

## POTASH TAXATION: HOW CANADA'S REGIME IS NEITHER EFFICIENT NOR COMPETITIVE FROM AN INTERNATIONAL PERSPECTIVE<sup>†</sup>

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### SUMMARY

Saskatchewan — and by extension, Canada — is the largest producer of potash in the world, accounting for over 30 per cent of global production. Perhaps the good fortune of having an abundance of such a valuable natural resource has engendered an approach whereby tax policy has not been considered a top priority. That would at least be one explanation for the alarmingly inefficient and uncompetitive potash regime that currently exists in Saskatchewan. New Brunswick's potash-taxation regime is at least somewhat better designed than Saskatchewan's, although it hardly stands as a model of efficiency. In both cases, poorly designed policies are hindering the provinces' economic potential and, in turn, Canada's.

Put bluntly, when compared against its international peers, Saskatchewan's potash-tax regime is not only the most complex and inefficient, it can also be the least competitive since its tax incentives conditioned on dated production levels and investment sizes cannot be used in perpetuity. Whereas its international peers tend to tax all potash investment projects equally, the marginal effective tax and royalty rates (METRR) on potash investment projects in Saskatchewan, either itemized or aggregated, are so widely varied that it is possible to calculate a METRR gap between two different projects as much as 48 percentage points.

The convoluted nature of Saskatchewan's regime benefits no one — not producers, investors, or the provincial government, which is left without any revenue certainty from its most significant natural resource. In fact, in recent years, where potash production and sales value rebounded substantially in Saskatchewan from 2009 levels, excessive tax allowances resulted in the province incurring three years of tax revenue losses from its potash production tax.

New Brunswick's potash-taxation regime is less complex than Saskatchewan's, but it is not efficient. The province recently introduced a price-sensitive royalty-rate structure that imposes a higher degree of taxation on risky projects. Greater efficiency can be achieved by using a royalty system that is mainly rent based.

Neither Saskatchewan nor New Brunswick needs to endure such a muddled and counter-productive approach to potash taxation. Simple solutions exist that would make both regimes far more efficient and competitive internationally. Both provinces should convert potash levies to an essentially rent-based royalty regime that ultimately taxes only revenues net of all the capital spending and operational costs. Any existing production- and sales-based ad valorem levies could be combined into a single royalty based on sales value, net of transportation and distribution costs and credited against the rent-based tax, thereby enabling, a steady revenue source for the government. Both unused capital and operational costs (deductible from the taxable rent) and sales-based royalty should be carried forward at the government's long-term bond rate.

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<sup>†</sup> We thank the editor, Bev Dahlby, and an anonymous referee for comments, and the two research associates, Philip Bazel and Ven Balaji Venkatachlam, for research assistance. We also appreciate the assistance of officials in Saskatchewan and New Brunswick in providing information on their provinces' royalty and tax regimes for potash.

Saskatchewan is the largest producer of potash in the world. Potash mining is a significant source of investment and jobs in Saskatchewan as well as revenues received by the government. New Brunswick is also a potash producer but on a much smaller scale. It too relies on the economic and revenue benefits from potash production.

In this paper, we evaluate Canada's potash tax regimes for their efficiency and competitiveness, with a greater focus on Saskatchewan, which is the dominant global producer. A royalty and tax regime is efficient if it results in the best allocation of resources in the economy to generate the highest standard of living. Businesses seeking to maximize profits will use price signals to determine how best to allocate capital and labour — they will, for example, use more capital and labour to produce output when prices and profits rise. If taxes and royalties vary across business activities, capital and labour resources in the whole economy will not be allocated to their best economic use. The loss in economic output arising from an inefficient allocation of resources will also harm competitiveness if an economy is relying on more costly economic resources to compete with foreign producers.

Through our cross-border comparative research we find that Saskatchewan's potash tax regime is not only the most complex and inefficient among its international peers but also the least competitive when the conditional incentives, based on incremental investment above threshold levels, are not sustainable for producers particularly during economic downturns. These conditional incentives under the potash-production tax were introduced on an ad hoc basis and appear to have lent a helping hand to the recent boom in potash investment. While fast write-offs may boost capital investment at a moment in time, they can result in excessive investment, drawing resources away from other productive opportunities in the economy. A downturn in the economy can result in a quick termination of investment, with firms facing relatively high potash taxes when the spigots are turned off.

Unfortunately, the restrictive conditions attached to these tax incentives based on investment size and/or production volume pose both constraints and uncertainty for future investment planning. Therefore, Saskatchewan's potash tax regime, on the whole, has become a hate-and-love story for business investors in the province,<sup>1</sup> which in turn trapped the government in a dilemma: giving it neither revenue certainty, nor an easy way out of the tax jungle.

In comparison, New Brunswick had a simpler regime that followed a conventional revenue-based royalty with a single rate of 6.25 per cent. To alleviate the deleterious effect of revenue-based royalties on marginal investments, New Brunswick introduced a variable royalty-rate structure in 2014 that applied to production value. This variable royalty-rate structure is price sensitive with the royalty rate varying between 6.25 per cent and 15.5 per cent based on the price ranging from \$325 (or below) to \$750 (or higher) per tonne. In effect, a price-varying royalty is an ad hoc way of introducing cost deductions for investment projects since rents would be higher when prices rise. Such a regime however, is inefficient, as it deters investment, especially in risky ventures, since the expectation of higher resource prices by producers increases the cost of investment associated with higher royalty payment. Like a flat-based royalty, it discriminates against high-cost projects with lower profit margins. New Brunswick could improve its potash royalty system by moving to a rent-based royalty (with a minimum royalty on sales that is creditable against the potash rent-based levy). Such a rent-based royalty structure will help enhance both tax efficiency and revenue stability.

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<sup>1</sup> Refer to Saskatchewan Chamber of Commerce, *Saskatchewan's Potash Royalty and Mining Tax Regime* (March 2011), which simultaneously criticized the government because it “charges a premium on its potash resources when compared to international levels” and adamantly demanded that the government maintain the current regime to preserve the growth of the potash industry in the province ([http://www.saskatoonchamber.com/file/Newsroom/Research\\_Papers/2011/ISSUE%20IN%20FOCUS.pdf](http://www.saskatoonchamber.com/file/Newsroom/Research_Papers/2011/ISSUE%20IN%20FOCUS.pdf)).

In early 2013, we published a research paper<sup>2</sup> proposing a reform of Saskatchewan's complex and inefficient potash tax regime in order for it to become a rent-based tax system.<sup>3</sup> This subsequent paper, in which we include New Brunswick, will first compare the Canadian potash tax regimes with their international peers in terms of simplicity, efficiency and competitiveness, and then investigate their revenue patterns over the past decade when the potash price went through wild swings. Based on this cross-border comparison and our investigation of the revenue patterns in both Saskatchewan and New Brunswick, we renew and refine our proposal for reforming Saskatchewan's present complex and inefficient potash tax system into a better rent levy. We also suggest that New Brunswick move to a simple rent-based potash royalty.

