1	23.2	24.1	22.4	27.9	23.5
Aggregate/excl. R&D	27.7	17.9	25.2	27.1	19.8	16.9	4.6	7.7	11.2
R&D****	-48.8	-49.5	-54.3	-59.6	-44.8	-55.0	-55.8	-54.4	-56.3
Aggregate*****	**24.6**	**15.2**	**22.0**	**23.6**	**17.2**	**14.0**	**2.2**	**5.2**	**8.5**

* *Same as the base case in Table 2.*

** *Adopted from Jack Mintz and Duanjie Chen, "Capturing Economic Rents from Resources through Royalties and Taxes," SPP Research Papers 5, 30 (October 2012).*

*** *Adopted from Jack Mintz and Duanjie Chen, "The 2012 Corporate Tax Competitiveness Ranking: A Canadian Good News Story," SPP Research Papers 5, 28 (September 2012); except for the numbers related to R&D (see below).*

**** *Adopted from K. J. McKenzie, "The Big and the Small of Tax Support for R&D in Canada," SPP Research Papers 5, 22 (July 2012): Table 3: R&D METRS, Large Corporations, Post-Budget 2012, "METR on R&D."*

***** *It is a weighted average between the aggregated METR excluding R&D and that on R&D assuming the share of R&D in the overall non-resource capital investment is four per cent, an estimate based on K. J. McKenzie et al., "The Calculation of Marginal Effective Tax Rates," Working Paper 97-15, prepared for the Technical Committee on Business Taxation (May 1998): Table A.5.1.*

Several findings can be drawn from this comparison.

First, the mining industry faces a lower METRR than that for non-resource industries as a whole except in the three Atlantic provinces (where the relatively low METRR for mining is higher than, or similar to, that for non-resource industries). This is mainly attributable to two factors:

(1) The expensing for the majority of depreciable assets used for mining (i.e. class 41a) contributes to a lower METRR on tangible assets (i.e. the aggregated METRR excluding exploration and development), unless that effect is offset by other tax measures such as those in Manitoba, Quebec and the three Atlantic provinces. In Manitoba and Quebec, the higher METRR for tangible mining assets compared to that for non-resource industries is mainly attributable to their rather low depreciation allowances — 20 per cent and 30 per cent respectively — under the mining tax. In the three Atlantic provinces, the existing 10 percent AITC for non-resource manufacturing and processing activities is more generous than expensing for mining assets.

(2) The intangible assets (e.g., exploration and development in mining and R&D in non-resource industries), which are taxed much less than tangible assets, account for a much greater share in mining capital assets (e.g., 44 per cent in exploration and development) than in non-resource industries (e.g., an average of below four per cent in R&D) and hence contribute to a much lower aggregate METR for mining than that for non-resource industries.[10]

Second, in the five major oil-producing provinces, the METRR for the mining industry is generally lower than that for the oil and gas industry, except in Nova Scotia. There are two main reasons for this METRR gap between the two resource sectors: (1) expensing for the majority of depreciable mining assets (i.e., class 41a), which is not available to the oil and gas industry, and (2) the generally much higher royalty/tax rates for oil and gas than those applied to the mining industry. In Nova Scotia, these two factors are more than offset by its greater support for oil production through the excessively generous return allowance provided under the oil and gas royalty system.[11]

Two questions arise from the above findings: (1) is it justifiable to fully expense the majority of depreciable mining assets (i.e., class 41a) for corporate income tax purposes?[12] And, (2) does the current mining tax allow a proper sharing of mining rent between the government and the miners? From the perspective of tax efficiency, our answers to both questions are "no." Tax efficiency requires similar marginal tax burdens across industries and assets to achieve a neutral application of the tax and royalty systems across business activities. Neutrality not only leads to less complexity in the fiscal system but also a better allocation of resources in the economy. Table 3 shows that Canada's tax system favours the mining industry relative to other sectors, except in the three Atlantic Provinces where the AITC provides (unjustified) tax preferences for manufacturing and forestry. It also leads to distortions in production by favouring some asset expenditures over others.

It is noteworthy that Canada is not alone in taxing mining more lightly than other industries. According to a recent UBS Investment Research report on global mining taxation in 2009,[13] the combined effective tax rate based on earnings before interest and tax (EBIT) was 65 per cent for the oil sector and 40 per cent for mining. This research report goes further to predict: "the push for higher taxes in mining follows a strong established trend in the oil industry where national resource tax take is rising." We do not assess the appropriate total burden on the industry since the marginal effective tax and royalty rates only provide information on tax distortions, not total revenue collection. Our focus is how to improve the efficiency and strengthen the long-term stability of our mining-tax system for the 21st century.[14]

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[10] Our calculation of the METR for the non-resource sector including R&D is a proxy, assuming that the share of R&D in overall capital investment by non-resource industries as a whole is four per cent across provinces. In reality, there can be significant variation in this R&D share by province. But such variation would not alter our observations on this issue in general.

[11] Jack Mintz and Duanjie Chen, "Capturing Economic Rents from Resources through Royalties and Taxes," (October 2012).

[12] Obviously, in the recent federal budget, the minister of finance did not believe it justifiable to provide expensing for the majority of depreciable assets under the corporate income tax.

[13] UBS Limited, "Global Mining Taxation," May 18, 2010, www.ubs.com/investmentresearch.

[14] For a well-articulated speech that promotes a rent tax for resource taxation in layman's language, refer to an address to the 2009 Minerals Council of Australia's Biennial Tax Conference by David Parker (the executive director of the Revenue Group at the Treasury of Australia): "Tax Reform –Future Direction," September 17, 2009, http://taxreview.treasury.gov.au/content/Content.aspx?doc=html/speeches/08.htm.

TRANSFORMING THE EXISTING PROVINCIAL MINING TAX TO A RENT-BASED TAX

In a recent research paper, we recommended a *clean* rent-based tax for the oil and gas industry in Canada. "By clean, we mean that all the costs incurred by the oil producer would be expensed or carried over at a return allowance matching a riskless financing cost, with offsets provided to avoid interactions with the corporate income tax."[15] We believe this same recommendation is applicable to the mining industry.

A standard rent-based cash-flow mining tax should feature the following:

- Rents should be measured as the difference between sales revenues net of current and capital expenditures (with no deduction for interest expense or depreciation). A presumptive deduction should be given for overhead costs based on a percentage of costs, similar to the treatment in Alberta (Table 1).
- The elimination of the super allowance for exploration (eg., 150 per cent write-off) in favour of expensing (100 per cent write-off).
- The elimination of processing allowances in favour of a full allowance for all depreciable assets, including processing-asset expenditures that are aimed at processing mineral ores not beyond the prime-metal stage.
- Carry-forward of all unused deductions (losses) at a government bond rate with no higher uplift reflecting risks already shared by the government. Unused deductions could be applied to mining profits from other projects to ensure that governments not only tax income, but also share losses.
- A proper level of minimum tax on net sales (i.e., the selling price net of transportation and distribution costs), which is creditable against the rent-based tax and, hence, no holiday of any kind is necessary for this minimum tax.
- The provincial mining tax would be assessed on mining rent at a rate compatible with provincial policy-makers' judgment of their fiscal conditions.

A close version of such a rent tax is Australia's Minerals Resource Rent Tax (MRRT), which took effect July 1, 2012.[16] It applies only to the mining of iron ore and coal, with an effective rate of 22.5 per cent — the result of a nominal rate of 30 per cent less a 25-per-cent extraction allowance to recognize the use of specialist skills. Its main deviation from the standard rent tax specified above includes an uplift factor that is seven percentage points higher than the long-term government bond rate (LTBR). By applying an uplift factor equivalent to the normal LTBR, rather than the LTBR plus seven percentage points, our estimate of Australia's METRR for mining would be 15 per cent.[17] This *presumed* METRR for Australian miners is still much

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[15] Jack Mintz and Duanjie Chen, "Capturing Economic Rents from Resources through Royalties and Taxes," (October 2012).

[16] Refer to http://www.futuretax.gov.au/content/Content.aspx?doc=FactSheets/resource_tax_regime.htm.