## **POTASH TAXATION: A CROSS-BORDER COMPARATIVE REVIEW<sup>4</sup>**

In the world of potash mining, Canada is the top producer, accounting for over 30 per cent of global production, followed by Russia, Belarus, China, Germany, Israel, Jordan, and the U.S. We therefore include these eight major potash-producing countries in our cross-border comparison to assess the impacts of their potash tax regimes on capital investment.

As Table 1 shows, in all major potash-producing countries, miners face both general company income taxes and specific mining taxes; and the specific mining taxes are all deductible for income tax purposes. Some countries such as Russia and Belarus also impose general taxes that are asset-based and hence apply to both mining and non-mining sectors. Saskatchewan also has a retail sales tax on some capital inputs that directly contribute to the cost of capital consumed in producing potash; to a lesser degree, a similar sales tax cost on capital inputs also affects U.S. potash miners. In contrast, New Brunswick has harmonized its sales tax with the federal goods and services tax, which is based on value added. Therefore, like most other potash-producing countries in this study, and unlike Saskatchewan, New Brunswick has virtually eliminated sales tax on intermediate and capital goods.

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<sup>2</sup> D. Chen and J. Mintz, "Fixing Saskatchewan's Potash Royalty Mess: A New Approach for Economic Efficiency and Simplicity," *SPP Research Papers* 6, 7 (February 2013), <http://policyschool.ucalgary.ca/sites/default/files/research/mintzchen-potash-online.pdf>.

<sup>3</sup> That paper was noticed by the Government of Israel, the sixth-largest potash producer in the world, and led us to expand our research to cover all major potash tax regimes around the world and help formulate a rent-based potash tax structure for the Israeli government. The outcome of this expanded research is our report prepared for the Second Sheshinski Committee on Mining Royalty and Tax Regime Issues: J. Mintz and D. Chen, *An Evaluation of Israel's Resource Fiscal Regimes for Non-Oil and Gas Resources* (June 9, 2014), [http://www.mof.gov.il/Committees/NatureResourcesCommittee/SeconedOpinion\\_EvaluationOfIsrael.pdf](http://www.mof.gov.il/Committees/NatureResourcesCommittee/SeconedOpinion_EvaluationOfIsrael.pdf).

<sup>4</sup> This review is largely drawn from our recent report prepared for the Second Sheshinski Committee on Mining Royalty and Tax Regime Issues: *ibid*.

**TABLE 1: FISCAL REGIMES FOR NON-OIL AND GAS MINERALS: A CROSS-COUNTRY OVERVIEW (2013)**

	Canada/ Saskatchewan	Canada/New Brunswick	Belarus	China	Germany	Israel	Jordan	Russia	The U.S./ New Mexico
<b>Corporate income tax (total government)</b>	27 per cent	27 per cent	19.8 per cent (incl. an 18 per cent CIT and a 10 per cent surtax as a contribution to an "innovation fund").	25 per cent	30.2 per cent (incl. federal and sub-national rates).	26.5 per cent (2014)	14 per cent for mining industry.	20 per cent	37 per cent (incl. the 31.85 per cent federal CIT and the 7.6 per cent state CIT).
<b>Exploration expenditures</b>	Expensed	Expensed	No special provision but follows the financial accounting, which is most likely an amortization over the estimated life span.	No special provision but treated as depreciable assets.	No special provision but treated as depreciable assets.	Successful exploration is amortized and unsuccessful exploration is expensed.	No special provision but treated as depreciable assets.	Assumed to provide a 30 per cent initial allowance with the remaining 70 per cent amortized within the length of useful life.	Election between: (1) 70 per cent deductible with the rest 30 per cent amortized within five years and (2) a 10-year amortization.
<b>Development expenditures</b>	30 per cent annual allowance on declining balance.	30 per cent annual allowance on declining balance.	No special provision but follows the financial accounting (see above).	No special provision but treated as depreciable assets.	No special provision but treated as depreciable assets.	Capitalized and amortized according to the useful life.	No special provision but treated as depreciable assets.	Assumed to provide a 30 per cent initial allowance with the remaining 70 per cent amortized within the length of useful life.	Same as for exploration expenditure.
<b>Depreciation</b> (SL = straight line, DB = declining balance, B&S = buildings and structures, M&E = machinery and equipment, MACRS = modified accelerated cost recovery system.)	25 per cent DB annual allowance for majority of depreciable mining assets.	25 per cent DB annual allowance for majority of depreciable mining assets.	Tax depreciation premium (TDP): 10 per cent for B&S and up to 20 per cent for other assets; such TDP reduces the base for the annual depreciation allowance, which follows financial accounting practice.	Buildings: five per cent SL; M&E: 10 per cent SL; Automobiles: 25 per cent SL; Electronic equipment: 33.3 per cent SL.	Buildings: three per cent SL; M&E: six-12.5 per cent SL; Automobiles: 16.6 per cent SL; PC and related equipment: 33.3 per cent SL.	B&S: 1.5 per cent-6.5 per cent SL; M&E: six-20 per cent SL (M&E for mining: seven per cent-20 per cent SL); Automobiles: 15-25 per cent SL; Computers: 25 per cent. Accelerated depreciation allowance available for multi-shift use of assets.	Industrial buildings: four per cent SL; M&E: 10-20 per cent SL; Automobiles: 15 per cent SL; Computer equipment: 25 per cent SL.	Initial allowance of 10 per cent (for long-life assets) and 30 per cent (for assets with a useful life of three-20 years); officially specified useful life ranges from two to 30+ years, both SL and DB methods are allowed.	The MACRS categorizes depreciable assets by their useful lives: Buildings: 39 year; M&E: seven or 12 year; Motor vehicles and computer equipment: five or 12 year.
<b>Inventory accounting</b> (FIFO = first-in-first-out; LIFO=last-in-last-out)	FIFO	FIFO	Both FIFO and weighted-average-cost accounting are allowed.	FIFO or weighted-average-cost; LIFO is not allowed.	LIFO is allowed but not FIFO.	Actual, average or FIFO; LIFO is not allowed.	FIFO	Both FIFO and LIFO are allowed.	Optional