[17] The actual METRR simulating the Australia tax regime for mining, including both its corporate income tax and Mineral Resource Rent Tax, is reduced by the overly generous uplift provided under its MRRT. See Jack Mintz, "Evaluation of the Business Tax Recommendations of the Henry Review and the Australian Government Response," in *Australia's Future Tax System: Prospects After Henry*, ed. Chris Evans, Richard Krever and Peter Mellor (Sydney: Thomson-Reuters, 2010).

lower than that for the non-resource sectors (26 per cent) in Australia, but much higher compared to those for Canadian miners (Tables 2 and 3). This is mainly because, in Australia,[18] the depreciation allowance under the income tax is largely in line with the useful life of depreciable assets. In contrast, the majority of depreciable mining assets in Canada can be fully written off, regardless of their useful lives. The other contributor to the presumed higher METRR in Australia is the relatively high effective mining-tax rate in Australia (22.5 per cent) compared to those in Canada (ranging from 10 to 17 per cent, by province).

British Columbia also adopted a variant of the rent tax in terms of full expensing. The caveat within this province's mining tax is its super allowance (133 per cent) for depreciable mining assets. As explained earlier, this excessive mining-tax allowance, combined with the investment tax credit for exploration and development under the provincial corporate income tax, results in an effective negative tax at the margin, as measured by the negative-nine-per-cent METRR. By excluding both the super allowance for depreciable assets and the income tax credit for exploration and development, the METRR in British Columbia would rise to about 13 per cent, which is still very low compared to that for non-mining sectors (30 per cent for oil and gas and 25 per cent for non-resource industries, as shown in Table 3).

Table 4 presents four sets of METRR simulations in addition to the base case that is the same as the base case in Table 2.

The first set of METRRs in Case A simulates the following changes in the existing corporate income tax structure for mining: unifying the provincial tax bases with the federal one — which includes eliminating all the provincial investment tax credits (British Columbia and Quebec) and additional allowances under the corporate income tax (i.e., the full expensing for Canadian development expenditures in Quebec) and replacing Ontario's resource allowance with deductibility of mining taxes — and reducing the existing full allowance for the depreciable mining assets (i.e., Class 41a) under the corporate income tax to a 25 per cent annual allowance, the same as that for Class 41 in general. This would unify the corporate income tax bases across provinces and, hence, alleviate the complexity within the corporate income tax for mining, particularly among the three major mining provinces (B.C., Ontario and Quebec). By reducing the tax depreciation allowance for the asset class 41a from 100 per cent to 25 per cent, which is closer to its economic depreciation rate — assuming a useful life of seven years for the average mine — it would also significantly lessen the sectoral tax distortion favouring the mining industry over non-mining industries.

Case B is built on Case A to further simulate four changes that transform the existing provincial mining taxes to a rent-based cash-flow tax for all provinces: (1) equalizing all the asset allowances under provincial mining taxes to 100 per cent — which implies eliminating the super allowance for various assets in B.C., Saskatchewan, Manitoba and New Brunswick — while raising any allowance that is below 100 per cent for development and/or depreciable assets, including those for processing capital in Alberta, Manitoba, Ontario, Quebec and Newfoundland to 100 per cent, and eliminating additional processing allowances; (2) making all the revenue-based royalty rates — such as those in Alberta (one per cent) and New Brunswick (two per cent) — creditable against the existing profit-based mining tax, as is the

[18] Refer to Table 2 in Duanjie Chen and Jack Mintz, "2012 Annual Global Tax Competitiveness Ranking — A Canadian Good News Story," *SPP Research Papers* 5, 28 (September 2012).

case in Nova Scotia; (3) providing an uplift factor equal to the risk-free government long-term bond rate for carrying forward any tax losses; and (4) raising all the existing profit-based mining-tax rates to 25 per cent. The first three changes would essentially reformulate the existing mining taxes into being a rent-based tax. Raising the existing, widely varied mining-tax rates to 25 per cent is intended to improve tax efficiency or neutrality. That is, by raising the provincial mining-tax rate and, hence, the METRR for mining, tax neutrality across industries would be improved.[19, 20]

The final case, Case C, excludes the provincial sales tax that is not harmonized with the federal GST. This is relevant only to three provinces: B.C., Saskatchewan and Manitoba. The earlier analysis showed that the METRR impact of such provincial sales taxes under the existing mining fiscal regimes is over seven percentage points in Saskatchewan and Manitoba, and about 14 percentage points in B.C. After transforming the existing mining fiscal regimes to a system that combines a more neutral corporate income tax structure and a rent-based provincial mining tax as simulated through Cases A and B, the METRR impact of PST also drops to well below seven percentage points in all three provinces, as indicated by the comparison between Case B and Case C.