	Canada/ Saskatchewan	Canada/New Brunswick	Belarus	China	Germany	Israel	Jordan	Russia	The U.S./ New Mexico
<b>Mining tax</b>	Crown royalty (CR): 2.1 per cent-4.5 per cent on production value; Production tax: base payment (BP): 35 per cent of profit with a tight band of limits between \$11 and \$12.33 per tonne; Profit tax (PT): 15 per cent under an indexed profit cap, beyond which 35 per cent applies. See Box 1 for details on both Crown royalty and production tax.	Crown royalty: Based on production value with price-sensitive rate structure, with the royalty rate ranging from 6.25 to 15.5 per cent corresponding to potash price/tonne from \$325 (and below) to \$750 (and above).	A mining tax levied as a per-unit fixed amount, which is 972 rubles (or \$0.09); there is also an export duty for potash, which is set at 60 euros per tonne for 2014.	State mining royalty: 15 yuan/tonne, or 10 per cent on revenue; deductible for CIT purposes.	A general mining tax of 10 per cent, which is based on the sales value. But this general rate is varied significantly by mining product and can be adjusted from time to time. (The royalty rate for potash is assumed to be the general 10 per cent.)	For potash chloride, a two-tier revenue-based royalty applies: Five per cent for sales up to 1.5 million tons, and 10 per cent otherwise; and the royalty base is the unpacked ex-work value excluding "the proper expenses of packaging, sales fee and insurance and transportation" and a further 10 per cent deduction.	Ad valorem royalty based on sales is 125 dinar per tonne for potash; maximum 25 per cent of net profit. There are also a variety of annual mining fees largely based on per square kilometer of land for mining (e.g., exploration permits, prospecting licences, certificates of discovery and mining rights) and the type of mineral production.	Mineral-resources extraction tax is based on the sales value net of VAT (and customs duties) and transportation and delivery costs, or cost of production; the tax rate is four per cent for Apatite-nipheline, apatite and phosphorite ores.	There are two parallel state levies on potash mining: (1) The state severance tax for manganese is 0.125 percent; and (2) the state resource excise tax: 0.625 per cent including a 0.5 per cent resource tax and a 0.125 per cent processors tax. There appear to be royalties on potash payable to property owners: the federal royalty is one per cent and the state royalty two to five per cent by type of potash product. Both royalties are based on the sales value.
<b>Other taxes</b> (excluding property taxes)	Provincial sales tax on some of the capital inputs.		There are numerous other levies along with conditional exemptions.	N/A				Asset tax up to 2.2 per cent, on fixed assets only.	State sales tax on some of the capital inputs.

**Sources:**

1. *Canada: various government sources including both official websites (e.g., <http://www.nrcan.gc.ca> and <http://economy.gov.sk.ca/Potash-Tax-Guide>) and our direct contact with government officials (e.g., officials at the New Brunswick Ministry of Energy and Mines).*
2. *Belarus: Ernst & Young, Worldwide Corporate Tax Guide (2014); and Tax Code of the Republic of Belarus, Chapter 20, and the Application 10 ([http://www.wipo.int/wipolex/en/text.jsp?file\\_id=230139](http://www.wipo.int/wipolex/en/text.jsp?file_id=230139)).*
3. *China: various websites in Chinese including: [www.ccin.com.cn/ccin/news/2013/09/11/274974.shtml](http://www.ccin.com.cn/ccin/news/2013/09/11/274974.shtml).*
4. *Germany: Federal Mining Act, at [http://faolex.fao.org/cgi-bin/faolex.exe?rec\\_id=059848&database=faolex&search\\_type=link&table=result&lang=eng&format\\_name=@ERALL](http://faolex.fao.org/cgi-bin/faolex.exe?rec_id=059848&database=faolex&search_type=link&table=result&lang=eng&format_name=@ERALL).*
5. *Israel: Based on information provided by the Israeli Ministry of Finance.*
6. *Jordan: <http://www.nortonrosefulbright.com/knowledge/publications/100673/mining-in-jordan-10-things-to-know#section8>.*
7. *Russia: <http://www.russian-tax-code.com/PartII/Section8/Chapter25.html>, for Tax Codes of the Russian Federation," Chapter 25; <http://www.russian-tax-code.com/PartII/Section8/Chapter26.html>, for "The Mineral Resource Recovery Tax"; and <http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Tax/dttl-tax-russiahighlights-2014.pdf>, for general company taxation.*
8. *The U.S./New Mexico: U.S. Master Tax Guide (2013), 344-45, for "mining company's expenses"; <http://www.tax.newmexico.gov/> for both resource excise tax on potash and severance tax on manganese; and <http://www.bizjournals.com/albuquerque/stories/2004/12/06/daily12.html?page=all>, for federal and state royalty on potash.*

Saskatchewan has overly complex potash taxes including a production-based royalty, a potash-production tax (hereafter “potash tax”) consisting of a base payment and a profit tax, and a revenue-based surcharge targeting all resource extractive sectors; and these levies are designed to interact with each other and, in particular, the two-layer potash tax is embedded with tax incentives under various conditions, such as investment sizes and production volumes, varying by project vintage. For greater clarity, Box 1 summarizes these levies and their interplays.<sup>5</sup>

#### **Box 1: Saskatchewan’s Potash Fiscal Regime**

**The Crown royalty:** The effective royalty rate ranges from 2.1 to 4.5 per cent and the royalty base is the value of production priced for the lowest grade of product.

**The potash-production tax: Two layers:**

- (1) The base payment: the tax rate is 35 per cent and the tax base is a minimum of \$11 and maximum of \$12.33 per K<sub>2</sub>O (potassium oxide) tonne. The total base payment provides a credit for the Crown royalty and an additional one per cent resource credit that is based on the gross revenue. After these credits, any positive balance of base payment is creditable against the profit tax (see below) and negative balance is “restored” to zero. A 10-year holiday is provided for new investment projects.
- (2) The profit tax: the tax rate is two-tiered, based on an annually adjusted profit bracket, which is \$66.17 per tonne for 2014: 15 per cent on profit up to \$66.17 and 35 per cent otherwise. The maximum taxable volume is the average sales in 2001–2002 for firms that existed then, and 75 per cent of total sales up to 1 million tonnes for newcomers. Under this profit tax, a 120 per cent allowance is provided for both exploration and development expenditures. Investment in depreciable capital exceeding 90 per cent of the 2002 investment level is also entitled to a 120 per cent allowance, and investment below 90 per cent of the 2002 investment level is written off at 35 per cent on a declining-balance basis.

**The resource surcharge:** Three per cent on the sales value, akin to an ad valorem royalty but under the name of provincial capital tax.

As for New Brunswick, a newly introduced variable royalty structure took effect in 2014. This variable royalty-rate structure is price sensitive and is based on the production value. The bottom rate of 6.25 per cent applies to production value when the price is at or below \$325 per tonne, and the top royalty rate of 15.5 per cent applies when the price is at or above \$750 per tonne; when the price varies between \$325 and \$750, the royalty rate adjusts proportionately between 6.25 and 15.5 per cent. For example, if the price is midway between \$325 and \$750, or \$537.5 per tonne, the royalty rate would be the mid-point between 6.25 and 15.5 per cent, or 10.875 per cent.

In comparison, most other potash-producing jurisdictions including China (with its newly introduced pilot mining-tax regime for potash),<sup>6</sup> Germany, Israel, Jordan, Russia and the U.S. follow a conventional ad valorem royalty that is largely based on gross mining revenue, net of transportation and distribution cost. In Belarus, in lieu of a mining royalty, the government collects a unit-based export duty that impacts the cost of capital similar to a revenue-based royalty. In the meantime, Belarus, Jordan (with its additional annual mining fees), and China (with its unreformed mining-tax regime) also collect a fixed amount of mining levy that is either unit based, or differs by type of mining activity combined with

<sup>5</sup> For more details, refer to Chen and Mintz, “Fixing Saskatchewan’s.”

<sup>6</sup> China has introduced an ad valorem royalty for potash mining, which is implemented only in Hubei province as a pilot project. The rest of its potash industry is still paying a fixed royalty of 15 yuan per metric tonne (about \$2.50 per tonne)

or without other criteria (such as area of land used). All countries allow their royalties or mining taxes targeting potash and any other industrial minerals to be deducted for income tax purposes.

As is well known, the conventional revenue-or unit-based resource levies are inefficient, as their taxing bases are production or sales value and independent of costs. Hence, the effective tax rate on the return to capital moves in the opposite direction from mining margins. That is, for a given revenue-based statutory royalty rate, a higher margin is associated with a lower effective tax rate on profitability.

Saskatchewan's potash-production taxes are intended to avoid such an inefficient revenue-based royalty through some sophisticated crediting mechanisms. Unfortunately, the ultimate potash-mining taxation in Saskatchewan, in the name of a production tax, is affected by profit-insensitive restrictions that substantially diminish its correlation with profits; furthermore, the ad hoc tax incentives significantly hamper tax efficiency by distorting the level and structure of investment.<sup>7</sup> Therefore, Saskatchewan's potash regime is less efficient than its international peers because the latter at least tax all their potash investment projects more neutrally and with less distortion.

To our observation, and as pointed out in our previous paper,<sup>8</sup> the main problems with Saskatchewan's potash mining tax regime are the following.

1. The royalty, which taxes potash mining value with great precision through a finely designed grading scheme,<sup>9</sup> is further complicated by its interaction with the base payment under the production tax (see below).
2. The base payment of the potash tax virtually results in zero revenue<sup>10</sup> by providing credit for the aforementioned revenue-based royalty and an additional one per cent (revenue-based) resource tax credit (should the royalty itself be insufficient to offset this base payment). Not to mention the 10-year tax holiday for new investment projects or the base payment's creditability against the profit tax (see below) for "mature" projects. It is therefore an unnecessary layer that adds complexity and distortions to the entire potash tax regime.
3. The profit tax, the second layer of the potash tax, appears to be the only substantive part of the potash tax in terms of generating revenue. But because this profit tax is "discounted" by so many conditional incentives that are intended to encourage investment, its tax impact varies widely among potash miners by their investment sizes and vintages. On the whole, the design flaws make this seemingly profit-sensitive tax lack the transparency and efficiency of a rent-based tax that taxes only the cash flow net of both operational and capital costs.
4. The resource surcharge is a de facto revenue-based royalty under the name of the corporate capital tax. Therefore, combining this tax with the production-based royalty into a single royalty based on revenue would help simplify the potash-tax administrative and compliance process.

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<sup>7</sup> For the chronological development of Saskatchewan's potash royalty and mining-tax regime, refer to Saskatchewan Chamber of Commerce, *Saskatchewan's Potash Royalty and Mining Tax Regime* (March 2011).

<sup>8</sup> Chen and Mintz, "Fixing Saskatchewan's."

<sup>9</sup> According to The Subsurface Mineral Regulations (1960), the royalty rate ranges from 4.25 to nine per cent according to the grade of mine-run ore as measured by the percentage of potash contained, ranging from below 21 per cent to 45 per cent or higher; with every percentage-point gap in potash density, the royalty rate changes by 0.15 percentage points. Because the royalty base is the production (not sales) volume multiplied by 49 per cent of the published selling price for the lowest grade of product, regardless of the actual grade of the product sold, the effective royalty rate ranges from 2.1 to 4.5 per cent (i.e., 49 per cent of between 4.25 per cent to nine per cent), as presented in Box 1.

<sup>10</sup> Chen and Mintz, "Fixing Saskatchewan's," 2-3.

In comparison, the newly introduced price-sensitive royalty-rate structure in New Brunswick is also intended to avoid inefficiency that arose from its previously revenue-based single-rate royalty. With a flat royalty, high prices lead to higher rents, which in principle should be subject to higher royalty rates. However, given the relatively stable all-inclusive cost, when prices rise (fall), the rent will rise (fall) faster (slower) in proportion to the price. The flat-rated royalties therefore tend to under-tax (over-tax) rents when prices rise (fall), pushing governments to undertake discretionary changes to the royalty regime during cycles. Further, the revenue-based royalty, by not allowing for a deduction of costs, discourages marginal projects, since prices just cover economic costs in the absence of a revenue-based royalty.

With a price-sensitive rate structure, there is a better correlation between rents and royalty rates as discussed above. However, the price-sensitive rate structure is an ad hoc approach to recognize the market-determined profitability of investments since costs are not explicitly deductible.

Further, during the normal price cycle, the commodity-price peak (trough) often leads to a crash (boom) in sales<sup>11</sup> with certain time lags in price adjustment. That is, when the price is still high (low) while sales are dropping (rising), the high (low) royalty rate associated with high (low) price can also affect profitability for miners in a pro-cycle manner. As a result, the newly introduced price-sensitive royalty structure may hamper both market efficiency and revenue certainty intended by the government in New Brunswick.

We will further support our criticisms of the potash royalty regimes in both Saskatchewan and New Brunswick in the following two sections by first comparing the effective tax rate for capital investment at the margin and then investigating the revenue pattern over the past decade mainly based on the government statistics.

## CROSS-COUNTRY MARGINAL EFFECTIVE TAX RATES FOR POTASH MINING<sup>12</sup>

Table 2 presents the marginal effective tax and royalty rate (METRR) for the potash mining industry comparing Saskatchewan and New Brunswick with the other seven major potash-mining countries.<sup>13</sup> To segregate the METRR impact of mining levies and those of the income and other taxes, we provide three sets of METRRs in the table: The first is with mining levies only; the second with both mining levies and company income tax; and the third adding all other taxes such as the assets-based tax (Russia) and the retail sales tax on capital inputs (Canada and the U.S.).<sup>14</sup>

Note that the METRR associated with any revenue-based ad valorem mining levies such as the Crown royalty in both New Brunswick and Saskatchewan is determined not only by the royalty rate but also

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<sup>11</sup> For example, according to the *Canadian Minerals Yearbook* (2009), Canada's potash sales and exports both dropped by 59 per cent in 2009 compared to their peak levels in 2008, even though the potash price peaked at \$872/tonne in February 2009 and its annual average for 2009 is the highest in history ([minerals.usgs.gov](http://minerals.usgs.gov)).