[19] Although the rent-based royalty in principle does not distort investment decisions (the effective royalty rate on marginal investments is zero), it will distort the marginal decision due to interactions with the corporate income tax (see Jack Mintz and Duanjie Chen, "Capturing Economic Rents from Resources through Royalties and Taxes," (October 2012)).

[20] The only exception would be in the three Atlantic provinces, where the AITC is still available for manufacturing and forestry industries, which contributes to the existing, much lower METR for the non-resource industries as a whole. From our point of view, the AITC has not been an effective tax tool for its purposes and its complete elimination will help improve tax efficiency in the Atlantic provinces.

TABLE 4: METRR SIMULATIONS – REFORMING MINING TAXATION IN CANADA

	BC	AB	SK	MB	ON	PQ	NB	NS	NF
Base Case									
Depreciable	4.6	19.0	27.9	42.7	4.7	22.9	7.5	10.6	13.4
Land	13.0	12.8	13.3	15.4	10.3	15.0	13.9	17.3	16.3
Inventory	13.5	13.2	13.8	15.9	10.8	15.6	14.4	17.8	16.9
Aggregate/excl. E&D	7.5	17.3	24.1	36.6	6.6	20.8	9.7	12.9	14.5
Canadian exploration expense	-32.8	4.5	-7.9	-3.3	-6.1	-24.3	3.0	-2.8	-2.6
Canadian development expense	-24.2	10.3	-0.8	7.9	0.8	2.1	16.9	5.3	7.8
Aggregate	**-9.0**	**12.5**	**11.0**	**20.6**	**2.0**	**4.6**	**8.6**	**7.1**	**8.4**
Case A: Reform Corporate income taxes									
Depreciable	24.3	33.0	40.3	51.4	25.1	37.3	26.0	32.0	32.4
Land	13.0	12.8	13.3	15.4	12.2	15.0	13.9	17.3	16.3
Inventory	13.5	13.2	13.8	15.9	12.7	15.6	14.4	17.8	16.9
Aggregate/excl. E&D	21.3	28.0	34.2	44.3	21.8	32.0	22.9	28.2	28.4
Canadian exploration expense	-2.3	4.5	-7.9	-3.3	-2.3	-2.5	3.0	-2.8	-2.6
Canadian development expense	4.0	10.3	-0.8	7.9	3.8	4.5	16.9	5.3	7.8
Aggregate	**11.8**	**18.5**	**16.7**	**25.0**	**12.0**	**17.8**	**16.0**	**15.7**	**16.2**
Case B: Further Reform Provincial Mining Taxes									
Depreciable	44.7	31.2	43.9	47.6	31.2	33.3	31.2	37.8	35.6
Land	16.7	16.7	18.1	18.1	16.7	18.0	16.7	20.9	19.5
Inventory	17.2	17.2	18.6	18.6	17.2	18.6	17.2	21.5	20.1
Aggregate	38.6	27.5	38.1	41.3	27.5	29.5	27.5	33.6	31.6
Canadian Exploration Expense	-2.3	-2.3	-2.5	-2.5	-2.3	-2.5	-2.3	-2.8	-2.6
Canadian Development Expense	4.8	4.8	5.2	5.2	4.8	5.2	4.8	6.2	5.7
Aggregate	**21.6**	**15.4**	**21.4**	**23.1**	**15.4**	**16.5**	**15.4**	**18.8**	**17.7**
Case C: Case B excluding PST									
Depreciable	31.2	31.2	33.4	33.4	31.2	33.3	31.2	37.8	35.6
Land	16.7	16.7	18.1	18.1	16.7	18.0	16.7	20.9	19.5
Inventory	17.2	17.2	18.6	18.6	17.2	18.6	17.2	21.5	20.1
Aggregate/excl. E&D	27.5	27.5	29.6	29.6	27.5	29.5	27.5	33.6	31.6
Canadian Exploration Expense	-2.3	-2.3	-2.5	-2.5	-2.3	-2.5	-2.3	-2.8	-2.6
Canadian Development Expense	4.8	4.8	5.2	5.2	4.8	5.2	4.8	6.2	5.7
Aggregate	**15.4**	**15.4**	**16.6**	**16.6**	**15.4**	**16.5**	**15.4**	**18.8**	**17.7**

Note:

(1) The base case is the same as that in Table 2 and corresponds to the existing tax provisions, including the announced changes, such as reversing sales-tax harmonization in B.C.

(2) Case A includes two major changes under the corporate income tax: unifying all the provincial tax bases with the federal base and replacing the full allowance for capital class 41a with a 25-per-cent annual allowance.

(3) Case B replaces the existing provincial mining taxes with a rent-based tax of 25 per cent across all provinces, against which any revenue-based royalty is creditable, and provides an uplift factor equal to the long-term government bond rate.

(4) Case C is the same as Case B except it excludes provincial sales tax in B.C., Saskatchewan and Manitoba.

With the aforementioned changes applied to the existing tax regimes for the mining industry, as simulated in Table 4, the variation in METRR for mining across provinces could be significantly reduced, which in turn would facilitate more efficient capital allocation among provinces within the mining industry. A careful look at the table also shows that the variation in METRR, after the reforms we desire as simulated in the table, can be directly linked to the variation in the provincial corporate income tax rates (Case C) and the additional tax cost imposed by the provincial sales taxes that are not harmonized with the federal GST.

CONCLUSION

Recent federal and provincial budgets have been scaling back certain incentives for the mining industry. In our view, this is the right direction for policy, but much more needs to be done. Provincial mining-tax systems are highly distortionary and complex, resulting in sub-par profitability due to excessive investment in certain tax-favoured assets. Both the federal and provincial corporate income tax regimes need to be improved to create a more level playing field among business activities.

Compared to reform-minded peers — such as Australia, Norway and the United Kingdom, all of which have introduced a rent-based tax regime for their resource industries — we need to improve the efficiency and simplicity of our tax and royalty regimes for mining in relation to other industries. From our point of view, and along with all the concerns ranging from environment to public-revenue needs, economic efficiency is an urgent issue to be addressed when it comes to how we tax the mining industry compared to non-mining industries.

Two steps may be taken to improve efficiency of the overall tax system. First, the special preferential treatment under the corporate income tax system given to the mining industry (e.g., the special tax credit and the generous depreciation allowance for mining investment) should be eliminated gradually. And secondly, the provincial mining-tax systems should be reformed so as to create a rent-based cash-flow tax, which would strike an adequate split of the economic rent between the government and the miners while fully recognizing investment risks in mining industry.

APPENDIX

THE METALLIC-MINING METRR MODEL

This appendix describes the underlying methodology used to build the METRR model for metallic-mining sectors in nine Canadian provinces: British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, Quebec, New Brunswick, Nova Scotia and Newfoundland and Labrador. Despite excessive complexity and great diversity among these nine provinces in their mining-tax structures, and allowances provided under the provincial income tax systems, we managed to build a generic METRR model that is capable of capturing the majority of the provincial systems with the exception of Ontario, which has maintained the resource allowance that has been eliminated by the federal government and all other provinces.

The next two sections outline, respectively, the structure of the generic METRR model and the model for Ontario. Table 1A in the third section provides tax parameters for individual terms appearing both in the generic model and those representing Ontario. The statutory tax and royalty provisions associated with these metallic mining models are provided in Table 1 of the text.

Generic Model

The following equations were used for estimating the cost of capital, inclusive of taxes, for each type of investment expenditure. The full derivation is provided upon request.[21]

EXPLORATION:

(1) $$(P_T - C_T')\, f_t' = (1+r)^{(T-t)}(1- \varphi_p - \tau^* Z_m)/[(1-g/PCM)(1- \tau^*)]$$

Where:

φ_p = combined provincial investment tax credit (ITC) for qualifying exploration and development and ranges from zero to over 20 per cent [For example, φ_p captures Quebec's refundable tax credit, ranging from 15 per cent to 38.75 per cent depending on the corporation's status, the type of resource and the location of expenditures, under the income tax.]

τ = Statutory mining tax rate.

τ^* = $\tau(1+r)^{-(T-t-1)}$, with τ = real financial cost, and $T\text{-}t = 4$ is time span between starting exploration and the commencement of production and $T\text{-}t = 2$ is that for development (hence τ^* is of different values for exploration and development).

Z_m = present value of the tax allowances including super allowance under the mining tax;

g = the first-tier mining tax that is based on gross revenue.

PCM = profit margin = 15 per cent, adopted from NRCAN website.

Note that by ignoring Quebec's super allowance for its north, this generic equation for exploration may be equally applied to the Quebec regime.