<sup>12</sup> This section is partially drawn from Chen and Mintz, "Fixing Saskatchewan's," footnote 1; and Mintz and Chen, An Evaluation, footnote 2. Note that the gaps in the METRRs for Saskatchewan between our 2013 paper and the current one are mainly associated with the change in some non-tax parameters.

<sup>13</sup> The marginal effective tax and royalty rate is the annualized value of corporate income, capital-related taxes, sales taxes on capital purchases and other royalties paid as a share of the pre-tax and royalty return on incremental dollars invested in assets held by the firm. For example, if the pre-tax-and-royalty rate of return is 10 per cent and the METRR is 40 per cent, then the net-of-tax-and-royalty rate of return is six per cent.

<sup>14</sup> In this category of METRR calculation, we ignore certain unit-based or activity-aligned levies in Belarus and Jordan due to the lack of specific information for converting them to computable parameters.

the price-cost margin, or profit margin. For example, if the potash price is, on average, \$380 per tonne,<sup>15</sup> and the cost of production per tonne is \$115,<sup>16</sup> then the profit margin is 70 per cent. Therefore, for a given ad valorem royalty rate, say 10 per cent based on revenue, the effective royalty rate based on profit is about 14 per cent (= 10%/70%). In our METRR calculation, we assume a 70 per cent profit margin for all the jurisdictions where the royalty is independent of commodity prices. For New Brunswick, we adjust the profit margin based on the price range to simulate its price-sensitive royalty-rate structure. For example, for its top royalty rate of 15.5 per cent, corresponding to an average potash price of \$750 and above, the profit margin used in our model is 85 per cent (= 1 - \$115/\$750) and higher; and similarly, the profit margin used for simulating its bottom rate corresponding to the potash price of \$325 and below is 65 per cent (= 1 - \$115/\$325) and lower. It is also noteworthy that for a given royalty rate, the higher the profit margin, the lower the METRR associated with this given royalty rate; and vice versa. Therefore, we present for New Brunswick a range of METRRs associated with its range of long-run price-sensitive royalty rates.

For Saskatchewan, we also present two numbers for each of the three categorized METRRs in Table 2. But the variation in Saskatchewan's METRRs has nothing to do with any price sensitivity; it lies in the differentiated capital allowance, which is 120 per cent for investment exceeding 90 per cent of a company's 2002 capital expenditure and 35 per cent otherwise. By applying the same 35 per cent profit tax associated with the profit per tonne exceeds the annual profit bracket (e.g., \$66.17 for 2014), the lower-bound METRRs are associated with the more generous 120 per cent capital allowance and the higher METRRs with the 35 per cent allowance. With the lower profit-tax rate of 15 per cent that applies to profit under the annual bracket, the corresponding two METRRs would be -6 and 10 per cent respectively, reflecting partly a much smaller tax benefit being gained under a lower tax rate.

**TABLE 2 MARGINAL EFFECTIVE TAX AND ROYALTY RATES, MAJOR POTASH-PRODUCING COUNTRIES, 2014**

	Mining levies only	Mining & corporate income tax	Mining, corporate income tax & all other taxes
Canada: Saskatchewan	-34.2 - 14.2	-12.4 - 17.7	0.3 - 22.6
Canada: New Brunswick	4.2 - 8.0	9.3 - 13.2	9.3 - 13.2
Belarus (excl. fixed-amount royalty)	6.7	13.9	13.9
China	6.3	19.5	19.5
Germany	6.3	21.9	21.9
Jordan	5.6	15.6	15.6
Israel (with the 10 per cent statutory royalty rate)	11	16.1	16.1
Russia	2.5	19.1	21.6
U.S.: New Mexico (with five per cent royalty)	3.8	16.8	20.7
Simple average across all countries*	6.9	16.9	18.1

\* To avoid confusion, this simple average does not include the lower bound of METRRs in Saskatchewan and New Brunswick.

By looking at the first set of METRRs that covers only mining levies, Saskatchewan's two METRRs — 14.2 per cent versus -34.2 per cent — form its upper and lower bounds and are respectively the highest and the lowest among all countries. As reviewed above, the mining levies in Saskatchewan virtually include three layers: the royalty based on a specified production value with a simple average rate of 3.3

<sup>15</sup> This is roughly the 2013 average price for potash, based on <http://www.indexmundi.com>.

<sup>16</sup> This is roughly the 2013 cash cost, based on PotashCorp's Potash Cost Profile, <http://www.potashcorp.com>.

per cent,<sup>17</sup> the three per cent resource surcharge, and the two-rate profit tax (i.e., 15 or 35 per cent at the margin) under the potash tax.

By adding the federal and provincial corporate income tax, which is 27 per cent in Saskatchewan, the higher METRR in Saskatchewan is increased by only 3.5 percentage points to 17.7 per cent, while the lower METRR jumps from -34 to -12 per cent. Further, including the provincial sales tax increases Saskatchewan's upper-bound METRR by another five percentage points. For the lower-bound METRR, the provincial sales tax adds almost 13 percentage points (-12.4 to 0.3 per cent) since the sales tax impact is greater when the pre-tax returns are lower, resulting from less corporate taxation due to incentives.

In the case of New Brunswick, we provide a range of METRRs for each column in Table 2 corresponding to the newly introduced provincial royalty-rate structure that is sensitive to the potash price movement within the range of \$325-\$750 per tonne. As the table shows, the METRR associated only with the provincial royalty ranges from 4.2 to eight per cent; it ranges from 9.3 to 13.2 per cent when the corporate income taxes are also included. Unlike Saskatchewan, the harmonized sales tax (HST) in New Brunswick is based on value added and has little impact on cost of capital. Note that, as pointed out above, for a given cost of production, the profit margin drops (rises) along with the commodity price. Therefore, when the price rises above \$750 per tonne while the royalty rate is fixed at 15.5 per cent, the METRR in New Brunswick will drop, due to a higher profit margin, to below eight per cent when only the royalty is considered, and below 13 per cent when both the royalty and corporate income taxes are included. Conversely, when the price drops below \$325 per tonne while the royalty rate is fixed at 6.25 per cent, the METRR will rise, due to a lower profit margin, to above 4.2 and 9.3 per cent respectively. In other words, the price sensitivity embedded in the current multi-rate royalty structure and its intended tax efficiency are limited to the price range of \$325-\$750 per tonne.

Compared to Saskatchewan and New Brunswick, the METRRs for their international peers are straightforward, despite their common insensitivity to profit. Taking only the mining levies, the modal METRR is around six per cent (Belarus, China, Germany and Jordan); when the company income taxes are included, the METRRs are within the range of 14 per cent (Belarus) and 22 per cent (Germany). The only three jurisdictions that impose further taxes are Saskatchewan, Russia and the U.S. These taxes added less than three percentage points in Russia and four percentage points in the U.S., but they added five to 13 percentage points in Saskatchewan.