[21] For a similar underlying model, see Appendix A in Jack Mintz and Duanjie Chen, "Capturing Economic Rents from Resources through Royalties and Taxes," (October 2012).

DEVELOPMENT:

$$(2) \qquad (P_T - C_T')f_t' = (1+r)^{(T-t)}((1-\varphi_f)(1-u_f Z_f - u_p Z_p) - \tau^*(1-u)Z_m)/[(1-g/PCM)(1-\tau^*)(1-u)]$$

Where:

u_f = Statutory federal corporate income tax rate.

u_p = Statutory provincial corporate income tax rate.

u = $u_f + u_p$

Note that Z_m for development may differ from those for exploration and depreciable capital assets.

Also note that the term $(1- u_f Z_f - u_p Z_p)$ rather than $(1-uZ)$ is used here to accommodate Quebec's system in which, the depreciation allowance for development under the provincial income tax is different from that under the federal income tax (i.e., 100 per cent versus 30 per cent).

DEPRECIABLE ASSET:

$$(3) \qquad -C_K = (\delta+R-\pi)\{(1- uZ) - \tau (1- u) Z_m)\}/(1- u)(1- \tau)$$

Again, depending on the province, Z_m may differ from those for exploration and development.

PROCESSING (MILLING, SMELTING, AND REFINING):

$$(4) \qquad -C_K = (\delta+R-\pi)\{(1- uZ) - \tau(1- u)(Z_m' + Z_m^*)\}/(1- u)(1- \tau)$$

Where:

$Z' = a/(R+a)$ with a = mining-royalty depreciation rate for processing assets and $Z^* = \Lambda/R$ being the present value based on one dollar of capital invested in processing assets giving a stream of deductions based on a rate of the original cost without being reduced by depreciation.

Note that, smelting and refining are manufacturing activities according to the North America Industry Classification System. As shown in the latest Ontario input-output table (i.e., the Make Table), the processing activity within the mining industry is almost exclusively for concentration, for which the capital assets are typically subject to a straight-line annual depreciation allowance under the mining tax. That is, Z' = sum of $a/(1+R)^n$ with $n = 1...7$ and $a = 15$ per cent for the first six years and 10 per cent for the final year. The present value of the processing allowance is $V=m[1-X)/R$ with $X=1/(1+R)^T$ where m = processing allowance, R = nominal discount rate, T = life of asset.

The Ontario Model

Ontario's case is different from the generic model structure due to the resource allowance *(Θ)* under the provincial income tax in lieu of the mining-tax deduction. This allowance is more than double the mining tax that is deductible under the federal income tax. Therefore, the generic model is adjusted in two steps for Ontario:

First, the denominator is replaced taking the form of $X=[(1- u_f)\{1- \tau^*\} - u_p (1-\Theta)]$ with $\tau^* = (1+r)^{-(T-t-1)} \tau$ for exploration and development and $\tau^* = \tau$ for other categories of assets. The numerator is adjusted, following the equations below, for each of the three major types of assets: exploration, development and capital.

EXPLORATION:

$$(1') \qquad (P_T - C_T')f_t' = \{(1- u_f)\{1- \tau^*\} - u_p - \varphi(1-u)\}(1+r)^{(T-t)}/[(1-u_f)\{1- \tau^*\} - u_p (1-\Theta)]$$

DEVELOPMENT:

$$(2') \qquad (P_T - C_T')f_t' = \{(1-uZ)(1-\varphi)-\tau^*(1-u_f)\}(1+r)^{(T-t)}/[(1-u_f)\{1- \tau^*\} - u_p (1-\Theta)]$$

DEPRECIABLE ASSET:

$$(3') \qquad -C_K = (\delta+R-\pi)\{1- \tau(1-u_f)Z' - [u_f\{1- \tau\} + u_p (1-\Theta)]Z)\}/[(1-u_f)\{1- \tau\} - u_p (1-\Theta)]$$

PROCESSING ASSET (MILLING, SMELTING, AND REFINING):

$$(4') \qquad -C_K = (\delta+R-\pi)\{1- \tau(1- u_f)(Z_m'+Z_m^*) - [u_f+u_p (1-\Theta)]Z)\}/[(1- u_f)\{1- \tau\} - u_p (1-\Theta)]$$

with $Z_m' = a/(a+R)$ and $Z_m^* = \Lambda/R$ (the present value of the processing allowance based on one dollar of capital invested in processing assets giving a stream of deductions equal to Λ based on a rate of the original cost of assets).

Marginal Effective Tax and Royalty Rates

Marginal effective tax and royalty rates are estimated by taking the difference between (risk-adjusted) gross *(Rg)* and net *(Rn)* rates of return to capital as a share of the gross rate of return: $T = (Rg-Rn)/Rg$. *Rg* is estimated by subtracting depreciation from the value of marginal product. (Note: given the deductibility of losses under corporate and mining taxes, the cost of risk is reduced by corporate income and royalty tax rates so that *T* is independent of risk costs).

Main Parameters

Table 1A presents all the parameters required to construct the generic model described above and to build in the peculiar features of the Ontario system. Most of these input data are directly taken from statutory tax provisions and the general METRR model used for non-mining industries. But the rest, such as the present values of various allowances for different tax purposes, result from calculations formulated by province in order to accommodate the generic model.

TABLE 1A: INPUT DATA FOR THE MINING METRR MODEL

	BC	AB	SK	MB	ON	PQ	NB	NS	NF
Corporate income tax rate	0.25	0.25	0.27	0.27	0.25	0.27	0.25	0.31	0.29
Federal corporate income tax rate	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Provincial corporate income tax rate	0.10	0.10	0.12	0.12	0.10	0.12	0.10	0.16	0.14
Inflation rate	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018	0.018
Nominal interest rate on bonds	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056	0.056
Debt-asset ratio	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40
G7 personal tax rate on interest	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
G7 personal tax rate on equity income	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16	0.16
Nominal cost of equity financing (net of risk	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Provincial ITC for CEE/CDE	0.20	None	None	None	None	0.22	None	None	None
Statutory mining-tax rate	0.13	0.12	0.10	0.17	0.10	0.16	0.16	0.15	0.16
No. of years taken for exploration and development, of which:	4	4	4	4	4	4	4	4	4
No. of years taken for development	2	2	2	2	2	2	2	2	2
The pre-payout minimum mining tax	None	0.01	None	None	None	None	0.02	0.02	None
Price-cost margin: PCM=(P-C')/P	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Royalty rate as a percentage of PCM: g/PCM	NA	0.07	NA	NA	NA	NA	0.13	0.13	NA
Allowance under Mining tax									
For CEE	1.00	1.00	1.50	1.04	1.00	1.00	1.50	1.00	1.00
For CDE	1.00	1.00	1.50	0.20	1.00	1.00	1.00	1.00	0.10
For depreciable assets	1.33	0.15	1.00	0.20	1.00	0.30	1.00	1.00	1.00
For depreciable assets (processing)	1.33	0.15	1.00	0.20	0.15	0.30	1.00	1.00	0.25
Additional processing allowance	0.00	0.00	0.00	0.20	0.08	0.07	0.08	0.10	0.08
Allowance under corporate income tax									
Federal allowance for CDE	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Provincial allowance for CDE	0.30	0.30	0.30	0.30	0.30	1.00	0.30	0.30	0.30
Ontario resource allowance					0.25				
Ontario denominator									
For Canadian exploration expenses					0.70				
For Canadian development expenses					0.69				
For others					0.69				

Aggregated capital weight by assets type	
Depreciable assets	36.8%
Processing	2.4%
Land	0.2%
Inventory	16.8%
Aggregate-excluding E&D	56.2%
Canadian exploration expenses	30.6%
Canadian development expenses	13.2%
Aggregate-including E&D	100.0%

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Dr. Duanjie Chen is a Research Fellow at The School of Public Policy, University of Calgary. Over the past two decades, she served as a consultant to various international organizations, national government bodies, and business and non-profit organizations. She has published numerous articles and papers in the area of public finance.

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Jack M. Mintz was appointed the Palmer Chair in Public Policy at the University of Calgary in January 2008.

Widely published in the field of public economics, he was touted in a 2004 UK magazine publication as one of the world's most influential tax experts. He serves as an Associate Editor of *International Tax and Public Finance* and the *Canadian Tax Journal*, and is a research fellow of CESifo, Munich, Germany, and the Centre for Business Taxation Institute, Oxford University. He is a regular contributor to the National Post, and has frequently published articles in other print media.

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May 2013

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