Overall, Table 2 shows that Saskatchewan's potash tax regime is the most complex and distorting compared to New Brunswick and to its seven international peers. The METRRs in Saskatchewan, either itemized or aggregated, vary wildly among potash investors with a possible gap as wide as 48 percentage points (e.g., from -34 per cent to 14 per cent)! And this wide gap occurs only because new capital investment by any given company differs from its 2002 level to different degrees.<sup>18</sup> Furthermore, the upper-bound METRR in Saskatchewan (i.e., when the conditional tax incentives are unavailable) is the highest among all major potash-mining countries. That is, without the conditional tax incentives, Saskatchewan will be the least tax-competitive among its potash-producing peers in other jurisdictions.

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<sup>17</sup> Refer to Chen and Mintz, "Fixing Saskatchewan's."

<sup>18</sup> This variation is similar to an "incremental subsidy" for research and development (such as 30 per cent of R&D in excess of the average past five years). Subsidizing R&D investment on an incremental basis results in the bunching of investment when firms can access the incremental incentive. Firms hold off investments when planned capital expansion is less than the threshold. Incremental incentives therefore result in excessive pro-cyclical investment. For this reason, the federal government eliminated the incremental research and development incentive in favour of a flat-based incentive to avoid procyclical behaviour (see the Technical Committee on Business Taxation, Report, Finance Canada, 1997).

In comparison, New Brunswick appears to have a relatively competitive royalty and tax regime among its potash-producing peers. However, its newly introduced price-sensitive royalty-rate structure might achieve the intended taxing efficiency only to a certain degree while simultaneously adding complexity. As discussed below, the economic efficiency can be achieved by introducing a much simpler royalty system that is mainly rent based.

## RECENT TRENDS OF GOVERNMENT REVENUE FROM POTASH IN CANADA

In this section, we will explore the revenue pattern associated with the potash tax regimes in both Saskatchewan and New Brunswick. Note that the revenue pattern in New Brunswick reflects only the single-rated royalty regime before 2014 and has no relation with the newly introduced price-sensitive royalty-rate structure analyzed above. We also ignore the government revenue from potash leases, whose amounts are insignificant and relatively stable compared to potash royalty and tax collections in both provinces.

Based on the annual report published by Saskatchewan's Ministry of Energy and Resources, Figure 1 presents the annual government royalty and tax revenue (in millions of dollars) for 2001–2013.<sup>19</sup> It can be segregated into two categories:<sup>20</sup> (1) the sum of provincial royalty and resource surcharge revenues, which are respectively based on the production volume or sales value, and (2) the potash tax, or more accurately the potash profit tax.<sup>21</sup> To further explore these revenue patterns in relation to the industry's activities, we add three more lines to the figure: the annual potash-production volume (in billion K<sub>2</sub>O tonnes), the annual potash sales value (in billions of dollars), and the industry's annual capital spending (in billions of dollars).

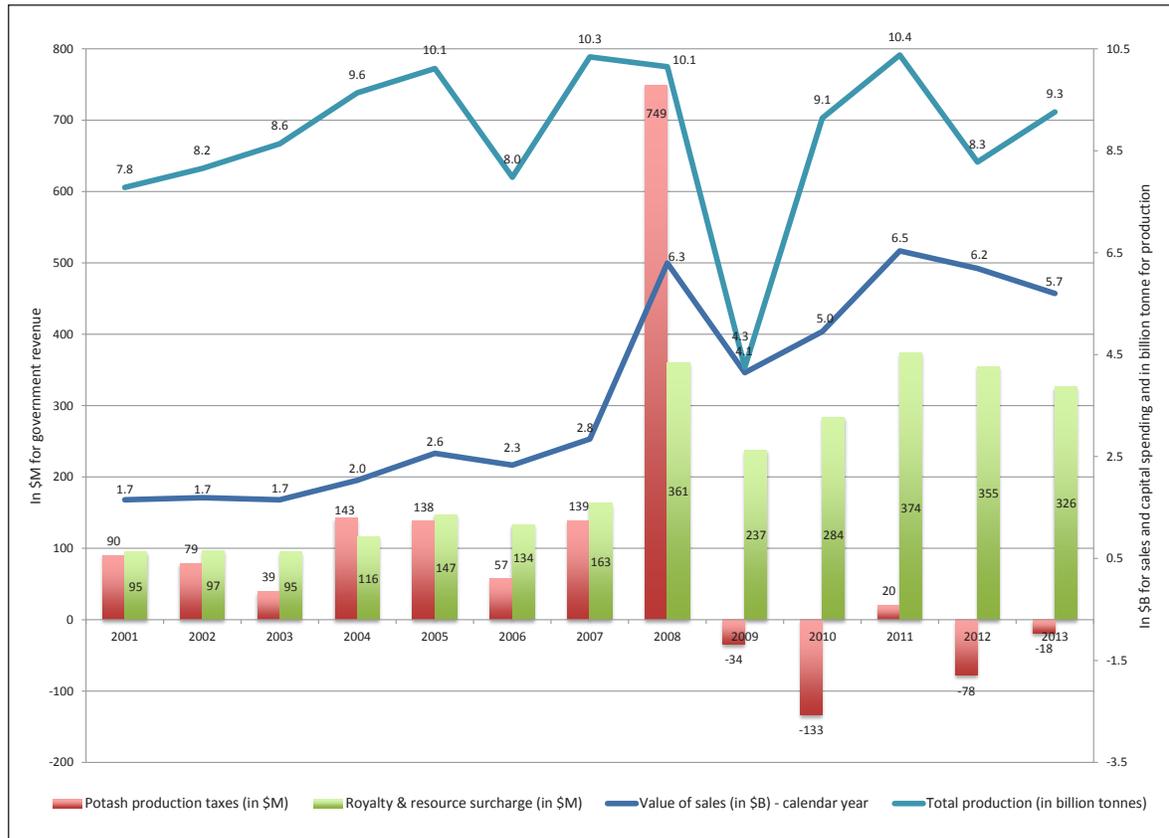
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<sup>19</sup> The original data on provincial royalty/tax revenue is for the government's fiscal year that starts April 1 of a given calendar year and ends March 31 of the following calendar year. We converted this fiscal-year-based data to that for calendar years.

<sup>20</sup> The government annual report does not segregate its potash revenue by royalty or tax items. Neither do potash companies report their precise royalty payment, which is normally embedded in the "cost of goods sold" on their financial reports. However, a news release by Potash Corp. posted on March 16, 2011 reported that its royalty and resource surcharge payments for 2010 were \$70 million and \$77 million respectively, which indicated a ratio of royalty to resource-surcharge of 10:11 for 2010. This ratio appears to be reasonable given that royalty is assessed based on the price of the lowest grade of product, while the actual sales value is associated with prices at and above the lowest grade of product. Based on this information and the annual resource surcharge reported by Potash Corp., we estimated that the sum of royalty and resource surcharge accounted for about 5.7 per cent of total potash sales revenue, which is reported in the government annual report. Applying this 5.7 per cent ratio, we estimated the total royalty and resource-surcharge revenue from potash mining in Saskatchewan.

<sup>21</sup> As pointed out earlier, the base payment as the first layer of the potash tax yielded little revenue mainly due to its limited tax base and the credit mechanism for the royalty payment.

**FIGURE 1 SASKATCHEWAN'S POTASH ROYALTY AND TAXES: GOVERNMENT REVENUE VERSUS INDUSTRY ACTIVITIES, 2001-2013**



Source: Saskatchewan Ministry of Energy and Resources, Annual Report, various years.

Three findings can be drawn from Figure 1.

First, the sales-based resource surcharge and the production-based potash royalty are two relatively stable, profit-insensitive sources of revenue to the government in terms of their relationship to potash sales. This is an intended revenue consequence by design.

Second, the potash-production tax fluctuated wildly from \$687 million for 2008 to a virtually negligible or even a negative amount after 2008.<sup>22</sup> Such fluctuations appeared to be affected negatively by the investment surge and positively by production and sales growth. The negative impact of the investment surge appears to outweigh the positive impact of the production and sales growth in more recent years.

For example, the potash-production tax revenue turned negative for 2010 and 2012–2013 and produced only \$10 million for 2011, despite the fact that both the production volume and sales value rebounded substantially from 2009 and exceeded their 2002–2003 averages. The key factor behind this disconnection between the potash tax revenue and potash sales was substantial capital spending, which in all four years exceeded the 2002 level of \$98 million by more than \$2 billion to \$3 billion. Given that the 120 per cent super allowance provided for capital spending exceeding 90 per cent of its 2002 level, over \$2 billion to \$3 billion of capital spending in excess of the 2002 level implies an allowance of more

<sup>22</sup> This observation is derived from the relationship between the “government royalty/tax revenue” and the total “royalty and resource surcharge,” which, for example, were respectively \$151 million and \$284 million for 2010, implying a \$133-million revenue loss associated with the potash production tax. It is also proved by Potash Corp.’s financial reports, which showed its total production-tax payment being -\$9 million for 2009 and \$0 for 2010.

than \$2.4 billion for both 2010 and 2011 and more than \$3.6 billion for 2012 and 2013. No wonder the government incurred a tax loss in three of these four years and generated very little revenue in 2011 through the potash tax! Only the revenue-based royalty collection kept the government in the black for its overall potash levies.

The flip side of this negative revenue story might be future revenue “surge” accompanied by future investment shrinking below the 2002 level. However, the more profound damage to the industry is the inter-temporal investment inefficiency caused by the government “incremental subsidy” based on the 2002 investment level. While investment boomed during years when prices recovered, a fall in prices discourages investment from taking place. Without much investment, potash royalties adjust upwards, thereby reducing producer cash flows, aggravating the incentive to invest.

And finally, in relation to the second finding above, the potash-production tax has not raised significant revenue sufficient to justify its complexity. Based on the implicit price index for GDP at market price (with 2007 = 100),<sup>23</sup> the accumulated potash-production tax revenue over 2001–2013 is below \$1.2 billion compared to the accumulated \$2.2 billion from royalty and resource surcharges. In fact, as shown in Figure 1, during the period 2001–2013, potash-production tax revenue was below the sum of royalty and resource surcharges for every year except for 2004, when the 120 per cent super allowance for capital spending had not yet been introduced, and 2008, when both the annual average price (\$630/tonne) and the total sales (over \$7 billion) peaked and the industry’s capital spending only started to jump and exceed \$1 billion. The main issue here is that the potash tax is far too complex in relation to its revenue capacity.

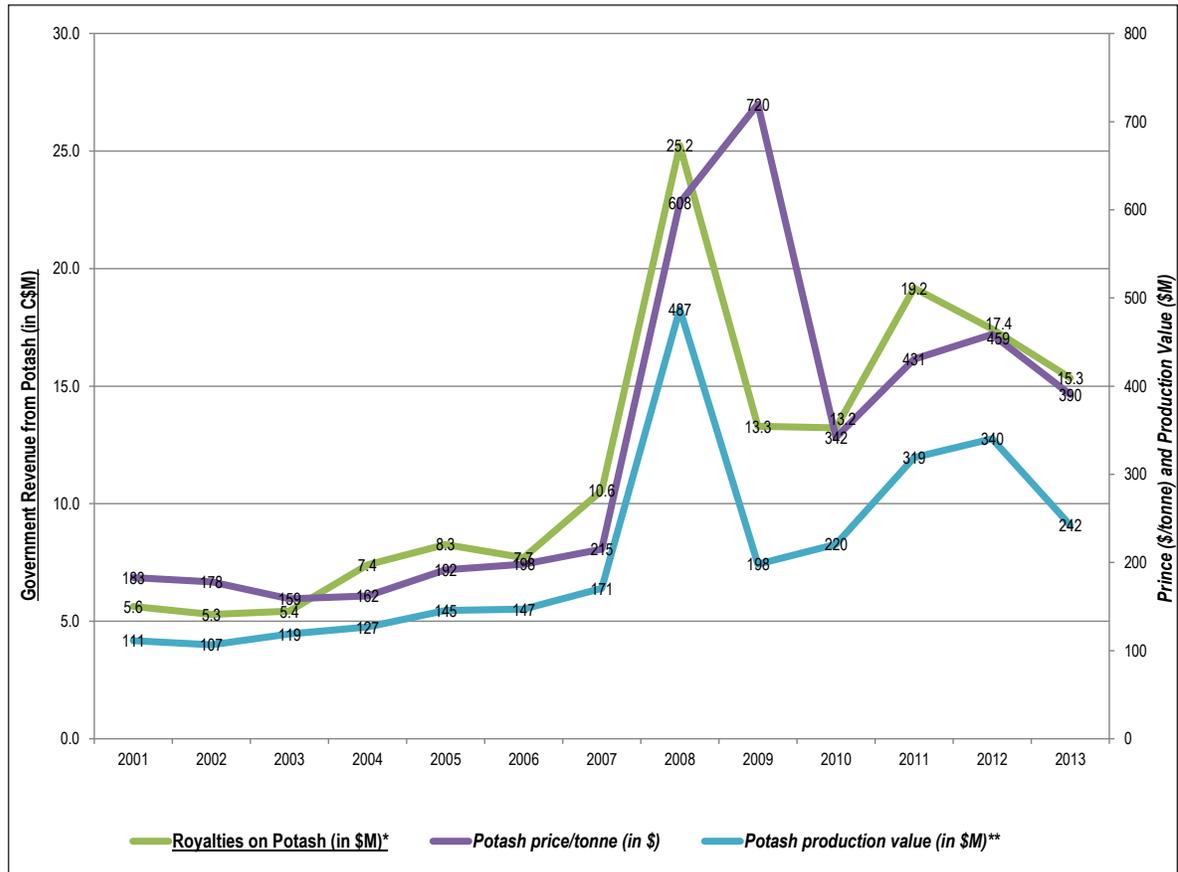
No doubt the 120 per cent super capital allowance embedded in the potash-production tax enticed rapid capital expansion in recent years. However, any tax-induced capital spending can result in the building up of excess capacity relative to that determined by market conditions. Such tax-induced capital spending also disrupts government revenue stability while complicating the tax regime unnecessarily. We therefore proposed previously, and reiterate below again, a simpler rent-based tax combined with a revenue-based royalty that both helps preserve market efficiency and revenue stability (see below).

Compared to Saskatchewan, the revenue pattern in New Brunswick is much simpler. As shown in Figure 2, the government revenue from potash closely follows the combined pattern in price and production, or production value, which we estimated based on the annual average potash per tonne and the potash-production volume in New Brunswick as published in the annual report of Potash Corp. This royalty-revenue pattern however, is relevant only to the single-rate royalty (6.25 per cent) that existed before 2014. From 2014 on, the current price-sensitive royalty-rate structure, as described and analyzed above, shall apply.

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<sup>23</sup> Refer to Statistics Canada, CANSIM Table 380-0102, Series V62471023.

**FIGURE 2 NEW BRUNSWICK GOVERNMENT REVENUE FROM POTASH: IN RELATION TO POTASH PRICE AND PRODUCTION VALUE, 2001-2013**



\* Obtained from New Brunswick "Public Accounts," Volume 2 (various years); all the numbers here are converted from the government fiscal year to calendar year, and the number for 2013 is our estimate.

\*\*Our estimate based on the annual production volume published on Potash Corp.'s annual report, Potash production (million tonnes KCl) in New Brunswick, and the average annual potash price per tonne based on the monthly potash price obtained from <http://www.indexmundi.com>.

## IMPROVING POTASH TAX AND ROYALTY REGIMES IN SASKATCHEWAN AND NEW BRUNSWICK

The above analysis shows that both provincial governments, Saskatchewan and New Brunswick, could significantly improve their royalty systems.

Saskatchewan's potash tax regime is highly complex and inefficient compared to its international peers. In designing Saskatchewan's potash tax regime, the government provides an "incremental tax subsidy" based on the 2002 investment level and restricts its revenue collection based on production level combined with mine vintage. Such incremental subsidy and sophisticated restriction on revenue collection provided some short-term competitiveness (as indicated by a METRR of 0.3 per cent, Table 2) while causing inter-temporal inefficiency in capital allocation. Simply abolishing them all would make Saskatchewan's potash regime the least competitive (with a METRR of 22.6 per cent) among its international peers.

New Brunswick's potash fiscal regime moved from a single royalty rate to a price-sensitive, fine-tuned multi-rate structure, which still yields a relatively low METRR mainly because of a more favourable Canadian corporate income tax structure compared to those of other potash-producing countries.

Is there any way out of this tax dilemma? The answer is an absolute yes. We suggest three significant reforms.

- Both Saskatchewan and New Brunswick should convert their potash levies to a simple rent-based royalty. In both cases, the current potash levies should be substantially simplified by applying a levy on cash flows. Capital spending and operational costs can be expensed so that only the net cash flow, or rent, is taxable. (And hence, no special incentive is necessary for stimulating capital investment.) To preserve the value of deductions given when the firm has little or no cash flow, unused deductions should be carried forward at an interest rate reflecting the degree to which the government shares risks with investors through the cash-flow tax. That is, with full risk sharing, the government long-term bond rate should be used, as it is with Alberta's oilsands royalty.
- To ensure a steady potash revenue to the government as resource owner, both provinces should consider combining any existing profit-insensitive levies into a single royalty that is based on the sales value, net of transportation and distribution costs or output. This revenue-based royalty would be creditable against the rent-based levy with any unused credits carried forward at the same interest rate as that for preserving the value of unused allowances under the rent-based royalty (i.e., the government long-term bond rate), as proposed above. Such a revenue-based royalty serves as a minimum tax-preserving revenue source for the government in the earlier years of the project, but results in less revenue in later years when the project yields greater profitability. This revenue-based royalty therefore primarily affects the timing of payments to the government rather than distorting revenues.
- Similar to New Brunswick, Saskatchewan should harmonize its sales tax with the federal GST, which will immediately reduce the METRR for Saskatchewan's potash industry from 22.6 to 17.7 per cent (Table 2), which would be below the average of the all-tax-inclusive METRRs among its international peers (18.5 per cent).

We firmly believe that Saskatchewan and New Brunswick can simultaneously achieve an efficient, stable and internationally competitive potash tax regime while attaining greater revenue stability by replacing the existing potash levies with a proper rent-based tax.

Our simulation shows that, by keeping intact all the non-resource levies (including the corporate income taxes and Saskatchewan's PST) and replacing all the existing resource levies with a 45 per cent rent-based royalty combined with a 6.5 per cent revenue-based royalty that is creditable against the rent-based royalty, the METRR for potash investment will be 17.7 per cent in Saskatchewan and 14.0 per cent in New Brunswick, both of which will be well below the average of their international peers, which is 18.5 per cent.

## CONCLUSIONS

This study compares Canadian potash tax regimes in Saskatchewan and New Brunswick with their international peers in terms of efficiency and competitiveness. We find both regimes wanting. The Saskatchewan profit tax is needlessly complex and distorting. New Brunswick's newly introduced potash royalty is sensitive to price changes but does not achieve desirable tax efficiency.

We specifically investigated the revenue patterns in both Saskatchewan and New Brunswick over the past decade when the potash prices went through wild swings. This investigation shows the current potash tax regimes in both provinces do not receive revenues sufficiently related to rents being earned by the industry, losing revenues during boom periods and raising too much revenue during downturns, pushing governments to continuously revise their royalty regimes and creating greater instability for the industry.

Based on our study, we renew and refine our proposal for reforming Saskatchewan's present complex and inefficient potash tax system into a better rent levy. We also suggest that New Brunswick move to a simple rent-based potash royalty.

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The James S. & Barbara A. Palmer Chair in Public Policy

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.

Dr. Mintz presently serves on several boards including Imperial Oil Limited, Morneau Shepell, and as Chair of the Social Sciences and Humanities Research Council. He is also appointed by the Federal Minister of Finance to the Economic Advisory Council to advise on economic planning.

Dr. Mintz has consulted widely with the World Bank, the International Monetary Fund, the Organization for Economic Co-operation and Development, and various governments, businesses and non-profit organizations in Canada.

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#### **ISSN**

1919-112x SPP Research Papers (Print)  
1919-1138 SPP Research Papers (Online)

#### **DATE OF ISSUE**

January 2015

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